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EXPLORING THE PROFESSIONAL GROWTH
OF A FIRST-YEAR ELEMENTARY MATHEMATICS TEACHER
UTILIZING THE MODEL OF HOLONOMY

A Thesis

Presented to the

Department of Teacher Education

And the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts in Elementary Education

University of Nebraska at Omaha

by

Joanna Philippi

July 2000

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Thesis Acceptance

Acceptance for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the
Requirements for the degree Master of Arts in Elementary Education
University of Nebraska at Omaha

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EXPLORING THE PROFESSIONAL GROWTH OF A FIRST-YEAR ELEMENTARY MATHEMATICS TEACHER UTILIZING THE MODEL OF HOLONOMY

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University of Nebraska, 2000

Advisor: Dr. Elliott Ostler

This thesis is in part a collaborative effort written by three CADRE (Career Advancement and Development for Recruits and Experienced Teachers) teachers working on their Master's degree while completing their first year as teachers working with different grade levels, but all specializing in the area of mathematics.

All three theses attempted to answer the same question. How did critical incidents impact our interactions with the students within our educational environments and influence our growth as an educator and a learner of mathematics? The researchers keep in mind the concept of holonomy while documenting and reflecting upon the events that transpired and consequently contributed to their professional growth. The information that was gathered was organized according to its relevance to each of the five states of mind: Consciousness, Craftsmanship, Interdependence, Flexibility and Efficacy.

The researcher ultimately found it impossible to answer the research question due to the inability to measure a concept as intangible as professional growth. It was determined that growth as a mathematician did not necessarily occur because the mathematical concepts addressed when teaching elementary math were not new or challenging to the teacher. While growth as a mathematician was not evident, the reflective journaling revealed those critical incidents significantly contributed to the researcher's growth as an educator.

Acknowledgments

This thesis is dedicated to two of the women who supported me most in my personal and educational endeavors, my grandmothers, Virginia Kelly and Elsie Hiatt.

Thank you to my parents, my brother and my husband. You listen to my endless stories and always share in my excitement.

An additional thanks to all of the people who have assisted me in the development of this thesis: My CADRE Mentor, my building mentor, and the thesis committee.

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CHAPTER I

The Problem

Section A. Introduction

This thesis is written by one of three first-year mathematics teachers exploring the beginning of a career in education. As a group we met regularly to discuss our progress, share research, and at times collaborate in writing portions of this study. Parallel to this first-year experience is participation in a graduate program, CADRE (Career Advancement and Development for Recruits and Experienced Teachers). This program enhanced my knowledge and supported me through the events I encountered during my first year of teaching.

Writing a thesis collaboratively was a concept pioneered by three graduate students at the University of Nebraska at Omaha during the 1998-1999 academic year. Jennifer Benard, J.P. Caruso, and Stacy Stewart were also new teachers completing their master's degree while participating in the CADRE program. First Footsteps: A Teacher's Perceptions and Explorations of an Urban Middle School during the First Year of Teaching (Bernard), First Footsteps: A Teacher's Perceptions and Explorations of an Urban High School during the First Year of Teaching (Caruso), and First Footsteps: A Teacher's Perceptions and Explorations of a Suburban Elementary School during the First Year of Teaching (Stewart) provided a crucial starting point for this thesis.

Upon concluding their studies, these three first-year teachers stated "while we believe that it has been a successful experience for us further research is recommended to explore its promise and value in similar projects" (Stewart, 1999, p. 70).

Taking into account this statement, two other first-year teachers and I planned to conduct a similar investigation that specifically examined the development of new mathematics teacher. We each earned a bachelor's degree in education between December of 1998 and May of 1999 and together we entered the CADRE program in June of 1999. I am writing this thesis from the perspective of an elementary school teacher, but have been able to gain numerous insights from two other first-year teachers at other grade levels, performing their own studies. Angela O'Connor earned a degree in secondary mathematics and physics education and taught 7th grade mathematics. Joining us in our research was Brent Larson who earned a secondary mathematics education degree and taught 9th and 12th grade mathematics. Each of us taught in a different school district within the Omaha Metropolitan Area.

Although we had several differences, we all shared the common bond of being first-year teachers whose main focus was mathematics. This collaborative effort offered many advantages to the study of the development of first-year teachers. We encountered many new and different situations both in and out of the classroom. Throughout the year we shared our experiences with each other through reflective journaling and discussion. We found that we often experienced similar problems, joys, and concerns. Each time that we met as a group we compared stories, offered advice, and examined situations.

We all taught mathematics, but our educational background seemed to distinguish us. At the beginning of the year, I saw myself growing specifically in the area of mathematics since I spent approximately half of my instructional time teaching math and had only a few mathematics courses during my undergraduate experience. Contrary to

my feelings, Angela and Brent felt they would grow primarily as educators since their background was heavily weighted in mathematics. Recognizing and appreciating that difference enabled us to become a stronger team. We were able to offer support and knowledge from our various perspectives, while our common bond as first-year teachers created a safe place to “. . . voice concerns, share joys and frustrations, and help one another deal with problems” (Delgado, 1999, p. 28). Research has shown that regular meeting times where teachers “can talk and listen to one another not only helps them cope with the many problems they encounter during their first year, but also gives them the chance to learn and grow professionally” (Rogers and Babinski, 1999, p. 38).

Since we were all first-year teachers we viewed each other with a less critical eye. This common feeling of newness and uncertainty seemed to lessen factors of intimidation and competition since we knew that we would experience similar situations throughout the year and would never be in a position to evaluate one another. By asking guiding questions of each other we helped ourselves since “the same event can be characterized differently because the lenses through which individuals interpret what they see and encounter are uniquely theirs” (Cooney, Shealy, and Arvold 1998, p. 307). We learned from each other as we reflected on how we might handle the situations that each of us faced. The fact that we were all first-year teachers allowed me to freely express emotions with the others that I was not comfortable sharing with experienced teachers in my building or with the mentors assigned to me.

Although we spent hundreds of hours sharing events and research separate studies are presented. Chapters one, two and four are very similar while chapter three, data

collection and analysis, is based strictly on my own personal research.

Section B. Purpose of the Study

Our collective goal was to thoroughly examine our growth through our emotions so that we could recognize how several elements could impact our growth as professional educators. Through our reflections we examined the educator and mathematician in each of us and looked at how various events influenced our teaching.

It became evident that we were not just teachers, but also students who studied and gathered information based upon the experiences we had with our colleagues and the students that we interacted with daily. In Experience and Education, John Dewey (1938) tells us that the best teaching tools are our experiences. It is necessary to study these incidents because “just as no man lives or dies to himself, so no experience lives and dies to itself...every experience lives on in further experiences”(p. 16). Throughout the year this research shaped how and what I taught, contributing to my growth as a professional.

I, as a first-year educator, was the subject of my own study collecting and reflecting on information I gathered. “The ordinary experiences of our teaching days are the essence of our practice. Using a guide to reflect on the experiences - either individually or with colleagues - is an entry to improving our teaching” (Hole and McEntee, 1999, p. 34).

During my first year of teaching, I explored how critical incidents affected my teaching at the elementary school level. I focused on several factors that influenced my growth as an educator and a learner of mathematics. These factors included, but were not

limited to, student and parent interactions, individual backgrounds, colleagues, curriculum, and standards.

Section C. The Problem

August of 1999 marked the beginning of my solo journey. For the first time I walked into the classroom and stared at a class roster that bore only one name at the top...mine. No longer was there a cooperating teacher or university field supervisor watching and waiting to provide advice or wisdom. As I prepared my classroom and awaited the arrival of my first students it became frighteningly clear to me that my undergraduate experiences had not fully prepared me for the year to come. I felt as though the required university courses had not been enough to help me recognize all the needs of individual students or understand the many roles that I would be asked to fill. I fought personal anxiety and doubt about my ability and my preparedness for what was to come.

I soon realized that my education was only beginning. Although my formal training had been completed, and I had obtained a certificate that allowed me to educate children in the state of Nebraska, my professional growth was far from over. I had a strong desire to know more about this profession and more about how to effectively present information to those with whom I was entrusted.

One line from an article that I read in a NCTM (National Council of Teachers of Mathematics) News Bulletin was continuously running through my head. "Our knowledge, or lack thereof, can be a stumbling block to our students' learning"(Lappan,

1999 b, p. 3). Staring at the curriculum guides and looking at the faces of my students only deepened my need for further knowledge and perpetuated my desire to discover how student interactions and the educational atmosphere influenced my growth.

Section D. Research Questions

How did critical incidents impact my interactions with the students within the educational environment and influence my growth as an educator and a learner of mathematics?

Section E. Definition of Terms

CADRE: CADRE is an acronym that stands for Career Advancement and Development for Recruits and Experienced teachers. This program, which has been in existence since 1994, is organized through the Metropolitan Omaha Educational Consortium (MOEC) and the University of Nebraska at Omaha (UNOmaha). Participants simultaneously complete their first year of teaching and their master's degree with the assistance and guidance of an associate/mentor that is an experienced teacher in the district in which the CADRE teacher is assigned. (CADRE Project Handbook, 1999)

Collaboration: Webster (1991, p. 259) defines collaboration as "to work jointly with others or together especially in an intellectual manner". For the purpose of these theses the term collaboration refers to the process of three teachers continually working together to reach a common goal – the completion of individual studies.

Critical Incident: "Critical incident reports are short narratives of events judged to be

particularly meaningful by participants in the events” (Branch, Pels, Lawrence, and Arky, 1997, p.223).

Curriculum: Curriculum includes the resources supplied by the district to assist students in comprehending and teachers in presenting concepts connected to the local standards.

Educator: An educator is someone who provides formal knowledge, training, information, or brings someone to an understanding of a specific content area.

Holonomy: Holonomy is a concept presented by Costa and Garmston. Holonomy consists of five states of mind: consciousness, craftsmanship, efficacy, flexibility, and interdependence. Each state of mind emphasizes individual development as a contributing member to the community. (Costa and Garmston, 1994)

- Consciousness: Conscious individuals “strive to monitor and reflect on their own thoughts and actions” (Costa and Garmston, 1997, p.149).
- Craftsmanship: Craftsmanship means “knowing that we can continually perfect our craft, and being willing to work to attain our own high standards, and pursue ongoing learning” (Costa and Garmston, 1997, p.151).
- Efficacy: This involves “knowing we have the capacity to make a difference and being willing and able to do so” (Costa and Garmston, 1997, p.150).
- Flexibility: Flexible people “have the capacity to change their mind as they receive additional data” (Costa and Garmston, 1997, p.150).
- Interdependence: Those who are independent “contribute themselves to a common good, seek collegiality and draw on the resources of others” (Costa and Garmston, 1997, p.152).

Learner of Mathematics/Mathematician: “Mathematicians pose problems; they predict outcomes, collect data, offer conjectures, and share strategies...Mathematicians communicate; they ‘talk math’ and ‘write math’. Mathematicians clarify then revise their ideas, and then they pose new problems” (Reed, 2000, p. 346).

Mentor: Webster (1991, p. 742) defines mentor as “a trusted counselor or guide”. In the CADRE project teachers are matched with a master teacher who assists with acquaint the new teacher with the district and answer any questions that the teacher might have.

Personal and Educational Background: The past experiences of the researcher, inside and outside of the official school setting that impacts perceptions, attitudes, and teaching styles.

Reflective Journaling: Reflective journaling, the primary method of data collection for this thesis, is a method of recording and analyzing daily experiences that involves a contemplation of emotions, scenarios, and learning experiences.

School Environment: The school environment is not merely the physical components (location, design, classroom setting, etc.) but everything included in the school building. This includes administration, teachers, support staff, parents, and students, the attitudes of these individuals and their relationships with one another.

Standards: Standards for mathematical instruction have been developed at the local, state and national level. The researchers have examined each of these documents and use the information within to guide daily instruction.

Vulnerable Observer: When writing this theses I allowed myself to become “vulnerable” to my educational experiences so that I could study my professional

development and “continue our labor through introspection”(p. 9). Ruth Behar (1996) explains in The Vulnerable Observer that by making ourselves “vulnerable” we examine situations from a new open point of view, one that molds our learning through all aspects of life.

Section F. Methodology

The primary method of data collection was daily reflective journaling by the teacher. Journal entries were the result of deliberately contemplating situations that occurred within the school and/or classroom setting involving students, staff, administration, parents, and community participants. In addition to regularly writing in my journal, I participated in frequent discussions with two other graduate students performing similar studies about the development of first-year math teachers. As researchers we often examined the impact of specific events and considered how altering the event, or our reaction to the event, might produce a more favorable result in a similar future situation. This method is similar to the style utilized by the Bernard, Caruso, and Stewart trilogy (1999). They stated that the criterion for their study was listening, learning from their experiences, and letting their past and present experiences dictate the course of their study (Bernard, Caruso, and Stewart, 1999).

I read the following caution in Crane and Angrosino’s book, Field Projects in Anthropology (1974), and wish to include it in this section to stress the importance of my responsibilities as a researcher.

...ethical consideration lies in the area which recent United States

publications call "Protection of the Individual as a Research Subject." This includes the ethnographer's duty to make and honor promises of maintaining the anonymity of informants and present the material as honestly and completely as possible, bearing in mind that the informants or their children and neighbors may read the ethnography someday. It also includes the idea that the ethnographer owes the host a great debt for their (sic) cooperation and must be careful to repay it in part by, for example, not reporting on them so that punitive agencies can take action against them. Maintaining anonymity of informants includes not only cases where names must be "changed to protect the innocent," but also the responsibility for not using materials that could be traced to an informant by local people and used to his or her detriment (p. 6).

I was deeply dedicated to protecting the privacy of those who were a part of this experience. I made every attempt throughout this study to respect the members of the school environment by ensuring the anonymity of the individuals that may have in any way contributed to this experience.

Section G. Limitations

This study was conducted during the 1999-2000 academic year at an elementary school in the Omaha Metropolitan Area by a first-year mathematics educator placed in the district as a participant in the University of Nebraska at Omaha's CADRE project. The perspective of this thesis is limited to my own personal perceptions and point of view while interacting with a fraction of my school's student population.

Section H. Summary

There is no question that beginning a career fosters growth in a personal and professional manner. I have spent the past five years preparing for this journey, but as an educator I want to further my growth professionally. Every improvement that I make to my teaching provides a better educational environment and attitude for my students, specifically in the area of mathematics. Throughout the course of this thesis I will examine how and where growth occurred. The thesis will conclude with my findings in reference to the problem statement: How did critical incidents impact my interactions with the students within the educational environment and influence my growth as an educator and a learner of mathematics?

CHAPTER II

Review of the Related Literature

In selecting literature, we looked for work that supported the methodology of our study as first-year educators who teach mathematics. The first pieces of literature that we examined were the Bernard, Caruso, and Stewart First-Footsteps thesis trilogy (1999). Adopting their methodology and considering their recommendations for further study as a guide opened up the possibilities of conducting additional research using the collaborative writing process demonstrated in these previous studies. While the authors of the 1999 trilogy focused their research on the perceptions of a first-year teacher in his/her individual school setting, I and the two individuals that I worked with chose to narrow our study to examine the personal and professional growth of a first-year mathematics educator. Similar to the First Footsteps thesis trio (1999), our journaling was also the result of acting as “vulnerable observers” in our individual school communities (Behar, 1996).

In preparing to write this thesis I found it beneficial to examine a book that was also read by the First Footsteps trilogy: The Vulnerable Observer by Ruth Behar (1996). This book emphasizes the importance of pulling the reader into a work through emotional attachment. As I grow as an educator, I develop an emotional connection to what I do in and out of the classroom. I want to continue to explore this emotion and understand how it helps me to develop as a teacher. Behar explains that, “When readers take the voyage through anthropology’s tunnel it is themselves they must be able to see in the observer

who is serving as their guide” (p. 16). As I wrote this thesis my goal was to express my experiences as a first-year teacher in such a way that readers could connect to all of my successes and all of the struggles along the way. My aim was to continuously explore and examine critical incidents. By writing vulnerably I was able to learn more about the teaching profession and ultimately more about myself. In order to write vulnerably I had to set aside a rule that was taught to me repeatedly—“never say I” in writing (p. 29). Beginning in elementary school and continuing through my college career I was taught to write in second and third person. This style restricts the ability to openly analyze all experiences and feelings. In writing this thesis I was often reminded of Behar’s words, “Writing vulnerably takes as much skill, nuance, and willingness to follow through on all the ramifications of a complicated idea as does writing invulnerably and distantly” (p. 13).

While collecting data and acting as “vulnerable observers” there were numerous events that fostered some type of change within me. These events are referred to as critical incidents because of their significant meaning to me. The articles “Basic Clinical Skills: The First Encounters” by Konner (1997) and “Becoming a Doctor: Critical-Incident Reports from Third-Year Medical Students” by Branch, Pels, Lawrence, and Arky (1997) describe some critical incidents from the medical school setting. Many encounters within the hospital setting shaped the actions, words, and thoughts of these new doctors. Just as these medical students identified critical incidents, I was able to recognize incidents that caused me to reexamine my methods and philosophy of teaching.

In “Where Crowded Humanity Suffers and Sickness”, Abraham (1997) focuses on

a family who goes to the hospital seeking medical attention. Readers are told not only about the clinical condition, but also the details that have influenced the current situation. This comprehensive examination of the patient, the family, and their way of life allowed the medical student to tell the reader about the ailment and also information that provides a better understanding of the subject.

Teachers must also try to understand the “whole child”. We do not simply deal with what happens to a child during the school day, but what happens to them in all aspects of their life. As educators we do our best to learn about each child and try to find ways to inspire learning. For success to occur, an educator cannot merely teach the content. The educator needs to take into account everything that each child is dealing with and become familiar with their way of life. To effectively teach, a teacher must know what make a student who he/she really is, as Abraham demonstrated.

When we record and write about our experiences as vulnerable observers, it is necessary to examine the role played by a teacher. This role is described in Zen in the Art of Archery when Herrigel (1953) tells of his six-year study of Zen through the art of archery. During his years of study his teacher, a Zen Master, instructs him. In his account, the relationship between the student and teacher is defined. The student shares his experiences and questions during his instruction and growth. He experiences much frustration when he is given what seems to be misdirection and indirect answers from his teacher, rather than the quick and easy solution to his problems.

Given that it is our professional title, it is easy to assume that we play the role of the teacher and the children we see on a daily basis are in the role of the student. We

possess the knowledge and try to share it with our students. In reality, though, we are also students. Our goal is to be considered masters in our profession, but it is rather unrealistic for us to expect to be masters without having any real experience. We look for effective disciplinary methods. We want each lesson to be perfect in content and presentation. We want to provide an ideal learning environment. As we experience our first year of teaching, we are reminded of the master's words, "And if I tried to give you a clue at the cost of your own experience, I would be the worst of teachers and would deserve to be sacked" (Herrigel, 1953, p. 52). We truly learn when we let our experiences happen naturally. We look through professional journals and ask advice from veteran teachers, but we don't find easy answers.

As first-year teachers there were times when we were at a loss for words and in desperate need of advice and support. Through the CADRE project we worked closely with a mentor who was accepting of our needs and open to answering our questions. Rowley (1999) explains in "The Good Mentor" that mentors are models of continuous learning. By serving as models, they illustrate the need to pursue professional development as they guide us during our first steps in that right direction. "Lifesaving 101: How a Veteran Teacher Can Help a Beginner" explains that veteran teachers that use "compassion with a critical eye" have the knowledge to support and guide new teachers through struggles during the first years of teaching (Delgado, 1999, p. 29).

Rogers and Babinski (1999) suggest the importance of support not only from a mentor but from also from new teachers who experience new and similar situations throughout the beginning of a teaching career in "Breaking Through Isolation with New

Teacher Groups.” By collaborating with other new teachers Rogers and Babinski believe “new teachers experience an open and honest exploration of issues” (p. 38). The support received from mentors and other new teachers contributed to our professional development.

“Because much of what an individual learns about teaching is through interactions within various communities, it seems reasonable to assume that those contexts are important influencing factors in what is learned” (Cooney, Shealy, and Arvold, 1998, p. 307). The primary method of data collection for these theses was reflective journaling. Each member of the group read several articles that defined and described this method of writing. It is important to clarify that reflecting goes beyond simply writing in a journal. Dewey stated that “reflection is an active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds supporting it and future conclusions to which it tends” (Yost, Sentner, and Forlenza-Bailey, 2000, p. 39). A reflective journal contains more than a chronicle of actions. Included in a reflection are the emotions before, during and after an occurrence. The reflection asks and attempts to answer questions. How has this changed me? What does it say to me? What does it say about me? What impact does this have on me?

Student teachers have the benefit of working with a cooperating teacher and university field supervisor. Both of these people serve as observers who frequently model and/or share suggestions. New teachers no longer have those extra eyes and ears to monitor. It becomes necessary for the teacher to find ways to learn through self-evaluation. By writing down those reflections it is possible to accurately share the

situation with others and even look back after some time to reexamine the event and what has transpired since that time, contributing to professional growth. “The ultimate purpose of reflection is to get us into the habit of thinking about our experiences” (Costa and Kallick, 2000, p.60).

Reflecting is perhaps challenging because it requires an individual to look honestly at failures as well as successes. By finding time to thoughtfully consider these events, or interactions with members of the school environment, it often becomes apparent when adjustments need to be made (Hole and McEntee, 1999, p. 34).

As we examined our growth, our CADRE mentors reminded us to consider the concept of holonomy. Cognitive Coaching: A Foundation for Renaissance Schools explains that “the term holonomy comes from the Greek: *holos* meaning ‘whole’, and *on* meaning ‘part’ ” (Costa and Garmston, 1994, p. 129). This definition implies that an individual continues to experiment, experience, and seeks improvement while he/she continues to learn from and participate in the community.

“Five Human Passions: The Origins of Effective Thinking” discusses the five states of mind: efficacy, flexibility, craftsmanship, consciousness, and interdependence. The states of mind are believed “to be the generators of effective thought and action,” (Costa and Garmston, 1994, p. 149). As individuals we work towards reaching set goals through self-motivated behaviors. These behaviors guide us through successes and failures, while we learn from our experiences. Holonomous people understand that they must improve themselves to enhance the organization in which they participate.

As a first-year teachers my aim was to move toward excellence in my classroom

through my learning and my teaching. In his address to CADRE teachers and associates on December 4th 1999, Dr. Stephen Kleinsmith, Assistant Superintendent of Human Resources for Millard Public Schools in Nebraska, stated that schools need “teachers who move towards excellence and away from mediocrity”. Because we strive to be the very best educators possible it is difficult to imagine a community proudly using the word “adequate” to describe their educational opportunities.

We encountered such contentment when reading the book Growing Up American: Schooling and the Survival of Community. In this book, Peshkin (1978) examines the power of community, specifically in the town of Mansfield, as it molds the educational setting. Over a period of two years his data collection involved observing and interviewing several individuals including students, teachers, administrators, board members, and parents. Repeatedly, the word “adequate” arose. One teacher stated, “I guess it’s as good a school as you can expect Mansfield to have” (p. 209). Peshkin points out however, “If Mansfield’s children lack educational opportunities equal to those available in larger cities and suburbs, they are not denied these opportunities by virtue of race or national origin, but by virtue of Mansfield’s size and prevailing ethos, which establishes the limits of excellence” (p. 200).

While we were disturbed by Mansfield’s contentment with an “adequate” education, we recognized that a community the tremendous power to influence the public school system. A community can either promote or resist growth and change. Of course it is important to be cautious when dealing with the education of students, but change should not immediately be perceived as bad or dangerous.

As we strive for excellence in the education of our students we must not only consider instructional methods, but also competence in our discipline. In “High-Quality Teachers or High Quality Teaching?” Lappan (1999 a) explains that all mathematics teachers must improve their knowledge of mathematics as they enhance their knowledge in the profession of teaching. She continues by saying that “. . . to improve our practice, we must engage in exactly such study and reflection” (p. 3). This “study and reflection” refers to time for planning, evaluation, and collaboration with our colleagues. As first-year teachers, we need to take advantage of all such opportunities for growth as professionals.

Mansfield was content with the “adequate” education it provided for its students. The community and therefore the schools feared change and continued to follow a routine that did not provide opportunities for growth and expansion. As I mature professionally I must not become content and fear change, but continue to educate myself and apply new strategies in my teaching. “There are no quick fixes or magic pill by which mathematics teaching and learning can be instantly improved, and to make matters more challenging, our own experiences can make us resistant to change” (p. 3).

Although there were times this year when I felt apprehensive about my ability to explain certain mathematical concepts, my interest in the subject did not waver. My colleagues and I quickly discovered that this appreciation alone was not enough to foster mathematical growth in our students. “Knowing What We Teach and Teaching What We Know” (Lappan, 1999 b) expresses the need for a deep understanding of the mathematics curriculum that we teach. “Our effectiveness, in large part, is enhanced or limited by the

depth and breadth of our understanding of mathematics itself” (p. 3).

Howard Gardner’s Mathematical-Logical Intelligence encompasses the actions of someone who finds ease in understanding mathematics; Marilyn Burns (1998) refers to it as Math Intuition. Most math teachers had positive, successful math experiences throughout school. It is sometimes frustrating to find that our explanations do not always help students to understand. Often we have not felt the overwhelming frustration that many students experience in a math class. In Math: Facing an American Phobia by Burns (1998), solutions that will help to enhance students’ outlook on mathematics so they will not leave math class with a fear or hatred of the subject are discussed.

When outsiders discover that we are math teachers it often evokes some type of negative response. Comments such as “I was never any good at math” and “I always hated math” have always saddened me but now inspire me to make my classroom an environment that promotes more positive thinking. I know that I have the ability to mold student learning through my teaching and my attitude towards the subject and their questions. In addition to improving math attitudes I wanted to make sure that I covered all of the information that students needed to have before moving on to the next grade level. I examined several documents produced at the district, state, and national level to ensure that I was covering appropriate concepts. All year long I found myself trying to balance my desire to improve student understanding and ability to communicate mathematically with the need to finish the textbook and help raise standardized test scores.

One document that provided much needed information was The National Council

of Teachers of Mathematics (NCTM) *Principles and Standards for School Mathematics: Discussion Draft* (October 1998). A goal for all teachers should be to create a comfortable classroom atmosphere that provides opportunities for mathematical growth in our students. Obviously I want to encourage a positive outlook of mathematics in our students; I want them to possess a “positive conception about themselves as learners of mathematics – about their interest, their competence, their attitude, and their motivation” (p. 211). The NCTM standards emphasize “mathematics for all” and discuss the need for students to be successful in a classroom that includes diverse learning backgrounds and experiences (p. 17).

The goals state that students will benefit from participating in a math classroom where the student objective is “learning to value mathematics, becoming confident in their own ability, becoming mathematical problem solvers, learning to communicate mathematically, and learning to reason mathematically” (p. 15). As a teacher I wanted students to be successful and used the NCTM Standards along with state and local standards as a guide to help me establish a solid mathematics foundation for my students.

The situations I encountered during my first year as an elementary teacher influenced my desire to continually improve my practices. Although I experienced newfound success, I also experienced some frustration that eventually made me a better educator. “Teachers learn best by studying, doing, and reflecting . . . and by sharing what they see” (Darling-Hammond, 1998, p. 7).

Chapter III

Data Collection and Analysis

Section A. Introduction

Every CADRE seminar has included some dialogue about holonomy. At times, I had to keep myself from rolling my eyes because it seemed like the same old discussion over and over again. Inside my CADRE binder, I have four copies of articles that all include similar information about holonomy. Each reference describes the five states of mind: Consciousness, Craftsmanship, Interdependence, Flexibility and Efficacy. At each monthly meeting someone posed a question about our professional growth in these areas. I halfheartedly participated in discussions, occasionally feeling as though it was a waste of time. It wasn't until the CADRE seminar in February that holonomy actually started to feel relevant to me. I suddenly realized that I had been growing in each of these five states of mind.

In February we participated in a carousel activity in which we walked around the conference room looking at and thinking about the states of mind, each boldly written on a large piece of butcher paper. Our task was to write down examples of how we used or developed that state of mind. Initially, I wasn't sure how I was going to come up with something to write for each state. However, when I started thinking and reflecting, the ideas began to flow. I was recalling events from the beginning of the year and realizing just how relevant all of this holonomy stuff was!

One month later, at our March meeting, all CADRE teachers received a handout that displayed a continuum for each state of mind. The directions stated, “Mark an ‘A’ where you were on the continuum when we first met in August. Mark an ‘M’ where you are on the continuum at the end of March”. When I was asked to honestly contemplate my professional development in each of these areas, I realized that my growth has certainly not occurred as a constant in one direction. Another interesting fact is that my opinion about where I stood on the continuum at the beginning of the year was grossly optimistic. Perhaps that is why my first semester was so difficult for me. My student teaching had gone very well. I had received high recommendations and been told by several people that I was a “natural” in the classroom. As a substitute teacher in the second semester last year, I faithfully carried a notebook with me everyday, jotting down bits of information about classroom management, activities and such. I spent my free time reading books about being an effective teacher. I spent far more money than I care to admit at school supply stores buying books about Multiple Intelligences and resources that I was sure would make me one of the best first-year teachers ever.

Because the primary method of data collection for this research is reflective journaling, several entries will be included in this chapter. The entries have been organized using the five states of holonomy. It became apparent when writing this chapter that several situations could apply to more than one state of mind. However, the decision about placement was made based upon how I felt that the event most directly affected my growth. The order of the states of mind-Consciousness, Craftsmanship, Interdependence, Flexibility, Efficacy-is deliberate. My rationale for this order is that

consciousness seemed to be the driving force behind all growth that occurred. Being aware of all of the dynamics in the classroom environment led to my active pursuit of improvement. The people around me (Interdependence) were often resources that contributed to my development in the area of Craftsmanship. In understanding the community that I was a part of (teachers, students, support staff, parents) I realized my need to be flexible. For me, it was when all of these elements connected that I truly felt as though I had the ability to be a positive influence in my students' educational careers (Efficacy).

Section B. Consciousness

When I reported to the school building in early August, several teachers and staff members shared some of the background concerning my 6th grade class. I was told that this was a difficult group of 6th graders, but I confidently stated that I was sure that it would be a good year and we would work through any problems together. When the first week proved to be a little more demanding than I had planned, I chalked it up to the newness. I was disappointed, but not alarmed.

When after a month I still felt a little shaky, I started to panic. Instead of feeling like a "natural" in the classroom, I felt like a disaster in the classroom. I started wondering if 6th grade was the grade for me to teach, then I started wondering if teaching was for me. For the first time in my life, I felt completely unsuccessful. I had never worked so hard and felt so ineffective.

During times of frustration I was constantly trying to figure out what was going wrong. Before I could make things better I had to know exactly what needed to be fixed. “Consciousness is a prerequisite to self-control and self-direction. Webster defines consciousness as the knowledge of what is happening around oneself and the totality of one’s thoughts, feelings, and impressions. To be conscious is to be aware of events both external and internal to oneself” (Costa and Garmston, 1994, p.138).

I think that it began when I was going into 7th grade. I distinctly remember lying in my bed checking and rechecking my alarm clock to make sure that I would not oversleep. No matter how hard I tried I could not fall asleep. The anticipation of the first day of school was simply too great. I would think about what I wanted to wear. I would think about my friends and my classes. I would wonder if I would be able to find my classes and if my teachers would be nice. Would I remember my locker combination? My brain was working overtime.

This insomnia problem of mine did not go away when I went to high school and it did not go away when I went to college. I would lie in bed staring at the textbooks that sat on my desk. Would the classes be hard? Would I be able to get everything done?

I expected that I would again be afflicted with this nuisance as I prepared for my first day as the teacher in the classroom. However, I did not realize that my insomnia would begin so early! Two weeks before I was to report to the new teacher meeting, I was in bed thinking and wondering. What would my kids be like? What would the parents be like? Would I be able to handle everything? As the digital glow next to me flashed new times, I became more and more convinced that I was not ready. What would

I say to them? I knew that the first few moments they were in the room were crucial. I didn't want to blow it.

Off and on for those two weeks I experienced restless nights. As the calendar days breezed by I fluctuated between confidence and complete fear, but one thing never changed. My brain was suddenly unable to stop. It didn't matter where I was or what time it was, I was thinking about school. At red lights I tried to picture the faces of the kids that I knew only slightly from my substitute teaching experience at the school. In church, while others were singing, I was rattling off lists in my head; seating chart-check; name-tags-check.

The night before the students were to begin school was almost entirely sleepless. I went over and over in my head my schedule for the day and my opening speech. I was determined to start the year off on the right foot.

Throughout the school year I experienced several nights in which I was unable to sleep. Sometimes my thoughts centered on a particular student that was having problems. Sometimes I was running through the changed schedule due to special activities. Regardless of the subject matter, it always helped me if I wrote down my thoughts. In one of my final journal entries I wrote:

The good and bad news is my brain still refuses to shut off at night. As I get closer and closer to that last day of school, I am still continuously contemplating. I still wonder what life is like for my students at home. I can't help but think about the fight that two of my girls have been in for what seems like weeks now. I speculate about their futures, and my future. I marvel at some of the strides we have made this year and I mull over my decisions and strategies.

I am living in fear that my sleep patterns will never return to normal.

More than any other time in my life I have thought deeply. I have questioned my philosophy. I have considered actions and reactions as though every decision was imperative. Never have I been more aware of my thoughts and feelings.

In discovering and investigating the five states of mind, I have very closely connected with consciousness. As soon as the school year was in full-swing, I started reflecting back on my own educational experiences and realizing why occasionally (okay, often) my primary emotion when walking out of the building was frustration.

It didn't take terribly long for me to discover that my recollections of school days were very different from the majority of my students. I was a good little girl who always asked the teacher if I could help. I finished my homework on time-if not early, and my hand spent more time in the air than it did by my side. My mom was almost always home when I came bouncing in the door and I was always able to share with her the good and bad events from the day.

Not only did my view of instruction and student responsibility contrast with some of my students, but the classroom setup and method of teaching was also very different. I was one of the students at my elementary school that was pulled out of the classroom for math class on a daily basis. As I recall there were four of us at my grade level, and everyday when the classroom teacher started the math lesson we collected our materials and traveled down the hall to a small classroom where another teacher sat waiting for us. We were considered capable of working at a faster pace than some of our classmates and a special teacher was there to help us as we worked on the computer, worked individually on textbook assignments or attacked problems as a small group.

When, as the teacher, I looked out over the faces in my classroom; I became painfully aware that this was not a setting with which I was familiar. In one classroom I had students who were so different in independence and understanding. I was looking at students who were fully capable of completing the math text with little or no help from me and one seat over was a student who had recently “graduated” from the learning center program where extra remedial assistance had been provided. When I asked all of the students to work on the same problem, I walked around the room and saw that some students were finished before I ever reached their desk and others were so overwhelmed that they did not even have the entire problem written down. The students who understood were bored when I took the time to sit next to a student who was struggling.

Undergraduate methods courses attempted to prepare me for educational diversity in the classroom, but as I looked at homework and test scores I felt as though I could not possibly handle the academic differences. What made the situation even more frustrating was that I was discovering that my own math experience was, at least in part, a disadvantage to me. In a journal entry on September 2nd I wrote:

I have come to a not-so-pleasant and not-so-revolutionary conclusion. Being good at math does not automatically admit you into the good math teacher category. In fact, I am beginning to feel as though it has some hindrance. Some days I find myself getting so frustrated with the students who don't catch on. I ask them to let me know when they are having difficulty and yet when they ask for help I find my patience wearing thin when they do not suddenly grasp the concept when I explain to them one-on-one exactly what I explained to the class moments before. I once heard someone say that insanity is doing the same thing over and over and expecting different results. I need to have that framed on my desk. I also need to make myself think about mathematical concepts in different ways. I want so desperately to help the students to feel successful in math and yet I add to their anxiety when I continue to make them feel like they just don't understand. I want to be patient and I want to be able to rephrase the

steps in a way that makes sense to them. While discussing this with the thesis group one member shared that she often will tell a student to give her a minute to think of a better way to explain it. One other member said that he sometimes has another student explain it.

This is something that I can not resolve tonight but it is something that I will continue to work on and I will continually remind myself that I do not want to perpetuate a fear or a hatred of mathematics.

As a student going through junior high and high school I remember students who hated math class. Most of them seemed to hate it because they didn't understand and no one was able to help them without making them feel stupid.

Part of consciousness has to do with understanding that school is just one portion of a child's life. There are so many other aspects that are pulling at them or driving them in a certain direction. I realize that there are so many events and people that impact their lives. Sometimes the students, or their parents, give me a glimpse of that life through formal or informal meetings. When I hear about their experiences outside of school, I see a piece of the puzzle that was always out of view for me. I always leave those conversations feeling as though I understand those children a little more deeply.

Sixth grade students lead very busy lives! It seems as though every student has a number of extracurricular activities to occupy their evenings and weekends. It was at soccer and volleyball games that I felt as though I was really getting a picture of the children's personalities. I was also able to see them interacting with siblings, parents and sometimes grandparents. I was able to see the type of family support system that was in place.

You can learn a lot about a child by observing them in a happy, enjoyable setting. However, it seems as though far more is learned when you observe a child in turmoil.

Based upon my own experiences, I know that the death of a loved one, human or animal, is stressful and emotional. This year two students had to have their cats put to sleep and another student was devastated by the loss of her dog who had been hit by a car. Because parents notified me, I was able to keep a close eye on those students and see how deeply they had been impacted by the loss.

Friday November 12th, 1999

It was a sad day in my 6th grade class. One of the girls came to class this morning and told me that she had a note from her dad. The note simply said that she did not have her homework done, she had a good excuse, ask her. I admit I was a little irritated with the note, but I asked her what was going on and she started to cry. Her dog, which was just in our classroom last Friday, was hit by a car and died last night. She was a mess and as a former dog owner and always dog lover I just felt terrible for her. She asked a couple of times if she could walk down to talk to the counselor and I, of course, let her do that. I know that she really wanted to go home and she told me that she didn't feel good, but I told her that today was probably just going to be a yucky day and that we would do our best to get through it. (Dad was at work; mom was out of town) We all managed to survive the day, but she failed a spelling test so I told her to study over the weekend and she could retake it on Monday.

It is difficult to watch children dealing with stressful situations. I particularly noticed the behaviors and emotions of two students who were dealing with the ugliness of divorce. The following journal entry describes what I discovered about one of my students one night after school

December 1st, 1999

I was so incredibly sad after school today. I often tell the kids that if they want me to read and respond to their journals they need to leave it on my desk or on the back table. Today when discussing journal topics one student explained that he wrote about his parent's divorce. After school I noticed that he had left his journal on the back table. I read the last couple of entries and I was just overwhelmed with what he is dealing with. Not only did he write about the divorce, he included a drawing at the bottom of the page. It looked as though it was a torn piece of paper

with his dad on one side, him, his mom and siblings on the other. By each face he wrote a word or two about how that person was feeling. The word 'sad' was written next to several faces, 'happy' next to one face and the word 'clueless' written next to the small child. Some of the people in the picture were crying. It just broke my heart to read about the custody situation and to really hear how painful this is for him.

This student had great difficulty completing tasks on time. I had previously been very frustrated with him because he regularly greeted me by telling me what homework he did not finish the night before. I still stressed the importance of completing work on time, but I found that I was far more patient with him and often spoke with him towards the end of the day to discuss what he would be working on at home that night.

Another student became incredibly emotional shortly after school started. I spoke with her often and eventually she shared with me that there was a lot of fighting going on at home and that she and her dad had moved out. I had planned to discuss the situation with the girl's father but was caught off-guard when he arrived for his conference.

September 29th, 1999

This was such a difficult conference. I anticipated Dad being the only parent in attendance because the student has been telling me for a few weeks that they are living with her aunt because her dad and step-mom have really been fighting. She has been incredibly teary for approximately the same length of time. I had planned to discuss that with her dad. (She has had three instances in the past 3 weeks when she literally BURST into tears for relatively minor events). I wasn't sure how he would respond and there was definite tension in the room so I just asked her dad if she had mentioned any problems with other students at home. I shared with him the crying episodes and am hoping that he perhaps made the connection with the separation.

Not long after this conference, I received a note from the father explaining that he was divorcing his current wife and that he and his daughter would be living at another

location.

The lesson that I have repeatedly had to remind myself of is that teaching is so much more than just standing up and presenting a lesson. As the educator, I need to be aware of my own background and how that affects my teaching. I also need to be aware of each student's personal experience and realize that influences outside of the school walls impact their ability to learn and be comfortable in my classroom.

Section C. Craftsmanship

There were numerous instances where my consciousness led to action. When I realized what was going wrong I searched for possible corrections and implemented new strategies. According to Costa and Garmston, having a strong sense of craftsmanship is comparable to performers. "They take pride in their work and consistently strive to improve their current performance" (1994, p.137).

As I prepared for my first year of teaching I was actually naive enough to believe that I could glide into the classroom with ease and confidence. I had completed my undergraduate work. My student teaching and substitute experiences had been enjoyable and several people had commented that I was going to be great in the classroom. Every time that I was in a person's classroom I took note of what I observed, decided which techniques looked effective and noticed things that I would never do in my classroom. I had spent the summer pouring over classroom management books. I knew that I would be teaching three sections of sixth grade math. Perfect, I thought. I have always been good at math. This should be easy!

Before the bell rang ending the first day in the classroom, my confidence had already diminished. By the end of the first two weeks, I was beginning to feel defeated. I was confronted with discipline problems that I didn't know how to handle and I knew that I desperately needed something more in my math teaching. I had difficulty getting the kids to enter my classroom and get ready to start the lesson. I had several students chatting constantly. One thing that was really frustrating me was that some students were not walking through the practice problems with us, and when it was time to work on the assignment they wanted help because they "didn't get it".

An article published by Phi Delta Kappan, "Maintaining a Life" by Margaret Metzger, provided me with some advice from a veteran teacher that I needed to hear. "How does a teacher move from competence to excellence? Partially it's just experience. If you expect excellence immediately, you degrade the craft of teaching. You would not expect to do brain surgery during your first month in medical school"(346).

I was not an excellent teacher at the beginning of this year. Looking back now, I still feel a lot like a stumbling, newborn horse. I try and I fall. I try and I fall. I see myself as a competent teacher, but I want to be an excellent teacher. I kept comparing myself to the great teachers that I had and I always fell short. This made me think that my kids deserved an excellent teacher, not a teacher who was just trying to keep her head above water.

There are many components that can assist in the development of a teacher from competent or adequate to excellent. As a first-year teacher there were many resources available to me. The school district and the University offered many opportunities for me

to improve my craft. This year I was able to attend several training sessions that both encouraged me and provided me with a number of strategies that improved my teaching.

In addition to the official learning experiences, each day seemed to be filled with events that encouraged me to refine my teaching. Every time a lesson flopped or I saw a questioning look in a student's eyes I thought about what I had been doing and tried to find a new way to fix it.

I did a lot of adjusting after the first two math tests. I found out that the homework that was being turned in to me was not necessarily a true reflection of student understanding. I was shocked when students who had almost a 100% homework average earned only a 70% on a chapter test. Apparently, some students had a great deal of help available to them at home. Their parents were able to look over their assignments and assist them in correcting any mistakes. Unfortunately, to me it appeared as though the student was doing very well and fully comprehended the concepts.

When I realized what was happening I began giving 5-question mini-quizzes once or twice a week. Usually three questions pertained to the current topic and two questions required the student to remember information from earlier chapters. This provided me with a much clearer perception of who understood the math and who did not. I was then able to pull students who did poorly on the quiz and go over the troublesome concepts. One journal entry stated:

We took another mini-quiz in math today. I am really starting to feel more confident about their understanding of specific concepts. I am recording their scores and monitoring them closely. My knowledge of who gets it and who doesn't is increasing.

Some changes required some investigation outside of the school day. Many hours were spent in a quest to improve not only my math teaching, but my teaching in other subject areas as well. During the first two quarters of the school year, students were to write a total of six book reports. The policy stated that all books had to be approved by the classroom teacher. I found out on book report due dates students had read books that were inappropriate for their reading level or just plain inappropriate for a 6th grade book report. For my sake, I needed a method of holding the students accountable for the book selection. Also, for the students' sake I needed a way to ensure that they were not still looking for a book the night before the report was due. On paper, I was on vacation from December 23rd until January 4th. In reality, I spent several hours over the winter break researching teaching strategies in connection with student book reports. My journal reflects some of my discoveries during that time.

I have decided that Christmas vacation must only be for experienced teachers! I have spent a lot of time on the computer creating worksheets and searching the Internet. I have been able to locate several sites that I know will help me with my book report problem. I have collected information from several sites that I am going to combine into my new book report requirements. I am now going to require students to fill out a note card that tells the title, author, type of book, and number of pages. Students will then have to turn in the card, along with the book, at least one week before the report due date. My signature on the card will be proof of the approval. Also, I will be able to write comments and record their grade on the card.

It was when I realized that improvements needed to be made that I was able to search for possibilities that led to better teaching and better communication with the students. I am sure that craftsmanship is an area in which I will persistently need to develop.

Section D. Interdependence

As reflected in the previous section, my quest to improve my craft often led me to other individuals connected to the school environment. Working with and among a number of talented people enabled me to draw upon their experiences and expertise in order to grow as a professional. “Knowing that we will benefit from participating in, contributing to, and receiving from professional relationships; and being willing to create and change relationships to benefit our work.” (Costa and Garmston, 1997, p.152).

Not all teachers are able to enjoy the transition into a new career the way that I did. I was very fortunate to be placed in the same school and at the same grade level where I had done my student teaching and a significant amount of my substitute teaching. When I went in for the first building meeting of the year I was sitting near people that I had already gotten to know quite well. I was familiar with the building routines and I was aware of many of the procedures. Still, there were times when I was unsure of how to deal with a situation. So many things had been provided for me when I arrived to do my student teaching that I was unaware of where to locate some items and I also didn't know that there were forms to be filled out when there was a printing request.

The other two sixth grade teachers were wonderful. They provided me with answers to my questions and sometimes little notes or treats to get me through a tough day. We shared several lunches that served as strategy/venting sessions. We planned together and worked at integrating curriculum areas.

In addition to two highly experienced and well-respected teachers at my grade level, I also worked with a CADRE Associate. This person kept me informed of due

dates and deadlines as well as providing comments on my journaling. I specifically recall one situation where the assistance of the associate was particularly appreciated. I had been struggling with math instruction. I knew that I needed to change a few things but I was unsure what needed to be altered and how. I had difficulty sleeping one night because I just kept thinking about how I wanted it to be. I made a list of all of my concerns and I called my associate before school and asked her if she would be available to observe and make suggestions. She adjusted her schedule and arranged to be in my classroom for a large portion of that same morning. She made several notes and when the students had independent work time she shared with me a list of recommendations that helped me to feel more confident and helped the students to learn more effectively.

As a result of my concerns and her observations, I was able to make a number of changes that significantly improved my math instruction and the students' comprehension. One suggestion was that I talk with the principal about purchasing individual marker boards that students could use for working out problems. Instead of walking around and trying to find the answers on each sheet of paper, I was able to have the students lift their marker boards and show me their answers all at once. I was surprised at how eager the kids were to do their work on the boards as opposed to their notebooks. Kids who had previously needed reminders to stay on task were enthusiastically waiting for the next problem.

The mentoring relationship was beneficial to me because it allowed me to ask and get answers to many questions that are not addressed in new teacher training. It also

helped me to know that someone else had also been a first-year teacher once and had not only survived, but developed into a master teacher.

More than mentors and team members I depended on the students for feedback, both verbal and non-verbal.

I have acquired an ability that sometimes allows me to look at a student's expression and detect their confusion or frustration, but I also learned early in the year that my expressions spoke to the students as well. One afternoon, when the students had been extremely chatty and I was trying to get started on our language arts lesson, one student looked at me with concern and said, "Mrs. Philippi, do you have a headache?" I was shocked by her question, but replied that I did not have a headache. She again looked puzzled and said, "Hmm, your face just looks like you have a headache".

From that point forward I realized that I was always communicating to the class even when silent. When I again reached a point of frustration or slight irritation, I consciously thought of that conversation and tried to take a deep breath and uncrinkle my forehead.

Sometimes expressions are not enough to communicate a message of confusion or need. There have been other times when I have had to rely on the students to verbally inform me of their difficulties. The following entry is an example of the mutual dependence between a student and me. It also reveals the resulting communication between her parent and me.

January 11th, 2000

I saw some student frustration first hand this morning. One of the girls came in early and requested help with yesterday's math homework. In virtually every curricular area this student is highly capable and self-

reliant. She is very confident, uses her time wisely and works very hard. She was literally on the verge of tears and she became highly frustrated as we began working on the fraction assignment. I provided her with several relatively simple prompts but she continued to exhibit several signs of stress and anxiety. We made it through the assignment, but I asked her if she felt like she needed to stay after school to get a better handle on the concept. She said yes, so I phoned her mother at work and made the arrangements. Her mother explained that the child had been very frustrated with the math and was perhaps so flustered because she rarely encountered assignments that she was unable to complete without difficulty. We spent some time together after school working and talking through several examples. She left around four o'clock feeling much better.

Not only have I relied on the students to communicate concerns with me, I have also had a few conversations with parents that opened my eyes to some elements of my teaching that needed to be rethought. I spent approximately thirty minutes talking with two parents who brought up several valid points, some of which I too had been contemplating, and some that I had not. It was the first time that I had really been questioned about my methods and philosophy.

When they left my classroom, my initial reaction was to sit down at the computer and record every bit of the conversation that I could. I felt a little overwhelmed but knew that I wanted to try to address each issue they had laid before me.

The following entry was one of my longest, perhaps because I began reflecting immediately after the incident.

February 16th, 2000

I just spent thirty minutes with the parents of one of my students. Being "called on the carpet" is never easy, but usually beneficial. The parents expressed concerns regarding the math curriculum and my teaching of the subject. Their points were valid and I appreciate the comments because I know that, in the end, they will be helpful for the students, as well as myself.

Point #1-The students are being asked to deal with a number of new concepts at one time. This is creating much confusion and the students are frustrated.

Point #2-I am not requiring them to show their work on all problems. This is a problem for several reasons. Students don't differentiate between problems they need to show their work on and problems that they don't. If they know they don't have to, they don't want to. Also, the junior high teachers require students to show all of their work.

Point #3-Their child, and others (based upon sporting event-bleacher conversations) do not have a solid understanding of very basic mathematical concepts. They are never going to understand more advanced concepts until they do.

My reflection of these points-

Point #1-I agree and am trying to slow down and take the concepts more slowly, waiting until the majority of students understand before moving on. I want to try to find more practice problems for them that deal specifically with the concept, but also continue with my mini-quizzes to make sure that students are comprehending concepts that were specifically addressed in the past.

Point #2-I agree with this family that all work needs to be shown from now on. As a student who could often perform mathematical operations in my head, I was too willing to let students get by without showing their work. I see now how this can be detrimental because they will be required to show their work in junior high and also because I can not properly address a problem if the work is not shown because I can not tell when/where the mistake is being made.

Point #3-I recognize that several of the students do not have a solid background in math. I need to slow down and address those issues. Whew! Not a lovely experience, but probably one that I needed and will be helpful.

As a result of this conference and my reflections I instituted some changes in my class. I spoke with the students in each class about my concerns. I shared with them that I wanted them to be successful in math and that we needed to start doing a few things in order to help that happen. Previously, the students had done sample problems on scratch sheets of paper, which were often lost or thrown away after the lesson was over. I started requiring that the students take notes in math class in a notebook that I would look over

occasionally. We also talked about why it would be important and helpful to them if they would always show their work on homework assignments. Some of the changes were met with a little hostility, but within a week the students were in the habit of always taking notes and showing their work.

I had some mixed emotions about showing work for everything simply because as an adult I almost always perform mathematical operations in my head and very rarely do any paper and pencil math. To make sure that the students were still having opportunities to do mental math, we did some problems in class mentally and we had some assignments in which I specifically stated that they would not need to show any work, but should try to do all work mentally.

More than any other experience documented among my data this event truly could have been categorized as any one of the five states of mind. The decision to place it in interdependence was ultimately made because I believe that some of these changes would not have come about strictly based upon my own observations and concerns. It was because I spoke with these two individuals that I considered my previous policies and made progress towards being able to accurately assess student homework and prepare them for what will be expected as they move on to the next level of math instruction.

There were other relationships that also influenced my professional development throughout the past year. By talking regularly with other new teachers I was reassured that my feelings were not unique. Sharing frustrations and triumphs with someone else who was also feeling it. I had several conversations with two other new teachers who were also teaching math. We shared ideas about basic skills testing and also homework.

When my 6th grade students experienced great difficulty with fractions I passed the information down to the new 5th grade math teacher who then kept me up-to-date on the 5th graders progress in that area. Together we talked about progression of fraction instruction and we are hoping that the next class will not require as much review when they reach fractions in 6th grade.

Other CADRE teacher, including my thesis partners, were the people that I felt the most comfortable sharing this year with.

Monday February 21st, 2000

We had a new teacher meeting at Central Office today. My building mentor was unable to attend, but I was able to sit with another CADRE teacher who was also minus a mentor. One of the benefits of this program is that it allows new teachers to really get to know one another and feel comfortable discussing classroom situations. The relationship is different than the relationship with the CADRE Associate or building mentor. Sometimes it is difficult, at least for me, to admit to an experienced teacher that you don't have it all together. It is far less intimidating to talk with someone who is in the same predicament that you are. You don't feel threatened or judged at all by that person. The interesting thing is that as I looked around the room at all of the new teachers in our district I realized that I don't feel connected to them. It feels like a forced bond when compared to the relationship with other CADRE teachers.

The feelings expressed in the previous entry are particularly true when I think about my relationship with my thesis partners. Discussions with Angela and Brent kept me sane at times. There were occasions when we got together for the purpose of writing and instead spent an hour or so talking about how we were feeling about teaching and about our role as a learner as well as a teacher. As discussed in the introduction, there seemed to be something so safe in sharing failures and frustrations with someone who not only was experiencing some of those same emotions, but who was also entirely

disconnected from my specific school environment. Often I was able to take our conversations and use them in my class.

March 21st, 2000

I decided to try out Brent's theory that students will get more out of the lesson and also be less apprehensive of problem solving if that is how the lesson is started. We were talking about dividing fractions today. I told the students that my Chex Mix recipe was torn and I knew that it made six cups and that a serving was $\frac{1}{3}$ cup, but I wasn't sure how many people that would serve. Some of the kids drew pictures and some were trying to process it in their heads but we all started talking about it and finally figured out that it would serve eighteen people. Then we examined the written problem and talked about how we divide fractions. One of the classes did really well with this and seemed to get really excited when they started figuring it out. One girl who has struggled with math this year left the room floating! She brought her assignment in after school and showed me that it was all done. I could tell that she was very proud of what she had learned and was able to apply.

I can't even remember what started the conversation with Brent the night before, but his suggestion made an impact on me which in turn altered what happened in my classroom.

One of the biggest advantages to working with two thesis partners who taught math at the middle school and high school level was that I began to truly appreciate the scope of mathematics education. Professionally, I discovered that I was not just responsible for their sixth grade math education. I was preparing them for what was ahead. I thought about what their Junior High teachers would expect of them and how they would need to transition into higher-level mathematics courses. It was very important to me that I know as much as I could about where my students were headed mathematically.

This appreciation for their educational future led to a trip to two Junior High Schools in my district. By taking a professional leave day and making arrangements with

two Junior High counselors I was able to spend one morning observing varying levels of seventh grade mathematics. A few teachers were willing to give up some of their plan time to share with me some of the frustrations that they often feel with the incoming seventh graders.

March 28th, 2000

...I also spoke with a teacher who had some free time. He is an experienced math teacher in the school. He shared with me that he is often the bad guy because students have received all 1's (comparable to A's or E's) in math all through elementary school and are now earning grades on the lower end of the scale. He talked to me also about the vast difference between regular math 7 and advanced math seven. He commented that parents seemed to really push advanced math and as a result he has students that are failing advanced math that would more than likely be successful in regular math. He told me about the differences between the two courses and showed me examples of what the two classes were currently working on....

I appreciated his insight on the issue of regular math/advanced math. During the weeks following my visit several parents approached me about which class their child should enroll in. I was able to share with them my observations and provide facts about what would be expected. This was information that I needed to know but also made me feel a little pressure to make sure that my students moved on to the junior high with as much preparation as possible. I am, however, surprised that there is not more communication between the 6th grade teachers and the junior high. It seems to me as though that would help make the transition a little smoother for everyone.

One person that I have learned to communicate with often is our school counselor. There were several occasions in which I needed advice not about academics, but about the social development of my students. Our school is very fortunate to have a full-time counselor who meets with each class on a weekly basis. She had often told me that if I

ever needed her for anything during the day all I needed to do was send someone down to her office. My opinion was that I should be able to take care of the situations involving my students. I never really considered asking her to help me with a problem until one day this spring. From about Valentine's Day on I had noticed a change in my students. Several of them were definitely more concerned with social issues than academic issues. I had been able to handle the majority of "girl fights" on my own, but as one child's temper flared I realized that I was not able to give her the time or attention that she needed at that point. Socially, she was having problems and those problems were affecting her academically. Obviously, she would not be able to concentrate on schoolwork while she was so upset about what was happening with some of her friendships. The counselor came down to the room and after speaking with me for a few moments she took the student down to her office where they were able to discuss friendship and the qualities of a good friend for about forty minutes. When the child returned she had calmed down significantly and was able to focus on her schoolwork. Later, I was able to touch base with the counselor and find out some specific strategies that she had used. I thanked her for helping me out and she thanked me for asking her, reminding me that it was her job to help when needed.

It seemed obvious to me that I would depend upon people inside the school for assistance and advice, but I was somewhat surprised that some of my most needed conversations occurred with someone outside of the educational field. Even though he has always been a great support for me I had no idea how much I would depend upon my husband, Brad, during this year. He had a wonderful ability to help me see things in

perspective. One night when I was in tears because I felt so overwhelmed and frustrated with my abilities as a first year teacher, I said that it was too hard and that I should just go back to substitute teaching. He began to comfort me and said, "Maybe you're right, you should just quit because if you can't be perfect your first year, you probably shouldn't be a teacher." This sarcastic statement served as another reminder to me that it was unreasonable to expect that I would be a master teacher immediately.

Not long after this conversation, I attended the basketball game of several of my students. During the game I had the opportunity to speak with the grandparents of one of the girl's in my classroom. They were surprised to see a teacher who took the time at night to support a student. I left the conversation feeling great. That night when I shared the experience with Brad he said, "I bet you're going to miss that next year. I don't think that many kids would invite a substitute teacher to a game". His well-timed comments always seemed to remind me that, in spite of mistakes and frustrations, I wanted to be a teacher and I wanted to be an important piece in the educational lives of children.

The teachers and staff within a school building do not, or should not, function as several independent compartments. We use each other for support and rely on those around us for assistance when needed. Ideas are shared and advice is graciously given. The support within the school community, in addition to the support of my husband added up to a safe environment where in time, I was not afraid to ask questions or thoughtfully alter plans when needed.

Section E. Flexibility

The interactions that I had with the students and the staff at my school made it clear just how crucial flexibility was for a happy and productive environment. Unfortunately, I again had some prior experience that was working against me. Throughout my pre-teaching experience I have had to work on my flexibility. I am, or at least always have been, a person who finds great comfort in order. There is a very predictable sequence of events. I like knowing where to locate things and I like having a clean and well-organized space. During a month-long field experience in the spring of 1998, I started to realize how unrealistic my expectations were for the classroom. I remember tensing up when a teacher would mention that the schedule would need to be changed. I also remember being irritated when the art teacher was supposed to arrive, but did not.

When working with a number of students and a number of teachers, it is necessary to “go with the flow” sometimes. “Flexibility involves the ability to step beyond yourself and look at a situation from a different perspective” (Costa and Garmston, p.135).

My flexibility was tested again and again during this year. I made plans to test and end a chapter entitled “Multiplying and Dividing Whole Numbers and Decimals”. The review seemed to go well and I was shocked when a significant percentage of students failed the test. It became apparent that the students did not have a clear understanding of the concepts because they could perform the operations in isolation, but suddenly confused the process when faced with several different problems. I quickly

realized that I could not move on to the next chapter until most, if not all, of the students were capable. I took a long look at my lesson plans and decided to move back the beginning of the next chapter and spend some time further discussing and practicing the skills related to that concept. Of course this left me with 6-9 students in each of the classes that did have a very firm grasp of the information and did not necessarily need to participate in such remedial work. I did what was very difficult for me to do...allow two separate activities, with separate goals, at one time. While I was working closely with the students who needed some more time and experience, I had other students working in small groups preparing a skit that focused on the use of math in their daily lives.

It was a time of confusion and frustration for me because I very much wanted to be perceived by other teachers and the administrator as a teacher who had control of the classroom and was capable. The more I thought about what others would think if they observed a little chaos in my room, the more I realized that how things *looked* was not nearly as important as how things *were*. Student growth was taking place. It was happening in different areas and some was self-directed and self-motivated, but we were all working on and experiencing math.

Because of some of the confusion that students were feeling during math class I needed to be flexible with my after-school time. I often allowed students to stay after school for some additional assistance, but I soon learned that I didn't need to refine the routine because I learned some lessons about myself. Some students were honestly interested in getting help and working on schoolwork. Other students wanted a cool place to hang out. My sympathy got the best of me. I felt badly for students who told me

that they were bored when school was out because no one was at home. I allowed them to stay in the room and sometimes had 4 or 5 students with me when I walked out to my car. It became apparent that I was not able to accomplish as much with other students because of the distractions that some created. I decided that students could stay only if they were working on homework. That made me a little less popular but it decreased the size of the group a little and I was better able to assist the students who needed help in addition to being able to take care of some of the little chores that I needed to complete.

I always tried to express to the students that I was more than willing to provide them with a little extra help after the bell rang. For a few students, weekly appointments were in place. Every Monday and Wednesday night one boy stayed to redo any low assignments and make sure that he was on the right track with that evening's assignment. Although math was a particularly difficult subject for this student, he began to make progress.

I wrote about his accomplishments and his mother's frustrations in the following journal entry.

A parent came to pick up one of my students today. We had worked on his math for about 30 minutes. The parent is somewhat frustrated because we have been working faithfully after school twice a week and his grades have not improved much. She asked me what I thought about the lack of significant improvement in his quiz and test grades. I told her very honestly that it was somewhat discouraging to see only slightly higher scores, but that when I took a look at his work and his answers I could see that he was understanding the concept far more, but was still making computational errors. Overall, I am encouraged by his improvement in understanding. It will just take more time to refine some of his basic skills.

It was fairly easy to be flexible after school when there were fewer people to be concerned with. Flexibility between 8:00 and 3:00 was more difficult for me. Our school design is not ideal. The sixth grade hallway leads to three classroom entryways, all without doors, just inches apart. The sound from each room travels into another and it is difficult to do a group activity when the class next door is working silently. Often times, adjustment was in order. Sometimes, we would plan group activities when another class was working in the computer lab or science room. Other times, the students would use whisper-voices to keep from disrupting the other sixth graders.

One day, while experiencing unseasonably warm weather, we were trying to present book reports after lunch. The room was hot and I was uncomfortable. Students were fanning themselves and no one-including myself-was paying much attention to the presenters. After two book reports I could not stand the thought of staying in that room a moment longer. I asked the students who still needed to present to gather their papers and line up at the door. The rest of the students joined and we all walked to a shady spot just outside and listened to the rest of the reports while enjoying a cool breeze.

Flexibility is also necessary when students are not grasping a concept. There were a few instances where I planned to cover a topic in a set amount of time and it became obvious that more time was needed. Someone once asked me how I handle deciding what to teach and when to teach it. My answer was with a plan and a big eraser. Sometimes plans had to be changed and adjustments had to be made. At the beginning of the year that bothered me. I wanted to accomplish a set number of objectives within a

given period. As the year wore on I loosened up, realizing that it was better for students to have a solid understanding of essential concepts than a light dose of several topics.

It was not until dealing with fractions that I completely let go of the philosophy that I needed to cover every page in the textbook. I began noting the important concepts and then spending the time needed to expose the students to the concept and allow for enough practice and application. Not surprisingly, I was happier and students seemed to retain the information more effectively.

I also saw a happier student when I listened to one girl as she complained about always having to sit in the front row.

March 23rd, 2000

There is one little girl in my class who has struggled in almost every subject all year long. I have spoken with her parents on numerous occasions and they have expressed their concern and frustration with her. Her mom said, "She will probably never be a straight A student, but there is no reason for her to be getting these grades". She is a very exuberant girl who speaks clearly and has a wonderful sense of humor. The frustration is that she often chooses not to do, or not complete her homework. I have stayed after school with her many times and it seems to take several examples on one-on-one time for her to grasp the concept and even then she did not always finish the assignment.

On Monday she asked me if I would move her desk because she was tired of being in the front row. She talked to me about how she hates being in the front row and she proposed that perhaps I would consider moving her on Friday if all of her grades this week were above an 80%. This was a pretty lofty goal, but we have been keeping track of all of her assignments on a sheet of paper. I want to celebrate and scream at the same time! This student has turned in nothing but average to failing work all year and suddenly this week she has had several perfect papers! I am happy for her, but a little apprehensive. Although, when I give it more thought I realize that for the majority of this year her parents and I have relied on negative consequences-no recess, no computer or phone at home-and suddenly she was working FOR something that she really wanted.

I had taken courses in classroom management and student behavior and I was aware of the disadvantages of using types of punishment, my instinct had been to do just that. This situation reminded me that I hated to feel “knocked down” and so did the students.

Disagreements between students also required some flexibility on my part. I needed to read the situation and decide when to step in and when to stay out. There was one occasion when I had observed dirty looks transferring from one girl to another several days in a row. I was not sure of the reason, but when one of the girls suddenly turned sullen and withdrawn, and started turning in incomplete assignments I knew that I needed to have some time to talk with her. I adjusted the afternoon schedule and allowed for a study hall time. During that time I was able to talk one-on-one with the student and express my concern about what I had been observing. Tears started flowing. After having the girls talk together it was disclosed that one had made a remark about the other’s dad and she had been very hurt by it. We talked about our words and how even when we don’t mean for them to, sometimes they hurt someone. We also talked about the importance of communicating with our friends and letting them know when something has hurt us instead of holding it all inside.

Section F. Efficacy

“Efficacious people believe their efforts make a difference” (Costa and Garmston, 1994, p.133). I have always believed that teachers have an unbelievably important job and that they have an ability to mold a student’s attitude about school and learning. For 6

hours a day, 180 days a year, a child's teacher directs activities, monitors behavior, provides feedback and encouragement.

My sense of efficacy suffered many blows this year. Before school started I felt very confident and ready to be a positive role model in the lives of the children on my roster. My goal was to encourage them in their educational pursuits and help them to realize the full extent of their capabilities. Teachers play such an important role in a child's life. I wanted this to be a year of amazing growth.

In the beginning, I was confident that I had the skills and attitude that could handle the difficult situations and create a positive learning environment. However, one event after another knocked me down, and for a while, I was tired of getting up. How many times do you need to ask a 6th grader to stop talking and pay attention? How many times do you need to discuss the importance of treating people kindly and not call names? I found myself slipping into a "drill-sergeant" mode that said I was not going to put up with nonsense. I took away recess times, called parents and "kept my thumb on" some students who had trouble remaining on task.

I was miserable and at times I felt as though I could not do anything to help these students. Comments from other teachers in the hall didn't help much. "They've been like this since kindergarten." Occasionally, a comment would encourage me. "They are behaving so much better than before."

As mentioned previously, I went home a few times close to tears, and told my husband that perhaps I was not supposed to be a teacher. I felt truly powerless. I could not figure out what I was doing wrong. The kids were being mean to each other and

some didn't seem to care about turning in assignments. My low sense of efficacy was beginning a very viscous downward spin.

Throughout the year I noticed that this state of mind was very closely related to the degree of confidence that I felt with my teaching. At the beginning of the year I clung to my math manual, reading pieces out of it and taking my examples directly from the pages. When students asked a question I found myself looking into the manual to find the answer. I was afraid of telling them something that was wrong so I tried to stay as close to the book's way of teaching as I possibly could. The problem came when students asked a question that was not addressed in that book. I tried to answer as carefully as possible and I know that ended up confusing some students. One student in particular often looked at me with a perplexed expression. She was from a Middle Eastern country and had only been in the United States for two years. Her development in most academic areas was phenomenal, but math was often a source of frustration for her. When dividing fractions we learned how to multiply by the reciprocal. In the middle of an example she raised her hand and simply asked, "Why?" I tried to refer her back to the book and show her more examples, but her response was, "I still don't get it". Her questioning frustrated me because I didn't always have an answer for her, but it also pushed me to think about my own knowledge and understanding of mathematical concepts. I learned that I often needed to spend time with her separately. Often, she stayed after school and we work through several examples. One day she said, "You know, I was really frustrated earlier, but when I started paying attention, it all made sense".

Gradually I weaned myself away from the manual, thinking more about the concept than the book's approach. I equate this to listening to sermons on Sunday morning. When the minister stands behind the pulpit and reads his sermon, rarely making eye contact with anyone, I am so bored. On the contrary, when a minister walks around and speaks more from the heart than the notes, I am drawn in. I know that the same is true in teaching. If I am concentrating on my notes or my manual, then I am losing the students. However, if I just have a firm understanding of the concept and refer only occasionally to the text, I can be more attentive to the students' actions and reactions.

I took some extra time to really think about the math concepts and their application to the students' lives. When I relaxed a little, and let go of the teacher manual, I realized that I was fully capable of teaching this topic. Instead of following so closely to the textbook, the students and I would talk about the concept. This generated more enthusiasm from them and more confidence for me.

When we encountered fractions, I soon realized that the students did not have the prior knowledge or experience that the teacher's manual, and I assumed that they would. I knew that they would enjoy fractions once they got the hang of it so we talked about all of the times that we see fractions and all of the careers that use fractions. Our favorite correlation was always pizza. When comparing fractions we talked about eating pizza from Pizza Hut. If I had $\frac{3}{8}$ of a pizza and you had $\frac{2}{5}$, who had more? Changing my teaching was helping the students learn. I was focusing on what they knew and using that to teach math.

This approach also worked when dealing with percentages. Many of the students in my class enjoy going out to eat with their families so we started talking about going out to a restaurant. I asked the students to raise their hand if they had ever heard an adult trying to figure out how much of a tip to leave for the server. Students chuckled at the thought of asking someone for a pencil so you could work out the problem on your napkin. Some students were aware that it was standard to leave a 15% tip. We laughed as some students talked about arguments that took place at the table about how much to leave for the waiter or waitress. The students shared the methods that they had heard used, including one student who shared that his dad just left \$5 at Applebee's and \$10 at Red Lobster. I also shared with them that I always find 15% of the total bill by first finding 10% then adding half of that. The Monday after this discussion the topic came up again and several students shared how they had helped calculate the tip over the weekend. One student even brought in the receipt from the Mother's Day dinner with the tip calculated at the top.

The students also used their new knowledge of percentages and their relationship to decimals and fractions to calculate their scores on daily assignments. Instead of asking "How many points off?" They were able to figure their percentage grade on their own.

When I realized that some of the students were still struggling and I worked on ways to assist them. I worked with students after school and found that when there was a small group sometimes another student was capable of explaining even better than I was. It also was not taking up too much of my time because the students began helping each other. Often they would go up to my marker board and quiz each other on problems.

Seeing students who were frustrated earlier explain a concept to someone else seemed to genuinely boost their confidence in their abilities.

I will never forget sitting at a conference with the mother of one of the girls in my class. The student was having some difficulty in math and had been staying after school for some extra help. Still there was some confusion and frustration. When I assured the mother that I was happy to stay with her after school to help her out, she paused for a minute and said, "I have two older children who struggled somewhat with academics. You are the first teacher to ever offer that kind of help."

Other boosts to my sense of efficacy came from the students. One day I returned to the classroom after a meeting and found a note on my desk that said, "You're the best, Mrs. Philippi". Little messages often seemed to arrive at just the time I needed to hear them. One day I was informed that two kids had called into the local radio station and nominated me as teacher of the year. Another time, I received an e-mail from one girl's father. "This is just a 'dad-note' to thank for all that you have done. It has meant so much to us." Perhaps my favorite was included in an evaluation that the students did on me. One anonymous paper said at the bottom, Mrs. Philippi, YOU ROCK". I'm pretty sure that was a compliment.

Of the five states of mind, efficacy has been the most difficult for me. Because my expectations for myself were so high at the beginning of the year, I found myself constantly falling short. One required article that we read for our January seminar helped me keep my "defeats" in perspective. "Autonomous individuals set personal goals and are self-directing, self-monitoring, and self-modifying. Because they are constantly

experimenting and risk taking, they fail frequently, but they fail forward, learning from the situation”(Costa and Garmston, 1994, p.153).

The reason that I decided to become a teacher was because I knew that I could make a difference, but it was not until I worked through several other issues that I felt a sense of efficacy this year. When the first few days of school left me feeling ill-equipped I spent a lot of time thinking about my role and working on ways to improve. When I started working closely with others and working on my flexibility I again began to feel as though I really could make a difference.

Section G. Summary

The journal entries in this chapter served as the data that was collected in an effort to answer the research question that was posed in Chapter I. How do critical incidents impact our interactions with the students within our individual educational environments and influence our growth as a learner of mathematics and an educator? My response to that question is addressed in Chapter IV.

The information that was collected and organized in this chapter was my recollection and reflection of the critical incidents that occurred during my first year as an elementary teacher. When I read over each of my entries, one stuck out as an overall expression of how I felt at the beginning of the year and how I finally chose to view the many challenges that faced me.

March 20th, 2000

I learned a lot today from an unexpected source! An author of children's books was at our school today. He led a writer's workshop for

our grade level in the morning. I was absolutely fascinated by what he shared with the kids. I found myself taking notes while he talked and I discovered that so much of what he said about the process of writing and getting a book published applied to this year as a first-year teacher and also as the writer of a thesis. He talked about how he had struggled to get books published and also how his main character engages in struggles throughout the course of the book. One phrase that stuck in my mind was "Enjoy the Struggle". I realized that this year has certainly been a struggle for me. There is no way that I can do this job perfectly. However, if I dwell on the fact that I wish I had done some things differently, I am going to be miserable! I am struggling to understand what my philosophy really is, how to run the classroom more efficiently, how to help my students get along, how to help them really understand math concepts...the list goes on and on. I want to enjoy this year and the time that I have with these students. I don't want to gloss over the rough spots but I do want to focus on the positive and understand that all of these experiences are making me a better person and a better teacher.

CHAPTER IV

Conclusion

Section A. Introduction

Throughout this first year of teaching many events have impacted my professional and personal development. Additionally, many people contributed to my growth through their words and actions. Participants in the CADRE program inspired me with their ideas and perseverance. My building mentor and CADRE associate played important roles in this journey because I looked to them for the answers to many of my questions. Above all, the cohort of new math teachers has proven to be an invaluable resource. As Bernard (1999) described, the members the First-Footsteps trilogy became a necessary support system. Members of our group relied on each other for encouragement during difficult times, and have also eagerly shared suggestions. I became so familiar with Angela and Brent that I was comfortable honestly sharing questions and concerns.

The purpose of this study was to have a small group of mathematics teachers examine personal and professional growth during the first year of teaching mathematics. While studying various pieces of literature recommended by members of our committee and beginning the writing of this thesis, group discussions created a secure learning environment. These professional relationships built a trust amongst the participants that allowed each of us to share our experiences openly. During the data collection stage, I continuously met with the other two researchers to talk about the happenings in and outside each of our classrooms. During these times I was able to give detailed

explanations about the events in my classroom, ask for suggestions about how to teach a concept and describe all of the emotions that I experienced. I also spent time listening and asking questions of my two partners. As I participated in these conversations I learned more about myself while contributing to the growth of the others.

This last chapter allows me to further examine my progress during this period. When speaking to others I have often compared this year to a journey. Whenever you embark on a journey you do so with certain expectations. More often than not, the events that transpire, and sometimes the eventual outcome, are very different than anticipated. As a traveler it is necessary to adapt to unforeseen circumstances and occasionally alter the course. Sometimes at the end of the journey you discover that what you thought you wanted in the beginning can not possibly compare with what you have actually achieved.

I find this analogy appropriate as I attempt to address my research question: how did critical incidents impact my interactions with the students and influence our growth as an educator and a learner of mathematics?

Section B. Response to Research Question

Upon reaching this concluding chapter I realized that the combined efforts that contributed to this thesis resulted in a unique research product. Although this type of research is non-traditional in the mathematical sense, every effort has been made to maintain the integrity of this product as a scientific endeavor.

What is referred to as data in Chapter Three is essentially a combination of feelings and experiences stemming from a series of critical incidents. One difficulty I encountered during this collection was the use of critical incidents to answer the research question posed in Chapter One. My perception of "critical incident" changed during the year. There were several events that initially seemed critical but ultimately paled in comparison to some small potentially unrecognizable event that literally changed who I am as a teacher.

I wrote in my journal almost every day and regularly met with Angela and Brent to compare experiences and discuss books and professional journal articles. However, the science of our approach seemed incomplete because we did not have the ability to answer a confined problem comparing growth as an educator to growth as a mathematician. The type of growth to which we were referring, we assumed would reveal itself in time, and it did, but not in the way any of us expected.

Mathematicians tend to approach communication and even experiences in a very quantifiable and logical way. Measuring growth initially seemed attainable, presumably through a structured analysis of documentation collected during the year of teaching. However, while acting as a vulnerable observer and participating in my classroom I

focused more on the emotions and feelings related to teaching making it difficult, if not impossible to construct a quantifiable answer to the research problem.

In our original efforts to define a problem statement that was attainable, we failed because we were not experienced enough in teaching or in research to know what the data might ultimately yield. This is not an excuse for the sake of finishing a thesis but rather an answer to the research question in the form of an explanation of a new level of understanding that has been gained.

How do critical incidents impact our interactions with the students within our individual educational environments and influence our growth as a learner of mathematics and an educator?

I find it difficult to address this research question without going back to the beginning of this entire thesis process. This has been such an amazing year. I feel as though I have experienced every emotion possible. I wanted the challenge of writing a thesis, but from the very beginning I felt somewhat intimidated. I had always loved math and done very well, but I found myself sitting around talking to all of these “math people” who sometimes started rambling about a concept that I was unsure of. Additionally, my classroom situation was very different from the other group members. I was an elementary teacher who spent a large part of the day teaching math to each of three 6th grade classes, but also taught Language Arts, Reading, Spelling and Writing to my homeroom class.

In spite of some differences, we had many things in common, including our curiosity about what the future held. All three of us were wondering about how different

we would be at the end of this crucial nine-month period. I knew that this school year would change me, but I wondered what would be different. Because many of our conversations centered on the different levels at which we taught, we started speculating about the direction in which we might grow. I truly felt, as I listened to my partners speak, as though this would be a time in which I would grow as a learner of mathematics. By far, the majority of my undergraduate courses were education and methods courses. I had really only had four math courses.

In order to document my growth I wrote in my journal almost every day. I compiled a total of 126 entries in all beginning August 6th and ending May 25th. The journal entries varied greatly in length; some a sentence or two and others two typed pages. There were days that I shared facts alone without much elaboration, and there were times when I poured it all out. Sometimes I wrote on paper, but most often I sat down at my computer at the end of the day.

Throughout the year my CADRE Associate read my journal entries and wrote additional questions for me to think about, and many of the events in my journal I shared when meeting with my two thesis partners. At the end of the school year I was able to look back at the entire year with a very clear picture of how and why I changed.

There were several obstacles that seemed to hinder my growth at the beginning of the year. For several years I had listened to people compliment me on my teaching and my ability to work well with children. When I was in the classroom without the instant feedback from a cooperating teacher or university supervisor, I suddenly felt inadequate. I had to stop relying on other people to validate my performance as a teacher.

Eventually, my pride and joy came from within and from interactions with students and their parents.

In addition to my desire for, and lack of external validation, I struggled because of my own educational background. I managed to survive the majority of my formal education without a great deal of effort or thought. I listened to instruction, performed the task, received a gold star and moved on to the next task. My experiences this year forced me to really think about my beliefs, philosophy and former experiences in a way that I was not familiar with. I experienced degrees of frustration that I never have in the classroom. School was always easy for me, but I quickly realized that I had never been asked to think about the concepts that I was taught. As a result, I lacked the thorough understanding and confidence that I needed at the beginning of the year. I had to work through my frustration to be a better teacher and for the first time in my life I was able to empathize with those students who find learning difficult.

I also had to accept the fact that it is simply not possible for a new teacher, or a veteran teacher, to do everything perfectly. Mistakes are common. It is important to take from those experiences all that you can to improve. When I think about my abilities as a teacher I realize that it was okay for me to not know it all in the beginning and it's okay that I don't know it all now. What is most important is that I want to keep growing and I want to learn more and more about how to be a better teacher. I learned that I needed to trust myself more. I learned that I have the ability and the desire to find answers when I am not sure and I certainly have the ability to let my students know that I care and am there to help them.

Regardless of all obstacles, I had some wonderful motivation: my students. When I think about my kids that accompanied me throughout this journey I see 25 students that walked in the door in August very energized about starting the year as the leaders of the school, but a little nervous about what was going to be expected out them. At the beginning of the year they all seemed to stress about everything. For every assignment they had a hundred questions. They were not accustomed to much math homework and they complained a lot. Their stress plus my stress was a very bad combination, but as I relaxed, so did they. On May 24th, 24 students (one moved during the year) walked out the door with a little more knowledge and an excitement about what the future held.

I am not sure that I would have been able to make such realizations about myself, and my students' needs, without the reflective journaling. By writing down the events that occurred throughout this year, as well as the emotions that accompanied them, I was able to relieve stress and also look back later and see that, at times, my emotional reaction was not proportional to the severity of the event. Although I found it difficult to write about times when I felt like an ineffective teacher I found that the writing helped me to see the entire situation from a clearer perspective. However, being a vulnerable observer proved to be very challenging at times. When I began journaling about the year I realized that I had great difficulty writing about times when I felt as though I was screwing up. It seemed as though like writing it down meant that someone else might know that I wasn't a perfect teacher. I sometimes wanted to skip over the bad parts and skip ahead to happier events. It would have been very easy to try to forget about the unpleasant

experiences from this year, but I have truly found that by examining those circumstances, I have been able to move forward as a teacher as a person.

When I sat down to begin writing Chapter Three of this document, I read through all of those journal entries. I was surprised to realize that when looking back my primary reaction was laughter. I remembered feeling so overwhelmed and I remember feeling a little hurt by comments made by other teachers. I also remember feeling very upset with a few of my students for treating each other in such terrible ways. This made me laugh in the end because I could see that sometimes my emotions were overly sensitive. I was often still hurting when students involved in a disagreement seemed to have completely forgotten the event. I really saw the importance of recording all of these events, for immediate growth, but also for growth later on when the emotions were not as fresh.

As quoted in the beginning of this thesis, John Dewey believed that all experiences are opportunities to learn. Reflectively writing about my experiences in the classroom greatly contributed to my development as a teacher. It was always enjoyable to share with my friends and family all of the wonderful experiences I had. At times, I suspect that I was like a new parent who shares with anyone and everyone all of the little events that they find to be monumental. What transforms in the classroom is exciting. It is amazing to watch kids learn. There was absolutely nothing like watching as someone completed a task on his or her own that had always required assistance. Those events were ones that I delighted in sharing.

When looking at my entire collection of entries, one of the most surprising realizations for me was what I considered to be critical incidents. My original opinion

was that critical incidents would be major events and I would recognize them immediately. There were a few occasions throughout the year where it became necessary for me to talk with the principal or counselor about a student's behavior. I wrote very long journal entries on those days with detailed descriptions of how the situations were handled. When I thought back over the year, those big events did not seem as important as some of the "little things" that still brought back memories and feelings months later. I had assumed that I would know a critical incident when it happened, but found that was not true.

Using the concept of holonomy helped me for many reasons. It made me realize that even when I am struggling in some areas, I am growing and maturing in other ways. Also, by considering the five states of mind I was able to identify specific ways in which I could improve in those areas. Growth became more than just a general term, it became more detailed and helped me to develop and work towards goals as I worked with those around me.

My perceptions of my growth as related to holonomy bring me once again to our original research question. "How do critical incidents impact our interactions with the students within our individual educational environments and influence our growth as an educator and a learner of mathematics?" I don't feel as though I can properly answer that. There is no question that I have grown during this time, but not in a way that I can measure or compare with anyone else. I know that teaching 6th grade math did not necessarily cause me to grow as a learner of mathematics because I knew how to do 6th grade math in August and I still know how now. However, I did learn to explain math

and I learned how important it is for students to not just be able to perform mathematical tasks but also UNDERSTAND mathematical tasks and concepts. I learned how to really check for student understanding and I learned how to read the faces of students during math class.

Perhaps most importantly for me, I also learned that professional growth leads to personal growth and personal growth leads to professional growth. It is amusing to me now as I think back to our original plans for this thesis. Even though I read the book The Vulnerable Observer by Ruth Behar (1996), I stressed that I wanted to concentrate on my professional, not personal, growth. I seemed to think that it was possible to separate the two! The two are not independent, as I had believed in the beginning, but are constantly influencing each other. I am growing all of the time. And my growth continues even now as I write this conclusion.

Next year I won't have a CADRE Associate to ask about my journal entries and I won't be meeting regularly with a thesis advisor or my thesis partners. I will not be officially enrolled in any course work, but I am a life-long learner. I have been an official student for the past 15 years and I am confident that my role as a learner is far from over, and I am certain that I will continue my professional development in some capacity. The process of writing this thesis has convinced me of the value of reflective journaling. I know that by continuing that habit, I will continue my growth.

Section C. Evaluation of Holonomy as a model and Collaborative Thoughts on the Five States of Mind

At the beginning of our graduate experience each member of our trio had difficulty understanding how holonomy was relevant to our professional growth. This concept was the focus of the Exit Portfolio option and not the thesis project in our CADRE Seminars. The usefulness of holonomy as a model was not apparent until we had experiences that we could look back and reflect on. It was not until a thesis meeting in April, where we brainstormed how to organize our theses, in which we decided to use this model to analyze our data. As we looked at the data collected in our journals we found incidents that fit into each state of mind and we could see how we had changed throughout the year in each of these five areas: consciousness, craftsmanship, efficacy, flexibility, and interdependence. One problem that we found during the organizational process was that there were many situations that could easily fit into more than one area. The placements of such incidents were based upon how the situation most directly impacted the researcher. Although we found some difficulty associated with the use of holonomy, we believe that this model will continue to be a useful tool to evaluate further personal and professional growth in the continuation of our careers.

Since this trilogy has been focused around the collaborative effort of the researchers and reflection of critical incidents, after the responses to our research question were written, we felt that it would also be beneficial to our growth to collectively examine each state of mind.

Consciousness

The most important thing that we discovered was that in order to be successful as teachers we need to pay attention to students' attitudes and abilities, as well as, the needs of the school. As teachers, we must also be aware of how we interact with our individual schools; we need to focus on maintaining an open mind and not entering with preconceived notions about our situation. We feel that consciousness is the stepping-stone to development in the other states of mind. If we are not aware of our surroundings then we cannot add to its growth and our personal development.

Craftsmanship

We project that significant growth in this area will occur during our second year of teaching since we will then be able to review and revise lessons and activities that have previously been used. As first-year teachers we were able to make minor adjustments to our teaching, but there were still many strategies that we envisioned. These strategies were not implemented because of our lack of teaching experience and other demands made upon us within this past year.

Efficacy

As first-year teachers we repeatedly told ourselves that we knew we could make a difference in the lives of our students, but struggled with maintaining this confident attitude. When we felt failure in the classroom our sense of efficacy suffered, but our

desire to have a positive impact on our students did not. This desire, along with the confidence that our students had in us as their teacher, pushed us to continue our pursuit of professional development.

Flexibility

We learned that flexibility allowed us to take advantage of those “teachable moments” not only for our students, but also for ourselves. It was necessary to be flexible in various situations with a multitude of individuals and in planning our classroom curriculum.

Interdependence

This year we looked to others for advice and support as we encountered new and unfamiliar situations in the classroom, but we also were able to make contributions to colleagues who had more experience. It became apparent that some veterans looked forward to working with first-year teachers since they are enthusiastic and have fresh ideas from their university courses. We also felt that we benefited greatly from working with other first-year teachers who were having similar experiences.

Section D. Future Growth as Professionals

This first year was the beginning of a long and unpredictable journey for each of us. In any profession, if growth ceases effectiveness diminishes. Professional educators must continue to practice their craft and monitor their growth.

The only way that we can continue to examine our growth is to reflect on what happens to us. When student teaching, a cooperating teacher was helping me learn from my mistakes, offering suggestions, and providing continuous feedback. Even though I had the support of mentors this year, they could not be available at the snap of my fingers to help in a time of frustration. I learned to depend on myself.

Initially, I believed that this study would have significant implications for other first-year teachers, regardless of grade-level or subject area. After analyzing my reflections, it seems apparent to me that all teachers could greatly benefit from the practice of reflectively writing about the significant events that influence their professional development. I also feel that this practice and the benefits that result are probably not exclusive to the teaching profession. This leads me to believe that this process can help to foster the personal and professional growth of individuals in a variety of careers and in all walks of life.

Section E. Recommendations for Further Research

Completing this study has sparked several speculations regarding the possibility of similar research involving the process of reflective writing and the concept of holonomy. The following recommendations are recommended.

1. This study involved an elementary mathematics teachers collaborating and meeting with math teachers at the, middle school and high school levels. Discussions that we had revealed that found that our quantitative mathematical background and mentality to be a stumbling block in our attempts to write vulnerably in a qualitative study. We would recommend a similar study that is conducted by first-year teachers in a variety of subject areas, such as: science, social studies, language or fine arts.
2. This study focused on my first year as a teacher, but perhaps a longer study may provide additional insights about the development of a new teacher. I recommend that a similar study be conducted that involves a beginning teacher continuously reflecting and gathering data about professional growth during the entire probationary period (typically three years).
3. My goal was to examine the growth that occurred during my first year as a teacher. It is probable that many interesting reflections might also be made about the professional growth of a first-year counselor, principal or administrator who has changed roles within the school setting.
4. Reflectively writing and examining professional development throughout my first year as a teacher greatly contributed to my growth and awareness of my abilities and

beliefs. I believe that a similar study conducted by people who are beginning a career in a field other than education may also experience the same benefits.

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