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## Classroom environment and its effect on student achievement in a 3rd grade mathematics classroom: An autoethnographic study.

Darlene R. Voorhees

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**Classroom Environment and its Effect on Student Achievement in a 3<sup>rd</sup> grade Mathematics**

**Classroom: An Autoethnographic Study**

**Darlene R. Voorhees**

**Dissertation submitted to the  
College of Human Resources and Education  
at West Virginia University  
in partial fulfillment of the requirements  
for the degree of**

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in**

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## **Abstract**

### **CLASSROOM ENVIRONMENT AFFECTS STUDENT ACHIEVEMENT**

**by Darlene R. Voorhees**

Student achievement in mathematics is a concern of policy-makers as well as those who teach the subject. Due to concern regarding lagging mathematical achievement in the United States that began with a series of events that include the launch of Sputnik in the 1950s, the federal report *A Nation At Risk*, and the *Third International Mathematics and Science Study* have sparked a fervent desire for school children to succeed and compete mathematically with our global neighbors. Although policy-makers are striving to improve educational practices of mathematics by formulating curriculum plans to foster mathematical achievement and a joy of mathematics, one element has been given little consideration, though it plays a significant role in accomplishing these goals and that is the classroom environment. First, to create a classroom environment that promotes student achievement, it is necessary to understand the social and educational milieu. To document the events of this study, I utilized an auto-ethnographic approach to social research through self-reflection. The students that I observed made strides in mathematics and developed positive affect for mathematics. The results of this study concluded that the classroom environment created through the interpersonal relationships between a teacher and students plays a significant role in her students' achievement in mathematics.

## Dedication

I wish to dedicate this to my husband Mike and my family for all their support and patience during this process.

## Acknowledgements

The author wishes to thank the staff and students at the elementary school where this study was conducted.

## Table of Contents

Abstract.....	i
Dedication .....	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Figures.....	v
List of Tables.....	vi
Glossary of Terms.....	vii
Introduction.....	1
Chapter 1 .....	7
A Historical Perspective of Educational Theory	
Chapter 2 .....	30
How Mathematical Curriculum Has Not Lived Up to Josph J. Schwab	
Chapter 3 .....	48
A Literature Review of What Education Should Engender	
Chapter 4 .....	84
Methodology	
Chapter 5 .....	98
Physical Attributes of the School	
Chapter 6 .....	113
Student Descriptions	
Chapter 7 .....	135
Analysis	
Conclusion.....	198
Bibliography.....	202
Curriculum Vitae .....	209

## LIST OF FIGURES

Figure 1 .....	41
Figure from H.E. Huntley- <u>The Divine Proportion</u> .....	57
Figure The Parthenon .....	58
Figure Golden Rectangle.....	58
Figure 2.....	182



LIST OF TABLES

Table 1 MATHEMATICS CURRICULUM <u>THIRD GRADE</u> - Fourth 9 Weeks.....	38
Table 2 Woods & Poole.....	115

## Glossary of Terms

Sputnik- a rocket launch by the Soviet Union in the 1950's.

A Nation At Risk-a Federal report that stated that the United States school children were not able to perform as well academically as our global neighbors.

The Third International Mathematics and Science Study-a report that states that children in the United States are not able to perform as well internationally.

National Council of Teacher of Mathematics (NCTM)-an organization that establishes standards and principles that West Virginia and many other states base their mathematics curriculum

aesthetics- the standard or judgement of taste; the science of the senses or emotions

classroom environment-the atmosphere, feeling, tone or mood in a classroom

student achievement-a students being able to improve or master school disciplines

auto-ethnography- to focus on ones own center and periphery as well as being cognizant of the complexity of others center and periphery. The notion lies in a perception of *home* and *away*.

The Practical-a document written by Joseph J. Schwab about a practical method to develop curriculum

open classroom-a school where no walls exist between class, most teacher use dividers such as book cases to define the speration of one classroom to another.

## Introduction

In this dissertation, I examine the effects of the classroom environment on student achievement in third grade mathematics. I begin by outlining the historical and philosophical impact on educational curriculum theory and practice. I do this to better understand how current curriculum practices have evolved and to discover the best curriculum methodology to utilize with the third grade class of students that I had the pleasure of spending a semester with.

I first became interested in the classroom environment when a parent entered my classroom on the night of one of the many sixth grade orientations that the middle school hosted for my incoming sixth grade mathematics students. I had realized that I made a difference in the lives of my students by the comments that they made, but this particular parent made an impression on me, acknowledging as to the influence that I could have had on the lives of students that I was not aware of. This parent came to thank me for all that I had done for her daughter when she had attended middle school several years before this visit. Evidently, I was going to have this parent's second daughter in my mathematics class for the upcoming school year. She proceeded to explain that I had such an effect on her daughter who was now in high school. Terri was taking calculus and trigonometry. These were classes that she never expected her daughter to be interested in because she hated math and felt that she was not capable

of success in mathematics, much less advanced mathematics. I remembered this student because she was in my honors class and she stated on the first day that she arrived that she hated math and that she was not very good at mathematics. I proceeded to tell her that her math skills were probably better than she thought. Her reply was that she gotten a 'D' in math last year and that she was not going to do any better. I explained to her, "You can do well if you decide you are going to do well, and if a subject is hard for you, then you have to work harder to succeed in that class." On the first day of class, I usually assign seats, but for this honors class, I allowed them to choose their seat. She decided to sit in the middle of the back of the class, which seemed to be the worst place if one did not have very proficient mathematics skills. I asked her if she wanted to sit closer to the front and her reply was, "No." I decided to let her have her way so as not to make her feel uncomfortable. As the year progressed and her math skills improved, she would comment every now and then, "I did better than I thought." She would smile at the same time and I perceived that she was quite pleased with her accomplishments. For the most part, she was an attentive student, but like most, she sometimes needed a reminder to focus. Terri did not appear to be as skillful as her classmates; however, she passed my class with a 'B' and I reminded her of what I said at the beginning of the year. It appeared that building a classroom

atmosphere that supported success enabled this student to feel comfortable and experience mathematical achievement.

Once this group of students left for summer vacation, I did not think about the conversations I had with this student until her parent came for her sister's sixth grade orientation several years later. After this parent stopped in to see me and I digested the essence of her praise, other such events surfaced. I can recall several students stating that math was their favorite class because they felt that I cared. They would also make statements such as, "I never did so well in math." I asked them why and they would respond with, "Because you make it fun," "You make it easy," or they just enjoyed being in my class.

After recollecting many comments students had made, I became very interested in the classroom environment and its effect on student achievement, particularly when a student's parent came to me in tears of joy over her daughter's accomplishments in my mathematics class and the effect that it had on her future endeavors in high school mathematics. Although this information is not tied to a formal study, the events presented in my classroom were not isolated and the results were duplicated time and again as I reminisce about the students that have passed through the halls of the school where I taught mathematics. I decided to study the effect the classroom environment had on students' achievement. To better understand current curriculum practices, it is necessary to visit curriculum practices

historically. I refer to curriculum practices in this paper as being what is taught in schools but it is how the teacher approaches the curriculum and devises a plan to teach an identified curriculum so as to foster learning for the group of students that sit in a given classroom.

## **Dissertation Outline**

This dissertation is organized around Joseph's Schwab's The Practical. In Schwab's rationale, he relies on studying the relationship among the student, the teacher, and the curriculum—a triangle can be used to emphasize these connections. It is within these connections that this dissertation lies. The effect one element plays on the other results in an outcome. It is the intention herein to identify these relationships and utilize them to achieve mathematical success for students. Schwab's rationale is a frame from which to work. He suggests three methods for evaluating and deliberating solutions that will aid in accomplishing desired outcomes or to adjust desired outcomes to suit a need. In other words his rationale is a way to find a means to an end or in some case adjust the end to suit the means. Schwab's approach to educational savvy is to use a triangle to examine a situation from all angles to discover connections just as one side of the triangle connects to another side and yet another side which brings it back to where the initial side was drawn, so do the elements of the educational milieu.

The literature review utilizes a similar organization—the historical approach to education, philosophy of education and the teacher’s individual approach to teaching through hermeneutics. The history of education is undergirded by the curricular history of schooling which has been influenced by such notable individuals as Rousseau, Pestalozzi, Tyler, Bobbit, and organizations such as NCTM, The National Council of Teachers of Mathematics. The philosophical approach engenders my approach to students as referenced by Rousseau and Pestalozzi which will be examined in chapter one. The hermeneutics addressed in chapter four deals with my struggle between the order of the school curriculum and the idea of communication in Chapter 3 as a developmental tool to improve teaching. It is this struggle that serves as the gray spaces for my dissertation. My students as well as I, have a lived history which influences the events of our lives. An auto-ethnography allowed me to be aware of my own history and what comprises my inner compass and how that will influence my interpretation of my third grade class of students that I studied. Additionally the reader of this document has a lived history that will influence interpretation of the events that took place in my third grade classroom.

The method section of this dissertation builds on hermeneutics outlined above and paves a road for the use of Schwab’s, The Practical as a philosophical guide to collect ethnographic classroom data to present an autoethnographic study. I use the following aspects of Schwab—the practical

and the quasi-practical, and the eclectic—to address the relationships between learners and the curriculum, me and the curriculum, the curriculum and education, mathematics and learning, community and schools, and how this is lived out in my classroom through class relationships, verbal and non-verbal communication, and ultimately the construction of trust and change in learning. I believe that this approach, one that uses, the practical, the quasi-practical, and the eclectic enlivens the kind of data that specifically addresses questions that I pose to address in this dissertation. The questions are as followed:

- 1.) Does the classroom environment have an effect on a student's achievement in mathematics?
- 2.) Can a student's feelings about his/her relationship to the subject matter affect achievement in mathematics?
- 3.) Can the interpersonal relationship between the teacher and students affect a student's achievement in mathematics?



## Chapter I

### Introduction

In this chapter I examine curriculum theory from a historical and philosophical perspective. Historically education began as an endeavor to create good citizens that would participate in a community. This is still an active part of current educational ideology. Through time the manner in which to accomplish this has visited many venues. There are several camps of thought. What encompasses education historically is a result of philosophies that comprise the manners in which educational practices are performed. Below is an account of historical events that have shaped educational practices which are influenced through philosophical beliefs.

#### **A Historical Perspective of Educational Theory**

Historically, curriculum practices began with Plato's philosophy, based on an ideal existence, to Ralph Tyler's (1949) rationale of building a curriculum through scientific methodology to Joseph Schwab's (1969) The Practical, which, as its title suggests, utilizes a practical approach to examining and developing curriculum practices on a local level rather than a global level where most curriculum building takes place. There have been several camps of thought regarding the ideal model for curriculum practices.

For these particular third grade students in rural West Virginia, what is the best instructional practice when negotiating the mathematical curriculum

to promote achievement while keeping abreast of the students' collective narratives? This study attempts to examine the enduring effects the classroom environment plays in a particular third grade student population in rural West Virginia while ensuring that present curriculum expectations are met. The researcher will observe and note the effects of teacher-student relationship on student achievement in mathematics while remaining conscious of student narratives when making decisions as to a best practice for teaching mathematics.

In West Virginia, current teaching and learning practices suggest that practices should be one that supports student growth and development in mathematics, yet the scripted outline of what is to take place in public schools is formulated. The formula is idyllic, but in reality, time constraints can impede the desired outcome and student growth. Additionally, this scripted formula does not consider the particularities from one student population to another. Considering the particularities of one population to another is something that policy-makers and curriculum practitioners should bear in mind when developing educational policies and defining curriculum practices.

### **Educational Theory Develops**

This section is an effort to connect the influential philosophies that have impacted early education in public schools. Educational theory has

long been a part of the development of educational practices. Aristotle believed that we live in a world of objects and that we come to know them and to develop generalizations about them through our senses. His matter-form hypothesis is fundamental to metaphysics (Guttek, 1997). He embraced the notion that matter is arranged in different designs to create form. Form constitutes matter and human beings are a form designed of matter; however, what sets the human being apart from the rest of matter-form of this existence is the ability to reason (Guttek, 1997).

To further understand Aristotle's educational theory, it is necessary to examine not only his dualistic reality of matter-form, but also his epistemology of sensation and abstraction. Sensation is the human endeavor to acquire data from an object through the senses, while abstraction is the process of sorting out the sensory data that is gathered as concepts from objects.

Aristotle's conceptions of learning and knowledge have had great effect on theory and practice in education (Weimer, 1962). If humans learn through their senses and abstractions, then instruction should be a practice designed to provide students with time to explore and investigate objects. These perceptions have established, as well as, driven educational doctrine.

The Greek philosopher was studied by scholars of medieval universities and Thomas Aquinas was particularly influential in reestablishing Aristotle's

philosophy in Western culture; however, there was some debate over the prudence of assimilating the philosophy of a pagan scholar with Christian beliefs. The rebirth of Aristotle's philosophy became a major influence in shaping Western philosophy and education. His thought on the structure and function of reality has greatly influenced Western thoughts on education.

The Medieval era or the Middle Ages is identified as a time between the fall of Rome and the birth of the Renaissance. Educational endeavors lost their dynamic characteristics during this epoch. With the reawakening of the human mind came the rebirth of classical learning (Guttek, 1997). Thomas Aquinas, a scholastic theologian, created a bond between a classical liberal education and Christianity (Nash, Kazamias, Perkinson, 1965). He believed that education contributed to the development of a human being's virtue. Education was influenced by several entities, such as the family, the church, and society. The educational formula encompassed a body of knowledge, a teacher, and a learner (Nash et al. 1965). These same ideas are present in today's educational theories and formulas, such as those of Joseph Schwab (1969).

Notably, with the amalgamation of Aristotle's philosophy and Christianity, life and learning were dichotomized. It came to be categorized into the spirit and the body. Life is lived through the spirit and learning is performed with the body. With the maturation of these categories

developed the concept of theory and practice. Theory expanded from the intellectual growth of the spirit and practice from the body, that of performance. The development of theory and practice has become the structure of the educational system in Western society (Guttek, 1997).

As the medieval era in Europe had ended, the newly arrived colonists in The New World embraced the notion of theory and practice. They brought with them the philosophies of the Renaissance and the Protestant Reformation. By the time the Revolutionary War had ended, the newly conceived nation was a product of eighteenth-century Enlightenment. The secularism and republicanism of the revolutionary American inhabitants opposed the hierarchy of medieval ideas of ranking people, ideas, and reality into levels of more or less significance (Guttek, 1997).

With the emergence of the middle class during the Renaissance in Europe came the need to reorganize the developing social structure of the Middle Ages. John Calvin, the leader of the Protestant Reformation of the sixteenth century, believed that education was the path to "religious belief, civil order, and economic prosperity" (Guttek, 1997 p. 96). Churches supporting Calvinism drew the attention of this newly birthed social class. The English Calvinists or Separatists who colonized the Massachusetts Bay Colony brought with them the same strong religious beliefs held by the Calvinist Reform. The Bay Colony was among the first municipal authorities requiring children to learn to read and write, hoping to ensure that

youngsters knew religious doctrine and the laws that governed their commonwealth (Tyack, 1967). Calvinist doctrine emphasized that its members lived socially and economically productive lives. This came to be known as the "Protestant ethic." This ethic would strongly affect the establishment of public schools in the late eighteenth and nineteenth centuries in the United States, as institutions that would prepare a literate and law-abiding citizenry.

As the Puritans embraced the importance of the individual working through his/her vitae, there existed a counter ideology: that of Peter Ramus. His followers wanted a map to follow that controlled outcomes. He developed a step-by-step linear method of curriculum, the precursor to modern grouping of disciplinary knowledge. His curriculum methods were a diagram of the structure of knowledge and situated the teacher as the instructional leader and decision-maker. Ignoring the human spirit, which is less formalized and more open to individualism, Ramus proposed a kind of standardization that still guides curriculum development in the modern era. Harvard used Ramus's methodology as a way to master knowledge and skill. However, the institution's implementation of curriculum gradually transformed toward the sense of the individual working through his/her vitae (McKnight, 2006).

Jean-Jacques Rousseau also believed that individuals need to work through his/her vitae. He was an intriguing theorist whose life coincided

with the eighteenth-century Enlightenment. His thoughts on education provoked a revolution in educational practices (Rippa, 1984). Although the preceding eras looked to the past to seek wisdom, the Enlightenment theorist looked to the future. Rousseau believed that human destiny could be shaped to achieve a desired outcome. He pointed out that childhood was a necessary stage in human development and that childhood experiences often led the way to adult behavior. Rousseau believed that childhood should take as long as a person needed, contrary to the past belief that childhood should be passed through as quickly as possible (Boyd, 1963). With this principle came the theory of child permissiveness: allowing the child to follow his or her interest as desired. Rousseau is credited for clear statements that identify the importance of age-appropriate learning activities (Weimer, 1962). His child-centered learning environment went beyond the four walls of the conventional classroom and diverted from the traditional liberal arts education (Rippa, 1984). Critics not only of his day but also today find his ideas of child permissiveness to be an anti-intellectual element. Should the child be the director of his own learning? (Guttek, 1997).

Johann Heinrich Pestalozzi had ideas similar to Rousseau in regard to the natural education of the child, seen by the importance he gave a sensory-based education and by his practice as a teacher and as a teacher of educators (Cremin, 1953). Pestalozzi philosophy consisted of the

harmonious development of three powers: intellectual, moral, and physical. Conventional education only developed the intellect and neglected the moral and physical powers. Pestalozzi believed that human development and education was stimulated from that which was direct to that which was distant (Wiemer, 1962). He criticized conventional schools for being verbal, for teaching children to memorize without meaning. He believed that schools should be loving places that are emotionally secure for children. In conventional schools, teachers ruled like tyrants and preferred books to people. Pestalozzi's romanticized vision of school was a place where the world was viewed as a forest covered in an early morning mist. In his opinion, seeking knowledge was the sun that burns away the mist to view all the forest has to behold. He reasoned that the teacher is the facilitator of children activities to examine, explore, and observe (Norden 1951, Gutek, 1997).

William Maclure brought the Pestalozzi method to the United States in the early nineteenth century initially to diffuse information to farmers and the working class (Cremin, 1953). Henry Barnard, the common school leader from New York, also publicized this method through his popular lectures and teacher institutes. Yet another means to institute Pestalozzianism is credited to Edward A. Sheldon and his associates of Oswego Normal School in New York State (Rippa, 1984). The Pestalozzianism objective-lessons improved teaching methodology of the



common school by organizing instruction, which gave teachers greater planning ability and control in the classroom.

Like Pestalozzi, the progressive educators of the late nineteenth and early twentieth century struggled with formalized education practices. Such progressive educators as Kilpatrick's ideology that centers on the interest and need of the child and Rugg's child-centered school reflect Pestalozzi's methodology, which included focus on the child and activities as a basis for learning. Pestalozzi also anticipated Dewey's philosophy of maintaining a child's experiences to affect learning. But even with these innovative ideas for education, the traditional education system changed slowly. Pestalozzi's philosophy of the child-centered curriculum was a major contribution to educational practices but they are still ideas that have not been fully utilized by many education practitioners (Gutek, 1997 p.153).

### **A Changing Nation**

As the United States' ethnic make-up changed between 1880 and 1920, so did the need for an educational system that could satisfy the needs of a changing society. John Dewey's vision brought about a modern way of viewing democracy and education. Joining the newly-founded University of Chicago, Dewey brought together the discipline of philosophy - which was the precursor to educational psychology - and the development of children and adolescence, learning theories, and pedagogy. Those who joined the

progressive education ranks with Dewey included William Heard Kilpatrick, George S. Counts, and Harold Rugg. In addition to Dewey's progressive educational philosophy, he was a strong supporter of the pragmatic view of education. "Our net conclusion is that life is development, and that developing, growing, is life" (Dewey, p. 49, 1916). Dewey believed that a person would reach self-realization not through the spirit, as claimed by theologians, or by attaining a perfect reality, but through the experience of social dealings that included the ever-changing human experience (Cremin, 1965).

Darwin's theory of evolution-that species grows slowly to adapt to its ever-changing environment-made a lasting impact on Dewey (Rippa, 1984). "The ideal of scientific organization is, therefore, that every conception and statement shall be of such a kind as to follow from others and to lead to others" (Dewey, p. 190, 1916). He believed that humans have the possibility to change their world by directing and controlling events through the use of the scientific method. Democracy was another important element in Dewey's philosophy of education. His values demonstrated that education should assure the survival of all participants in a community, not just the dominant class that has ruled the educational process (Rippa, 1984). "A society which makes provision for participation in its good of all its members on equal terms and which secures flexible readjustment of its institutions

through interaction of the different forms of associated life is in so far democratic" (Dewey, p. 99, 1916).

Unlike Dewey's idea that society needs to be flexible and adjust to changing needs a contemporary of Dewey, Edward L. Thorndike, believed that education could be scripted. "Intellect and character are strengthened not by any subtle and easy metamorphosis but by the establishment of particular ideas and acts..." (Thorndike, 1906, p. 247). Dewey believed that every circumstance in every community of students differs; therefore, growth of the student occurs when the student is able to form a purpose for himself and plan strategies to pursue those purposes (Eisner, 2002). These strategies or, "[a]ctive habits involve thought, invention, and initiative in applying capacities to new aims" (Dewey, p. 52-53, 1916). Although Dewey's ideology was an innovative approach to education, another camp of thought emerged from Franklin Bobbitt. He believed that life was a combination of specific events that schools could prepare its students to manage through a set of definite steps, regardless of individual idiosyncrasies; one could discover the particulars related to individual idiosyncrasies and adapt by being submerged into the transactions of the world (Eisner, 2002). Bobbitt's and Thorndike's thoughts on education were cultivated out of a desire to attain academic respectability. This formulated approach to educating the youth of this nation is now judged as a naive vision of the teaching and learning process. This train of thought - "the

biggest bang for the buck,” as we would characterize it in today’s culture - was also characteristic of the efficiency model that resulted from the onset of the Industrial Revolution, (Eisner, 2002). In Bobbitt’s later years, he professed that education of youth should be directed toward the learner and toward an efficiency model.

“The school is not the “make” a curriculum but to help the child or youth 6better to find his own. The school’s job is not to process the child into a shape that it has planned for him. It is to recognize that a life is going on before ites eyesm and its work is to help in making that life go on in the best possible way” (Bobbitt, p. 321, 1941).

A student of Dewey, Ralph Tyler, devised an efficient approach to curriculum development that heavily incorporated his mentor’s belief in the importance of lived experiences. However, he also included the scientific methods of Bobbitt. His formula for education included four questions that he posed in a syllabus for his university students. Although his monograph is considered an oversimplification of curriculum planning, his questions still play a role in educational planning in today’s society in the United States (Eisner, 2002). His four questions include:

1. What educational purpose should the school seek to attain?
2. How can learning experiences be selected which are likely to be useful in attaining these objectives?
3. How can learning experiences be organized for effective instruction?

#### 4. How can the effectiveness of learning experiences be evaluated?

(Tyler, p. 1)

Tyler's introduction to the reader in his small book, Basic Principals of Curriculum and Instruction states that it is not a comprehensive approach to curriculum building and that other rationales should be considered when developing a curriculum program. Tyler felt that his book was not a comprehensive document on curriculum building, but that the four questions he posed were essential to curriculum development and instruction. When looking at today's curriculum, it is evident that it is predominantly Tylerian in disposition, though Tyler himself acknowledged that other rationales needed to be considered. Joseph Schwab's The Practical should also be considered when curriculum practitioners develop the components of a discipline program. With Tyler's suggestion that other rationales should be considered when developing curriculum and Schwab's suggestion that all elements need to be considered when developing curriculum practices it makes good sense to bring these two ideologies together when planning teaching and learning strategies for curriculum practices.

Prior to the launch of Sputnik, mathematics in the United States was integrated into other subjects; then it developed into a subject that was taught to emphasis practical problem-solving (Pascopella, 2007). World War II had enlisted the most qualified mathematicians and left behind the least

qualified individuals to teach (Raimi, 2005). Since the launch of Sputnik in 1957, the United States has been trying desperately to meet, or rather, beat their rivals in the quest for scientific and mathematical superiority.

Americans were surprised by this event and interpreted it as a direct indication that their schools were failing. They had been duped by a foreign nation (Cavanagh 2007). What was wrong with American schools?

### **'The Practical' Approach to Curriculum Development and a Changing Nation**

There have been many camps of thought on how to improve the education system in the United States. One viable measure for "improving" American schooling came from Joseph J. Schwab (1969), a professor of education. In the early 1960s, he proposed that curriculum was moribund due to its reliance on theory that was borrowed from outside the field of education. According to Schwab, these theories could not answer the problems particular to their own subject, much less those of schooling. Schwab's path to renewing the field of curriculum was to avoid generalizing principles globally. He offered three modes of operation: the *practical*, the *quasi-practical*, and the *eclectic* (Schwab, 1969).

The practical is a decision for action that is applicable to the varying nature of a given situation for which it was initially intended. Whether it is

considered a good action depends upon whether the consequence reveals itself as favorable. Tyler and his mentor John Dewey define theory as a *means to an ends* process of formulating and solving problems that arise (Tyler, 1949). In the practical reflection, means determine ends and ends determine the search for means, allowing the problem to take shape and the direction of the search to surface. To initiate an action, a policy is deliberated. A policy can be deemed the principle directive of the practical. It is developed by deliberation and formulated by past deliberation of an institution's coherence and continuity, and it is no better than its original source. This is a transactional discipline aimed at disclosing the desirable end or modifying what is desired to be the desirable end (Schwab 1969).

The next principle of Schwab's curriculum methods is the quasi-practical. This method is much like that of the practical but with the consideration of a diverse audience. What works in one setting of specifics may not be prudent for broader settings of diverse specifics. The quasi-practical addresses social and educational milieus. Although they differ in many aspects, there exists an organic connection between them. The problem of one may be seen as isolated, but realistically, it influences others. In education, an organic connection exists. The teaching of reading is not limited to the methods of the reading teacher and the reading content. It is also influenced by other disciplines, such as social studies. The reading teacher not only teaches a student how to recognize words but to form an

understanding of those words when they appear in a context. This skill is also prerequisite to learning social studies. Students must be able to read content to understand what is written in the social studies text. The presentation of science inquiry influences the truths of the social sciences, such as sociology and social studies. The teacher herself has an effect on the students, the school, the parents, and the community at large. Again, the quasi-practical emphasizes the methods of the practical with an intense appreciation of diversity and the virtuous use of delegated authority. Partisans of the deliberation are not to present solutions that are in their best interests, but rather to give advice to solve a problem that best suits the person(s) that are seeking the solution. The giver of advice is obligated to honor this delegated power.

Schwab's third approach to correct the demise of curriculum is termed "the eclectic." This mode of operation realizes the advantages of theory while recognizing its weakness. First, theory can be used as bodies of knowledge so the deliberator does not need to seek his own knowledge. For instance, utilizes Skinner's theory of the learning process where appropriate. Secondly, the terms that characterize theory can be utilized practically. According to Schwab, the weaknesses that exist in theory are incompleteness of subject matter and its partiality of view. Incompleteness of subject matter refers to a theory that addresses one aspect while not being able to explain another broader aspect that is apparently related.



While learning theories explain cognition, they do not take into account students emotional needs, which, in turn, could affect cognition. Partiality of view refers to the distinction of attitudes and values that are incorporated into the structures of terms in theory. It may be difficult for an advisor to make rational educational decisions while not cognizant of the influence of his/her individual attitudes and values (Schwab, 1970). The eclectic brings the incompleteness of theory and the partiality of view to the foreground. It grants the deliberator the ability to bring the identifiable elements of more than one theory together to find a particular educational solution. This method also brings to light the shortcomings of partiality of view and subject characteristics of a given theory. The distinction of terms that are the skeleton of a theory, the relationship between them, and the influence of particular biases in educational decision-making are brought forward to be considered. "In brief, this branch of eclectic method makes it possible to see what each member of the collection of theories does and does not do with and in their approximately common subject matter," (Schwab, p. 13 1970). The eclectic joins the subject matter of a theory with subject matter of another theory without having to wait for a unified theory of a whole.

Schwab's The Practical is an ideal not utilized by curriculum practitioners today. We are in a state of *flight from the field* by Schwab's account. Many practitioners and critics have taken a step back to observe, to revisit the past, to develop models that will solve the problems that exist

within the curriculum field, or just simply offer critiques of the situation as it exists. However, the latter does not offer much hope of discovery of viable resolutions to the ailing curriculum sphere.

Curriculum has tended to lean on theory to explain and defend decisions proposed to create or better curriculum. The question is which theory is ideal. Should a curriculum focus on the individual, group, culture, ethnicity, society, community, or bodies of knowledge? As Schwab suggests, *all* these bodies need to be considered when proposing a curriculum. Individuals are a component of each of these entities, so how can one be left out when each is affected by the other? The ideas of a theory are bound by its subject, its complexity, and its capacity for change. To devise a universal curriculum would be extremely complex due to the vast differences that encompass human behavior.

What remains as a viable alternative is the unsystematic uneasy pragmatic and uncertain unions and connections which can be effected in an eclectic. And I must add, anticipating about discussion of the practical, that changing connections and differing orderings at different times of these separate theories will characterize a sound eclectic (Schwab, p. 25, 1970).

To bring theory to the application of curricular practices requires the ability to identify disparities between real and theoretical representation, to modify applied theory when discrepancies are identified, and to devise

techniques to consider the many elements of reality that a theory does not account for. *The Practical's* proposition is not to throw out the principles that have been utilized, but to carefully make changes piece by piece. It does not recommend following an educational trend because it worked in one setting. Rather, *the practical* suggests that curricular practitioners maintain and make improvements to curriculum practices where needed so as to establish coherence and relevance to the intended discipline. To devise ways to solve educational frictions, it is necessary to understand what goes on in classrooms and the effect of these actions. It is also necessary to understand the ripple effect an implemented change will have on the educational institution. As problems arise in curriculum, the practitioner should keep in mind the vast diversities that may accompany the proposed disparity. One problem may present itself; but it is wise to look beyond the presented scope of the obvious or identified problem. However, to utilize *the practical* soundly would call for the expertise of educational philosophers and subject matter specialists, a quality and sophistication which has rarely been sought (Schwab, 1970).

### **A Curriculum that Serves its Audience: Intellectually, Physically, and Morally**

To improve the educational milieu, consideration of the effects of relationships between the teacher, the student, and the curriculum is necessary when developing an instructional program. However, today's

curriculum applies very little consideration to the relational effect of the three facets mentioned above. These facets are: how the classroom environment affects a student's achievement in mathematics; how a student feels about himself/herself in relation to the subject and its effect on a student's achievement in mathematics; and how interpersonal relationships between the teacher and students can affect student achievement in mathematics. Even with the insightfulness of *The Practical*, teaching practices in the new millennium is still much like the linear design that Tyler proposed in 1949. 1) What educational purpose should the school seek to attain? 2) How can learning experiences be selected which are likely to be useful in attaining these objectives? 3) How can learning experiences be organized for effective instruction? 4) How can the effectiveness of learning experiences be evaluated?" (Tyler, p.1). These are necessary questions to consider when developing a curriculum, but they need to be broadened to not only meet the function of knowledge but also to include human behavior that greatly affects the acquisition of knowledge and the milieu of the educational setting.

The development of curriculum practices has evolved over time. It has also changed to some degree to hopefully better suit the audience that it serves. Aristotle believed that, for students to learn, they should be given time to explore and investigate objects, but his philosophy did not provide room for the development of the body and spirit. Jean-Jacques Rousseau's

child-centered philosophy intended that the child's interest would direct his education and that he should not be educated through scholarly exercises but rather through play without compulsion. This permissive venture of educating children was a more humanitarian approach (Weimer, 1962). Johann Heinrich Pestalozzi's sensory-based education was intended to allow the child to learn through his senses while developing three elements that were the powers behind his philosophy: intellectual, moral and physical. "His 'elementary education' was to become, in principle, the foundation of *all* education of *all* children" (Wiemer, 1962). John Dewey believed that learning was accomplished through a student's lived experience, which can be related to the philosophies of Rousseau and Pestalozzi. Ralph Tyler's rationale for developing curriculum was to satisfy the four questions he presented to his college students.

All the viewpoints that have been presented are intended to promote learning in the classroom. Essences of each of these philosophies tend to reside in the others. For instance, Aristotle's philosophy of time to explore is also evident in Rousseau's child-centered philosophy, Pestalozzi's sensory philosophy, and Dewey's philosophy of lived experiences. However, most educational practices today profess a curriculum that is - in today's terms - *real-world*. But in reality, curriculum practices are formulated and scripted, as is Tyler's rationale that he presented to his students at the University of Chicago. Joseph Schwab's approach to utilizing all facets that exist in the

educational realm that influence teaching and learning within curriculum development is perhaps the most singular foundation for constructing curriculum that will serve today's audience. So, to serve the educational audience, the curriculum practitioner needs to keep in the foreground the elements that affect the educational setting and to present instructional solutions to achieve goals set before educators. One such element is the teacher-student interpersonal relationships.

### *Developing the Classroom Environment*

For the particular third grade class that I taught during the spring of 2007, I had to keep in mind the elements that Schwab has professed and that other curriculum practitioners have supported. I used Schwab's ideology as a means to deliberate the best teaching practices for learning outcomes of curriculum mandates. Upon arrival, I was the foreigner. I had my ideas of what these third graders were going to accomplish in mathematics, and that was dictated by the established State guidelines for curriculum, but we also could have fun. At the beginning of my visit, I spent some time getting to know the students and their routine. When a situation arose that I felt needed to change, we did so. There was a problem with talking out and as a class we discussed the proper way to act during class discussions. The students and I came up with some rules that everyone

could live with and when someone forgot the rules, they were restated by me or another student as a reminder to everyone.

This set of third graders gave me the opportunity to observe and act in given situations to improve the classroom environment and promote student achievement. Although these third graders commented several times that they were not as smart as one of the other third grade classes, they experienced many successes and enjoyed mathematics due to the environment that was established and the interpersonal relationship that was formed between the teacher and her students. So, what is the effect of the classroom environment on student achievement?

## Chapter II

### **How Mathematical Curriculum Methods Have Not Lived Up to**

**Joseph J. Schwab**

This chapter will outline a vision for mathematic education in West Virginia schools while identifying the underlying misconceptions of what is needed for schools to reach their intended goals as described in their mathematics policy through the framework of Joseph J. Schwab. Much of the identified curriculum for mathematics education in West Virginia answers Tyler's linear questions. It does not appear to include other rationales as Tyler suggests that could answer questions of how his curriculum and instructional questions are to be satisfied. As in many school systems across our nation, West Virginia too wishes to implement a mathematical policy that will assure student success in mathematics. To accomplish this, it is not only necessary to set goals to achieve student success, but also to examine the classroom environment, which is determined by the interactions and relationships between the teacher and her students. The setting, which includes the student participants and the teacher as well as many other facets of the educational venue, play a role in the educational endeavor.

This school system has experienced successes, but like many other public school systems, it pushes teachers to teach-to-the-test to achieve satisfactory mathematical test scores. Again, this is not teaching students to



be life-long learners or to enjoy mathematics as professed in National and State visionary statement. In addition, the visionary statement professes ideal ideas, but there is no apparent sense of humanity in the formula.

## **The Formula**

Current curriculum “Standards” in West Virginia describe what each student should be able to accomplish in K-12. The mathematics policy is designed to align with the National Council of Teachers of Mathematics (NCTM) document which includes the five mathematics standards: Numbers and Operations, Algebra, Geometry, Measurement, and Data Analysis. It states that objectives spiral upward, increasing rigor without repeating content throughout the graduated grade levels of the student’s academic career. It also stipulates the importance that all students develop an appreciation for mathematics, develop mathematical competence, communicate mathematically, become problem-solvers, make connections to real-world applications and to other content areas, and become skilled at reasoning mathematically (West Virginia Department of Education, 2005). To develop mathematical competency, West Virginia’s vision also includes a guide for educators that strives for continued improvement in mathematical education. To assure this improvement, the following “Principles” which also align with the National Council of Teachers of Mathematics (NCTM) principles

are deemed the most important influential stimuli for improving mathematics proficiency in classrooms, schools, and educational systems.

### Principles for School Mathematics

1. Equity: High expectations and strong support for all students.
2. Curriculum: Coherent, focused on important mathematical concepts, and well articulated across the grades.
3. Teaching: Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. Learning: Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. Assessment: Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. Technology: Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning, (West Virginia Department of Education, 2005).

Although the mathematics vision for West Virginia school children is commendable, it is formulated and suggests a "one size fits all" approach to refining mathematics education in a diverse population. What is not included in this repertoire is the importance of classroom environments. Schools will continue to require their students to meet a recommended set of goals, but it is the classroom environment that affects the bond between students and the curriculum.

This dissertation is a study on what enduring impacts a teacher can have on how students learn mathematics. This ethnographic study examines the relationship between a third-grade teacher and her students as they negotiate classroom procedures to satisfy the mathematics curriculum for West Virginia, their personal narratives, and their classroom environment that seeks to address the enduring outcomes of teaching and learning mathematics. What effect can the classroom environment have on student achievement in mathematics?

I posit that the curriculum is a lived experience. William Pinar writes that curriculum is a course to be run (Pinar, Reynolds, Slattery, Taubman, 1995). For many years, K-12 curriculum has remained static and ahistorical because it has been driven by a need for accountability. The growth and structuring of this position began with the launch of Sputnik in the 1950s and continues to plague decisions regarding curriculum presently. Again, the Third International Mathematic and Science Study (TIMSS) reported that American schools were not performing as well as our international neighbors. Pat Carini (2001) writes that the culture of fear is the one steady influence in the post-1980s curriculum. Schools have placed their entire success on the backs of learners and teachers, with high-stakes testing. The success of American schools could also be a function of many other elements that have yet to be considered such as the effect of interpersonal relationships within the school setting.

## **The “Practical” Solution**

Schwab’s *The Practical*, written in 1969, addresses curriculum in such a way as to view all elements involved, rather than formulating a series of linear events and outcomes that apply to all settings and participants when making decisions on best curriculum practices. Eisner too a postulate that educational situations are distinctive in their own right and must be considered with respect to those diversities if decision-making is to be effective (Eisner, 2002). Decades ago, Schwab articulated the most constructive techniques to build curriculum practices that could potentially ease fears and shortcomings that exist in public education. However, his conception of *The Practical* was looked upon as difficult to employ. “To be enacted, Schwab’s proposals would require related changes in teacher education and research, thus further reducing the likelihood of implementation” (Shulman, 1984; quoted in Pinar et al., 1995). This reconceptualist’s ideology lost its cohesiveness due to a decline in opposition toward the traditional field. This change brought a streamlining of school curriculum and statewide minimum-competency testing, and teachers responded to public pressure by teaching-to-the-test (Pinar et al, 1995).

Schwab’s intention in The Practical was to consider all possibilities of a problematic situation and to deliberate the elements of an event so as to formulate a solution that is a *best* practice for the parties involved. His attention was not to secure the needs of the abstract classroom but to

ascribe his attention to the classroom here and now, to the student here and now, and to the course here and now (Pinar et al, 1995). This means that those involved in deliberating a problematic event are implored to honor this position with integrity and truth when making decisions and not to make decisions that can benefit self. Although Schwab identified a need to bring curriculum back to life, he did not want radical change. He desired that curriculum development and improvement “must be so planned and so articulated with what remains unchanged that the functioning of the whole remains coherent and unimpaired” (1978, p. 312; quoted in Jackson, 1992a, p. 29; quoted in Pinar p.35).

### **The Curriculum Reality-Critique of Curriculum Standards & Objectives**

Presently, curriculum practices appear to be modeled after the four questions that Tyler posed in a syllabus for his university students who were interested in curriculum building during the 1930s and 1940s. For instance, West Virginia curriculum standards are given to each teacher dependent upon the grade level taught, and it is clear that a specified set of Curriculum Standards and Objectives (CSO) are to be taught within a designated time frame for each of the nine-week grading periods. Not only is the teacher expected to teach these identified standards, but she is also expected to date when a particular CSO has been addressed. In addition, the elementary teacher at this particular school is expected to utilize a practice

standardized test. The Informal Mathematics Assessment (IMA) is used to identify whether a student has achieved a level of Distinguished (D), Mastery (M), Partial Mastery (PM), or Novice (N) standing for a given CSO. Each student's name is listed on a standard form that identifies his/her identified level of proficiency of skills. This form is then turned in to the administration near the end of every nine-week grading period with the intent to identify those students who are not meeting expectations. The teacher is then advised to revisit the area(s) in question in conjunction with the CSOs that have been laid out to be taught. Mathematics has been reduced to a systematic endeavor of accomplishing one task after another with little meaning or connection of one concept to another.

Additionally, CSOs are identified with codes. A code of *essential* (E) means that these particular objectives at this grade level are essential for the student to learn the skill so that he can be successful at the next grade level. A code of *important* (I) means that these objectives introduce new knowledge or expand skills already learned. A code of *compacted* (C) means that these objectives are a review of skills that have already been learned. Also, each CSO is classified as to whether it is taught for one, two, three, or four of the nine-week periods of the year. As presented in the table below, the Fourth Nine Weeks of the third grade mathematics curriculum lays out the expected objective to be covered by a third-grade teacher. As the year progresses, the list of objectives grows to not only include the objective for

the designated nine-week period, but also many if not all of the previous nine weeks: a meaningful attempt to reinforce mathematical concepts. In addition to meeting third-grade CSOs, students spend a great deal of the designated hour for mathematics learning the times tables as well.

It is an enormous task to bring students to a proficient level in mathematics, but other core subjects contain the same level of expectations as the mathematics curriculum. Extra-curricular subjects such as music, art, computers, physical education, and health also need to be addressed. As Jackson has demonstrated in his book, Life in Classrooms, a host of events takes place in the classroom (Jackson, 1990). Students as well as those in the community have come to expect and accept the events that comprise classroom activities.

MATHEMATICS CURRICULUM THIRD GRADE - Table 1  
Fourth 9-Weeks

Date	Code	Number	Objective
<b>NUMBERS AND OPERATIONS</b>			
	E <sup>4</sup>	MA.3.1.1	Read, write, order and compare numbers to 10,000.
	I <sup>1</sup>	MA.3.1.2	Read, write, order and compare decimals to hundredths with models.
	E <sup>4</sup>	MA.3.1.3	Identify place value of each digit utilizing standard and expanded form to 10,000.
	E <sup>4</sup>	MA.3.1.4	Estimate to nearest 10,000 and 1,000 using rounding, benchmarks and compatible numbers to determine reasonableness of an answer.
	E <sup>2</sup>	MA.3.1.5	Identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
	I <sup>1</sup>	MA.3.1.6	Compare and order fractions with like and unlike denominators using concrete models.
	I <sup>1</sup>	MA.3.1.7	Add and subtract fractions with like denominators using concrete models and pictorial representations.
	I <sup>1</sup>	MA.3.1.8	Recognize and model equivalent fractions using concrete materials.
	I <sup>1</sup>	MA.3.1.9	Recognize and model proper and improper fractions and mixed numbers.
	E <sup>4</sup>	MA.3.1.10	Add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
	E <sup>3</sup>	MA.3.1.11	Understand multiplication as repeated addition and division as repeated subtraction.
	E <sup>3</sup>	MA.3.1.12	Understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
	E <sup>3</sup>	MA.3.1.13(A)	Memorize basic multiplication facts a - 5 and the corresponding division facts.
	I <sup>2</sup>	MA.3.1.13(B)	Memorize basic multiplication facts (6-10) and corresponding division facts.
	I <sup>2</sup>	MA.3.1.14	Model multiplication of 2- and 3-digit numbers by a 1-digit number.
	I <sup>2</sup>	MA.3.1.15	Model division of 2- and 3-digit numbers by a 1-digit number.
	E <sup>4</sup>	MA.3.1.16	Solve grade-level-appropriate story problems using multiple strategies.
<b>ALGEBRA</b>			
	E <sup>3</sup>	MA.3.2.2	Use input/output model with grade appropriate functions.
	I <sup>2</sup>	MA.3.2.5	Write equivalent numerical expressions.
	I <sup>2</sup>	MA.3.2.6	Represent the idea of a variable as an unknown quantity using a symbol.
<b>GEOMETRY</b>			
	E <sup>3</sup>	MA.3.3.1	Identify basic polygons and their components through decagon.
<b>MEASUREMENT</b>			
	E <sup>2</sup>	MA.3.4.1	Estimate, measure, compare, order and draw lengths using inches (to the nearest $\frac{1}{2}$ inch), feet, yards, centimeters and meters.
	I <sup>2</sup>	MA.3.4.2	Estimate and count the number of cubes in a rectangular solid to determine volume.
	I <sup>2</sup>	MA.3.4.3	Discover by modeling the formula for determining the area of a rectangle.
	I <sup>1</sup>	MA.3.4.4	Understand appropriate grade level conversions within a system of measure.
	I <sup>2</sup>	MA.3.4.5	Estimate and measure results of mass/weight in ounces, pounds, grams and kilograms.
	E <sup>3</sup>	MA.3.4.7	Calculate elapsed time to quarter-hour.
	E <sup>3</sup>	MA.3.4.8	Read and write amounts of money to \$100.00.
	E <sup>3</sup>	MA.3.4.9	Role-play making change up to \$10.00.
	E <sup>2</sup>	MA.3.4.10	Estimate, read and recognize common temperatures of Celsius and Fahrenheit.
<b>DATA ANALYSIS AND PROBABILITY</b>			
	I <sup>0</sup>	MA.3.5.1	Collect data from observation, surveys and experiments, and construct and label a graph.
	I	MA.3.5.3	Experiment and describe concepts of probability and chance and list possible outcomes from a sampling.
	E <sup>4</sup>	MA.3.5.4	Analyze data represented on a graph using grade-level-appropriate questions.



This formulated mathematical curriculum does not explain how a teacher is to teach the identified material while being cognizant of the influence that human relationships play in teaching and learning. Although the teachers' manual for any mathematical series offers many suggestions and provides supplemental materials such as a workbook and concrete mathematical manipulatives, it does not offer a language that is pertinent to a pluralistic audience. This is where the intuitive instructor tailors the material to suit her audience. Mathematical knowledge and theories of learning are fairly clear in policy documents, but these documents are less clear about details of teaching practices that are rooted in ideas of knowledge and learning (Latta, 2002). So when the recommended test for the series is administered, the students are unable to successfully complete the task - unless they speak the language - because their lived language differs from the language employed by the publisher of the series. Could this be a factor that affects the success of schools in the United States? Perhaps but we will not know because all attention to the success of schooling is focused on one outcome-standardized testing. Latta suggests teachers invent a practice where they continuously negotiate moves which are determined by the situation rather than by what is defined and prescribed in advance (Latta, 2002).

The above describes a formula very similar to the type of questions that Tyler posed in his syllabus for curriculum building.

1) *What educational purposes should the school seek to attain?* (Tyler, p.

1). West Virginia CSOs identify exactly what objectives are to be taught by grade level, and in most cases, teachers have a chart that tells where the objective can be found in the mathematics book.

2) *What educational experiences can be provided that are likely to attain*

*these purposes?* (Tyler, p. 1). Each grade level is assigned a math book that the classroom teacher is expected to utilize to attain these goals. In addition, the teacher is provided with workbooks, homework workbooks, manipulatives, prepared tests, and answer keys to all materials.

3) *How can these educational experiences be effectively organized?* (Tyler,

p. 1). The West Virginia CSOs are very organized to the point of identifying what time of the year each objective is to be taught and the importance of each objective that is to be taught.

4) *How can we determine whether these purposes are being attained?*

(Tyler, p. 1). To assess the success of students as well as the teacher, a standardized test is administered near the end of the school year. This information is not only used to determine student success, but it is also used as a way to make teachers accountable for what goes on in their classroom.

Tyler's four questions are utilized well when identifying the curriculum that is taught in West Virginia Public Schools. However, it leaves itself open to criticism and failure because it does not include any other rationale that

could influence the success of teaching and learning of mathematics. For instance there are particular concepts that students learn in a given time frame as mapped out in Table 1 Mathematics Curriculum for Third Grade on page 39. How the concepts are presented and taught to students is open ended. There are no identifiable techniques. Schools in West Virginia offer Principles for Mathematics as stated on page 32. This explains what is desired but does not include techniques or strategies to accomplish these goals. In addition these Principles do not take into account the idiosyncracies of the individual classroom. One technique that should be considered is the classroom atmosphere. Utilizing Schwab's The Pracitcal will assist curriculum practitioners in understanding that classroom environments differ from one setting to another and each setting dictates a technique relative to its own idiosyncracies.

### **Assessing Outcomes**

According to high-stakes testing advocates, a student who scores satisfactorily on the test is proficient in mathematics. If the student does not score satisfactorily on the test, then he is identified as not proficient and will need remediation. I have observed students that score well on standardized tests and are competent when applying a skill to a situation. Usually high scorers understand mathematics well and can perform in diverse circumstances. On the other hand, some students can perform adequately on the standardized test but cannot apply mathematics outside

the conditions of the test. Administrators on many levels push teaching in the style of the standardized test, but not all questions that students will come across in daily living will be in the form of a standardized test. They then have to learn how to adjust to the real world.

Another boast of mathematic developers is to teach real-world problem-solving techniques. This is difficult when teachers are teaching with a standardized testing technique. One assessment cannot tell the multi-faceted accomplishments that a child can experience in the classroom. It can give, perhaps, one view of a student's success. I am not professing that the teacher or the student should be assessed. However, I assert that our society should not rely on one assessment to determine the success of the student, the teacher, and the educational system.

When a student needs or wants to spend more time on a concept, time constraints and the need to address Curriculum Standards and Objectives (CSOs) can impede this need or desire. Many times, students need time to linger on a mathematical skill to absorb its meaning and application. Even if a student has been exposed to a particular skill in the past, it may have been introduced just as swiftly as it was abandoned for yet another skill or piece of knowledge. Students need time to converse to build dialogue between themselves and the subject. Latta (p. 47, 2001) writes of Yinger, "This suggests that conversation entails an entering into and living with a context and its participants. As such, conversation is not only a means of

interaction and a way of thinking, but also a type of relationship with one's surroundings" (Heaton 2001). When the discovery is eliminated from learning, "the self as participant, as inquirer, as creator of meaning has been obliterated" (Greene p. 12, 2001). So much material is crammed into one grading period, not to mention into one day, that there is no time to converse, to build dialogue and relationships with peers or adults, or to linger and absorb information not only in mathematics but many disciplines. Supplementary to this is the effects of what goes on outside the four walls of school. Students' experience affects how they negotiate in and out of the classroom, which also has an effect on the success of education.

### **Curriculum Practices Cannot be Left to Only a Teaching & Learning Process**

As Schwab proposed so many years ago, there are many elements that play into determining best curriculum practices. Aquinas also believed that education includes several entities, such as the family, the church, and society. The educational formula encompasses a body of knowledge, a teacher, and a learner (Gutek, 1997). This too is what Schwab proposed. Curriculum practice cannot be left to only a process of teaching and learning. Culture, society at large, family, persons, and places all affect the teaching and learning process. These elements or facets circle from one to the other while comprising the educational setting. Politics is comprised of the people who make up Culture, Society, and the Family. These are the persons who

feed education with what Curriculum will include which is comprised of Standards and Objective. The use of a particular Theory is determined by use of Standards and Objectives and the Students who are being taught. The Practice is used by the Teacher to execute Theory that is relative to a particular Curriculum that is dictated by Poticis which is comprised of the Society at large and inclusive of the Teacher. Figure 1 illustrates the various factions in education and society. The center circle represents the facets of education and how they circle while also influencing the agents that are acted upon and vise versa.

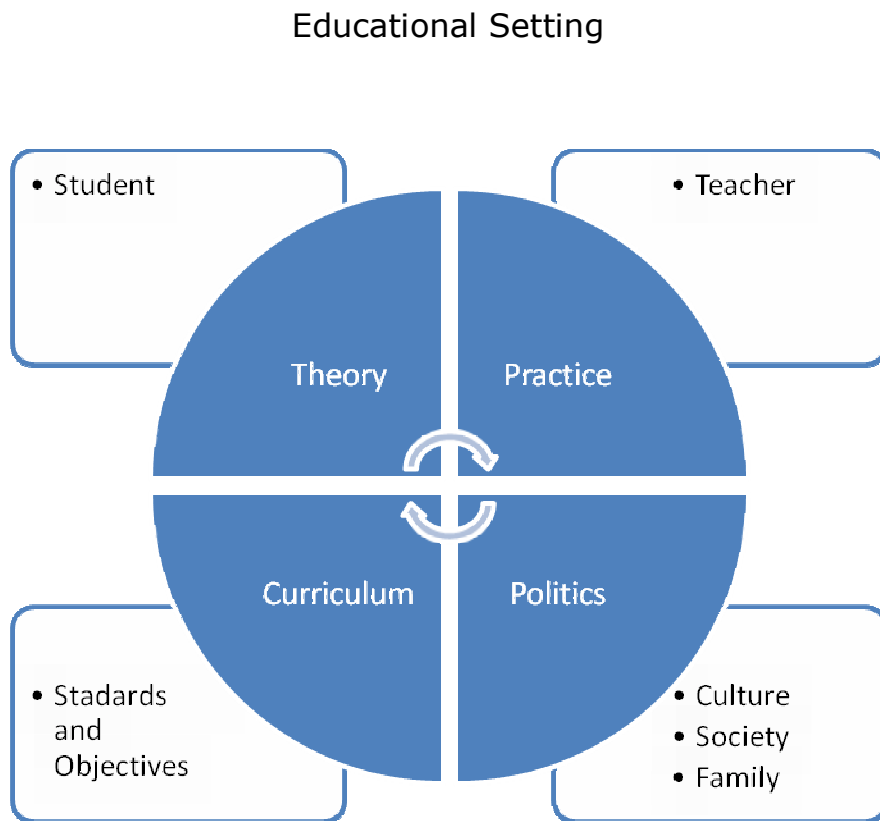


Figure 1

Learning is a relational process that cannot ignore the state of the persons who comprise the educational setting. Persons and setting are different, diverse and plural. "I wonder if the failing of modernity could be connected to a resistance on the part of what I shall call the multiplicity of worlds of names, the diversity of culture" (Lyotard, 1993). "Education is not a field that will yield to simple prescription or recipes" (Eisner, 2002). West Virginia's curriculum for mathematics is formulated and direct; it requires a teacher to teach a certain objective during a certain grading period to an identified level of proficiency. Relational characteristics prove time and again to have a tremendous effect on student's mathematical success. But this idea is not mentioned in the mathematics CSOs for West Virginia. Why do curriculum practitioners ignore the evidence? I found not only in this third grade classroom but in other classes I have taught that many students performed better and enjoyed mathematics because of the relationship that was forged between the teacher and students and then between the students and subject as a result of human relationships. Live curriculum and human relationships are an enormous underpinning hypothesis in the educational setting that is not being taken seriously.

Schools are institutions that will continue to require students to work and meet a prescribed set of objects, but it is the classroom environment, the relational aspect between the student and teacher, that affects the

relation between the student and curriculum and the teacher and the curriculum. Sidorkin desires that “students will want to go to school not because of what they will do but because of who they will meet” (Sidorkin, 2002). Schools can become attractive due to the quality of human relationships (Sidorkin, 2002). Many American students get up every day to go to school to see friends and those adults who they feel are congenial. People are innately social beings; however, the education realm has relegated the natural relational feature of interaction to the background (Sidorkin, 2002). The relational quality of human interaction seems to be considered a byproduct in the education field when in reality, teaching and learning are the byproducts of human relationships.

### **Curriculum Practices Fair Poorly**

Curriculum practices have not lived up to Schwab’s *The Practical* when attempting to build a discipline. As educational philosophers of the past and throughout history, curriculum design was and still is a formula that is meant to satisfy all participants without considering the pluralisms that exist from one group or setting to another.

“Each situation in which educational decisions are made is significantly unique, not simply unique in the sense of time and place - all situations are unique in that sense - but unique in the sense that the goals, methods, people, and context differ from each other in important ways and must be treated with respect to those differences if decision making is to be effective” (Eisner, 2002).



Mathematics education and curriculum development has not lived up to *The Practical*. Many school systems desire to develop curriculum practices that are Schwab in nature when in essence they are not. As described above, mathematics practices are formulated and do not take into consideration the effect of the classroom atmosphere on student achievement. The Department of Education espouses in their vision statement that students should develop an enjoyment for mathematics; however, the curriculum is very formulated and predictive, and it is ascribed in a linear fashion that is intended to suit a diverse population. Current mathematical curriculum can answer the four questions that Tyler proposed in his small book but he too suggests that his rationale has limitations. Other rationales need to be considered when formulating a curriculum plan and its execution. Curriculum practitioners need to take all knowledge, theories, and practices about education and dovetail these principles to develop a mathematical program that will satisfy the pluralisms of culture. Schwab's vision allows for recognition of those elements that influence any given situation and deliberation of a conclusion of best practice(s) for its participants.

## Chapter III

### **A Literature Review of What Education Should Engender**

As seen in the previous chapter historical perspectives are comprised of philosophical practices. This literature review describes philosophies that effect student achievement. Aesthetics in mathematics invokes students' interests by eliciting the emotions that are attached to goodness, truth, and beauty, elements that can be discovered in mathematics. This interest is expanded upon with the use of communication to ensure credibility of the subject matter as well as the instructor. The result is student achievement—the desired outcome.

To properly engender mathematical competency, educational systems should use aesthetics to stimulate mathematics achievement as explained in Chapter 1. This can be accomplished with the utilization of communication techniques and the relational aspects of the teacher/ student interpersonal relationship within the classroom. Teachers who understand the need and use aesthetics to instill a joy of mathematics have developed an artful skill of the teaching profession. What Schwab has suggested in The Practical is what I will use as a lens to view elements that affect the classroom environment of a particular group of third graders I taught during a spring semester.

Since mathematics education is of great concern to those who teach the discipline and who establish its policies. With the launch of Sputnik in

the 1950s (Meadows, 2007) and the subsequent federal report, *A Nation At Risk* (Meadows, 2007), and *The Third International Mathematics and Science Study* (TIMSS) (Martin & Kelly, 1996), reporting that students in the United States do not perform as well as those internationally, educators, policy-makers and researchers continue probing to find solutions to increase student performance in mathematics. Through viable research, resolutions to this dilemma can be targeted. One such theme that has proven to have an effect on students' attitudes toward mathematics and their performance is the climate of the classroom. Researchers are taking notice of the implications the classroom environment has on student achievement. Although this is not a new topic, its recent discovery has ignited an interest in teacher-student interpersonal relationships. This teacher-student relationship influences the climate of the classroom which in turn affects student performance. The condition of the classroom atmosphere is a viable factor when considering solutions for what ails the present state of mathematics education.

Interpersonal relationships within the educational setting are an encouraging resolution to instill mathematical success in United States classrooms. Instructional communication is a relational process that begins in the classroom with the teacher, the student, and the mathematical curriculum as its venue (Richmond, 1986). Lived experiences and dialogue that develop from the interaction of the teacher, student, and subject create

an atmosphere in the classroom that affects student achievement and elicits a joy of learning mathematics (Mottet, 2006). Teachers need to artfully orchestrate what and how the classroom environment will be constructed. To do this, it is important for teachers at all levels to identify their communication traits and to refine their art of teaching so as to facilitate optimal interpersonal teacher-student relationships while keeping in mind that their students have varying communication traits. These traits can vary in levels of desire to communicate to anxiety associated with communication. Ultimately the teacher's goal is to smooth the progress of learning and assist the student in achieving academically (Mottet, 2006). This is to suggest that the teacher understands the diverse elements that encompass the teaching and learning of mathematics, an idealistic view of The Practical where all aspects and the relationships between them are considered. Therefore in this dissertation I will consider the aesthetics in mathematics and the interactions of communication as a venue for teaching and learning as means to impact student achievement in the discipline of mathematics for a one group of third graders in rural West Virginia (Mottet, 2006; Richmond, 1986).

### **Aesthetics and Mathematics**

The term "aesthetics" was introduced by German philosopher Baumgarten, who introduced the Greek word "aisthetikes." Not used widely in English until the nineteenth century, the term was referred to as the

“standards of taste” or “judgment of taste.” Aesthetics is a branch of philosophy that studies sensory-emotion value. Hegel suggests that “‘Aesthetics’ denote more accurately the science of the senses or emotions” (Kant, 1984 p. 1).

There is no objective rule for the judgment of taste, which can determine a process of determining what is beautiful. The feeling of the subject is the determining ground (Kant, 1984 p. 103). To detect the pleasure and/or the pain of a composition is sensory; thus, this is a capacity for pleasure (Kant, 1984 p. 103). Also, while utilizing the senses to evoke enjoyment, to judge something as beautiful, the senses must give rise to contemplative reflection (Kant, 1984 p. 104). To seek a position that relates “objects to a pre-ordained standard cannot adequately account for the diverse experiences of the observer” (Gardner, 1973 p. 9). Aesthetics is the individual judgment of beauty, which is based on the perceptions and sensory response of that individual.

Mathematicians revere their discipline as one that holds aesthetic value. Mathematics holds a beauty that it shares with our world. Additionally, mathematics orchestrates the universe as we know it and perhaps what we have yet to discover. Discovering the many facets of mathematics is joyous and evokes the senses to respond emotionally. The excitement of discovery is aesthetically pleasing to the participant. To

experience the joy of mathematics is to discover it for the first time (Pappas, 1989).

The quest for mathematical aesthetic can be viewed through the three entities of truth, beauty, and goodness. Truth being the reality that aesthetics contributes to mathematics. Beauty beholds the phenomenon of mathematics and goodness is the pure joy elicited through the pleasureable activities of mathematics. "Mathematics, rightly viewed, possesses not only truth, but supreme beauty...yet sublimely pure, and capable of a stern perfection such as only the greatest art can show," (Russell, 1957 p. 57).

### *Aesthetic Truths in the Mathematics Classroom*

To assist the teacher in building a mathematics classroom where students want to spend time, it is also necessary to understand the aesthetics of mathematics. Using aesthetics as a tool to encourage students to view the beauty of mathematics can foster a desirable classroom atmosphere where teacher-student relationships and the excitement of learning mathematics in a meaningful way can bring about the desired level of mathematical achievement. Children can behold the beauty that mathematics emits by being wrapped up in its essence through experiences that incite discovering meaning. Mathematics is then no longer an obscure domain fitted only for a select few who dare to enter. Mathematicians incarnate immense power. As Sir James Jeans deduced, "The Great

Architect of the Universe now begins to appear as pure mathematicians” (Cole, p. 10). It is just like putting the pieces of a puzzle together. If the right ones can be had, the picture goes together quite easily. As in mathematics, if the students have the right pieces, then the puzzle of mathematics becomes a clear picture.

### *Beauty Discovered in Mathematics*

In a realistic sense, mathematics is a function of our everyday lives and is necessary to perform various tasks that are required. To go beyond the mundane and to explore the hills and valleys of mathematics is where the aesthetics of mathematics lies. Is it possible to comprehend the vast distance in space? S. George Djogvski offers an analogy that “if the Sun was an inch across and five feet away from our vantage point on Earth, ‘the solar system would be about one fifth of a mile across. The nearest star would be 260 miles away, and our galaxy would be 6 million miles across” (Cole, 1998). Although the vastness of our solar system is depicted by this analogy, it still can become somewhat abstract to the student because of the large numbers that are being used to simplify the explanation. This is a fascinating account in which a student could elicit joy and a desire to know more and to appreciate the fineness of mathematics.

The idea here is to find connections that explain the universe (Cole, 1998). Through mathematics, phenomena can be explained and possible

predictions of future occurrences can be foretold. Although mathematics possesses a practical application such as balancing a checkbook, measuring distance, or making change, it also includes a beauty that has escaped our daily lives. Mathematics also demonstrates a beauty that inspires excitement through sheer calculations of theorems. For instance, Euler's Theorem  $f - e + v = 2$  can elicit joy through calculation of this formula. Although this is a theorem which believes that for all cases the result will be the same it is intriguing. Taking the number of faces of a polyhedron, subtracting from it the number of edges, and then adding the number of vertices will always result in a conclusion of 2. To the mathematician, this is a thrilling event. To the layperson who is given the opportunity, it too can be a thrilling event. For instance prime numbers - the prime factorization of 12 is  $2 \times 2 \times 3$  and this is only true of the number twelve. In the 1700s, Christian Goldbach believed that every even integer other than 2 could be shown to be the sum of two prime numbers:  $8=5+3$ ,  $24=11+13$ , or  $24=7+17$  (Pappas, 1994).

Mathematics can also be intriguing and frustrating. Fermat's Last Theorem has troubled mathematicians for nearly 350 hundred years, as they try to find a proof that can satisfy  $x^n = y^n + z^n$  when  $n$  is a natural number greater than 2 (Pappas, 1994). The premise is to demonstrate that a cube whose sides are whole numbers can indeed be broken into two cubes whose sides are whole numbers (Salem et al., 1990). Andrew Wiles's 200-page



paper, *Modular Elliptic Curves and Fermat's Last Theorem* indicate promise that Fermat's Last Theorem can be proven. These are the art forms, the poetry, and the music of mathematics. It seems that these beautiful experiences are the reward of those who chase mathematical quests in an extensive pursuit of mathematical victory.

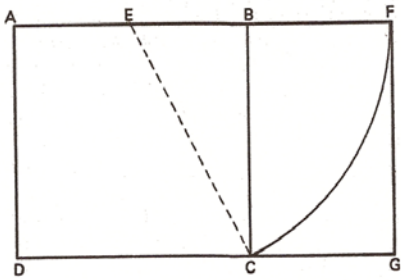
How about whole powers of numbers? This is another way to enjoy mathematics. The word *square* come from the understanding that if  $a=3$ , then  $a^2=3 \times 3=9$  meaning that 1 whole is divided 3 by 3 into 9 pieces. In the same fashion, when  $a$  is multiplied by itself twice, it is then a *cube* and written as  $a^3$  or  $a \times a \times a$ . Also, negative powers of numbers can be written as  $a^{-1}$ ; by definition, it is the reciprocal of  $1/a$ . If  $a=2$  then  $2^{-1} = 1/2=0.5$  and so on. To continue this process, imagine  $2^5=2 \times 2 \times 2 \times 2 \times 2$  and then group the five numbers into a set of three and a set of two,  $2^5=2^3 \times 2^2$ . If relating this to genealogy, it can be demonstrated that with two parents, there are four grandparents and the number of ancestors doubles with each generation.

The Fibonacci Sequence is yet another means of explaining this world. If one pair of mature rabbits produced a pair of rabbits at the end of each month and this continued in the same fashion and no rabbit died, how many rabbits would there be at the beginning of each month? Assuming that each new pair reaches maturity in two months and produces a new pair of rabbits, how many will there be after one year? (Garland, 1987). The Fibonacci sequence calls  $F_n$  the number of rabbits at the beginning of the month.

Since the mature pair of rabbits produces a second pair in the second month, there are two pairs of rabbits at the beginning of the third month. Here Fibonacci noticed that the rabbits can be divided into two groups, the old  $F_{n-1}$  who were there after  $n-1$  months and the number of new ones who were just born. When the new ones become mature and produce a new pair of rabbits, the number of new pairs is equal to the number of pairs two months earlier,  $F_{n-2}$ . The formula result is as follows:  $F_n = F_{n-1} + F_{n-2}$ . The Fibonacci series  $F_n$  includes but is not limited to the following terms: 1,1,2,3,5,8,13,... (Salem et al., 1990). This also extends to nature, where the right- and left-handed spirals on pine cones, the base of a pineapple, the arrangement of leaves on a branch (Pappas, 1994), the seed head of sunflowers, and other similar flowers often contain consecutive numbers of the Fibonacci sequence. Flowers can contain the number of petals that is found in the Fibonacci sequence - the cosmos with 8 petals and the wild rose with 5 petals, to name a few. The bounty of mathematical relationships and their beauty waiting to be discovered in nature is overwhelming. Taking only these few areas mentioned and to bring them to the classroom would open a world for students that they will never forget, creating the joy and excitement of *aha!* Imagine the splendor students would experience when exploring the aesthetics of mathematics.

One of the most appealing figures is the golden rectangle. "The construction of the golden rectangle is a simple matter. The side  $AB$  of a

square  $ABCD$  is bisected. With center  $E$  and radius  $EC$ , draw an arc of a circle cutting  $AB$  produced in  $F$ . Draw  $FG$  perpendicular to  $AF$  meeting  $DC$  produced in  $G$ . Then  $AFGD$  is the golden rectangle" (Huntley, 1970).



(Figure from H.E. Huntley-The Divine Proportion p. 61)

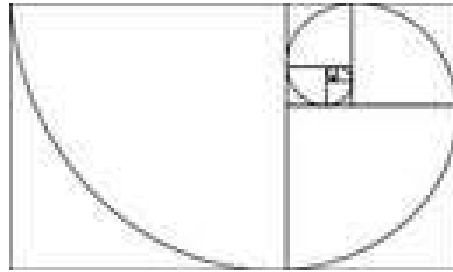
The golden proportion can be seen in the Parthenon, which is considered the most beautiful structure in the world because of the use of the golden rectangle.



[http://fotogenetic.dearingfilm.com/golden\\_rec...](http://fotogenetic.dearingfilm.com/golden_rec...)

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“The golden rectangle continually generates other golden rectangles and thus outlines the equiangular spiral” (Pappas). This is the only spiral that does not alter its shape as it grows. This is typically known as the nautilus.



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### *Goodness of Mathematical Aesthetics*

All these fascinating finds are wonderful resources to utilize in the classroom to spark interest and facilitate a long appreciation for the aesthetics of mathematics. Teachers are the artists of the mind and soul. They create the environment for the mind and soul to expand like the golden rectangle which is representative of the nautilus. The art of teaching stirs joy within the student whose mind is free to work (Dewey, 1938; Greene, 1979; Latta, 2001). The interplay of self and world is continual and by no means final (Latta, 2001). Introducing students to discoveries or observations other than the current mathematical trend will delight the soul and bring joy to the face. Teachers are the catalysts that will set the wheels in motion, utilizing more than the teaching manual to stimulate the student to search for mathematical beauty so as to understand self and the world.

Mathematics is not merely figures that are manipulated to find a solution. It is an engagement of mind and body in the essence of mathematics. “[What] Coleridge said of the reader of poetry is true in its way of all who are happily absorbed in their activities of mind and body: ‘The reader should be carried forward, not merely or chiefly by the mechanical impulse of curiosity, not by a restless desire to arrive at the final solution, but by the pleasurable activity of the journey itself’” (Dewey, 1934 p.5). Mathematics has all the elements of pleasurable activity as demonstrated so briefly in the few preceding paragraphs. It is the figuring of theorems and formulas, the patterns they create, and the relationship one has to the other. Mathematics is the skeleton key that explains while also creating science, art, poetry, and music. To understand, to feel the sensory emotions that are evoked by mathematics, is to experience mathematics aesthetically. Utilizing aesthetic for teaching mathematics is a view that lends itself to Schwab’s quasi-practical. Aesthetics is defined as the existence of diverse sensory perceptions of taste and where diverse experiences exist simultaneously.

### **Communication is Interactive**

The classroom is a dynamic place where the goal is for students to attain academic and social success for a productive future. Students come to school full of awe at a very young age. The desire of the teacher is to maintain the splendor of wonderment, to sustain and foster the truth,

beauty, and goodness of mathematics. "A productive and stable classroom atmosphere is at the heart of teaching effectiveness, and the quality of the climate is dependent on the nature of teacher-student communication" (Levy, DenBrok, Wubble, Brekelmans, 1992, 2003). The teacher is in control of the events that take place within her four walls. In saying this, I refer to how the teacher chooses to react to any given situation. If the teacher chooses, she can control and direct events. How she reacts demonstrates if she controls her actions or if she relinquishes control to others. Instructional communication is a vital element in the classroom context that greatly influences learner outcomes. Teachers who utilize immediacy cues to develop affinity with students are more likely to obtain compliance from students and increase affection for the subject while increasing student motivation and cognitive learning. "The central role of the teacher is to create instructional environments in which the probability of achieving intended educational objectives are met, and student learning outcomes are enhanced" (Andersen & Krathwohl, 2001; Bloom, 1956; Krathwohl, Bloom, & Masia, 1964, chap. 8 p. 168).

To begin, instructional communication is both rhetorical and relational. Instructional communication can be examined from a rhetorical perspective, which includes four of the five classical canons. These areas include *invention*, how the teacher illustrates relevant meaning to the student. *Arrangement* of material must meet students' needs; *style* is the phrasing of

messages for instruction; and closely related to style is *delivery* (Mottet, Richmond, McCroskey, 2006). Utilizing these characteristics skillfully will impact the speaker's credibility. According to McCroskey's research, this credibility is measured by degree of caring, competence, and character and is based on the perception of the student. Teachers are perceived as most credible when they exhibit all three characteristics of credibility (McCroskey, 1998). The relational perspective focuses on the teacher and student, recognizing the emotional aspects of instructional communication.

Upon walking into a classroom, the teacher has all eyes upon her just as all students are open to the teacher's scrutiny. In this manner, I suggest that how the teacher conducts herself/himself has an effect on the students, and how the students conduct themselves has an effect on the teacher. The key is to orchestrate these interactions in a manner that is beneficial to both parties.

### *Teacher Beliefs*

While keeping in mind that the classroom is interactive, teachers must be cognizant of the significant role their beliefs play in what happens in a classroom. Since beliefs impact classroom practices, it is important for the teacher to be aware of her belief system. The term "beliefs" is used to mean anything that one holds to be true (Beswick, 2004). Statements of beliefs that match actions across context are likely to be beliefs that are centrally

held (Greene, 1971). Enacted beliefs within the classroom comprise the context of the classroom (Wilson & Cooney 2002). It has been theorized by Ajzen and Fishbein (1980) and Green (1971) that what happens in the classroom is belief-specific. Green also suggested that the strength of the belief that is held is reliant upon the context within which it is enacted. For example, if a teacher holds a constructivist view yet does not practice this view due to a particular classroom context, what is influencing his/her practice and are student needs being met?

Additionally, teacher belief concerning mathematics plays a dynamic role in creating the classroom environment. Teachers may or may not have had a positive mathematical experience, which influences their attitudes about the teaching and learning of mathematics. Some teachers may have an aversion to mathematics because of prior experiences but still realize the importance and the advantage of completing particular mathematics courses. Teachers' beliefs concerning mathematics are a result of several factors: their past experiences, schooling, and teachers (AlSalouli 2004). Since teachers are the primary mediators connecting the subject matter of mathematics to the student, it is only natural to infer that teachers' perceptions are communicated to the student (Thompson, 1992). It is ideal to create a mathematics classroom that is not merely figures that are manipulated to find solutions; it should be an engagement of mind and body in the essence of mathematics.



Students' needs are a concern of the classroom teacher, but they are ideological in nature. Teachers take into account different factors when defining what is necessary to teach their students. These factors include student knowledge or lack thereof, what they should know, previous experience, what they bring to school, what they need to succeed in life, and what jobs they will hold. The teachers' judgment of these factors is based on their own world-views, their ideology which is subject to what elementary teachers teach in schools (Sztajn 2003). It is highly important for teachers not only to hold a constructivist view of teaching and learning mathematics but also to attend to beliefs that can impact classroom practices. All mathematics classrooms should exhibit practices of equity, showing that all students are capable of learning mathematics. However, what the student brings to the classroom is of importance. It is important for teachers to keep in mind that the varying backgrounds of their students should not determine the quality or the interpretation of mathematics and how it should be taught. Some classes are more advanced than others, but all students should be expected to strive for excellence. Whether teaching low or high SES students, teachers should not predetermine their students' outcomes. Although students' background should not determine teaching practices, pupils' perceptions of the school, the teacher, the classroom, and their fellow students can have an impact on learner outcomes. "By focusing on culture, we can learn more about how the 'invisible' components in the teaching and

learning situation can contribute to or detract from the quality of the mathematical learning that takes place” (Nickson, 1992, p. 102). Culture too is an important element of teaching mathematics as well as a given mathematics content. Mores can have great effects on the student, the teacher, and the acquisition of mathematical skills and understanding. This is what Schwab intended for the curriculum practitioner to consider when developing a curriculum for the student from one group and setting to another.

### *Internal Factors & Student Beliefs*

The internal factors of schools that influence student engagement included caring teachers and administrators who treat students fairly, accessible counselors, the curriculum and how it is presented, and the time students are allotted to spend with peers of similar interests. Schools that have adults who provide authentic learning experiences and show interest in students will engage students in learning and ultimately foster student achievement. Thus, how students feel about school, their classes, and their relationship with teachers and peers strongly influences their sense of acceptance in school and their academic engagement (Certo, Cauley, Chafin 2003).

Students’ belief about the role and function of the teacher has an impact on their behavior in the classroom. Also, students’ belief about their

mathematical confidence impacts their perception of mathematics relevance. Those with high confidence perceive mathematics as relevant, whereas those with low confidence perceive mathematics as irrelevant (Op't, DeCorte 2003). The interpersonal relationship between the teacher and her students is vital to the success of teaching and learning mathematics. A good teacher also knows that showing concern for her students' well-being is fundamental to the students' success in school. If students feel valued and are expected to participate in the classroom activities, they will be engaged. Students' perception of their teacher's interpersonal skills is reflected in students' achievements and attitudes within the classroom (Lapointe, Legault, Batiste 2006).

However, it is important to note that the attitudes or experiences that students bring to the classroom can have an effect on the students' outlook toward mathematics and their performance. Students who view mathematics as relevant and find success in the mathematics classroom continue to be successful. Teachers of mathematics find it ideal to promote students success so that they continue to experience success and view mathematics as relevant. Additionally, it is ideal to encourage and set students up for success that do not view mathematics as relevant so they too can develop skills and attitudes that promote mathematics as relevant.

Listening to students' views on mathematics and the teaching and learning of mathematics is one way to develop a teaching practice and be

aware of what goes on in the classroom (Diaz-Obando, Plasencia-Cruz, Solano-Alvarado, 2003). This opens opportunities to reflect on ways to better appreciate students' understanding.

Teachers' and students' beliefs play a role in the development of the classroom environment. How teachers and students interact and perceive the other is a factor in the type of classroom environment that is established. Beliefs and perceptions also influence the behavior each exhibits toward the other.

### *Teacher Immediacy & Influence*

One way to develop the classroom culture is to foster teacher immediacy. Teacher immediacy is defined as "physical and/or psychological closeness" that exists between the teacher and her students (Andersen, 1979; Mehrabian, 1969, chap. 8, p. 170). Some common behaviors of immediacy include smiling; a touch on the arm, hand, or shoulder; physical closeness to another; eye contact; using warm vocals; facing one another; and leaning forward toward one another (Mottet, 2006). Instructors who are more nonverbally expressive have demonstrated more influence in their students' lives. They experience more student compliance and less student resistance of teacher requests (Plax & Kearney, 1992). Also, those teachers who are perceived by their students as highly humor-oriented are perceived as more immediate. Students learn more from these humor-oriented

instructors (Wanzer & Frymier 1999a). Like teachers, students who exhibit more humor-oriented behaviors also demonstrate more verbal and nonverbal immediacy (Gorham & Christophel, 1990; Wanzer & Frymier, 1999a, 1999b).

The influence that teachers exhibit in the classroom can have a positive or negative effect on student learning. There are five relational powers as identified by French and Raven (1995): legitimate, reward, coercive, expert, and referent power. These powers are exerted by the agent, the teacher, and are fixed in the relational perceptions of the target, the student. Students' perception of teachers' power elicits a significant response in student learning. Coercive and legitimate power are negatively related to student learning, while referent and expert power are significantly related to student learning and reward power is not significantly related to learning (Richmond & McCroskey, 1984). A study conducted by McCroskey, Richmond, Plax, and Kearney (1985) found that the use of pro-social (referent, expert, and reward) behavioral alteration techniques (BAT) have a positive influence on student affective learning and that anti-social (legitimate, coercive) BATs have a negative effect on student affective learning. There exists a strong correlation between the use of humor and pro-social behavior alteration techniques such as: *self-esteem, expert teacher, peer modeling, and teacher modeling* in getting the target (student) to comply with the agent's (teacher's) request. It is difficult to dislike

someone, or to refuse a request, when you are smiling (Punyanunt, 2000). Teachers who are perceived as nonverbally immediate are also perceived as using pro-social behavior alteration techniques and behavioral alteration messages even when they are using antisocial BATs/BAMs (Kearney, Plax, Sorensen, Smith, 1988). In the classroom, the principal role of teachers' verbal interactions is to convey content to improve student cognitive learning and the principal role of nonverbal behavior is to improve affection for the subject. Affection increases learning (Mottet, 2006).

### *Teacher/Student Behavior Patterns*

Teacher behavior patterns affect student behavior in the classroom. Teachers who engage in immediacy cues with students will increase affinity, which results in increased respect for the teacher and an increase in student learning. This is in relation to the referent-power explanation (Mottet et al., 2006). Teachers who use these cues are perceived as more competent communicators and are more likely to listen and care, which increases student-teacher interaction (Mottet et al., 2006). Students who perceive their teacher as caring and as presenting authentic material will more likely engage in the learning of mathematics. As a result, students will experience success.

Just as the teacher's communication behaviors affect the student, the student's communication behaviors affect the teacher. The teacher-student

relationship is transactional. It is a mutually reciprocal interaction of messaging (Watzlawick, Bavelas, & Jackson, 1967). To properly understand the transactional process in the classroom, the teacher-student interpersonal relationship needs to be examined.

Student nonverbal immediacy messaging influences instructors' perception of the student. Those students who utilize these techniques increase teachers' perception of their credibility and interpersonal attractiveness, and influence the teacher's motivation to teach. In addition, student nonverbal immediacy also impacts the teachers' perception of student competence, teacher self-efficacy, satisfaction, and the value of the teacher-student relationship (Mottet, Beebe, Fleuriet, 2006 pp. 152-153). More than verbal responsiveness, students' nonverbal responsiveness has a greater effect on teacher satisfaction than teacher self-efficacy. Teachers who perceive their students as nonverbally responsive increase their liking for their students, and are more likely to comply with their students' requests (Mottet, Beebe, Raffeld, and Paulsel, 2004). Teachers are more willing to grant referent power to students who are responsive and these students also receive higher grades on their essays. Student nonverbal involvement affects teacher nonverbal involvement (Mottet, 2006). This suggests that the teachers' increase or decrease of nonverbal behavior is a response to the degree of student nonverbal behavior. Both parties are

“partially responsible for the other’s performance and important relational outcomes” (Comstock 1999 chap. 7, p.154).

Frymier and Thompson (1992) found that teachers’ use of affinity-seeking techniques is strongly associated with the credibility dimension of character while the competence dimension indicates a smaller yet important relationship. Also, affinity-seeking has an impact on student motivation and learning. Students who like their teacher increase affection for the subject matter and are more motivated, thereby increasing learning (Richmond, 1990). Again, students who are motivated and enthusiastic about a class, learn. This is most likely due to the student putting more effort into the subject material because of the affection they feel for the teacher and the subject due to teacher immediacy. Teachers who use affinity-seeking techniques such as immediacy with students improve the classroom environment by enhancing student motivation and affective learning (Myers, 1995). These teachers are also perceived by students as being more credible (Frymier & Thompson, 1992). Teachers who perceive students as utilizing affinity-seeking strategies have greater affection for their students (Wanzer, 1995). As long as teachers recognize students’ use of affinity-seeking techniques such as: *conversational rule-keeping*, *comfortable self*, *dynamism*, and *facilitate enjoyment*, teachers will increase affection for students.



Primary and secondary teachers use different affinity-seeking strategies when soliciting affection for them than when petitioning affection of subject matter. To gain affinity from students, teachers utilize techniques that include *optimism, eliciting disclosure, and inclusion of self*. When trying to influence affection for the subject - which teachers find more difficult than influencing teacher affection - they utilize techniques such as *facilitating enjoyment and conceding control*. Frymier and Thompson (1992) found that *facilitating enjoyment, assuming control, nonverbal immediacy, and trustworthiness* are significant predictors of student motivation. At the college level, professors tend to use affinity-seeking techniques that demonstrate self-confidence and control, whereas graduate teaching assistance employ strategies that include equality and openness (Rouch, 1991). However, in the college setting, the teacher-student relationship is asymmetrical and affinity-seeking techniques that violate the norms could be detrimental to the relationship. More studies on the effect of affinity-seeking techniques need to be conducted with school age children.

### *Teacher Misbehavior*

Another aspect that influences what happens in the classroom is teacher misbehavior. Teacher misbehavior is any act that is identified by the student, whether intentional or not, that interferes with student learning (Kearney, Plax, Hays, and Ivey, 1991). Teachers' misbehavior at the college level can include showing up late for class, humiliating students, lacking

basic teaching skills, returning papers late, and making the class overwhelmingly difficult (Kearney, Plax, Burroughs, 1991). Students who are paired with misbehaving teachers will exhibit increased noninvolvement, opposition, and possibly combative behaviors (Boice, 1996). Misbehaving teachers not only affect the student, but also have a negative effect on themselves. They are perceived as less credible (Schrodt, 2003) and their teacher evaluations, which new teachers rely on for tenure, are negatively affected (Boice, 1996). Additionally, teacher misbehavior affects student affective learning (McPherson & Bippus 2003; McPherson, Kearney, & Plax 2003; Wanzer & McCroskey 1998) as well as student levels of comprehension (Boice, 1996). Myers (2002) reported that student motivation and self-reporting cognitive learning is negatively affected by verbally aggressive teachers. Teacher accents-when difficult to understand-interfere with the teaching and learning process (Gill, 1994). Misbehaving teachers are liked less and students articulate that they have lower affection for the subject (Wanzer & McCroskey, 1998). Being aware of teacher misbehaviors is important when trying to establish a classroom environment that fosters success. These are behaviors to be avoided due to their counter-productive nature to student achievement. As Eisner suggests, it is just as important to know what is being taught in schools as it is important to know what is not being taught in schools (Eisner, 2002). This is applicable to teacher misbehaviors. How a teacher should behave in the

classroom is as important as how the teacher should not behave in the classroom when trying to promote student achievement.

As stated previously, teacher immediacy is a communication behavior that influences perceived closeness of teachers and students. Students who perceive their teacher as being immediate are less likely to resist teacher compliance-gaining attempts. Resistance from the student can be either passive or active. Passive resistance is of a covert nature, where students may not turn in an assignment on time, for example. Active resistance is more direct, such as challenging the teacher openly (Boice, 1996). Both types of resistance impede the learning process (Kearney, Plax, Richmond, & McCroskey, 1984). Students and teachers alike prefer passive resistance behaviors because they are less likely to disrupt the entire class and provoke a power struggle. Passive resistance is also perceived as more socially acceptable (Mottet et al., 2006 p.241). Resistance can be either constructive or destructive. When resistance is destructive, student learning is jeopardized; constructive resistance is viewed as aiding the student in defending against teacher behaviors that inhibit on-task activity (Kearney & Plax, 1992, chap.11 p. 240). "The most important stimulus to students' resistance decisions is likely to be the teacher," (Mottet et al., 2006, p. 241, 243).

Teacher immediacy is a major predictor of student resistance. Those teachers who exhibit immediate behaviors are more likely to gain student

compliance, whether the teacher utilizes prosocial or antisocial behavior alteration techniques (Kearney et al., 1988). Teachers who are perceived as immediate and use antisocial BATs are not perceived by students as using antisocial BATs. "Immediacy provides an antecedent attribution to the specific behavior of compliance-gaining strategy choice" (Mottet et al., 2006, p.245). Students are more likely to comply with immediate teachers and when they resist, they are more likely to blame themselves for non-compliance. Those teachers who are perceived as non-immediate are blamed by the student for non-compliance (Kearney et al, 1988). Although teacher immediacy is a strong factor in gaining student compliance, there are potentially other factors that need to be examined to complete the picture of student resistance. One such element could be the students' perception of fairness regarding outcomes or procedures in the classroom (Chory-Assad & Paulsel, 2004).

### *Communication Outside of Class*

Another viable approach to developing interpersonal relationships that cultivate student achievement is to engage in communication outside of class (COC). Many students come to school with the desire to connect with those in the building. Providing the opportunity to communicate in a mutually respectful manner is just what they are looking for. I have had several students who hated math and lacked skill but loved the class because they knew they could talk to me and I would listen. Building an

interpersonal relationship with these students changed the landscape of mathematics for them. It gives them a sense of shared power. When students perceive shared power, they also feel closer to their teacher and feel more positively toward the class and its content (Dobransky, Frymier 2004). This is assumed to affect student learning. Evidence is needed to back up this claim.

“People are drawn to people or things they like, evaluate highly, and prefer; they avoid or move away from things they dislike, evaluate negatively, or do not prefer” (Mehrabian, 1971, chap. 8. p.170). Teachers who engage in affinity-seeking techniques will utilize immediacy cues to increase teacher affection and attractiveness. “People communicate more with people whom they find to be attractive than with those they find to be unattractive” (McCroskey, 1992 p. 42). Increased teacher affection will result in affection for the subject, cognitive learning (Kelley & Gorham, 1988), increased student motivation (Richmond, 1990), and decreased student resistance in the classroom (Kearney, Plax, Smith, Sorensen, 1988). This in turn increases teacher communication attractiveness (McCroskey, 1992). “The principle of homophily, in part, suggests that the more similar two communicators are, the more likely they are to interact with one another” (McCroskey, 1992 p.43). Increased perceived similarity increases communication, which strengthens teacher-student interpersonal relationships.

### *Research Reveals*

Relationships are involved in creating the classroom atmosphere, but just how one relational variable linked or influenced by another is a question that needs attention. It has been documented that a productive and stable classroom climate is where teaching effectiveness lies and that teacher-student communication is a prerequisite for establishing such an atmosphere (Levy, DenBrok, Wubble, & Brekelmans, 2003). Researchers are still trying to wade through the breadth of relational variables and their potential effect on classroom perceptions and practices. It is likely that all relational variables influence one another within the classroom. This is why it is so important for preservice teachers as well as seasoned teachers to create a classroom that is conducive to a positive atmosphere for all.

Although the teachers' goal is to teach, the dynamics of how to accomplish this is changing. More and more research is revealing that teacher-student beliefs and interpersonal relationships create classroom affection, which plays a significant role in student achievement. An "increased interest in social and interpersonal aspects of the classroom has led to a shift in the nature of research undertaken, and it recognizes the importance of social interactions within the classroom and of what pupils and teachers bring to them" (Nickson, 1992, p.105). To foster positive outcomes

for students, teachers need to be aware of their beliefs and how they practice these beliefs in the classroom. They also need to know how to cultivate interpersonal relationships with their students in order to promote student achievement in mathematics. Additionally, teachers need to utilize aesthetics to facilitate a refined understanding of mathematics.

One place to start facilitating these changes is in teacher education programs. Although the time frame for teacher education programs is short, expecting pre-service teachers to examine their beliefs can have a constructive effect on their belief system and instructional practices. Usually teacher education programs have their pre-service teacher write their philosophy and goals for teaching. To extend this notion would be to expect the pre-service teacher to examine why he/she holds the identified philosophy and goals. What beliefs does he/she hold and are these beliefs practiced in the classroom? Does the student teacher enact his/her beliefs regardless of the context of the classroom and are there any conflicting beliefs that need to be resolved? "Perhaps as teacher educators, we need to take a broader view of our students and their beliefs and try to understand not just their beliefs about mathematics but also their wider beliefs about education, human relationships, and a person's role in society" (Mewborn, 2002, p. 27).

Although seasoned teachers understand the importance of the classroom environment, the next stage in establishing the importance of the

classroom culture is to disseminate the findings to the classroom teacher as well as the pre-service teacher. Through coaching, mentors can direct or affirm the value of creating a classroom environment that exhibits an atmosphere supportive of the teaching and learning of mathematics. All teachers need to identify their beliefs and values to create a teaching practice that will promote student achievement.

### **Engender Education**

Since the initial report from the Third International Mathematics and Science Study (TIMSS) to better mathematics achievement in our nation's schools, educators and researchers have committed themselves to finding methods that will enhance student learning and success. "The practical analyses of mathematics classrooms suggest that beliefs, attitudes, and emotions should be important factors in research on the affective domain in mathematics education" (McLeod, 1992, p. 578). Creating interpersonal relationships in classrooms and understanding their forceful dynamics is a promising approach to reaching educational victory and political mandates. The teacher has an effect on the students' attitudes and beliefs about mathematics. Therefore, it is crucial to invest time and effort into developing an art of teaching which in turn is beneficial to cultivating interpersonal relationships between students, teachers, classes, and schools while perpetuating an atmosphere that incites the joy of learning mathematics.



“Teaching is a form of human action in which many of the ends achieved are emergent - that is to say, found in the course of interaction with students rather than preconceived and efficiently attained” (Eisner, 2002).

Latta writes about Schiller, “[t]hus he refuses to compartmentalize human being, insisting on the concept of an organic whole. In Schiller’s words, the ‘cultivation of the whole of our sensuous and intellectual powers in the fullest possible harmony’ becomes the educational imperative” (Latta p. 43, 2001). Today’s mathematics curriculum formula proposes to increase student performance while instilling a joy of learning mathematics. In theory, this is what current mathematics practices are supposed to accomplish. In many cases, the numbers justify these claims; however, the formulated and compartmentalized design and the manner of evaluation do not measure student enjoyment of mathematics or their development mathematically. In this dissertation I will examine the effects of the classroom environment on third grade students’ achievement in mathematics as the teacher and her students negotiate the mathematics curriculum while being mindful of student narratives.

### *Conclusion*

Mathematic instruction is a relational endeavor that can be facilitated by the classroom teacher. For the classroom teacher to ensure mathematical achievement, it is necessary to establish a classroom

environment that is conducive to mathematical achievement. In stating this, I refer to the environment that is created within the classroom walls. In essence, the teacher is the catalyst for getting the classroom environment off to a productive start. By utilizing Schwab's The Practical as a lens for which to view and deliberate a viable solution to a productive educational environment, educators can obtain a desired level of success for teachers, students, and the curriculum.

The Practical provides educators with a means to understand and consider all the elements that play a role in the teaching and learning environment of not only mathematics but all disciplines. In this dissertation, I will utilize the *practical*, *quasi-practical*, and *eclectic* aspects of Joseph Schwab's formula for defining curriculum practices. My use of these aspects is limited to my third-grade class of students. Utilizing The Practical while deliberating the best practice for this particular third-grade class will afford me the ability to consider all teacher-student interactions and their unique lived experiences in relation to the curriculum. There are a number of elements within the interpersonal domain that are necessary to deliberate when developing a classroom environment that will produce desired student achievement.

Taking into account teacher as well as student beliefs can aid the teacher in taking steps to foster student affection for herself (the teacher), the school, and the subject. Additionally, being aware of teacher behaviors

can influence student perceptions of the teacher, the school, and the subject matter as well as their own behaviors, which can influence student achievement. These are a diverse set of influential features that affect the classroom environment and student achievement. *The Practical* is a lens through which to view these characteristics and to formulate the best practice for a given group of students in a given setting.

Historically teaching and learning practices have evolved, from Aristotle's philosophy of matter-form through the middle-ages to present day practices. Aristotle's philosophy, students learning through their senses is a viable technique but it seemed to lose its essence through time. Teaching became a practice of efficiency and lost its compassion for the human soul, for bringing out and developing the person as well as the mind. To counter this loss Rousseau turned his attention to child-centered permissiveness, a method which was viewed negatively by many of his contemporaries. Pestalozzi and Progressive educators of the late nineteenth and early twentieth century wanted to formalize education but also wanted to remember the essence of the child's needs.

Ralph Tyler's Basic Principles of Curriculum and Instruction contains four questions that curriculum practitioners should answer when developing a curriculum. Additionally, he suggested that other rationales should also be considered during curriculum development. One such rationale should be Joseph Schwab's The Practical. His reasoning for building curriculum

practices is visionary. The aspects of The Practical allow the curriculum practitioner to deliberate and formulate a plan that takes into account all the elements of diverse educational and social milieus while utilizing theory where needed to explain and justify decision for a given audience. The figure on page 41, diagrams the many facets that encompass the educational setting and the organic connection one facet has with another.

One facet of the educational setting that impacts students is interpersonal relationships between teachers and students. Teachers who utilized relational techniques to establish a classroom environment affect learning and student achievementAs stated in Chapter 3. Interpersonal techniques include immediacy and influencing, affinity seeking, the beliefs and attitudes of teachers as well as students bring to the classroom, and communication that takes place outside the classroom. Through the use of Schwab's The Practical teachers can come to understand their audience's needs and utilize the relational aspects of communication and mathematical aesthetic's, truth, beauty and goodness as a means to foster mathematical achievement.

Mathematical aesthetics can be utilized to instill a joy for mathematics, promote teacher liking, and build a positive relation between the student and the subject. When some one is enjoying the content because the teacher is using communication techniques that promote liking of the teacher the student finds the teacher to be credible which increases liking of the subject.

Increased liking of the subject promotes student success because the student sees relevance in the subject and will work which influences student achievement.

## Chapter IV

### **Methodology**

Schwab's triangle-the teacher, the student, and the curriculum and their relationship to one another are the tools which were utilized to gather data that refers to the themes of the literature reviews. The themes of the literature review include the aesthetics of mathematics and classroom communication techniques and their effect on student achievement. Hermeneutics is utilized to address these themes, to gather data and to draw conclusions of the events that took place in my third grade class of students.

*Alethic hermeneutics* is defined as a means for human beings to understand and orient themselves in ever-changing situations (Alverson & Skoldberg, 2000). The term "alethic" identifies this area of hermeneutics from its Greek derivative, *aletheia*, meaning "reveals" or "uncovers" - the disclosure of something hidden (Heidegger, 1959). In order to understand any text, it is necessary to place it in the context of its circumstances and its author. "The interpretation of understanding has also become increasingly linked to empathy: understanding calls for living (thinking, feeling) oneself into the situation of the acting (writing, speaking) person" (Alverson et al., 2000 p.54). Interpreting the observations that I took was a function of assimilating to this third-grade classroom culture and then replaying the events that encompass this culture so that the reader will find an

interpretation similar to the experience that I was able to view. Although each reader can only interpret and acquire meaning of this endeavor from his/her own history, our shared commonality as educators and perhaps our shared culture and language should make it possible for the reader to understand my attempts herein (Wolfson, 1977). What I want to reveal in this dissertation is the effect the classroom environment has on student achievement in mathematics, which is not directly revealed in current curriculum dictations. The classroom environment includes how the student feels about himself/herself in relation to the subject matter (mathematics) as well as the teacher-student interpersonal relationship. Using Schwab's The Practical as a lens to view current teaching and learning techniques curriculum dictations, I will identify the effects the classroom environment—that is created by the teacher and her students—has on student achievement in mathematics. To accomplish this it is necessary for the reader as well as myself, to step out our own context.

The term "horizon" is referenced to mean "flexible," changing from one time to another (Gadamer, 1989). Using this as a means of understanding a context outside one's world allows the individual the opportunity to put himself/herself into another's horizon. Although my history differs from the students that I taught for a semester, we do share a schooling experience. I *was* in the third grade and my students *are* in the third grade. Therefore, we can share an experience, not identical but closely similar. Because

anyone who reads this paper has also been in the third grade, we can share this experience with similar meaning.

To aid in the understanding of those elements revealed in this observation, it is also necessary to view the phenomenological perspective of curriculum and learning that encompasses a given educational setting. From one setting to another in a planned schooling environment, there exist differences. The amount and the kinds of supplies such as buildings, materials, and resources reflect the values of the designer of the environment. Whatever the design of the autocrats, "it is the classroom teacher who is the final designer... [of his/her classroom environment]" (Wolfson, p. 83).

What is the effect of the classroom environment on student achievement? While pondering this notion keep in mind that the classroom atmosphere is defined by how the student feels about himself in relation to the subject and the interpersonal relationship that is present between the teacher and the student. As the author of this dissertation I will keep in mind the elements of what has drawn me to study such a phenomenon. As I reminisce about past students and their comments concerning mathematics and the class and particularly one parent's comment about her student's achievements, I have come to believe the classroom environment plays a role in students' mathematical achievement. While observing the phenomenological perspective of a particular school system, I will step into



an “horizon” at the same time and be ever so cognizant of the existential hermeneutics of the students in the third-grade classroom where I spent many hours observing and developing an understanding of its agents.

In an attempt to understand others I will need to understand myself as a researcher and as an individual. Auto-ethnography allows me to focus on my center and periphery as well as being cognizant of the complexity of others center and periphery. The notion lies in a perception of *home* and *away*. To be home is the familiar where primary experiences are explored and our inner compass is born, our ability to anticipate, linking our past to the future. Being away is a projection of home because it lacks the inner template provided by home. In being away anticipation is lost because it cannot be read or interpreted. Being absorbed into the away or the foreign we are able to expand self and discover the unknown components of the away and the unknown parts of self (Alsop, 2002). In this study I take what is home with me to the away which is the third grade class of students that I taught. My goal is to understand why I interpret gathered data the way I did from my home perspective to the influences and interpretations I discover from being away.

My home, my inner compass developed from a homeland where education, self respect and achievement were life’s ambition. When I left home to the foreign (school) there was a lack of ability to interpret the meaning of what I thought about school at a young age. Schools did not appear to care for children or whether children learned. I developed a strong feeling that school was not a friendly place. Once I entered higher education my feeling

for schooling change to a degree. Instructors were more interested in their students' achievement. Although I became a classroom teacher grade schools still seemed to hold the same attitudes that I experienced during my early schooling career. The social setting where I taught for the majority of my career differed from the social setting form where I grew up. The social milieu where I taught put more stress on the importance of education and the educational setting itself put more stress on the success and welfare of the students this differed from what I had experienced during my early schooling career. Teachers cared and wanted their students to achieve. I taught mathematics at the middle school level for more than ten years and I demonstrate daily a caring attitude for my student welfare and success. I have high expectations for my students which they meet. At times they may have viewed my expectations as challenging but by the end of the school year they are grateful that someone took the time to care and to expect them to achievement and to engage in mathematics. I am compassionate and flexible but I have little patience for whining and idle people. I believe that relationships are the core of what makes humans civilized or barbaric. How individuals treat others demonstrates one as civilized of barbaric. Relationships are what make the world what it is.

#### Procedure: Collection of Data

To begin I gathered data by taking notes on daily mathematics lessons plans from January-June 2007 in the designated plan book that is distributed to each teacher at the beginning of each school year. In this plan book I wrote specific pages that would be utilized from the mathematics text for all

mathematics lessons. On most days I presented the material and made decisions about how to approach the lesson based on the needs of the class. For instance, if I feel the students were able to comprehend and understand the presented material, I would use the designated lesson descriptions within the teachers' manual and perhaps interject or relate the content to their lives. When we covered parallel line I may ask my students were they saw parallel lines. If the students were having trouble understanding the material from the text, I formulated a different approach to explain the lesson by relating it to them through the content of their lived experiences. In this instance I utilized Schwab's quasi-practical by considering the uniqueness of this class as opposed to a universal approach. I also used the eclectic to apply learning theories relative to this age group.

Keeping a daily journal of student observation during mathematics class was of great help in recalling events and conversations on mathematical topics. Additionally this made me aware and alert to events that demonstrated student achievement in conjunction with interpersonal relationships such as those conversations that would give way to insights about my students' beliefs, feelings about their relationship to the subjects, and their accomplishments and or failures. While keeping this journal, I wrote about specific events that occur in the classroom on a daily basis, which allowed me to paint an accurate picture of the dynamics of the classroom at a later date. In my journal I also wrote down specific

conversations that took place between my students and me. I also documented conversations that took place between parents and me and staff members and me. Documenting conversations between my students and me allowed me to recall events as well as identify attitudes that would aid in supporting my conclusion. By documenting conversations I have with parents, I can also identify elements that describe the social milieu of this particular area. Also documenting conversations that occur between staff members and me served as a way to authenticate the educational setting as well as the social setting from their added perspective. Writing about these events will also allow me to reflect on the individualism of this social and educational milieu. In conjunction with documenting events that took place in the classroom, I also documented the applied components of Joseph Schwab's The Practical when making decisions about how to approach teaching practices for these children.

I observed and documented students during class periods other than mathematics and add this information to my daily journal. Since the educational setting has an organic nature, it is wise to document conversations and events that take place during lessons outside the designated mathematics time slot. Since the classroom environment is established by interpersonal relationships that develop between teachers and students, all the events that transpire in the classroom are of interest in

validating the effects the classroom environment has on student achievement.

Documenting interactions with students, for example during lunch, recess, and bus dismissal demonstrated the relational aspects of interpersonal events that take place during these time spans. As literature has demonstrated, the interpersonal events that occur outside the structure of the classroom are relative in developing interpersonal relationships between the teachers and students. Since interpersonal relationships play a role in creating the classroom environment, it is necessary to document the interpersonal events that occur outside the classroom as well as those that occur in the classroom.

To document the effects of interpersonal relationships and student achievement, I felt it was necessary to photocopy classroom works of achievement that can be associated with interpersonal relationships between my students and me. A daily journal dating and documenting interpersonal events between the teacher and students was helpful when cross-referencing the interpersonal events that occur and the documented achievements on dated tests and assignments. Recording this dated material allowed me to demonstrate the corresponding interpersonal events and assignments to validate the connection between interpersonal relationships and student achievement. These procedures afford me a means to orient myself and document the ever changing situations that

would arise in this third grade classroom. Since I personally gathered and documented data for this third grade class it is necessary to understand that there is an influence in how and why the data was gathered in a particular fashion. This setting lends itself to a hermeneutic approach to gathering and interpreting data.

Gathering data will allow me to collect information about my students while being cognizant of my own influence on the interpretation of such data. It will also require me to be aware of my students' lived history, my lived history, and the fact that I am stepping into their horizon; I am the foreigner and I must be cognizant of *home* and *away*, as mentioned above. Joseph Schwab's The Practical is the lens that I will use to view the events and decisions that are made in this third grade class of students. First, decisions are made in a "practical" sense when determining what classroom practices are to be utilized as a means to an end as well as utilizing the ends to find a means. This is a transactional event where the aim is to find the desirable *end* or to modify the *end* to be what is desirable. What teaching practices can I utilize to obtain a satisfactory end or do I need to adjust what the end should be so that I can utilize a means that is of significant value to the students. The second approach of Schwab's The Practical is probably most relevant to this study of third graders. Many of the decisions that I made when determining the best practice for these third graders were set in the embodiment of the "quasi-practical." The heart of this aspect addresses the

social and educational milieus which I found to be vital to the success of these students. These particular students had their own lived experience, their own existential hermeneutics, their own "horizon." Each individual exists within an intricate meaning-field, intentional of time and space (Alversson et al., 2000). I had to step out of my lived experience and step into my students' lived experience to view a horizon other than my own. However, there was no way for me to view their world from only their perspective because I too have a history that I cannot separate myself from.

Additionally, there exists an organic connection of one subject matter to another. What happens in reading can effect mathematics education. Being able to read word problems and comprehend their contents can increase mathematics proficiency. The quasi-practical allows for the consideration of diversity among educational settings and the connections within that setting.

The *eclectic* approach to Schwab's The Practical allows the teacher to broaden a search for ideal solutions. Although I did not decide what the curriculum will be, I will decide how that material will be presented to best serve my students. Utilizing Schwab's eclectic approach to solving curriculum practices will give me a clear view of the best approach when teaching this third grade class of students. I can utilize theories that pertain to this particular group of students in the practical sense. Here I can address a matter that can be explained by one theory and explain another aspect of the same matter while utilizing another theory. To explain a matter, I will keep in mind my attitudes that

could have an effect on how I perceive or solve a matter in reference to the third graders I taught for approximately six months. This method grants the deliberator the ability to bring the identifiable elements of more than one theory together to find a particular educational solution. By gathering this information, I hope to add to current educational literature-the classroom environment effects student achievement in mathematics.

### *Auto-Ethnography*

To interpret this study and to draw a conclusion I utilized auto-ethnography. The information in this dissertation is not of statistical value but rather of personal value that I intend to share with the reader. Upon initiating this study, I whole-heartedly feel that the classroom environment is a key to the success of school children, and through this self-reflective study, I will reveal the elements that I experienced as meaningful ways to establish a classroom environment that impacts student achievement.

In an auto-ethnography, it is the writer who takes his values and experiences that have been established from his *home* - the place from which he comes - to a new setting, *away*. As the writer and interpreter of the data that will be collected, I will make it clear from where I come so that the reader has an understanding of how I interpret the data.

In an attempt to understand others, I will need to understand myself as a researcher and as an individual. Auto-ethnography allows me to focus



on my center and periphery as well as to be cognizant of the complexity of others' center and periphery. This notion lies in a perception of *home* and *away*. To be home is the familiar, where primary experiences are explored and our inner compass is born: our ability to anticipate, linking our past to the future. Being away is a projection of home because it lacks the inner template provided by home. In being away, anticipation is lost because it cannot be read or interpreted. Being absorbed into the away or the foreign, we are able to expand self and discover the unknown components of the away and the unknown parts of self (Alsop, 2002). In this study, I take what is *home* with me to the third grade class of students which is *away*.

My home, my inner compass, developed from a homeland where education, self-respect, and achievement were life's ambition. When I left home as a child to the foreign (school), there was a lack of ability to interpret the meaning of what I thought about school during these years. Schools did not appear to care for children or whether children learned. I developed a strong feeling that school was not a friendly place. Once I entered higher education, my feeling for schooling changed to a degree. Instructors were more interested in their students' achievement. Although I became a classroom teacher, grade schools still seemed to hold the same attitudes that I experienced during my early schooling career. The middle school and social setting where I taught for the majority of my teaching career differed from the educational and social setting where I grew up. The

educational and social milieu where I taught put more stress on the importance of academic success and the educational setting itself put more stress on the success and welfare of the students. This differed greatly from what I had experienced during my own public schooling career. Teachers cared and wanted their students to achieve. This is an attitude I had not seen anywhere else except for *home*. I taught mathematics at the middle school level for more than ten years and I demonstrated a caring attitude for my students' welfare and academic success daily, because this is how my inner compass was programmed to navigate.

I had high expectations for my students, which they met. At times they may have viewed my expectations as challenging, but by the end of the school year, they were grateful that someone took the time to care, to expect them to achieve and to engage in mathematics so they could build their mathematical skills. They felt good about themselves and about the subject of mathematics. I am compassionate and flexible but perhaps my greatest flaw is that I have little patience for whining, idle people. I believe that relationships are the core of what makes humans civilized or barbaric. Relationships are what make the world what it is.

## Triangulation

In this study the literature review documents that aesthetics in mathematics and communication techniques in the classroom have a viable effect on student achievement in mathematics. The methods and procedures for gathering data of this third grade class of students are supported by a branch of hermeneutics that allowed me to orient myself in changing situations to disclose something hidden-the effect of the classroom environment on student achievement while utilizing supporting data from the literature review. Utilizing autoethnography to interpret data kept me cognizant of my own history and allowed me to interpret gathered data with the documented themes from the literature review.

## Chapter V

### **Physical Attributes of the School**

After teaching sixth-grade math for ten years, I took a sabbatical to pursue a doctorate degree. I earned an internship at West Virginia University, which allowed me to engage in the necessary coursework to complete a doctorate degree in Curriculum & Instruction. While taking classes, in Curriculum and Instruction I also taught undergraduate and graduate courses in mathematics methods and classroom management at the university. To finish up the needed coursework, I took an additional semester off from my public school teaching position. When I returned to the classroom, it was January, the second semester of the academic school year. Since my position was no longer available to me due to the fact that I had taken an additional leave of absence, I was offered a third-grade position in the school system.

The school where I taught faces a secondary highway, which was once the main road north and south for this area. It is believed to have been used by soldiers during the Civil War. In the early 1970s, an interstate highway was built parallel to this one to accommodate the community. Turning off the secondary highway and then turning onto a smaller road put me onto the road that runs in front of the school. This road is as long as the front of the building and it loops back in front of the building, where I park in

a diagonal, as indicated by the parking lines. This parking area is intended for guests, and it is also where the school buses line up during dismissal. Between the two long roads in front of the building is a green area where two flag poles stand flying the American flag and the state flag. In between the flag poles is a brick sign that displays the school's name.

The school is a one-story design. As I walk to the main entrance, I must cross the road that I parked on and step up onto a concrete sidewalk. There is a large concrete area which is covered, likely designed to protect the students from inclement weather. This area is about thirty yards square. Doors open out to this area from classrooms. This design was meant for teachers to dismiss students to the buses directly from their classrooms. When I arrive at the two sets of double doors, they are locked and someone has to let me in the vestibule.

The vestibule is probably twenty feet wide, and at either end, there is a glass display case that sports student achievement awards such as Pioneer of the Month, given to a student each week from each class. There is a bench between the two sets of double doors at the entrance of the school and another bench facing these two sets of double doors, adjacent to the main office. On this wall there is a large window that is covered with mini-blinds from inside the office. One of the secretary's desks sits in front of this window, which is also behind the counter in the office. To the right of the bench is the double door that is the entrance to the main office. The floor is

covered with twelve-inch-square white tile. I cross the vestibule to enter the doors to the main office, where there is an eight-foot-long counter and one secretary's desk that sits behind the counter, which is also in front of the window that faces the vestibule. In front of the counter is a walkway and to the right are a couple of chairs for waiting patrons. These chairs could be utilized by parents waiting to pick up students, students waiting to be picked up by parents, or anyone else who has business with staff or faculty members. At the end of the counter is a hallway to the right. On the other side of this hallway is the public address (PA) system and a set of double glass doors that lead to the media area, better known as the library. In front of the PA system is another secretary's desk. Beyond the two secretary's desks is a hallway that leads to the vice principal's office and the nurse's office. Across from these offices is a staff restroom and conference room. The room at the end of the hallway opens into the teacher's lounge. This room also has a door that leads to the media area, as does the office. The floors of the office area as well as the media area are covered with very old carpet, a questionable shade of green.

Back in the waiting area of the main office, there is a hallway to the right, as I have stated. Down this hallway there is a restroom and the additional rooms are utilized as storage for paper, textbooks, and workbooks for kindergarten through grade three students. At the end of the hallway is the principal's office, where I interviewed. The principal's office has a desk

in a corner and a conference table in the center of the room. Every inch of wall space is taken up with office paraphernalia, including television screens for strategically placed surveillance cameras. The only space that is not congested is the narrow walkway between the parallel doors that allow entrance or exit from the room. This office has a door that opens from the hallway off the office area and a door that opens to a hallway that is used heavily by students and teachers. There is a surveillance camera on this hallway, as well as other places in the building. The only problem with this is that no one is monitoring what is being recorded from the cameras. The tapes are re-recorded over daily, which seems to defeat the purpose.

Upon walking into the school for the first time, it felt like a warm place. This was a place where children would want to come and spend time. The physical environment was clean and organized. The lighting was bright, the ceiling was high, and the space was open. The person that greeted me at the counter was friendly and welcoming. The first thing she said after she found out that I was interviewing for the third-grade job was, "This is a friendly place; we are like a family." This was a comfort to me because I had never taught elementary school full time except when I substituted. With her comment, I knew that there would be someone to talk to if I needed guidance or someone to confide in.

I interviewed with the principal and the vice-principal in the principal's office. They asked the usual questions: "How many years have you been

teaching?”, “What have you been doing since you been doing since your last teaching job in the county?”, and “What is philosophy of teaching?” I explained how I felt about the importance of the classroom environment and its potential impact on student learning and achievement. I also explained that there are many elements that play a role in student success but that I was very interested in studying the classroom atmosphere and potential outcomes. Both the principal and the vice-principal seemed to appreciate this insight and agreed that teacher-student interactions are important to student success. At that time I requested to study and document the interactions of myself and the students that I would be teaching so as to meet the requirements of completing a dissertation for a doctorate degree. They were in agreement that I could do such a study while teaching.

After the initial segment of the interview, I requested to see the classroom where I would be teaching. We walked out of the office conference room into the halls of the school. Straight across from the door we exited were restrooms for the children. The bathroom fixtures were much smaller to accommodate the size of the individuals that would be using them. Walking down this hall gave a great insight into the nature of the attitude of the people that taught at this school. There was a cinder block wall on the left that stood a mere five feet tall. In the center of this wall was an entrance to the media center. There was also a pathway down the center of the media center that split the library in two. Where the cinder blocks



ended, there was a retractable wall made of chalkboard material that separated the media center from the gym-cafeteria. On either side of the media center was a hallway of classrooms that were divided by partitions. Beyond the gym-cafeteria were additional rooms that could be accessed by the hallways that ran on either side of the media center and gym-cafeteria areas. This was part of the open schools idea in this county which was believed to promote the educational setting.

Back to the hallway of the principal's office where we exited and about ten feet down the hall to the right was where the computer lab was partitioned off with office dividers. To the left was a large open area which led to the library. Further down this hall was a pair of restrooms and to the left was the gym-cafeteria, housed in the same room to utilize the space most efficiently. At the end of the computer area, we stopped because some children were coming in the main building to attend "specials." I also noticed that student work was hanging in view, both to display work and to decorate the halls of this school. I found this to be a particularly appealing characteristic. This suggested to those who entered this school that children are important and what they do here is important. The principal informed me that these were the students that I would have in my third grade class. I was introduced to the teacher that was filling in until a permanent teacher was found to take the place of the regular teacher. When the students passed and entered the gym-cafeteria, we turned right at the corner of the

computer lab. We then turned left at the end of another partitioned wall of the computer lab. At this juncture we were in another hallway that ran parallel to the hallway that we entered into from the principal's conference room. We passed by two kindergarten classrooms that were separated by office partitions. To the left of this hallway was a set of cabinets used by the youngsters in the kindergarten classes. There too was a sink that was low to the ground for the children in the kindergarten classes to use as needed. At the end of this hall there was a closet to the left that was utilized as a storage room for the third-grade teachers. Most of the items in this closet were classroom sets of books. As we turned right to head out the door of the main building, we passed a room to the left, used by the guidance teacher during specials classes, special events, and team meetings with the principal and vice-principal. Next to this room on the same wall was the space that was reserved for special education classes. My mentally impaired (MI) students had most of their classes in the back of this large room that was divided into two classes by the use of partitions. To get to my MI students' room, I would have to walk through the first classroom to get to the second. On the right of this hall on the other side of another set of partitions was the speech room.

We exited the main building to a cement sidewalk that ran along the outside of the building. Stepping down off the sidewalk, we crossed a blacktop road to a row of six trailers in the back of the school. Walking the

path from the principal's office to the trailers, I again noticed that the school was very clean and tidy, with a lot of children's work being displayed. Since the open classroom design has proven to be a hindrance to the educational process, walls will be installed during the upcoming summer break. The noise level is one major complaint of teachers and students. This particular school district has issues with a growing student population due to influx in a nearby metropolitan city and the establishment of various industrial businesses. This area is a bedroom community to Washington, D.C. With the growing population, space for school children has become an obstacle that county board officials deal with by renting trailers that are designed as classrooms.

The principal pointed out the trailer where I will be teaching. The trailers were lined up, with every two trailers having their doors facing another trailer's set of doors. The doors that were used most often by the teachers in the trailers are the ones closest to the building. The doors to my trailer opened toward the doors to the trailer to my left. My classroom was the second trailer when facing the trailer from the door that exits the main building and counting left to right. There was a small landing and five steps down to the blacktop that faces the playground. The stairs were built of treated lumber: nothing fancy, just functional.

I imagine that the blacktop between the main building and the trailer was at one time a road utilized by vehicles to travel from the front of the

building to the back of the building to the adjacent faculty parking lot. Presently, there are gates at either end of the road to keep vehicles from passing between the main building and the row of trailers that house the six third-grade classrooms. To get to the faculty parking lot, it is necessary to turn into the second driveway on the right, which is behind the school, rather than the first entrance where I parked for my interview.

Upon entering the class, I felt that the ceiling seemed awfully low, which meant that the fluorescent lights felt as though they were just above my head. This felt rather uncomfortable and I believe it was more noticeable because the ceiling in the main building was approximately twelve feet high. There were all kinds of posters and seasonal pictures hanging on the wall, but not much student work. Every bit of wall space was host to supplies: papers, books, and manipulatives.

As I stepped in the door, I could see a small bathroom in the far left corner on the front wall. Outside the door of the bathroom to the left were tote trays for the students to store additional materials such as books, paper, and pencils. Next to the totes on the same wall was a string of hooks for the students to hang their coats and lunch bags. On the back wall perpendicular to the tote tray wall was another door. This door was at the other end of the trailer on the same wall as the door we entered initially. Just left of the second door was the teacher's desk, caddy corner to the rest of the room. Behind the rather small desk was a bookshelf sitting between

the second door and a window. This shelf held many of the manuals that the teacher refers to when attempting to meet curriculum mandates. To the right of this window was a file cabinet. On top were a hole punch and a cassette player to be used with the reading series. On the left side of the desk was a little table that held the teacher manuals, and just below it on the floor was a cardboard box of various blackline Xeroxed papers paper-clipped in groups. I imagined that they were there so that if the teacher had some extra time, she could keep the students busy with these additional papers.

To the right of the mini bathroom on the front wall was a bookcase about three feet high and eight feet long, painted a celery green color but showing signs of needing another coat of paint. It too was packed with books and boxes of papers. On top of this bookcase was reading material for the students to utilize as needed. To the right of this bookcase was a chalkboard about four feet tall and ten feet wide. On the same wall was a small bulletin board with a calendar and next to the bulletin board was a television on a tall cart. On the bottom shelf of the television cart was a cardboard box with seasonal posters and a few manipulatives.

On the wall running perpendicular to the front wall and about four feet down from the right corner of the class was a string of four computers. Where the computers ended, there sat a small shelf unit about three feet high and two-and-a-half feet wide, which is home to construction paper that

in some cases is discolored from age. On top of the little shelf unit was a cardboard box printed to look like a school bus. This is where the students that carried their lunch to school placed their lunch boxes when they entered in the morning, making it convenient to pick them up when they left for lunch. At this site was the main door that we used initially to enter the class.

On this back wall, there were four windows covered with mini-blinds and plaid valances. These four windows separated the two doors that were on this wall. Every bit of wall space between the windows was taken up with either a cabinet or bookcase, and under each window there was a student desk. The window to the right of the file cabinet next to the teacher's desk also had a cardboard box filled with papers. The bookcase between the next two windows held a set of dictionaries and a set of encyclopedias. Between the main entrance door and the cabinet that held craft supplies was a table with a rack holding different boxed games and a plastic pencil case with old markers.

The floors were covered with twelve-inch-square peel-and-stick tiles. There was also an aluminum plate running the length of the trailer that covered the seam where the two sides of the trailer was put together. The students' desks were in a horseshoe arrangement facing the chalkboard, and four desks were in the middle of the horseshoe. This room was not very spacious and the desk arrangement seemed rather cluttered and jumbled.

Luckily, this trailer did not have two poles spaced at one-third intervals across the trailer as stabilizers. These poles can be a hindrance when trying to create a design that is beneficial to student learning.

Most of the students who attended this school rode the bus to and from school because of its location adjacent to a secondary highway. Some students were picked up daily: the car riders. The school was across the street from a major factory that had been closed down for many years, now vacant. At the corner of the secondary highway and the access road to the school was a convenience store. There were no other merchants in the immediate area. The next town in either north or south is several miles away and would require automotive transportation. In this same vicinity, there were many open farmed fields; deer and small wildlife are seen often. Additionally, a family of groundhogs made their home under a bush on the playground behind the third-grade trailers, but far enough away from the playing area as not to pose a threat to the children. It was suspected that the rapid development of the area had run wildlife out of their typical habitats. The playground was an open grassy field fenced off from the well-traveled road. Perpendicular to the secondary road was a row of twenty-five-foot evergreen trees, which also housed small forms of wildlife. This was one barrier of the playground. To enter the playground, we exited from the same door that the principal and I entered. We walked between my trailer and the first trailer in the row of six to get to the playground. The

open grassy field could be muddy, but it was predominantly grass. I immediately noticed a pole about ten feet tall for the children to climb up. To the left was a set of flip-over bars and on the right was a bench that was close to the fence of the enclosed area. The fence ran from the front of the main building to the line of evergreen trees perpendicular to the secondary road. Looking outward to the right was a geometric climbing half-circle made of metal bars. In front of the twenty-five-foot trees was a set of four swings with very long chains. Between this swing set and the geometric-shaped monkey bars was another swing set, caddy corner to the playground. Perpendicular to the swings in front of the trees was a jungle gym set made of plastic tubes, including a slide and climbing poles. To soften a student's fall, bark mulch had been spread under all the playground equipment. In many places except for the plastic gym set, the mulch looked as if it had worn away. Fifty feet beyond this gym set was a field and track. The track was estimated to be about one-third of a mile around. A string of trees laced the track on its longest side to separate the school grounds from the adjacent field.

To get back into the building from the field and track area, it was necessary to cross the faculty parking lot to a door at the back of the school. This door enters to a hallway, where there was a kindergarten class and a second door to the guidance room which we passed on the way to the trailer. On the other side of this hall was an autism classroom. Passing



through another set of doors, the gym-cafeteria could be seen on the right and a set of children's restrooms were on the left. About fifteen feet to the left was the partitioned computer lab.

The music room was in a little room in the corner off the gym-cafeteria. To get to the music room from this side of the building, we had to walk through the media area and turn right at the hallway separating the media area and the first-grade areas. After walking ten feet, there was a set of double doors used to enter and exit the gym-cafeteria. Continuing straight ahead was the art room. It seemed logical to design rooms for multiple uses as well as pathways, but this could be distracting to teachers and students who occupied the room serving a double purpose. It appeared that teachers as well as students had adapted to the constant interruptions and the excess noise of people coming and going. I never cared for this design, and that is one of the reasons that I did not teach elementary school in Berkeley County.

I can recall walking through either the special education class or the speech classroom when my key to the building entrance-the hallway between these two rooms-would not work properly. I felt horrible for disturbing these classes, but the teachers on duty did not seem to mind.

As Schwab suggests it is necessary to consider all elements of the educational milieu to formulate teaching techniques to satisfy the needs of a

finite audience. The physical attributes of this school play a role in the decision making of teaching practices that will be utilized. For instance this setting is unique in that the third grade classrooms are independent of the rest of the building. This physical environment calls for additional safety factors than perhaps an all inclusive grade school. Students needed to be aware and practice safety during any travel from their third grade trailer to the main building several times a day. This was a practice that was up front and ever present to these third graders.

## Chapter VI

### **Student Descriptions**

This chapter will include a narrative of each student and demographic data to familiarize the reader with the group of students that I taught and the area where they live. I feel that this is necessary because it will allow the reader to see similarly what I saw during this experience. As stated in the methodology chapter, no reader will have the same interpretation as I will, yet we are all able to step out of our horizon and into another's to view an event. We will have similar experiences because we are educators.

### **Demographics**

To better understand the dynamics of this setting, I will share statistical data that will describe the nature of this community. This area was settled prior to the Civil War era; supposedly, it changed sides thirteen times during the course of the war.

Schooling has also been highly valued in this community for many generations. The building that houses the present central board office was initially a school house for all grade levels. My grandfather, who was born in 1900, attended school here. He actually finished the twelfth grade, which was uncommon during this era, when most adolescents finished their schooling at the eighth-grade level. To encourage his brother to finish high

school, he offered him one hundred dollars - a substantial fortune, at that time.

The table below identifies population changes that occurred over the past forty years. In 1969 to 2006 the type of households has changed. In 1969 only the number of households was recorded but as the years past it became necessary to identify the *type* of households that comprise this county so as to better understand its dynamics.

The last date of historical data in this *State Profile* for this county is 2005 for the 2006 profile. Much of the data in the Woods & Poole database is acquired from the Bureau of Economics Analysis (BEA) of the Department of Commerce. The historical population data is from the U.S. Department of Commerce, Bureau of Census. A small amount of historical earnings and employment data was withheld by the Department of Commerce due to federal information policies. Approximately 4% of the data was withheld and had to be projected.

Much of the data in the table above indicates an increase in population yearly and an increase in employment and wages. Although there is an increase in wages, the Woods & Poole wealth index indicates a decrease over the course of one decade to another. Although the number of households has increased, the number of people per household has decreased within the years indicated in the prescribed table. Also, the type of households has

deviated from 1990 to 2000. Apparently the rise in number of households is due to the increase in population as well as the increased number of single male or female households with children under 18 years of age.

Woods & Poole  
BERKELEY, WV [COUNTY, 54003]

	1970	1980	1990	2000	2006
TOTAL POPULATION (THOUSANDS) ....	36.52	47.03	59.84	76.45	97.53
MEDIAN AGE OF POPULATION (YEARS)	30.43	30.77	33.40	35.81	36.39
POPULATION 0-17 YEARS (THOUSANDS)	12.17	13.78	15.39	19.73	23.29
POPULATION AGE 15-17 YEARS .....	1.92	2.53	2.44	3.34	3.98
POPULATION AGE 18-24 YEARS .....	3.61	5.24	5.93	6.34	8.84
POPULATION AGE 65 YRS AND OVER ..	4.04	5.36	6.99	8.53	10.47
TOTAL EMPLOYMENT (THOUSANDS) ....	16.35	19.63	25.44	34.41	40.59
TOTAL EARNINGS (MILLIONS 2004 \$)	\$424.81	\$588.44	\$765.75	\$1,192.39	\$1,532.05
PERSONAL INCOME (MILLIONS 2004 \$)	\$517.24	\$818.65	\$1,260.61	\$1,926.01	\$2,480.38
INCOME PER CAPITA (2004 \$) .....	\$14,163	\$17,409	\$21,067	\$25,195	\$25,431
INCOME PER CAPITA (CURRENT \$) ...	\$3,456	\$8,366	\$15,648	\$23,248	\$26,882
W&P WEALTH INDEX (U.S. = 100) ...	82.70	82.77	81.04	78.41	75.48
GROSS REGIONAL PROD. (MILL. 04 \$)	\$669.19	\$910.18	\$1,201.04	\$1,818.85	\$2,388.26
PERSONS PER HOUSEHOLD (PEOPLE) ..	3.07	2.79	2.62	2.52	2.46
TOTAL HOUSEHOLD BY TYPE	na	na	22,350	29,569	36,879
Family Households (families)	na	na	16,220	20,702	25,389
With own children under 18	na	na	na	9,889	11,943
Married-couple families	na	na	13,226	16,153	19,705
With own children under 18	na	na	na	7,035	9,123
Other family, male householder	na	na	860	na	2,163
With own children under 18	na	na	na	na	973
Other family, female householder	na	na	2,134	3,151	3,461
With own children under 18	na	na	na	1,960	1,847
Nonfamily households	na	na	6,130	8,867	11,550
Householder living alone	na	na	5,181	8,867	9,004
Householder 65 years and over	na	na	2,126	2,412	3,431
MEAN HOUSEHOLD INCOME (2004 \$) ..	\$43,777	\$48,795	\$55,435	\$63,725	\$64,748
MEAN HOUSEHOLD INCOME (CURRENT \$)	\$10,684	\$23,448	\$41,176	\$58,802	\$66,612
NUMBER OF HOUSEHOLDS (THOUSANDS)	11.45	16.48	22.41	29.84	37.40

Table 2

The student body at the particular school that I taught was comprised of 525 students. The students who attend this school are predominantly White, at 89%. However, there are students of various ethnic backgrounds: Hispanic at 3%, Asian at 0.001%, and African American at 8%. The number of students on free and reduced breakfast and lunch was 39.5%.

When I took the position at this elementary school, there were 16 children in the class. Two students were identified as Mentally Impaired (MI) and the other 14 students were general education students. Even though there were only 14 students in this third-grade class, I was apprehensive about teaching elementary school and being with the same students all day long. The half-time teacher who taught the second half of the day in the trailer that faced mine assured me that the students were sweet kids. They liked hugs and they were like grandchildren. The students were rather distant when I arrived, likely due to the fact that I was someone new and they were a little unsure of what was happening, since their teacher had left so quickly and the teacher next door was filling in. Some students asked me if I was going to be their teacher. They seemed a little unsure of what to expect.

### **Student Profiles**

The first student that I am going to write about is Tommy. The reason for this is because many of the events that took place in this classroom occurred

because of this student's presence. Tommy was a small child in comparison to many of the other third graders. He was a brittle diabetic that needed attention constantly to attempt to regulate his diabetes. All of a sudden during a lesson, I would have to send him to the nurse to have his sugar checked. I was told when I took this job that I would have him in my class. This did not bother me because I had to deal with diabetic students in the past and I had a diabetic sibling.

In addition to this, both of his parents were serving jail sentences that would last for several years. This child had some stories to tell and he had travelled to several states while his parents were on the run from the authorities. He and his younger sister were being cared for by his grandmother. I knew this grandmother because I had taught her older grandson, Tommy's half-brother, about four years earlier at the middle school from where I took my sabbatical.

Tommy was a bright young boy who was capable of many good things. He would miss a lot of class time due to his diabetes, but he was able to maintain fairly good grades. At first, he used his illness as a way to get out of class and to seek the attention of other adults, but the majority of his high or low complaints were legitimate. Evidently, he was very good at knowing when he was not well and to see the nurse, and Tommy's grandmother agreed. I explained to her that he was a bright child, but with all the class time that he missed, he was going to develop holes in his

education. Developing these kinds of habits would hurt him in the future. She said she would talk with him about getting his classwork done and his attempts to get out of class for no good reason. Over time, his need to leave became more legitimate.

To compound the interruption due to his diabetes, Tommy needed to leave the class at about 10 o'clock each day to have a snack. This was an effort to maintain his sugar at a desirable level. So that he would not have to leave valuable class time, the nurse and I decided that he could eat his snack in the classroom. He seemed a little shy about the idea, but his mischievous grin that gave him away. The only downside to this was that the other children looked at his snack, longing for one of their own. To ease the children's yearning, I decided that everyone should have a snack.

Barb was a short girl who was a little over weight and wore some rather funky glasses for a third-grader, which looked very nice on her nonetheless. She had a round face and moderately long brown hair. She was always clean and always did her work; however, she always had her bangs hanging in her face when she was letting them grow out. I asked her about it once because I was concerned that it was getting in the way of her vision, but she was not bothered by it. I told her I would really like to see her lovely face. Her voice was rather raspy, which made her sound older than she really was. It was enjoyable to hear her talk. She generally did well academically, and I would say that she grasped new concepts well. Her



handwriting was neat and she took pride in her work. She spoke fondly of her family, especially her mother.

The one thing that stood out about this child was her sense of fairness. She was a loving child who didn't want anyone to be mistreated. When an event occurred that needed to be deliberated, she had a wonderful sense of right and wrong. I was so impressed with her ability to weed out what would be the right thing to do so that all parties were treated with respect, kindness, and consideration. She had a tremendous gift. Sometimes she would take the side of a friend's 'cause' that was a little shaky, and I would say, "Now, do you really think that is fair?" She would reevaluate, smile, and come to a conclusion that was just. She was an amazing child. I wish adults had her insight.

Andrew James preferred to be called A.J. His haircut was a buzz. He was on the taller side and very slim. This young man always had a smile on his face and sported a positive attitude. When I first arrived, he was quiet and exhibited his nervousness by fidgeting. He was an energetic child who had a hard time sitting still, or, for that matter, even sitting at all. He would stay in his seat by sitting on one leg and lean forward on his desk with his elbows. Often when he would write, he would hold this same position to complete assignments. His handwriting was terrible but improved over time with encouragement. He liked the teacher's attention and talking about

anything. A.J. had an aptitude for mathematics. He knew his times tables and was able to comprehend new skills easily.

I believe that A.J.'s family took an interest in his needs. He always came to school with his supplies and all his assignments were completed. On one occasion while we were talking, he informed me that his father had been in prison. He talked about it freely and did not seem too embarrassed. Since I had not passed judgment on Tommy's parents, I suspect that A.J. felt comfortable about telling his family stories. He was a little reluctant at first, but he mentioned this several times later and spoke freely about his father's trouble with the law.

Randy was a little boy who usually sat in the front of the class because he wore glasses. Generally a child who wears glasses sits in the front of the classroom to accommodate a vision deficiency. His face was speckled with freckles. He was of average height for a third-grader, with brown hair and eyes. He usually did well on everything he attempted. He came to school every day and completed his assignments neatly and accurately. I remember that his handwriting was more legible than most of the other boys in the class. Upon my arrival, Randy would have one stomachache after another or a hangnail that he felt needed immediate attention. His brow was often wrinkled with distress and worry. I sent him to see the nurse a few times with a belly ache. I came to find out that small children often exhibit belly aches or other minor ailments when they are stressed. He

seemed nervous, which seemed unusual for children this young. Randy lived with his parents and two older sisters.

This next child I refer to as Abby T because there were two girls named Abby in the class. Abby T was a rather tall girl who seemed to act more mature than some of her classmates. She had blond hair that draped on her shoulders and she wore wire-framed glasses. When reading her facial expression, I would be inclined to believe that she was constantly annoyed or disgusted with most matters that came her way. She did like to talk and told me on several occasions that she was glad I came because evidently she and the regular teacher had not gotten along well. I even had an episode of disrespect from her. I called her to my desk to inquire as to why she talked to me so rudely when I did not talk to her in that manner. She informed me that she was taking medication and that she could not help herself. I explained to her that I would call her mother to get the details about the effects of her medication. When I called, she informed me that Abby T was using the medicine as an excuse to justify her rude manner. She told me that Abby T had confided in her that her friends did not like her. The mother told her, "No wonder your friends don't like you; you're not nice to them. I wouldn't like you either." This mother held no bars. On the up side, the mother was very supportive and took Abby T to the doctor to regulate her ADD and to get her the HPV vaccine. She also took a day off

from her demanding work schedule to spend much-needed time with her daughter.

After talking with her mother, I confronted Abby T about the lie that she told me. I explained to her that I did not talk to her in a disrespectful manner and that I would not tolerate her talking to me or anyone else in a disrespectful manner. Of course, she looked annoyed, but agreed that she would do better and she did. Additionally, she would talk about her mother's husband as if he were an authority on many matters. I came to find out that he was very hard on her and physically abusive. Once this incident was reported, the mother was contacted and Abby T was a much happier child. I could hardly believe the transition. One additional fact of interest is that this child was recommended for a PASS (Providing Academic Self-esteem Support) volunteer. One of the cooks from the school's cafeteria, a very nice woman, agreed to be her volunteer. She was informed that Abby T had her moments, but she agreed to spend time with Abby T provided she could quit if the child proved unruly. Most of the time that the lunch lady spent with Abby T was not a pleasant experience for the lunch lady, as she told me on several occasions. Finally, she gave up. Once the incident with the stepfather surfaced, Abby T's behavior was easier to understand. Unfortunately, this realization came too late to be of benefit to Abby T.

The second child known as Abby came to the class a couple of weeks after I started teaching. Her mother was a dental hygienist who worked in

Northern Virginia and decided to move to this area, where she had family. They lived with her brother who also picked Abby up from school from time to time. She was a quiet child with red wavy hair and blue eyes. She was very pleasant and seemed to get along with the other students. She was helpful and a nice addition to the class. Abby was an average student who did not ask questions. When I would ask her if she understood what we were doing in math, she would always reply, "Yes." Her test scores often indicated she did not, but when I would watch what she was doing in class, she actually did seem to understand. Perhaps her skills were weak and she needed more time to spend on an area rather than moving so quickly to the next area. But educational mandates dictate that all curriculum contents need to be addressed. It does not address what to do when the student is not ready to move onto the next concept.

Mitch was a very tender-hearted boy who fiddled with objects incessantly. He had an endless supply of pencil toppers and grippers. I finally had to have him put the excess paraphernalia in his tote tray so that he would not be distracted. This seemed to help. On one event, this little boy had been absent for three days due to illness. He began to cry because he missed his mother. He asked if he could go to the office to call her so I fulfilled his request. When he got back to class, he was much better. On many occasions, he would talk very affectionately about his mother.

When I arrived, the second marking period had come to an end and parent-teacher conferences were scheduled. I was expected to meet with parents who came in to meet the teacher. I met with Mitch's parents, who were very nice and concerned about their child. They had requested from the previous teacher to be contacted if there were any concern regarding their child. Evidently, they felt that his first teacher did not comply with their request. I explained that Mitch fiddled with various objects and that he needed to pay better attention in class. He, as well as other students, was in his own world; he zoned out. His mother commented that she too was like this in school and thought that it was perfectly normal and okay. But because Mitch was a very average student, he needed to develop his ability to pay close attention to what was going on around him. It was obvious that this student would have to work at developing his skills.

Mitch really liked another boy in the class, practically idolizing him. He would much rather pay attention to this other student than anything else. The other little boy, Brian, didn't comment on this situation, but I sensed he was glad that I kept them separated in class. When lining up or during assemblies, Mitch always would seek out Brian to stand or sit next to.

Sarah was perhaps one of the brightest little girls in this class. She was of average height and had brown eyes and long, dark blond hair that reached her shoulder blades. She was studious and took pride in her work. She had a good thought process and seemed to grasp concepts quickly, with

only one explanation. She would always get to her work immediately and at times could anticipate what the assignment was going to entail and start the assignment before I explained its content.

Sarah was probably the most proficient little girl in the class at knowing the times tables. She was one of the finalists in the third-grade times tables competition and came in second for all the six third-grade classes. Looking back, I suspect that there were a couple of students that were also very proficient, but believed that they were not as capable. This attitude was likely a hindrance to their performance. This is an example of the effect students' attitude play in student achievement. As the classroom teacher it is necessary to be aware of such attitude and to foster an environment that promotes success which will affect students' attitudes that effect student achievement.

Star was a short girl with a full round face and a pouch mouth. She wore glasses that covered her blue eyes. Her hair was blond and she spoke with a lisp. Her teeth were not always brushed and she was in need of orthodontic work. When I arrived, Star was in her own world and liked to play with small objects. Her motor skills were somewhat jerky, perhaps due to her young age. She was disorganized but always well-dressed. She was not a particularly good student and her handwriting was terrible. Most of her work resembled scribble and her papers looked as if they had been used to wipe up the floor by the time she got done with the assignment. Star had

been recommended for special education testing via the regular teacher because she felt that the child needed additional help to complete the third-grade curriculum successfully. I learned that she was named after a hard rock band member, but when I asked her the name of the band that her name came from, she didn't know, only smiled and giggled. As time passed, Star became motivated to complete assignments in an acceptable fashion. Encouraging this student with positive comments and pointing out her success elicited from the student a desire to experience more success which ultimately effected her achievement.

Gwen was probably the most annoying child in the class. She was a year older than the other children because she had been held back in kindergarten. She was a slender child with brown eyes and brown hair that reached to bottom of her chin after it had been cut. This child had an ailment every day. All her complaints were a way to get attention, as I soon learned. I tried to make light of her ailments so as to redirect her focus on school and not herself, but this backfired. I spoke to her mother per her request. The mother called to complain about my method, but when I explained my goal to redirect Star's focus, she was in agreement.

Then Star's mother proceeded to tell me that the child's father had been in jail and he lived a distance away from his daughter. From the conversation, it did not seem that the father was all that interested in seeing the little girl, even though she appeared to spend countless hours thinking



about him. The mother was the one who arranged time and travel so that her two daughters could see their father. Finances played a role in their travel plans also. The mother had a boyfriend or a new husband and an infant child in the household.

Wayne was a little boy who joined the class a couple of weeks after the marking period started. He was a tall child with a heavy frame and a full round face. He didn't smile much; he seemed very nervous. Because he was a rather heavy child, I was hoping that the children would not poke fun at him for it. The children were very accepting and welcomed him to the class. Wayne was very shy. He generally would not speak unless I asked him a question. His academic work was above average. He would answer questions that sometimes the others did not know, and at times, he would contribute additional information that enhanced the class. Again, his handwriting was not so good, but there was time to work on improving that. Wayne was a strong student with a personality that was pleasant and enjoyable.

Jerry was an average height and rather thin. He had blond hair and blue eyes and didn't smile much. He would enter the class late many mornings and look rather grumpy. Most assignments that were sent home were not completed. In class, he would get rather moody and then refuse to work. I would tell him that it would be to his benefit to do his work and that the only person he was hurting was Jerry. I talked with his mother, who was at the

school often because she was a Parent-Teacher Association (PTA) member. Early in the semester, on one of the days he was tardy, she came to my class to explain why he was late. She said to me that Jerry suffers from Oppositional Defiance Disorder (ODD). I was not familiar with this term, but I soon learned what this meant. Jerry would get in a mood and refuse to do what was requested of him because of any given incident that offended him or that he just didn't like, or maybe the way a request was made. His mother explained that Jerry was late because he refused to get ready and therefore they left their house late. This happened often. In class, he would not comply and his assignments would not get done. On occasion, he would have to complete his assignment during his recess. Even then, sometimes he would still refuse to finish his assignments, so he would lose another recess. After two attempts to get him to finish that required work, he was graded on what he did complete, or he took a zero. Trying to coax this student into doing his work was nearly impossible when he refused. This was a sad situation because Jerry was very bright, but his behavior was a hindrance to him. During several encounters, his mother stated that Jerry was responsible for his choices. At first I thought that this was rather harsh, but she was absolutely right. Even though he was only in third grade, she was teaching him that his choices were his own. This was a good lesson.

The next student that I will write about was Brian. He was probably the brightest little boy in the class. He was of average height and slender; he

had brown hair and brown eyes. Like Sarah, Brian could grasp new concepts quickly and accurately. He too could almost anticipate what was going to happen next and be half-done with the assignment before the other students got started. When we decided that it would be a good idea to have a snack in the morning around 10:00 - which was Spelling - Brian was the only student that consistently brought in snacks to share with the class. Although I explained that everyone participated in snack and that it would be nice if someone else could bring in snacks to share, the only other one that brought something in was Sarah.

I soon learned that Brian's mother was also a member of the PTA. If I stated that we were getting low on snacks, the next day Brian came to school with an armful of snacks for everyone. It did not seem fair that Brian was the only student that would bring in snacks for everyone, but Brian shared happily. He never complained and never boasted of his kindness.

This next child that I will write about had the most unusual name I had ever heard - Agway. Kind, thoughtful, gentle, and loving are just a few adjectives to describe this child. He was a little taller than the other children, perhaps the same height as Wayne. His eyes and hair were dark brown and he had olive skin. He looked as if he was Hispanic and he spoke with a slight accent. I asked him if he spoke another language other than English and he said, "Yes." I asked him what language he spoke and he replied that his parents spoke Spanish but he only spoke it a little. He said that he could

understand it when he heard it but did not speak it well. I told him that he should really learn to speak and read it if he could, since this knowledge could be useful. He just looked at me and smiled. Agway was a hard worker and wanted to please adults as well as his peers.

Emma was a little girl with long blond hair and blue eyes. She was not very tall, perhaps average for a third-grader. She loved horses and animals in general. Her ambition was to be a veterinarian. Her weakest subject was mathematics. I met with her father one afternoon as she was getting ready to leave for the day. He was taking her home after a visit to the school for another function. He asked how she was doing and I said that she needed to be sure that she got her homework done nightly because she did not always come prepared. He agreed. I also told him that she was a very nice little girl and that she was a pleasure to have in class. Emma was a quiet child and could be rather impish. She seemed to enjoy reading and spelling, but because she was left-handed, handwriting assignments were tedious for her. She knew the form so that she could create the best-looking letters, but she was a little slow in completing the task.

Dan was of average height, with brown hair and eyes. His academic abilities were not as superior as his parents would think. I was in competition with Dan for the class's attention. He called out constantly. When I gave attention to another student, he would try to direct my attention to himself. I finally had to confront Dan and tell him that he was

expected to be respectful to me as well as his classmates. This proved to be a challenge, but he eventually learned when the children started telling him to be considerate of others. The class realized that this was my rule and they were happy to adopt it. Their voices were valuable and should also be heard.

As I stated earlier, I arrived just in time for report cards and parent-teacher conferences. Dan's parents came in to meet with me and, as I told many of the parents, I could not share a whole lot because I did not know the children well after only a week. They came in for two reasons: to meet their child's new teacher and to request that he be allowed to make up a spelling test that he missed in December due to an illness. They were afraid that the missing grade would affect his final grade, which turned out to be true. I told them that I would look into it but I did not see a problem with it, provided that the test was missed due to an illness. They said that the previous teacher refused to talk with them about it and would not allow him to make up the spelling test. This was the second set of parents that commented that the regular teacher did not take the time to talk to parents.

In this class of students, two boys were MI students. When I interviewed for the job, it concerned me that I would have these students in the class because I had no background or experience with these types of children. I was assured by the principal that there would be an aide with them and that they were only in the regular education setting for

socialization. These students were included in Social Studies, which I taught, and in Science, which was taught by the half-time teacher in the next trailer.

Nathan was a student of average height, with brown hair and pretty blue eyes. His face was round and he had very fair skin and freckles. He was probably the best-dressed student in the class, since he was the only one to wear the Ralph Lauren label. At the time of my arrival, Nathan's mother was in Iraq, serving in the military. The family had recently returned from Germany, where he and his father and two brothers had been visiting his mother for Christmas break while she was on leave. The aide that followed the two MI students commented that she thought he was having a hard time dealing with mother being far away and then returning home, which required constant adjustment. Not long after I arrived, his mother was expected home for good. He was so excited and again, he had to adjust to a new situation. These changes seemed to impair his behavior. He was not mean-spirited, and although he did hit or pinch from time to time, he was a loving child. His mental condition played a role in his emotions, which even baffled the medical community. The condition that he was born with was genetic in nature, but he was the first known case; therefore, it was named after him. Evidently, his diagnosis is rare. He and the other MI student would come to my classroom in the morning to check in and to do

“morning work.” He rarely finished, but this time was utilized as a way for him to socialize and enhance motor skills for handwriting.

Evan was the other MI boy that came to my class in the morning. He had a small frame and was somewhat round-shouldered. He was always clean and had the necessary school supplies. He too came to my class to develop socialization skills and to potentially refine his fine motor skills by writing the morning assignment. He was rather quiet but would become vocal if he felt his rights were being violated. Often, Nathan would irritate him and Evan would yell out and become angry. At these times, it was hard to get him to focus and complete on the task at hand.

Evan liked to rock forward and backward in his chair when he was not engaged in a task or when he would appear to be listening during a lesson. When he would talk to me, he rarely looked at me, but to get my attention he would look right at me. Then, when he had my attention, he would look away and proceed to tell me his tale. He was particularly fond of his aide, Ms. Heer, and she particularly liked this child’s personality. He was a cute little boy who spoke with a lisp. Although he was impaired mentally, he could discern right from wrong and could explain the details of an event.

About eight weeks before the end of the year, a little girl named Jenny joined our class. She was also an MI student. Her functioning level was

very low. She wore thick glasses and tilted her head back to look at something as if to improve what she was looking at.

I came to find out that both boys exceeded their expectations in monumental ways. They were able to attend the general education science and social studies classes. The aide was with the boys the entire time they were in the general education classes to keep them focused and to attend to their behavior when necessary. Sometimes during the class, which lasted 30 minutes, the boys would get restless or if something happened earlier in the day that upset them, they would act out. The aide was very good with them and had developed a wonderful rapport and trust with these children. She made no exception when it came to behavior. They were expected to be respectful to adults as well as their peers. They did very well.

Student profiles can aid the teacher in determining instructional techniques that best serve students. Tyler's rationale can be useful when determining what to teach and how to evaluate curriculum. Schwab's rationale is inclusive of Tyler's underlying principles when applying the three aspects of The Principal. Utilizing theories and practices that are practical for diverse educational and social setting can be useful in answering the four questions posed by Tyler. Knowing students lived experiences is a key to deliberating best practices in the classroom to meet educational goals.



## Chapter VII

### **Analysis**

The analysis in this chapter is designed to answer the questions:

- 1.) Does the classroom environment have an effect on a student's achievement in mathematics?
- 2.) Can a student's feelings about his/her relationship to the subject matter affect achievement in mathematics?
- 3.) Can the interpersonal relationship between the teacher and students affect a student's achievement in mathematics?

This dissertation utilizes a combination of hermeneutical methods, including auto-ethnography. Relying on themes from literature review, I applied Schwab's curriculum approach to my class of third-graders. The themes include how teacher behavior affects student behavior in the classroom. Teachers who engage in immediacy cues increase affinity, which results in affection for the teacher and subject. Increased affection for the subject increases student motivation, resulting in cognitive learning. Students who are motivated and enthusiastic put more effort into the subject matter because of the affection they feel for their teacher. For the teacher to be an effective communicator, he/she also needs to be aware of the invisible components of culture. Through conversations that occurred during

mathematical lessons and caring interpersonal relationships that evolved through the school year, these third graders in rural West Virginia developed a sense of efficacy for mathematics that led to an improvement in their mathematical knowledge.

In this chapter I will (a) describe the themes that emerged from literature review; (b) include demographic data for this particular region; (c) describe teaching elementary school - the events that created the classroom environment where I taught; (d) make suggestions for improvement and research; and (e) include an auto-ethnographic conclusion. These processes mentioned above describe events that occurred in my third grade classroom that are explained through an auto-ethnographic means and justified by current literature on communication practices in accordance with researched literature from Chapter 3.

The research questions I propose emerged out of a desire for students to experience mathematical success in my class. I observed and took mental/written notes over the course of my teaching career that suggested the classroom environment and interpersonal relationships formed within the classroom have an effect on student achievement and affect for the subject, especially mathematics. I used Schwab's environmental relationships (classroom, curriculum, and students) to document my hypothesis which is the classroom environment impacts students' achievement in mathematics, students' affect for the subject of mathematics, and the interpersonal

relationship between teachers and students affects student achievement in mathematics.

The classroom environment, students' beliefs about themselves and their relationship to mathematics, and interpersonal relationships within the classroom plays a significant role in student achievement. The literature review demonstrated that the classroom atmosphere has a profound effect on students at so many levels.

Educational research needs to have an undergirding notion that practice can be influenced by theoretical conclusions developed in studies such as this. This self study has demonstrated that my carefully orchestrated practice impacted the third graders that I taught. It can be seen in their development and success. Thus, educational research that probes for a means to improve success in the classroom for teachers and students needs to explore the impact of interpersonal relationship in the classroom and its effect on the classroom environment and how both of these views can be utilized to perfect teaching practices to effect student achievement. This question need not be about an entire school, district, or education in general. It simply needs to have a phenomenological effect on the practitioner. In this case, that is me and my practice, which I hope will lead to an emergence of success for students that teachers can begin to discuss. For this reason, I will employ alethic hermeneutics and rely on auto-ethnography to re-tell the narrative of how conversation and caring led

to evolved proficiency in mathematics for my third grade students. Auto-ethnography, as defined in Chapter Four where human beings orient themselves in ever-changing situations that develop their understanding (Alversson et al., 2000). This method allowed me to convey the phenomenon that occurred in my third grade classroom while understanding the perspective from which it came to be known, and the social context that this and learning experiences occur within. The reader must remember that interpretation is also subject to the personal history of the reader, not just the writer. While being cognizant of my own history, I was aware of the students lived history that I observed, and I was mindful of the phenomenological perspective that encompasses curriculum and learning in this given educational milieu.

### ***Teaching Elementary School***

#### *Report Cards and Parent/Teacher Conferences*

I started teaching at this elementary school on a Wednesday. Report cards were due to go out on Friday for the Second Nine Weeks grading period, which also included the Semester I averages. The teacher who was filling in was so gracious as to average all the grades for each subject area that was taught by the regular classroom teacher. All I had to do was record the grades on each student's report card and write a comment about each student. This was very time-consuming because it was all written by hand.

Writing a comment about each student was not easy since I had only had these students for a couple of days. To attempt to complete this task, I read what the previous teacher had stated in the comment area for the first grading period. I also perused their grades from the first marking period and wrote one sentence to satisfy the comment requirement. Most often I wrote that, "I am looking forward to working with you and your child," and then I made a smiley face at the end of the sentence.

Since this grading period signified the middle of the school year, it was also the time for parent/teacher conferences. Conferences were held one week after report cards were distributed. I did not think I would have many parents, since I was new to the classroom and there was not much that I could comment on about any child in the class. The night of conferences, four parents came to see me. Most had a concern and were hoping that I would be able to remedy it. Mitch's parents were the first set that I met. They were very interested in their son's progress and wanted to be informed if there was anything that was going on at school that they should be aware of. They mentioned that he was being picked on by another student. I told them that I was not aware of this but that I would certainly be on the lookout for any such behavior. They complained that the previous teacher did not keep them informed, so when an event took place, they were not aware of the episode except for what their son told them. They mentioned the name of a student, but he was not in my class. I told them to inform

their son to let me know of any such occurrence and that I would definitely take care of it. They also informed me that they had moved to this area the preceding October. I explained to Mitch's parents that he seemed to get along well with the students in the class and that he was particularly friendly toward Brian, who was a very nice kid. I also told them that Mitch liked to play with pencils and erasers or any small object that he could make into a toy. He liked to joke around and thought he was the funny guy – but this was distracting to the educational process. His mother laughed it off and said that she was the same way in school. Her concern with her son's progress and then laughing off his behavior seemed inconsistent, but she did not seem to comprehend the connection of behavior and progress. This happens often, as I can recall from past parent-teacher conferences.

Sarah's parents met with me because they were concerned about her attitude and its effect on her school work. Evidently she was giving them some attitude at home and did not want that to become part of her repertoire at school. I told them that I had only been there for a short time but I had not seen this behavior and that I thought she was a nice little girl and a very capable student. I told them that if I saw a poor attitude, I would call them.

The next people that I met were Brian's parents. They basically came to introduce themselves and to meet their son's new teacher. As I had told the other people that I met, I said that it was hard for me to comment

accurately about anything because of the short timeframe I had to work within.

Finally, I met Dan's parents. They were eager to discuss anything about their son. Their main concern and the ultimate reason for their visit was to request that their son be allowed to make up a spelling test that he missed before Christmas Break. The previous teacher would not allow him to make up. They were concerned that the zero he received would affect his final grade for the year. I inquired as to why he missed the test and they assured me that his absence was due to illness. I told them that I would allow him to make up the test if he was out for being sick on the day of the test. I checked the record on his attendance card and Dan was absent due to illness, so I did allow him to make up the test. The missed grade was the difference between an end-of-the-year grade of a "B" or a "C." I also explained to Dan's parents that he called out often, which was a distraction to the other students, and that he needed to be respectful of his classmates. They said that they would talk with him.

The daily schedule consisted of students arriving to school, checking in, and completing their "morning work." Announcements were received over the PA system that commenced with the Pledge of Allegiance to the flag and the West Virginia Pledge. Once the day officially began, reading was on the agenda first, including Language Arts and Spelling. Then we addressed handwriting and mathematics. Science and social studies followed, lunch

and recess were sandwiched in, and “specials” came at the end of the day. There was much to complete during the day and many situations needed immediate attention - very little could be deferred to another time. To manage the daily grind was a matter of being attentive to the needs at hand and attempting to foresee what could happen, then being prepared to deal with it and or to diffuse it before a problem arose. At times, it could be a juggling act.

### *The Daily Schedule*

Check-in consisted of being marked present and saying whether the student was eating a packed lunch or a hot lunch. This particular teacher had a unique system of identifying whether students were eating packed lunch or hot lunch while taking attendance at the same time. A set of vertical pockets hung on the narrow wall outside the built-in restroom and the long green bookcase. Each student’s name was displayed singularly in a pocket. As each student arrived, he/she would choose a red clothespin to represent packed lunch or a white clothespin to represent hot lunch and clip it next to his/her name. This also identified students who were not attending school that day. Attendance cards and the Teacher Daily Report were sent to the office so that the administration knew who was absent and could document the information in their computer, while allowing the head cook to know how many lunches to prepare for the day. The Teacher Daily



Report included the names of absent students and the number of student and adult lunches that needed to be prepared.

Once the students arrived, they were expected to hang up their coat and backpack on their designated hook on the wall next to my desk. They were to put the materials that they needed for the day in their desk and they check in with the appropriate colored clothespin. This was a very effective way to manage the morning activities, as I soon discovered. Any student who wanted to go to breakfast would take their lunch tag, which was attached to a strap that they could wear around their neck, and go to breakfast. Only a few students went to breakfast, and once they returned, they were expected to complete their morning work before announcements were made.

Morning work was the activity the students engaged in while everyone arrived, went to breakfast, and checked in. Nathan and Evan, the MI students, arrived with their aide and followed the same procedures. They were also expected to attempt the morning work. When the day began at about 9 o'clock, the MI students went to a special education teacher for the majority of the day. Morning work was also utilized as remediation and review of past lessons.

Morning work generally consisted of writing three sentences and correcting grammatical errors, and calculating two to three math problems.

Sometimes the work had been taught recently, or it could be something that I felt the students needed to revisit. Additionally, it helped the students to learn to transfer information from one place to another accurately and to assist them in practicing their penmanship. After about twenty minutes of preparing for the day to begin, announcements were made over the intercom. The announcements consisted of an array of topics. They could include "Student of the Week" recognition, activities that were to take place during the school day or an evening event, the lunch menu for the day, the daily weather forecast, and of course the Pledge of Allegiance to the flag and the Pledge to West Virginia. Once the announcements came to an end, I had three different students each day make the grammatical corrections and calculate the math problems that I had assigned. These students really liked being able to write on the chalkboard.

Nathan and Evan returned to the general education class for science and social studies in the afternoon and they also joined their classmates for "specials," which consisted of art, computers, library/guidance, gym, and music. They also ate lunch and had recess with their classmates.

Reading was the first subject of the day, starting at about 9 o'clock. Since this was a Title I school, there was a designated teacher-a special education teacher-that came to the class to assist with the reading series. Reading as a whole lasted for an hour and a half, with two different teachers coming into the class for a half-hour each. Mr. Peabody arrived first, just

after announcements. He began the reading lesson with a review of the week's reading vocabulary. He was very good at finding ways to relate the material to the students so that they would remember the meaning and application of each word. The manner in which he presented the reading series worked well because it differentiated the subject's material. He would use the reading vocabulary in sentences that were relevant to the students or draw pictures on the chalkboard and tell a story using the students' names as his characters. Mr. Peabody was exceptional and the students loved him. He was a big jolly fellow that had an excellent rapport with the children. At times, however, he would get them so energetic that it was difficult to get them to focus once again.

When Mr. Peabody arrived, the children got excited. If he was absent or had a meeting that he was expected to attend and could not come to class, the children were terribly disappointed. These children knew that he cared about them. There were several little boys in the class that gave him a hug as he was getting ready to leave. They were sorry to see him go and held on tight so as not to let him go. He and I discussed this phenomenon and were at a loss as to why these boys were so "huggy." Since we had not spent time with them and their families, we thought that maybe they just needed some attention that they were not getting at home, or that they just like getting out of their seats for a hug. In any event, Mr. Peabody did care about these children and he made it known to them. They knew that he was

their friend and enjoyed the time they spent with him. Mr. Peaboy is a teacher who understands the relevance of the classroom environment and its effect on student achievement.

When I first took this job, Mr. Peabody was the only teacher that came to my class for a half-hour to help with reading. About a month into my stay, another teacher, Mrs. Linton, was assigned to my class to help for an additional half-hour. This teacher was added to the staff because the number of students that attended the school forced the county to hire another teacher. Mrs. Linton came into my class daily as Mr. Peabody left at 9:30 to go to his next class. Between the two of us, we would read the story and check for understanding, review the vocabulary, and then introduce the workbook pages that coincided with the story that we were reading for the week. The students were given a certain number of minutes to finish the assignment and then Mrs. Linton or I would review the answers. There were many pages that could be completed, but I used the ones that I felt were most helpful in preparing the students for the reading test that took place at the end of the week. Mrs. Linton was an older woman and a seasoned teacher. She had left teaching to take care of an ill relative and was now trying to make her way back into teaching. She was very calming and treated the children kindly. Mrs. Linton was a seasoned teacher who knows how to treat children so as to promote success.

Once the hour and a half for reading was over, it was time for Language Arts. Most of the children did not really care for this subject. I think their background was weak; therefore, they found elements confusing. Most of what we studied related to nouns, verbs, and describing words as identified by adjective and adverb. These words confused them. Usually, they could identify a noun or a verb, but when it came to the describing nouns and verbs, they became confused. To help my students better understand, I had them make up a sentence about something they did - to make it more personal and relevant - and then we dissected the sentence. This helped somewhat. The other part of speech that they seemed to understand better as time passed was the use of pronouns. They liked to replace the proper name with the correct pronoun. They were also good at knowing when to capitalize a word in a sentence.

Spelling also had to be squeezed in during the morning hours. I think the children actually liked Spelling. I introduced the lesson on Monday, and just about every day, I had the students say the words out loud so that they could have the experience of saying the word and hearing the word from their own pronunciation and those around them. I would then review the directions for the assignment and they would complete it. They usually finished the assignment in about fifteen minutes and then we would review the answers and clarify any misconceptions. When I first arrived, the

children simply seemed to treat the subject as just another one to get through.

At the same time that Spelling was taking place, Tommy would need to go to the office to have his sugar check because he was feeling high or low. In the beginning of this experience, we would no sooner start the day when he would need to leave to check his sugar. On a regular basis, he would need to leave at the beginning of the Spelling unit at 10 o'clock to have a snack.

The routine for getting Tommy to the main building to have his sugar checked or to have a snack involved using a walkie talkie to call over to the office. Once I got someone's attention, I would tell them that Tommy was feeling high or low and that I needed someone to meet him at the side door to the main building. Since I had a schedule to adhere to, I would call the main building, stand on the landing of the trailer with the door open to see when the nurse or some other office personnel would arrive to meet Tommy, and teach the lesson at hand by giving directions or explanation. This series of events could take place at any given time during the day. At first, the children took advantage of this event to become talkative, sit back in their seats, and drop what they were doing. I explained to my students that even though Tommy needed to go to the office, we were still required to do what is expected. I also explained that if we did not get the required work done when we were supposed to, then we would have to take free time to get it

done since we spent work time to play. This seemed to get them to stay focused. I told them, "Work when you work and play when you play, but don't get the two confused." Dewey too suggests, "[i]n short, the grounds for assigning to play and active work a definite place in the curriculum are intellectual and social not matters of temporary expediency and momentary agreeableness (Dewey, p. 195, 1916). They certainly did not want to spend recess doing work that they could get done in class. At first, sending Tommy to the office was very disruptive, but as a class, we worked out a system to deal with the event and things went rather smoothly on most days.

Snack was a requirement for Tommy, but it kept him out of the classroom for the majority of the Spelling unit and he missed work that he would need to make up. The only problem was that he didn't make up the missed work and his Spelling grade was in jeopardy. Additionally, the other students did not seem to feel that they needed to do the work because he was getting away with not finishing. I had to keep the class moving to get all the requirements accomplished for the day. The only time that Tommy could make up the work was during recess, which I felt he needed to run off steam, or at home in the evenings. The assignments were not completed at home, so I had to find another approach to solve the problem. To remedy this circumstance, I talked with the nurse and asked if it would be okay if he had his snack in the room. This was fine with her. I also inquired as to

what specific snacks were allowed. My thought was if everyone had a small snack, then he would be able to have his snack without having to be singled out - not that he minded being a special case-and he would not have to eat in front of the other students. I was sure that the other children in the class would like to have a snack too, since they ate such a late lunch.

I asked the children if they would like to have a snack during our Spelling unit, since Tommy was going to stay in the room to have his required snack. They were thrilled with the idea. I asked for snack donations of Cheeze-Its, animal crackers, or pretzels. Brian brought in animal crackers and Cheeze-Its on several occasions. Sarah also brought in some snacks, but Brian was the student who brought in the daily snack on a regular basis. I also supplied the class with many snacks. Since the students had "third lunch," they did not eat until 12:30 p.m. By this time, they were starving and very eager to get to lunch. The snack not only kept Tommy in the room for the Spelling lesson, but it also helped to keep the children focused and willing to work to get their own assignments completed.

Once the students started their assignment, I had a different student each day hand out paper towels to put their snack on. One by one, the students would wash their hands and return to their seats for a snack and to complete their Spelling assignment. I then handed out the daily snack,



which they ate while finishing their assignment. They were very good about not being distracted by the snack.

After Spelling, we headed to the main building for a bathroom break. Taking a bathroom break was written into the regular teacher's plan book as a daily occurrence. Before we left the room, the rule was that everyone had to be done their snack. Most of the time the students finished their snack and they were ready for our walk to the restroom. The students liked this as much as I did because it gave us a chance to be outside. Since there was so much material to cover, I was hesitant to take the time out of the schedule to run to the bathroom since there was one in the trailer. One of the other third-grade teachers commented that it was not a requirement to go into the main building to use the restroom. It was my choice. This time outside of the classroom gave the students and me a chance to see each other in a different setting. As we would walk to and from the restrooms, the students would talk about what was on their minds or they would ask me questions to find out more about me. This gave me the opportunity to build a rapport with my students which affected their attitude about me as a caring teacher which effected their performance in the classroom which in turn effected their achievement.

The daily bathroom break usually took between ten and fifteen minutes. The boys lined up on the wall to the right across from the boys' bathroom and the girls lined up on the wall across from the girls' bathroom.

Since there were three stalls, only three students were to be in the restroom at one time. As one came out of the restroom, one could go in. Between the two restrooms was a water fountain where the students could get a drink. They usually took advantage of the opportunity because we did not have access to a water fountain in the trailer, and they were thirsty because we just had a snack. Some of the students did not use the restroom because they did not have to or they wanted to be first in line. Once everyone was finished, we headed back to the trailer.

When I first arrived, they were rather quiet when we would walk through the halls. As they became more comfortable with me, they could get rather loud. While they stood in line, they liked to chat with each other and they also liked to talk with me. On several occasions, I had to remind them to quiet down so that we would not disturb the other people in the building.

Early in my stay, Abby T said that she was glad that I came to replace her teacher. Evidently they did not get along very well. She seemed to have issues with more than one adult she came into contact with. I told her to be respectful of her teacher and if she had nothing good to say, then she should not say anything at all. Abby T was a bright, capable student, but she had some personality quirks that could be offensive, as I stated earlier. I think that Abby T came to respect and appreciate my candor. She knew that I cared and that I was interested in her, but there are limitations in

what one can say. This was something that she obviously needed to learn. As time passed, she did become more thoughtful of her neighbor.

Tommy was particularly outgoing. He really liked to talk and he was the first one to share a story about himself and his family. On one occasion while walking to the main building Tommy was at the front of the line, as we walked, he made small talk. On this particular occasion, he told me that his parents were in jail. They had been on the run from the law the previous year, for almost nine months. He thought that what they had done was wrong but I think he was looking to find out what I thought about this situation. He commented that his parents were bad. I told him, "Yes, what they did was bad, but you still love them, right?" I proceeded to tell him that sometimes the people that we love do bad things, but you can still love them. I felt sorry for this child because although his parents had done some awful thing, he still loved them and he was torn as to how he should feel about all of the events that he had experienced over the last year or so. It seemed to me that the child felt as though he should not care about them because of what they had done. I am not sure what he had overheard from adults passing judgment on the situation, which may have affected his feelings about this burden he had to endure. I did not probe to get details because of the sensitivity of the situation. I listened and tried to comfort him as best I could. Although he appeared to have the weight of the world on his small shoulders, he was always smiling and seemed to enjoy life.

Math was an hour long and it lasted from 11:30 to 12:30. For the first half-hour, a Title I teacher named Mr. Todd came to the class to practice mathematics skill-mostly the times tables-with the children by utilizing mathematics manipulatives. As standardized testing approached, the Title I teacher focused on multiple-choice activities to prepare the student for the test. Third grade is the first year that the students take standardized tests in this state.

The class as a whole seemed to like Mr. Todd. He was a jovial individual who always spoke kindly and expected the students to cooperate. If they became zealous over the activity that that they were engaged in, he would calmly say, "I'll wait until you are ready," and he would stop until they were ready to continue in an orderly manner. He had some interesting games that he would play with the children. One game was designed like a game show. The students were divided into four groups with about four students in each group. He would pose a question, and the student that thought he/she had the right answer would push the buzzer to answer the question. This, of course, got the other students excited as well.

This was an interesting approach to teaching mathematics. These activities were hard to compete with when I had to teach from the county approved mathematics book. The joy of calculation and the sense of accomplishment seemed over-shadowed by the glitz and glitter of a game show which was hard to compete with.

Mr. Todd generally left at 12 o'clock to go to his next class. I was in charge of teaching the material from the book and being sure to teach the required Curriculum Standards and Objectives (CSOs) for the designated grading period. I was also expected to teach the times tables, which Mr. Todd spent a great deal of time teaching as well. His approach was to teach the times tables in a song. The children liked the songs, but I wonder how effective this tactic was in actually learning and understanding the concept of the times tables. Most students who have a hard time remembering the times tables do not really understand what they mean or represent. To help my students remember the times tables, I demonstrated the concept of repeated addition on the chalkboard and then turned it into a multiplication problem. They were supposed to have had this exposure prior to my arrival, but my students did not seem familiar with the concept. To further aid them in understanding the multiplication tables, I gave the students chips and had them make arrays of random times tables problems. Making the array proved to be entertaining for the children and it also helped them to grasp the concept of multiplication.

After math, the students had a 30-minute lunch break. When they returned, it was 1 o'clock in the afternoon. I then settled them down for the teacher next door to come into the class to teach science, while I went to the classroom next door to teach social studies. I returned to my room at 1:30, time for recess. This was also a time for those students who did not

do their work or needed to make up work due to absences to get it done. To manage duties for recess and the classroom, teachers were assigned an outside duty on a daily basis to monitor students or to stay in the trailer to help students get missed assignments completed. Each teacher assigned an inside duty had one day a week where students came to their class to make up missed assignments.

Recess consisted of the usual fighting and scraping and “he said, she said”; nonetheless, the children seemed to have a wonderful time running, playing, and sharing discoveries and joys with fellow students and their teachers and aides. Recess ended at 2 o’clock, when the teachers on the playground signaled to the students to line up outside their respective classrooms. Everyone entered their class for the rest of the day. At this time, I taught social studies for a second time to my own class of students. The MI students and their aide took part in this lesson as well.

At 2:30 p.m., it was time for my students to attend “specials.” My class was the only third-grade class that had “specials” at the end of the day. Depending on the day of the week, the class attends a different class. The children enjoyed this time, for the most part. They particularly enjoyed computers, gym, and art. While the children were gone, I had a planning time when I wrote plans, graded papers, or called a parent. Most often, the time was spent planning.

The children returned at about 3:15 and then prepared to go home. They were expected to get their coats and backpacks and put anything in the backpack that was to go home, including their text for homework. The intercom in my trailer was very loud, and the person calling the bus number so that the children knew when to leave to get on their bus talked very loud also. Sometimes it was hard to make out the numbers that were called. The children had been doing this for half the year, so they were very familiar with the routine, but I still took the time to learn the order in which the busses were called so that no one could slip out when he/she was not supposed to leave. Also, while busses were called, the office sometimes called on the walkie-talkie about a student that needed to go to the office to leave. In most cases, this was about Tommy and an issue with his blood sugar. He was tested at the end of the day to assure that his sugar was stable so he could make it home without incident.

### *In the Beginning*

This paper is meant to explain that the classroom environment is essential to student achievement. Coming into this classroom in the middle of the year was not as scary as I anticipated. At first, the students were reserved, as most people are in new situations. But once they became familiar with me and vice versa, the dynamics changed. There was more resistance due to the changes that I incurred. Young children apparently feel ill physically when faced with things they do not want to do or are

challenged by. Being a middle school teacher made me expect a certain level of responsibility, which was difficult for the children to accept. However, I stayed the course and the children met the challenge and were happy for it.

Upon arriving on my first day, Mrs. Ware, the assistant principal, gave me a set of keys to my trailer and the main building. The students were expecting me, so they were very agreeable and helpful - at times, almost too helpful. The day unfolded nicely and the students proved to be a challenge to keep on task. They seemed to like to fiddle with whatever they could get a hold of. I believed that these students needed some structure and expectation that would help them to become more responsible for their work. When I would ask them to rewrite portions of their work that were illegible, they complied. As I walked around the room, I commented about those students who had made improvement in their penmanship. They really liked to hear that their penmanship had improved.

One negative aspect of this classroom was that it was terribly dusty, the floors were filthy, and there was clutter at every corner. After my first day, I decided to clean up and arrange the students' desks in a way that would suggest a relaxed atmosphere and an air of expectation. I wanted these students to know we were going to conduct our class in a way that was comfortable and where everyone was responsible for himself/herself. I arranged the students' desks into clusters of about four to five students.



They really liked the new arrangement because they could sit next to their classmates. We cleaned the room diligently and organized their desks. That meant taking everything out of their desks and throwing away unwanted papers and anything else that could be considered trash. A few days later, the teacher next door asked my students what they thought of me, and they said, "She likes things clean."

These students proved to be rather difficult to motivate and to keep focused. They would play with a pencil, an eraser, or even a piece of paper rather than pay attention. This was frustrating because although there was the occasional student in middle school-where I had taught most of my career-that would not pay attention, the students seemed to be focused. These children wanted to play and do nothing else. I had to adapt my methods in order to get a handle on this group of students, so that I could teach the curriculum without too much difficulty. Since there were problems with conduct inside and outside the classroom - on the way to and from lunch and specials - I decided to have the students practice proper behavior at all times. I utilized APL training which stands for the initials of the founders, Dr. Jean Anastasio and David Perry that I had received through the county where I was employed. This was a highly effective approach to classroom management, endorsed heavily by this school district. The idea behind this approach was to "teach what you want" - to teach the desired

behavior. For instance, if students are expected to walk on the right side of the hallway, then practice walking on the right side of the hallway.

The children in this class also had a tendency to call out and interrupt while others were talking. As a class, we discussed how each student should act and conduct him/herself. Some rules were that hands must be raised in order to talk, and everyone must listen when a fellow classmate or the teacher was talking. We decided that everyone should stay in their assigned seat, be respectful of other people's belongings, and keep the classroom clean by picking up paper or doing anything else to keep our room organized. Additionally, we established that "please" and "thank you" should be used regularly. The rules for traveling to and from the building were the next topic to address. These students were all over the place, running, jumping and yelling out. Again, we discussed as a class how to walk to and from the main building and why these rules are important. Running and yelling could result in injury, such as falling on the blacktop, which was sometimes slippery or icy after a snow. If students yelled, they may not hear important information or directions. We also discussed why it is important to be quiet when entering the building and walking through the halls. Students in the open space classrooms may be distracted from their work if they hear other people talking loudly. Although the students were in agreement that they should be quiet, they sometimes had a hard time following through, so we spent some extra time practicing how to be quiet in

the hallways of the main building and how to make a line. By the end of the year, they showed improvement.

Although this was an area with a lower economic standard the children seemed to be taken care of quite well. Parents would come to pick their child up when he/she was sick and take him/her to get medical attention when necessary. From conversations with the students, I learned that they all lived in some kind of home and they were well-fed and clothed. They did not always seem to have academic guidance from home, but nonetheless, parents were concerned about their child's progress in school and they felt that education was important. This was clear from statements that the students would make, such as, "My mom is going to be glad that I got good grades on my report card." Another commented, "My dad will be glad that you gave me a good grade on this test." I replied, "I did not give you the grade; you earned it." One parent showed concern for his daughter's mathematical development and asked what could be done to help his child conquer math. I suggested review and practice at home by doing her math homework nightly. On another occasion, this parent sent the child to school to tell me that she did not understand the concept that we were covering and wanted me to teach her the topic again. The parent was concerned but did not want to spend time developing the child's skills outside the classroom. This is why it is so important to spend time, to linger on each

topic so that the student can experience math beyond the pages of the math book.

Most of the students in this class had both parents living under the same roof. The children spoke fondly of their parents and seemed to spend time with them in a positive fashion. Although there were several students in the class whose parent(s) had served time in prison or were serving a prison sentence, the children seemed fairly well-adjusted.

### ***Discovering Aesthetics in Math***

Creating an aesthetic mathematics classroom can be a challenge while being sure to meet state and federal mandates. Much of what takes place in the classroom in regard to mathematics is how the material is presented to its audience. The manual that accompanies a chosen text has an array of suggestions, but it is the teacher who ultimately decides how the material is to be presented to her class. If the teacher elicits excitement and demonstrates the truth, beauty, and goodness of mathematical concepts, the students can experience the same joy the teacher emanates. Teachers are the artists of the mind and soul. The art of teaching stirs joy within the student, whose mind is free to work (Dewey, 1938, Greene, 1979 Latta, 2001). The interplay of self and world is continual and by no means is final (Latta, 2001).

In the following paragraphs, I will demonstrate the power of aesthetics in mathematics in my third-grade classroom. Students display an excitement for mathematics and develop a confidence in their mathematical abilities that in turn elicits joy. Interpersonal relationships between the teacher and students are forged, which also plays a role in developing a classroom environment that is conducive to mathematical achievement for its participants.

### *Multiplication*

I decided to play "Around the World" on a day that Mr. Todd was not able to come to our class. This was a math game that all the kids enjoyed. The idea of the game was for two students to compete with each other in answering the multiplication problem first that was presented on a flash card. One student stands by the other. Whoever wins moves to the next student in the row and the process starts over again. The idea is for a student to make it around the room and find himself back in his own seat - going "around the world." This proved to be entertaining for the children as well as informative for me. We started out with the times tables that they were most familiar with, and once we exhausted these, I suggested that we try some harder ones. I then stated that these were ones that they had not had yet, but they were eager to try. We came to  $11 \times 8$ , which, to my surprise, one student was able to answer. We then moved on to  $12 \times 5$ . The designated students counted by five twelve times to get the answer. "Great

job," I told A.J. We then came to  $12 \times 7$  took the participating students a moment to figure out. The next problem was  $12 \times 9$ . The designated student seemed to have trouble with this. I went to the chalkboard and wrote down the preceding problem and its answer. I then asked them, "How many more is 9 than 7?" They stated "2." I then asked them, "What is  $2 \times 12$ ?" They counted on their fingers by 2 and came up with 24. I then proceeded to add the sum of  $12 \times 7$  to the sum of  $12 \times 2$ . They were thrilled with the process. I explained that in math, there are many ways to get the same answer. They thought that was cool.

Once the game was over, we started our lesson on fractional parts. They seemed to have a little knowledge of these terms and were very unsure of the knowledge that they did possess. I planned on spending additional time on this area, so they would have a full understanding for their grade level.

To demonstrate multiplication by one and zero, I wrote  $7 \times 1 = 7$  on the board, since we were working on learning the 7 times tables. I asked the students, "If I say seven times one, that means I have one group of 7," and I drew 7 stars on the board. "Is that right?" They agreed. I then said, "If that is true, then I can do a really big problem and get the answer." I then wrote  $256,429,123 \times 1$  on the board and said the answer. "This means that I have one group of this number. Can someone say this number?" Brian rattled it off perfectly. I then asked the students if they could do this and

they said they could. To demonstrate multiplication by zero, I wrote another very large number on the board and asked the students, "If you have zero groups, do you have anything?" They replied, "No."

To facilitate their enjoyment, I asked a student to write a big problem for multiplication using one and zero, but they had to be able to say the problem and answer the problem. Brian wrote  $999,999,999 \times 1 = 999,999,999$ . Sarah used  $1,495 \times 0 = 1,495$ . I then asked her, "If you have zero groups of 1,495, do you have 1,495?" She quickly changed her answer to zero. The students were quite impressed with their ability to multiply such a large number. The students asked to finish the flashcards that we had started to make for the 7 times tables from the previous day. I instructed them to make sure their cards were in ascending order, smallest to largest, and to check to make sure their neighbor had them in the right order also. They particularly enjoyed checking up on their neighbor. I then asked the students to take the card with  $7 \times 1 =$  on it, turn it over, and write  $7/7 =$  but be sure not to write the answer. After finishing this for all of the 7's, we wrote the answers to the problems on the opposite side of the card in the upper right corner. They caught on fast and completed it in no time. They really liked having their own set of flashcards. Students who finished an assignment earlier than the allotted time would take out their flashcards and flip through them to become more proficient. They also would ask if they could use their flashcards with another student to help each other learn

them better. This was a nice gesture on their part, but they really liked the interaction with a friend. This is one way to build relationships, not only with each other, but also with me, because they knew that I was interested in their development and understood their need to talk with a friend. This tactic proved to build their confidence to multiply and to build teacher-student interpersonal relation by allowing them to enjoy this time in a way that suited them.

On one occasion, I took the opportunity to help my students review their 7 multiplication tables. This was a concept that Mr. Todd repeatedly tried to help the children to learn for the upcoming multiplication tables competition. I demonstrated an array on the board and asked the students if they knew how to do this. They assured me they did. When I asked them to make an array to show  $7 \times 6$ , they only sang the song that they had been taught and counted out 42 chips. The chips that the students used to make an array were somewhat organized but they also seemed a little scattered. I had the students construct a few other arrays with the 7 times tables but I asked them to be sure to arrange them so that as I walked around the room to see what they had done, I could tell right away what they were trying to show. I do not believe that these students had used mathematical manipulative often. At first, they really only wanted to play with them. Once we got past that phase, things went more smoothly.



The students were very interested in learning how to multiply and divide. However, one student asked if we could play "Around the World." Many of the students wanted to play. Since Mr. Todd came in almost daily and played games with them for a half an hour of the hour math block, they seemed disappointed that we were going to working on a particular math concept. This made it very difficult to teach the necessary standards while competing with games. Although games are an excellent way to reinforce mathematical concepts, the skills need to be taught first.

On this particular day, we worked on how to multiply by multiples of ten. I started out by using easy multiplication such as  $2 \times 3 = 6$  and then expanded to  $2 \times 30 = 60$ ;  $2 \times 300 = 600$ ;  $2 \times 3000 = 6000$ . I asked the class if they could see a pattern. One student said he could but had difficulty explaining. He became nervous and I told him to take his time. He said, "You take the numbers and multiply." I believe he meant that the numbers other than zero are multiplied. He became frustrated and gave up trying to explain. I tried to paraphrase by saying, "Do you mean you multiply these two numbers" - while pointing to the digits other than zero - "and then add the zeros?" He said, "Yeah." I then demonstrated this same concept by using  $3 \times 9 = 27$ . I then asked the class, "What is  $3 \times 90$ ?" One student said 127. Then I asked him  $3 \times 9$  and he said 27. I again asked, "What is  $3 \times 90$ ?" and the student replied, "270." We continued with  $3 \times 900$

= 2700 and  $3 \times 9000 = 27,000$ . I then asked the students if they could see a pattern with the two sets of fact problems, and they could.

To practice, I called out a problem and then pulled a popsicle stick from a cup with a student's name on it to give a response. They liked this way of choosing a student at random to answer the question. Since everyone was eager to answer, this process seemed fair to them rather than calling on students. With some coaching, the students were able to answer each of the problems that I called out. I then assigned them a practice page in their workbook. They did well on the concept that we covered, but when the book asked the students a question like  $9 \times \underline{\quad} = 720$ , they became confused. Since it was about lunch time, we only reviewed the problems that we practiced together. I told the class that we would review the other parts of the page tomorrow. The students appreciated not being expected to answer the questions that we had not reviewed. By not challenging their ability by setting them up for failure, I set them up for success. In doing this, students are more willing to do the work because they know they will succeed. This too builds a rapport with students. They know that their teacher cares if they succeed.

These students were just learning their multiplication tables this year. They improved as time passed. Before teaching the class how to estimate products, I reviewed rounding, which is necessary to estimate accurately. They were having trouble with rounding until I took a different approach of

explanation. I began by asking the students, "What number is halfway between 0 and 10?" I pointed out that 5 is halfway and that the numbers 0, 1, 2, 3, and 4 are closer to zero and that the numbers 5, 6, 7, 8, and 9 are closer to ten. When rounding the number 7, I then asked them, "Is 7 closer to ten or zero?" They replied "Ten," and I told them that when this happened, they should round up to ten. If the number was less than 5, they should round down. I then asked the students to round 23. "Do you round to 20 or 30? Is 23 closer to 20 or 30?" The students replied, "20." I also presented basic multiplication such as  $7 \times 2 = 14$ ,  $5 \times 10 = 50$ . After the introduction, we began to multiply by estimating. For instance, I wrote  $7 \times 18$  on the board. I asked the children, "What should the 18 round to?" They said, "20." I responded, "So now we can multiply  $7 \times 2 = 14$  and then add a zero to get 140 as we did the other day, when we were multiplying by multiples of ten." We continued to work on similar problems to give them the experience of manipulating this type of problem. The more they did, the more at ease they became. I finally presented them with problems such as  $5 \times 214$ . I asked them which number we would round and they said "214." I asked them what it would round to. A.J. said 200. Another student was not sure why so I asked him, "Is 214 closer to 200 or 300?" The student replied "200." I then wrote  $5 \times 200$  on the board and asked a student to answer. He said 1000, and when I asked him how he got this answer, he said he multiplied the 5 and 2 to get 10 and then added the zeroes. On day

two, we reviewed for a test on mental math multiplication patterns and estimating products. We utilized several problems that demonstrated multiplication of a number by a multiple of 10 so that students could see for instance,  $4 \times 3 = 12$  or  $6 \times 4 = 24$

$$4 \times 30 = 120 \quad 6 \times 40 = 240$$

$$4 \times 300 = 1200 \quad 6 \times 400 = 2400$$

We also practiced estimating products such as  $5 \times 65$  and  $8 \times 303$ . I reviewed with the children that, to multiply easily, it would make good sense to round the 65 to 70, making it easy to multiply the 5 and 7 and then add a zero. We did a few more examples and the students seemed to be familiar with the process. On the day the students took a test on mental math multiplication and estimating products, we reviewed their homework and then I gave the test. They were excited and pretty confident that they were going to do well. I returned their test the next day and they were thrilled with the results. Through creating a classroom environment that promoted student success these students experience the joy of learning mathematics.

### *Fractions*

To extend my students' understanding of fractions, I taught them how to name fractional parts of wholes. The students seemed a little unsure, so I decided to review this concept since this material was on the standardized testing that they were expected to take at the end of the year. I began by

using a large 4x4 grid the size of a piece of computer paper. I demonstrated how to divide it into two equal parts and then asked the children if they could think of another way to divide the grid into four equal parts. Most students cut it into four parts diagonally from one corner to the other. Two or three cut the grid in four by drawing lines down the middle and across the middle. One student drew four lines vertically to divide his grid into four equal parts, which was very clever for a third-grader. The students were as impressed as I was. I then asked the students if we could divide the grid into four parts by drawing three lines across. They said in unison, "Yes."

Being able to identify fractional parts and say the fraction that represented a picture seemed to delight the students. Additionally, we reviewed the previous night's homework page, which was additional practice on parts of wholes. The students seem to understand the concept based on their responses to the homework questions. They were all eager to respond. We again discussed the "equal parts" of a whole as compared to "unequal parts" of a whole.

A particular lesson consisted of naming fractional parts. The students seemed to have a good grip on being able to name the parts of a whole as thirds, fourths, twelfths, and so on. As a tool, I used a picture of the flag of Indonesia to demonstrate parts of a whole. The flag is divided into three parts, with two green ends and a white middle. I asked the students how many parts the flag was divided into and they said thirds. I then asked

them what portion of the flag was green and one student said  $\frac{2}{3}$ . I then asked the students what part of the flag was white. A student responded  $\frac{1}{3}$ . I then asked the students what part of the flag was not green. They had to think for a minute and then responded with  $\frac{1}{3}$ . I asked the students if they had any questions and they said, "No."

### *Division*

The children were very excited about learning how to divide. We learned how to divide using repeated subtraction. I started the lesson by reminding the students that we used repeated addition for multiplication. I wrote  $9/3=$ \_\_\_ on the board and said to the students that we were going to learn to divide using repeated subtraction. "Since we are going to divide by three, that means that each group will contain three markers," I said. I wrote  $9-3=6$  and demonstrated this by using markers as counters. I took 9 markers and took three away and put them into a group. I then continued the repeated subtraction by continuing the initial equation  $9-3=6-3=3$ . I then removed three more markers from the original cluster to make another group of three and put them next to the first group of the three. I asked the children how many groups we had and they replied, "Two." I also asked the students how many were left after subtraction. They stated, "Three." I continued with the original equation  $9-3=6-3=3-3=0$ . I then asked the children, "If I take away one more group of three markers, how many marker are there now"? One student raised his hand and said, "Zero." I

then asked the students how many groups of three markers there were. The students replied, "Three." They seem to enjoy learning how to divide. I think they felt like they were learning something the big kids learn.

Division is a difficult subject for middle school kids to master, so I imagined it would be difficult for these youngsters also. We started with mental math division and then I demonstrated that this was related to multiplication that we had just done. We progressed with dividing  $18 \div 2 = 9$ ;  $180 \div 2 = 90$ ;  $1800 \div 2 = 900$ . I pointed out the pattern. When 18 is divided by 2, it equals 9, and when a zero is added to the 18 to make 180, a zero is also added to the 9 to make 90, and so on. This demonstrates that when 18 is multiplied by 10, the quotient is also multiplied by ten. Since they were learning their multiplication tables this year, I also stressed how important it was to know them so that math would be easier in the future. To children this age, I wondered what they thought of when they heard the word "future." They did not have a very long past to compare it to.

### *Symmetry*

When Valentine's Day was only two days away, I decided to do a lesson on symmetry. The students knew what symmetry was because their previous teacher had covered this with them. A new experience with making hearts to decorate their Valentine bags would be novel. The children liked to exchange Valentines, and to help them distribute them in an organized

fashion, it is customary for each student to decorate a bag in which to keep their cards. To discuss symmetry, we used some of the examples in their text. To extend the lesson, I asked the students to give me examples of things that have a line of symmetry. They named a square, triangle, rectangle, circle, and one student said an octagon. I drew the geometric figure on the chalkboard and asked them to tell me where the line of symmetry was for each figure. I also asked the students to tell me if there was more than one line of symmetry. On the square, they identified the vertical and horizontal lines of symmetry. I then asked them if there were any others. They looked and could not see any more. I then drew a line from one corner to its opposite to make two triangles, and they eagerly pointed out the other line of symmetry. I then drew a heart on the board - not a very symmetrical one, but I suggested to the students that they use their imaginations. I then drew a rectangle on the board to represent a piece of paper that was folded. I drew half the heart on one side to demonstrate what they were to draw on their construction paper to make a heart to put on their Valentine bag. To demonstrate, I folded a piece of construction paper, drew half a heart, and then cut it out. They were amazed. I turned them loose to make Valentine hearts to put on their bags, which all turned out well.

### *Geometric Figures*



When I realized that my students had to learn some geometric concepts, I was a little skeptical as to whether they were going to be able to master the idea. Some of these ideas seemed a bit abstract for them, but they had done very well with multiplication and rounding, which can be abstract for youngsters.

During this lesson, we reviewed the lines, rays, and line segments that we had discussed on Friday. I had the students practice with a ruler, drawing a line, a ray, a line segment, intersecting lines, parallel lines, and parallel rays. I had the students fold a piece of computer paper hot-dog style, open it up, and then tri-fold the paper in the same manner a letter is folded to fit in an envelope. They were then instructed to open their paper. On the chalkboard, I drew the six boxes and I wrote the name of each concept that we had discussed. The instructions included that the students were to use a ruler and draw each of the terms in the designated box. They really liked this because they were able to draw and use a ruler, and they accomplished the task with great success. I showed them how use a ruler so that their lines would be straight.

On the following day, the students took a test on basic lines, rays, and line segments. I had them draw a diagram of each of six figures that they drew yesterday, and they were very proud when I told them that they did such a wonderful job. We even hung their papers up to show off their work. They liked this because I could not recall any of their papers being hung on

the walls. Students' work makes for great decorations and also makes the children feel that they have created something worthwhile.

### ***Student Self-Worth***

I came to find out from the students that they felt that they were not as smart as another third-grade class. I proceeded to inform the students in my class that they were bright and able to do very well, and not to put themselves down. I think they were surprised by my conviction. From that point forward, every time I could find something to praise them for, I would point out their accomplishment. A.J. said, "I never did so well in Spelling until you got here." I told him, "It is because you have become a good student." Several other students made the same comment and I told them, "Just didn't know how good you were, did you?" Agway also stated that he did not do well in Spelling until I came. Since he was exposed to two languages, English and Spanish, he did not hear either often enough to be proficient. Adjusting the Spelling lesson to include saying the words out loud really helped him, as well as many of the other students. With just a few words of confidence to boost their self-esteem and a carefully executed lesson, these students did very well on their spelling tests every week.

During the month of March, the Title I teacher spent time reviewing the times tables with the students in the all the third-grade classes. He would practice using flashcards or playing bingo. This was a help to the

children. If the lesson from the book would end before the bell for lunch, we would play "Around the World," the students' favorite game. To help the students remember the tables, I would have them say the flashcards, using the answer. For example, I would hold up a card that read  $4 \times 3 = 12$ . I would do this for all the tables that they were suppose to know. Then I would hold up the cards with only the problem, such as  $4 \times 3 =$  and they would have to say the right answer. This helped them to remember. To further help them remember the times tables and to understand the meaning, I had the students make arrays of each of the multiplication problems. This seemed to help them remember the more difficult ones.

Learning the multiplication tables is vital to building a solid foundation for mathematics. At this particular school, the third-grade classes were expected to participate in a timed test to evaluate their times tables proficiency. I feel that this is good practice, but I did not put much concern into the event. The students, however, seemed to think that this was an important event, probably because it had been built up by all those involved. After the first round of tests, only 27 students from the 6 third-grade classes were able to meet the requirement of 80% proficiency. Of the 27 students that made it, 9 were from my class. Additionally, that meant that 56% of the students in my class met proficiency. Pretty good for kids who thought they were not as good as the "top" class. Only three students from the "top" group made proficiency in the first round. I was pleasantly surprised, as

were my students. I did not let them know that I was surprised; I took the opportunity to let them know that I had the confidence all along that they could accomplish this monumental feat in their third-grade career.

The announcement about the test was made after the class finished their lunch in the cafeteria. I was lucky to be there because it was a Friday, the day that I ate lunch with two of my students. I used this as a time to get to know my students and for them to see another side of me. This was really a big hit. The students made sure that they got their bid in for a Friday lunch date. There were times I was booked for three weeks in advance. In addition to eating lunch, I would be sure to have something that I could share, whether that was home-baked bread, cookies, or gummy snacks.

After we returned from lunch on this particular Friday, the students were buzzing about how they had passed the first test. I reminded them that they were smart students and they could do as well as anyone. One student commented, "I thought that all the students would come from Ms. Carter's class." I said to them, "See? You're just as good as they are." They were pleased to hear this. I knew that having the largest number of students finish the competition from our class truly gave these students the confidence that they were lacking.

## ***What it Takes***

My students discovered that mathematics is not merely figures to be manipulated, or that mathematics is an obscure discipline for a select few. They discovered and experienced what "Coleridge said, ...the reader of poetry is true in its way of all who are happily absorbed in their activities of mind and body: 'The reader should be carried forward, not merely or chiefly by the mechanical impulse of curiosity, not by a restless desire to arrive at the final solution, but by the pleasurable activity of the journey itself'" (Dewey, 1934 p.5). Now they saw that mathematics has all the elements of pleasurable activity, as demonstrated through their accomplishments of mastering their third-grade times tables, and the discoveries and patterns that they unearthed during our multiplication and division lessons. They were able to see that multiplication and division is like a puzzle that can be put together and taken apart again. With the right pieces, the puzzle can be put together and the picture becomes clear.

By creating a classroom that demonstrated the enjoyment of mathematics through my own excitement and mathematics' aesthetic appeal, the children soon realized that mathematics can be fun. They developed skills and a proficiency that they thought they were not going to master. All this was accomplished by getting excited for the children when they made discoveries, and being excited for their developed ability. This classroom environment improved their mathematical achievements.

Additionally, the positive feelings of accomplishment that they experienced also influenced their mathematical achievement, which was fostered by the interpersonal relationships that were forged along the way.

Relationships are at the root to creating a classroom environment where students can achieve. A productive and stable classroom atmosphere is where teaching effectiveness lies and teacher-student communication is a prerequisite for establishing the classroom climate (Levy, DenBrok, Wubble, & Brekelmans, 2003). My students came to know that I was approachable by talking with them and fostering a classroom where they felt they wanted to be. My students as well as students from other classes learned that I cared for their welfare as individuals. This in addition to eating lunch once a week with students fostered a caring atmosphere. Not only was the classroom environment a player in my students' success, but the interpersonal relationships and conversations that took place outside the classroom setting expanded the students' belief that I cared about them, not only as my students, but as individuals. One day, we were in the classroom having a casual discussion and Emma said, "We like you because you listen to us."

On one occasion, Mrs. Carthy, a special education teacher, requested to come to my room to observe Star because the previous teacher had strongly recommended her for special education services. Mrs. Carthy asked me what I thought about this student's performance in class. I told her that

I thought she was a bit disorganized and scattered but I thought that she was capable of third-grade work. However, she would need to learn some organizational skills and develop some responsibility for getting her work finished in and out of class. I believed that she was an average student who needed to learn how to be a student. The teacher came to our class to observe Star's performance in the regular education setting. The interactions that took place seemed like a normal set of events to me. The children were eagerly raising their hands to answer questions that I posed. It seemed like an ordinary day in our class. Later that day, I stopped in to see the observing teacher to get her initial judgment on Star's performance. She said that she had observed these students prior to my arrival and she was pleased to see how they had blossomed. They were leaning forward in their seats and raising their hands eagerly to answer questions. Their behavior demonstrated that they enjoyed being in my class. She said, "That is the way it should be." Her initial response to Star's behavior was that she was in the proper setting - regular education.

## Communication is Relational

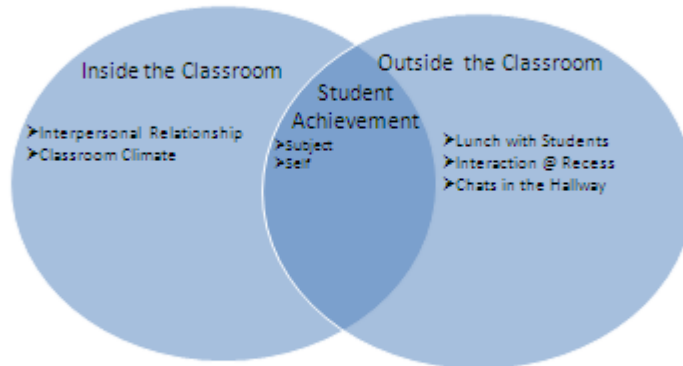


Figure 2

Additionally, I infer that the relationships that were forged between the students and me played a significant role in their mathematical accomplishments as well as their success in other disciplines. As I have demonstrated through several anecdote the above diagram is designed to express the effects of teacher student communication within the classroom as well as outside the classroom and its effect on student achievement. It is highly significant that the teacher emits a sense that mathematics is a friendly subject that can be achieved. To do this, the teacher needs to be aware of her own values and beliefs about mathematics. I told these students repeatedly that they were as good as any of the other students in the third grade. Setting my students up for success allowed them to achieve mathematically, which instilled confidence and promoted success. They



achieved mathematically not only in the classroom but in the multiplication tables competition, where they initially thought they had no chance. Because the classroom environment that was established suggested that mathematics is a subject that the student can understand, enjoy, and master, the students did just that - they achieved.

Not only did they succeed in mathematics, but they also achieved in the other subjects that I was required to teach, such as Spelling and Language Arts. As Schwab suggested, education is organic. One element is part of the others. My students' successes in mathematics also affected their accomplishments in their other subjects. The confidence that my students acquired in mathematics proved that they were as competent as the class that they and many others at the school felt was superior. Their dominance in the times tables competition was a tremendous boost for these students and hopefully for their mathematical careers.

### *A Framework for Choice*

Schwab's *The Practical* was the lens that I used to understand and formulate an action that would reveal the best practice that would be beneficial to the students in my third-grade classroom. This particular setting differed from my previous teaching setting. These children were far younger than any students that I had worked with in the past, which meant

that I had to adjust my approach if I was going to find success with these students.

These students were from a low Socio-Economic Status (SES) and most of the parents were blue-collar workers. Utilizing The Practical's *quasi-practical element* allowed me to identify the social milieu that my students were a part of. Understanding their backgrounds also gave way to an understanding of educational attitudes and beliefs that these students and their families possessed. All the parents that I had contact with wanted their student to achieve in their academics. This alone plays a tremendous role and has an enormous effect on establishing and maintaining a classroom atmosphere to achieve optimal success for students. When assignments were sent home, about 90% of the students brought their assignments back completed accurately. This demonstrated that most parents were participants in their students' academic endeavors. The amount of homework assignments that returned tended to fluctuate from time to time, so, to reinforce the importance of the homework assignments, I played up the fact that if you attempt these assignments, then you will most likely learn the material and do well on the test. From time to time, this increased the number of assignments that were returned.

The *practical* reflection—that means determine ends and ends determine the search for means—allow the problem to take shape and the direction of the search to surface. One situation that could have taken its

toll on the students' achievement level was their lack of attentive behavior. In this case, my desire for my students was for them to be successful, and to do that, I had to design a way to get their attention and to demonstrate that the work we were attempting to accomplish had a purpose. The first thing was to get rid of the distractions, so we cleaned out their desks and organized them so that they could find materials easily. This organization saved time and demonstrated to the children the importance of the work that they were doing each day. Completed papers were not just shoved in the desk and forgotten. I had the students place completed assignments in a folder so they could take them home to share with their families.

I soon discovered that what worked for one group of students did not always work for all groups. This is where Schwab's eclectic element of The Practical served as a component to demonstrate that a "one-size-fits-all" formula for education should not be employed to develop teaching and learning techniques for diverse groups of settings and participants. These students were unique in their being and in their setting.

Curriculum practitioners need and should be required to not only consider what ought to be taught in schools and at what age it should be taught, but they need to employ the practical sensibility of Schwab's The Practical. This practice will cultivate an understanding of the many elements that comprise social and educational milieus that affect curriculum planning success. Theories can be brought together that can serve as guides to aid in

determining best practices while keeping personal views in the foreground. Considering all elements allows the problem to take shape and solutions to surface that can be deliberated to formulate the best practice for the parties involved so that the best outcome can be attained. Curriculum and educational practices for teaching and learning are no longer scripted. Each educational setting is individually characteristic to its own time and place.

A common thread that runs through all settings, whether a social or educational milieu, and that is people want and establish relationships continually. They are relational beings. They thrive on the relationships that are formed and established through life's journey, no matter how short or long the timeframe may be for a given relationship. The interpersonal relationships that are established in the classroom affect the classroom environment, which can have a profound effect on how the student feels about him/herself and the subject matter and his/her level of achievement.

### *The Last Days of School*

This is probably one of the most enjoyable times for all individuals engaged in public education. It is a time to relax and not have to be so concerned with state and federal mandates. My students were going to be leaving their elementary school and heading to the intermediate school down the road. They were going to be fourth-graders. To help the students to be at ease with the transition, the receiver school hosted an afternoon of

singing and an informative orientation for their newcomers. The kids were really excited about going to “big” school, but on the other hand, they were apprehensive about the change. All the third-grade classes went on the trip to the new school that they would be attending in the fall. They liked having the chance to tour their new school.

After getting back to our classroom, the students chatted about the new school that they were going to attend next year. They asked me if I was going to teach third grade next year and I had to tell them I would not. They asked where I would teach and I said that I was not sure what I was going to do. They suggested that I teach at their new school and that they could be in my class. I explained that even if I did teach at their new school, I could not be sure that they would be in my class. Barb said, “I’ll have my mother call and tell them to put me in your class.” A few other students also made the same remark. I was flattered that they wanted to be in my class next year.

### ***Classroom Events that Affect the Classroom Environment***

In this section I bring together the events that took place in my third-grade classroom to demonstrate: (1) that the classroom environment can have a profound effect on a student’s achievement in mathematics; (2) how a student feels about himself/herself in relation to the subject can affect student achievement in mathematics; and (3) the interpersonal relationship

between the teacher and student can affect student achievement in mathematics.

While parent-teacher conferences were difficult when I had just arrived, they were an opportunity for me to get to know the attitudes and beliefs of my students' parents, since I was here to teach as well as conduct an ethnographical study of these third-grade students. As Schwab suggests in The Practical, it is important to be familiar with the educational milieu but it is as important to be acquainted with the social milieu of a given demographic area. "By focusing on culture, we can learn more about how the 'invisible' components in the teaching and learning situation can contribute to or detract from the quality of the mathematical learning that takes place" (Nickson, 1992, p. 102).

Although I had previously taught for ten years, I was a new teacher in an elementary school setting. I had to get used to teaching small children. The daily schedule had already been established by the previous teacher. I was grateful for this because I had never taught elementary school and scheduling so many subjects without a bell schedule seemed rather taxing. Becoming familiar with the educational and social setting that I resided in was an aid in determining how I would approach teaching my third-grade students. One aspect that helped me to get started and also seemed to help the children was to organize the class and to establish our routine even though we followed the same routine the previous teacher had. I speculate

that there were some idiosyncratic elements that played into each teacher's routine, but my students seemed to fall into the routine according to my execution.

In addition to an established routine, we formalized a snack schedule at 10 o'clock because of the diabetic student in the class. I strongly feel that initiating snack during Spelling was of great importance in not only boosting my students' attention due to fueling up, but also suggesting that I was a caring teacher. Additionally, it increased immediacy and affinity between the students and me. Students who perceive their teacher as caring will increase affinity, which will result in increased respect for the teacher and an increase in student learning, which I was striving for in my students. Additionally, this is what I wanted to document in my study because I strongly feel that the classroom environment affects student achievement. Students who like their teacher also increase affection for the subject matter, and they are more motivated, therefore increase learning (Richmond, 1990).

Through many mathematics lessons, the children learned how to calculate mathematically, but they also learned to enjoy mathematics. Their confidence level increased so that they were able to achieve a level of mathematical proficiency that surpassed their own expectations. I think this was due to setting these students up for success, building their confidence through mathematical success, and being a teacher who cared about their

success. My students felt valued and knew they were expected to participate and be engaged. They became responsible for their engagement in mathematics by their own choice. One example of this expectation came in a geometric lesson where they practiced drawing various geometric lines. As I have stated earlier these students came from low socio-economic backgrounds. It has been well documented that these students perform lower than more affluent students. Schwab's The Practical played a role in helping me to determine the best approach to teach this lesson. Since these students need lack academic exposure I decided to have my students experience drawing these geometric figures before testing them on this concept. Understanding my students social milieu assisted me in formulating a teaching practice that would be beneficial to my students. To begin this lesson we used our mathematics book that showed each of the lined figures. Then we discussed where we could see these figures in our classroom and then we discussed where we see these figures in our lives. Doing this made geometric lines and their names become real for my students. Additionally, I gave each student a piece of paper and directed them to fold it into six sections. I then drew a diagram of what their paper should look like on the chalkboard. I then wrote the names of the different lines that we had discussed in each of the six blocks. We used rulers to draw each of the geometric lines in its designated box. To help my students I showed them how to hold the ruler so that it would not slip while they drew



their lines. Once they had practiced drawing the various geometric lines, I tested them on drawing the lines and they all did well. They learned through experience, which John Dewey suggests as a viable means to enhance teaching and learning of children. I then hung their tests up as decorations on the walls of the classroom, suggesting to the children that what they did was worthwhile.

Mathematics curriculum in West Virginia is scripted much like the four questions posed in Tyler's Basic Principals of Curriculum and Instruction. As Tyler prescribes, other rationales need to be considered when developing curriculum. I was able to bring in Schwab's rationale to assist me in developing teaching strategies that would affect learning of mandated mathematics curriculum. Additionally, Schwab's rationale suggests that all elements of the educational and social milieu need to be considered when planning curriculum practices which also include teaching strategies that affect learning outcomes. The use of theory to deliberate teaching strategies is also utilized here.

To impact learning I also created a classroom environment that promoted student success. I used affinity seeking techniques such as creating success for my students which allowed them to experience mathematics as being relevant, connected to their lives, and their success turned to interest in mathematics which turned to more success. Their success increased immediacy because they knew I cared about their

success. They commented on more than one occasion that they were glad I came because they did well in school. This can also lend its self to Pestalozzi's theory that schools should be kind places. I think my students felt that I cared for them not only as students but as people.

The most significant and most notable event that demonstrates the effect of the classroom environment on student achievement was the third grade times tables competition. They did far better than any if the other third-grade classes at the school, and they were so surprised and very pleased with their accomplishment. To my students' surprise, they were also doing well in Spelling and said they had not done so well before I arrived. I proceeded to tell them that they were better students than they thought. As time passed, my students gained confidence and were able to achieve not only in mathematics but in other subject areas. Education is organic. One discipline is connected to the other; one affects the other, as Schwab suggested several decades ago. I believed in my students' ability; therefore, they came to believe in their ability. "The central role of the teacher is to create instructional environments in which the probability of achieving intended educational objectives are met, and students learning outcomes are enhanced" (Andersen et al., 2001; Bloom, 1956; Krathwohl et al., 1964, chap.8 p. 168).

In this social and educational milieu, my students achieved far more than they thought they were capable of accomplishing. They progressed

from a group of students who thought they were not as smart as another third grade class to be the students who dominated the times tables competition. I strongly believe that my students' success was directly related to the classroom atmosphere and the interpersonal relationships that were forged along the way. My students understood that I cared for their welfare. Not only did I demonstrate that I cared for them personally, but I also cared for their academic success and celebrated their achievements.

Through this journey, my goal was to gather data that I could use to validate my hypothesis that the classroom environment impacts student achievement in mathematics. I wanted to observe and document the effect of a positive classroom environment and its effect on student achievement in conjunction with how they feel about mathematics. I learned that the classroom atmosphere has an effect on student achievement, just as I had hypothesized from the beginning of this study. Additionally, I also learned that the interpersonal relationships that developed between my students and me had a tremendous effect on the nature of the classroom environment and how they felt about the subject of mathematics. This became apparent when my students surpassed the other third grade classes in the times tables completion.

The importance of developing interpersonal relationships with my students became evident when Emma said, "We (the class) like you because you listen to us." Additionally, the students asked if I would take a job at

their new school so that they could be in my class again. They felt comfortable with me and they knew that they would be successful.

### ***Suggestion for Improvement and Research***

The literature review herein shows that current trends in mathematical proficiency lie within the relational components of communication and its effect to creating a classroom environment that promotes student achievement. Present curriculum expectations appear to be viable on paper but there are elements that are pertinent to meeting educational goals. Although there is not a universal formula for teaching and learning, there is one aspect that needs much more consideration: the role the classroom environment plays in student achievement and students' beliefs about mathematics.

Perhaps the place to start making changes would be in teacher education programs. Pre-service teachers need to be aware of the impact the classroom environment has on students' relationship to the subject matter and its effect on student achievement. Additionally, teacher professionals and administrators need to be aware of the influence interpersonal relationships play on students' beliefs about their relationship to the subject matter as well as their effect on student achievement. To accomplish this, it is necessary for teacher education programs, school

districts, and the research field to explore and gather viable data to be disseminated to all interested parties.

*Teacher education programs should include:*

- Method courses that incorporate interpersonal technique for delivery of material,
- Interpersonal skills that enhance a sense of caring and belonging for students,
- Joseph Schwab's The Practical as required reading in addition to understanding the purpose and benefit this reading has for the education process,
- Discussions on how The Practical can be utilized as a lens through which to deliberate and discover meaningful curriculum practices for diverse social and educational milieus,
- Action research that explores interpersonal relationships in the classroom and its outcomes,
- Discussion of action research findings in a collaborative fashion with fellow students, instructors, and mentoring teachers during student teaching, as time allows.

*School systems should include:*

- Meaningful staff developments that address techniques to enhance the classroom environment,
- School superintendents and administrators need to be aware of the impact interpersonal relationships play in student achievement,
- Staff development that stresses and requires educators to incorporate interpersonal techniques that create a school atmosphere where students will want to spend time,
- Staff development that addresses interpersonal techniques that work with diverse agents within diverse social and educational milieus,
- The importance of understanding the social and educational milieus where teachers are working because what works in one setting may not work in a different setting, even within the same school district,
- Staff development where educators (classroom teachers/administrators) can explore their own history and how that affects their perceptions and judgment within the classroom/school,
- Dissemination of research data on the effects of interpersonal relationships in the classroom, and
- Become cognizant that there is *not* a global formula for educating students - there are commonalities, such as subject material, but

there are diverse settings that need to be addressed to reach educational goals.

*Research needs to gather data on the breadth and depth of:*

- The effects of the interpersonal relationships that take place within the classroom,
- Interpersonal techniques that promote caring and belonging within various social and educational milieus, and
- Interpersonal techniques that impact student achievement are dependent upon particular social and educational milieus.

### **Uniqueness of Study**

To gather and interpret the data that I gathered during the course of this study, it is necessary for the reader to be aware that I, the researcher, the gatherer of data, am also the interpreter of the data. I have honestly attempted to gather data as it occurred and to be objective in the process, but as I expressed in detail in Chapter IV, I have a history that is my own and that history is reflected in the interpretation of the data that I am writing about. There is no way that I nor any one else can completely separate him/herself from their home. We can step into another's *horizon* or leave *home* to be *away*, but we always take with us our inner compass to navigate.

This study was conducted in a rural area of West Virginia, populated largely by non-professional blue-collar workers. The residents of the surrounding area wanted the best for their children's education. To best serve these students, I had to adjust my way of thinking. Utilizing Schwab's The Practical gave me the insight to approach these students in a manner that was unique to meet their needs and promote their success. What worked in previous settings where I had taught did not always work with this set of students in this rural area. Even within the same demographic area, it was necessary to deliberate "the best practice" for this group of students. More studies need to be conducted to document and define best interpersonal practices for establishing a classroom environment that is successful for both students and teachers while remembering that there exist diverse participants and settings, and that there is no a global formula for teaching and learning.

## **Conclusion**

Through this study, I have documented that the educational system's goal is to promote student success in mathematics. A formulated system is in place as a guide to reach these goals, but it does not recognize the effect of individual persons or places. It is only a guide and should be treated as such. Guides should be utilized as tools to help to accomplish educational goals and objectives, but educators as well as curriculum practitioners need to be aware of the invisible components that affect teaching and learning in



the classroom. The roles of social and educational settings that affect the classroom environment are not taken into account when planning curriculum practices. These components play a role in how to approach teaching and learning. Although the present system espouses a desire to elevate student skills through rigorous training and to instill a joy of mathematics, there is not a method for this is to be accomplished. Literature review documents time and again the effects of interpersonal relationships within the classroom and their effect on student achievement and student affection for the subject matter of mathematics. Not only do educators and curriculum practitioners need to be aware of their students' perspectives, but they also need to be aware of their own perspectives. To be an effective teacher, it is necessary to utilize interpersonal skills to create a classroom environment that is stable and productive for all students.

### **Auto-ethnography: A Personal Journey**

When I started this journey I suspected that interpersonal relationships had an effect on student achievement. What I was not aware of was the degree to which it affected students and the classroom environment. My experience with past students suggested that words of encouragement helped them to feel good about mathematics and being in my class. I did not realize how vital the interpersonal relationships that were forged in the classroom were to student success. This experience has

made me understand more clearly and feel more strongly about the effects that environment can play in the success of my students at any level.

The third-grade class that I taught brought this to the foreground for me. Self-reflection through an auto-ethnographic study and the knowledge of my own history as an individual and as an educator enabled me to see how important interpersonal relationships are within classrooms and schools. By leaving *home* (words of encouragement) and being *away* (acute nature of interpersonal relationships) I discovered that it is well worth the time it takes to linger and talk with students to demonstrate to student a caring persona. When returning *home*, I brought with me an intense value of the role interpersonal relationships play in the classroom environment. As the literature review advocates, I too as an individual and teacher strongly believe that the teacher who uses affinity-seeking techniques to promote teacher affection encourages efficacy for the subject matter, which in turn effects student achievement.

As an educator, I am concerned with my students' affect for mathematics. After conducting this auto-ethnographic study, I have become acutely sensitive to the importance of interpersonal relationships within my classroom. I find myself reflecting on events that take place in my classroom and deliberating what I can do to continually promote and support a classroom environment that promotes positive interpersonal relationships

with my students, so that they have the utmost advantage to experience success in mathematics.

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## **Education**

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M.A. *West Virginia University*, Educational Leadership, 2001.

M.A. *West Virginia University*, Communication Studies, 1995.

B.A. *Shepherd University*, Elementary Education, 1983.

## **Refereed Presentation**

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Darkness within Our Eyes: How Re/covering Curriculum Conversation Can Empower Change. A panel paper presented at the American Association of Teaching and Curriculum, Charlotte, North Carolina, October 2006.

## **Professional Experience**

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### **North Middle School, Martinsburg, West Virginia.**

*Sixth Grade, Math, 2007-2008.*

### **Valley View Elementary School, Martinsburg, West Virginia.**

*Third Grade, all subjects, Semester II 2007.*

*Higher Education:*

## **West Virginia University.**

*Graduate Assistant, Department of Curriculum & Instruction/Literacy Studies, Fall 2005-Fall 2006.*

*K-6 Teaching:*

## **Hedgesville Middle School, Hedgesville, West Virginia.**

*Sixth Grade, Math/Science, 1995-2005.*

## **Berkeley County Public Schools.**

*Substitute Teacher, 1986-1995.*

## **Grants**

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**Reinventing Education**, *West Virginia Department of Education, Computer Science Grant, 1999.*

## **Relevant Experiences**

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**APL – classroom management**, *Berkeley County Public Schools, 1998.*

**Governor’s Institute**, *West Virginia Department of Education, 1999.*

**Benchmark Committee**, *Berkeley County Public Schools, 1999.*

**Math Book Committee**, *Berkeley County Public Schools, Department of Instruction, 1999, 2005.*

**Evaluation of Professional Personnel**, *West Virginia Center for Professional Development, 2001.*

**Fortified School Maestro** among teammates, 2001

**West Virginia School of Excellence**, *West Virginia Department of Education, 2003.*

**Vertical Team Planning**, *West Virginia Department of Education*, 2004.

**Space Camp**, *Space and Rocket Center, Huntsville, Alabama*, 2005.

**NCTM NCATE**, *Program Report Complier Training Session, West Virginia University, Department of Curriculum & Instruction/Literacy Studies*, 2006.

**Standards-Based Math Training**, *Berkeley County BOE*, 2007.

**Co-Operative Teaching**, *Berkeley County BOE*, 2007.

**Marzano Training**, *Berkeley County BOE*, 2007.

## **Courses Taught**

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### ***Undergraduate & Graduate Courses Taught:***

Elementary Mathematics for Elementary Teachers

Managing/Organizing Learning Environments