One Teacher'S Journey Toward Effective Teaching

Aaron D. Newton
The members of the Committee approve the thesis of Aaron D. Newton defended on October 8, 2004.

Alejandro J. Gallard
Professor Directing Thesis

Ann S. Lumsden
Outside Committee Member

Nancy T. Davis
Committee Member

The Office of Graduate Studies has verified and approved the above named committee members.
ACKNOWLEDGEMENTS

I would like to acknowledge the following people for their help and support during the writing and rewriting of this paper: Mrs. Ann Brennan, if it wasn’t for you I would never have finished this paper. Your encouragement and guidance is what got me through; my wife Kelly, whose prodding and application of Catholic guilt has also gotten me through this paper; and finally, to Riley who gave me the real inspiration to finish.
# TABLE OF CONTENTS

Abstract .............................................................................................................................. vi

1. OVERVIEW OF STUDY .................................................................................................. 1

   Purpose ......................................................................................................................... 3
   Summary ...................................................................................................................... 6

2. REVIEW OF LITERATURE ............................................................................................. 7

   Effective Teaching ....................................................................................................... 7
   Summary ...................................................................................................................... 13

3. METHODS AND PROCEDURES .................................................................................. 15

   Research Question ...................................................................................................... 16
   Case Studies ............................................................................................................... 17
   Reflection and Analysis .............................................................................................. 18
   Subject ....................................................................................................................... 19
   Geographical Considerations .................................................................................... 21
   Data and Collection .................................................................................................. 21
   Summary ...................................................................................................................... 22

4. FINDINGS .................................................................................................................... 23

   My Story ..................................................................................................................... 24
   Elementary School .................................................................................................... 24
   Middle School .......................................................................................................... 28
High School ................................................................. 31
University ................................................................. 38
Student Teaching ...................................................... 45
Etowah ................................................................. 56
Conclusions ......................................................... 62

5. CONCLUSIONS ................................................................. 65

REFERENCES .......................................................... 68

BIOGRAPHICAL SKETCH ............................................. 72
The purpose of this study is to follow one teacher's evolution toward effective teaching. The autobiographical case study with self-reflective analysis follows the teacher's progress from his first experiences as a student through college, graduate school, student teaching and his first two years of teaching. Introspection through reflection is used to evaluate the teaching practice of the teacher for the purpose of improvement. Constructivism is used as a referent. The conclusion finds four main assertions: effective teaching promotes students learning, the philosophy of constructivism promotes effective teaching, effective teaching deals with areas outside the curriculum, and effective teaching is time consuming and difficult.
CHAPTER 1

OVERVIEW OF STUDY

Introduction

I never intended to have a career as a teacher. Ever since I was in middle school, I told anyone who would listen that I was going to be an orthopedic surgeon. It was not until my senior year of college that I discovered my desire to be a teacher. It was then that I also decided that if I was going to be a teacher, I was going to be the best teacher I could possibly be.

In the fall of 1997 I entered the graduate program of study working towards a Masters Degree in Science Education. There I was introduced to the idea of reflection as a form of self-evaluation for the purpose of teacher improvement. I chose this method of evaluation to examine my own teaching to discern whether or not I was becoming an effective teacher. When faced with the question of what my thesis research should focus on, I chose introspection through reflection to evaluate my own teaching for the purpose of improvement. Am I becoming an effective teacher?

Before that question can be answered, the question of “What is an effective teacher?” must be addressed. So the first issue at hand is what criteria do I use to evaluate effective teaching? There are many perspectives that can be taken into consideration when evaluating effective teaching. “The performance of teachers can be judged by many different criteria, leading to different conclusions about what effectiveness is” (Anderson & Smith, 1988, p. 92). Administrators may judge by the number of failures in a class or the number of parental complaints. Parents may judge by student grades. Students judge by grades and how well they get along with their teachers. This puts teachers
under various pressures. In addition to these pressures are other practical concerns: Was the required state curriculum covered? Am I behind the other faculty? Can we get the test in before Spring Break? Will the students pass their EOCT (End of Course Test)? Whether or not learning is occurring sometimes can become a secondary matter in the grand scheme of a school year.

It is recognized that the behavior of teachers is influenced by intuition, successful experiences, and observations (Murphy, 1997, p.17). My own experiences as a learner help me to define my own criteria for effective teaching. I define effective teachers as those who inspire students to not only memorize facts, but to use those facts to draw parallels and connections. Effective teachers challenge students to think on their own and for themselves building their own understandings (Tytler, 2001, p. 7). Others, such as Anderson and Smith (1988), define effective teaching as addressing “...the critical learning problem of conceptual change. At a minimum, science teaching must help students overcome naïve conceptions or habits of thought and replace them with scientific concepts and principles” (p. 92). Wittrock (1994) echoes these beliefs when he defines effective science teaching as:

(i) learning about the students’ alternative conceptions, beliefs, attributions, and related cognitive and affective thought processes; and (ii) teaching students to use their knowledge, beliefs, and metacognitive and affective thought processes to generate new, fruitful, and transferable conceptions that have personal and everyday meaning and significance. (p. 31)

I understand that in order for me to become this type of teacher, I have to have the ability to reflect on my practice and to evaluate whether or not change is needed (Grimmett, 1988, p. 13). I must see what is working and what needs to be changed. In seeking to improve teaching, there is always the double burden of recognizing successful methods while implementing new methods to replace ones that are not working (Grimmett, 1988, p. 10). Facilitation of successful methods leads to effective teaching.
Therefore, in my effort to improve my own practice I have chosen to use reflection as a tool. Reflection is a tool teachers can use to stand back and examine events from a number of perspectives so that teachers may improve their practice (Rogers, 1988, p. 71). “Understanding what our behaviors and practices mean can oftentimes be both revealing, and hopefully, useful” (Murphy, 1997, p.19).

I want to be a teacher whom my students will remember after they leave school, not solely on personality, but based on the premise that they learned something in my class. What they learned would not be just the memorization of facts, but the building of conceptual understanding. When students look back on my class, I want them to think, “Mr. Newton’s class was not only interesting, he really made us think and got our minds working.” I want to be the teacher who made a difference in his student’s lives. What better way to accomplish this, than to do research that reflects on my practice? “Reflection is a tool that can be used to accomplish this goal. It is regarded as a process in which teacher’s structure and restructure their personal, practical knowledge” (Grimmett, 1988, p. 13).

**Purpose**

It is my intent by documenting my own journey towards effective teaching too not only improve my own practice, but also to provide an account of the evolution of an effective teacher to others. Beyer and Apple (1988) describe such research as follows:

Through careful introspection and retrospection the individual inquirer attempts to imbue present and past real life events with meaning. As research documents, these life stories are offered to those of us who are also seeking to more fully understand ourselves and our world especially, that portion related to education and formal schooling. (p.158)

As with any research there must be a place to start, a baseline. My baseline will be my own definition of effective teaching as established by my own experiences as a student. Using autobiographical reflection I will
define effective teaching as I saw it in my years before being exposed to the academics of educational philosophies. In writing the autobiography, I discovered that I remembered different teachers for different reasons. The teachers who I remembered in a positive light were the teachers who challenged me to learn and to think on my own (Doyle, 1983, p. 176).

Often educators adopt a particular approach or method without actually being aware of the theory or philosophy that underpins that method (Murphy, 1997, p. 17). When I started my graduate classes I found there was a name for this kind of learning. I was introduced to constructivism. The concept of constructivism is people learn by building on material that they already know and understand. People constantly expand and redefine their base of knowledge as they go through life (Tobin & Tippins, 1993, p. 10). While the word constructivism was foreign to me, the concept was not. The concept of constructivism was familiar to me because this is how I learn. I have always had an easier time learning new material if I can relate it to something that I already know and understand. Since I knew that this was how I learned best, subconsciously I suppose I believed that everyone learned like this. In my mind this was the key to becoming an effective teacher. Lorsbach and Tobin’s research supports my intuition that teacher’s beliefs about how people learn guide their own practice (1997, p.1).

Now the process of becoming an effective teacher begins. What do I take from my experiences as a student? What do I take from educational philosophies? What do I take from my experiences as a beginning teacher? The answers to these questions will guide me to the path of becoming an effective teacher. Goodson writes how this kind of information can be collected and used in the following account:

1) From the teachers’ own accounts, but also from more detached research studies, it is clear that the teachers’ previous life experience and background help shape their view of teaching and essential elements in their practice. 2) The teachers’ lifestyle both in and outside of school and his/her latent identities and cultures
impact on views of teaching and on practice. 3) The teachers’ life cycle is an important aspect of professional life and development. 4) The teacher’s career stages are important research foci. 5) Beyond major career stages there are critical incidents in teachers’ lives and specifically their work, which may crucially affect their perceptions and practice. 6) Studies of teachers’ lives might allow us to [see the individual in historical content]. (Pinar et al, 1995, p. 769)

My research will be presented as an autobiographical case study starting with my experiences as a third grade student continuing through my second full year of teaching high school. My early experiences establish the foundation of my own definition of an effective teacher. My graduate experiences help me to recognize constructivism as the paradigm of effective teachers. I decide to structure my own techniques and practices according to this paradigm realizing that this was the way that I learned most easily. My experiences as a student shape my beliefs as to what effective teaching should look like, and that look was constructivism. I chose constructivism not because of its theoretical basis, but because it described my own vision of effective teaching. This action is described by Grundy (1987) as teachers not always acting because of theory, but in ways congruent to theory. Informed action is not necessarily application of theory (p. 21).

I will be using the self-reflective analysis of my autobiography to determine whether or not my teaching is effective. This research is meant to answer the question, “Am I becoming an effective teacher?” Theoretical explanations can be tested in the light of our own experiences through self-reflection (Grundy, 1987, p. 21).

Research such as this bridges the gap between the ivory tower of the university and the realities of the classroom. It shows the power of self-reflection in the molding of practice. In Grimmett’s (1988) chapter, “The Nature of Reflection and Schon’s Conception in Perspective”, he quotes:
Dewey (1933) characterizes reflections as a specialized form of thinking. It stems from doubt and perplexity felt in a directly experienced situation and leads to purposeful inquiry and problem resolution. Inferences drawn from the observed phenomena of past experience are tested as the basis for future action. Central to the process is the paradox that one cannot know without acting and one cannot act without knowing. (p. 6)

Other teachers can draw parallels and conclusions based on their experiences, adding to their own philosophical foundations, and as Tobin states “…provide [Teachers]/students with a scaffold to build knowledge in directions that would not be possible without the influence of a teacher” (Tobin & Tippins, 1993, p. 10).

Summary

The story of my evolution towards becoming an effective teacher will be reported as an autobiographical case study. Specifically case study because case studies are a way of forging interactions between theory and practice. “Reflection has come to be widely recognized as a crucial element in the professional growth of teachers” (Calderhead & Gates, 1993, p. 1). Case studies can “take the learner beyond the limits of individual experience and permit opportunities for reflecting on the experiences of others”. (Shulman, 1988, p. 36)

Chapter 2 is a review of literature on constructivism revealing why constructivism is an integral aspect of effective teaching.

Chapter 3 explains the methods of research including autobiographical reflection and case study.

Chapter 4 is the story of my evolution as a teacher. It is divided into four parts, Aaron as a learner, Aaron as an education student, Aaron as a student teacher, Aaron as a teacher. Reflective analysis follows the progression from learner to teacher.

Chapter 5 is a conclusion of the study including implications.
CHAPTER 2

REVIEW OF LITERATURE

Introduction

The 1996 publication of the National Science Education Standards, NSES, gives a vision of effective teaching. Following this publication, the National Board of Professional Teaching Standards, NBPTS, took that vision and codified it with specific characteristics of effective teachers. The result is a vision of effective teaching and the practice of effective teaching. This appears to be an academic ideal. How does a teacher fit himself into that vision?

A new teacher brings his beliefs, experiences, and ideals with him upon entering a classroom. Each teacher has a vision of how teaching and learning are going to take place. Throughout the year, the teacher learns or discovers the reality of teaching. Things are not always as you want them to be. It is the dilemma of the teacher to reflect throughout the year, determining what is working and what is not working so that they will do a better job in the future. By reflecting on what has worked in the past and combining it with new ideas that may work in the future, a teacher will be more effective at reaching his students. Viewing this reflection from a constructivist viewpoint can move a teacher to a new vision of the classroom and a change in teaching practices (Lorsbach & Tobin, 1997, p. 6).

This chapter cites research on characteristics of effective teaching and the role of constructivism in effective teaching.

Effective Teaching

My research question is “Am I becoming an effective teacher?” In order to answer this question I have to define my vision of the characteristics of an
effective teacher. This leads to my other research question “What is an effective
teacher?” Historically, the vision of effective teaching has changed over the
years.

The previously dominant view of instruction as direct transfer of
knowledge from teacher to student does not fit the current
perspective. The present view places the learner’s constructive
mental activity at the heart of all instructional exchanges. (Layman,
Ochoa, & Heikkinen, 1996, p. 6)

In the current vision of effective teaching teachers recognize that
knowledge cannot be simply transplanted from the teacher to the student’s mind
(Cobern, 1993, p. 51). The learner must build knowledge. The learners build
new knowledge based on their prior knowledge.

Since Ausubel et al. (1978), theorists have argued that the
construction of new knowledge in science is strongly influenced by
prior knowledge, that is, conceptions gained prior to the point of
new learning. Learning by construction thus implies a change in
prior knowledge, where change, can mean replacement, addition,
or modification of extant knowledge. (Cobern, 1993, p. 51)

Gallard (1993) tells us that “learning and knowledge construction are
synonymous: one learns what one knows, and one knows what one has
learned” (p. 172). This philosophical viewpoint is referred to as constructivism.

As Tytler (2001) reports:
In recent years there has been considerable research into the
nature of student learning in science, and student’s conceptions.
This has led to the development of constructivist / conceptual
change teaching approaches which have gained broad acceptance
in the literature as being effective (Wandersee, Mintzes & Novak,
1994; Duit & Treagust, 1998). (p. 5)

Constructivism as a philosophy has reappeared in educational circles
recently. Constructivism, as described by von Glasersfeld, is a “theory of
knowledge with roots in philosophy, psychology, and cybernetics” (Murphy, 1997,
This philosophy is based on the premise that learners construct viable
knowledge that allows them the opportunity to use this knowledge in different
contexts (Tobin & Tippins, 1993, p. 4). “Real life experiences and previous
knowledge are the stepping stones to a constructivism, learning atmosphere”
(Smith, n.d., p.1). As von Glasersfeld stated in 1995; “Constructivism does not
claim to have made earth-shaking inventions in the area of education; it merely
claims to provide a solid conceptual basis for some of the things that, until now,
inspired teachers had to do without theoretical foundation” (Murphy, 1997, p. 2).
Moving from the theory of constructivism to the practice of constructivism
presents challenges (Murphy, 1997, p. 2).

Constructivism deals with the idea that all people have certain extant
knowledge that is drawn upon when new situations are encountered, or in other
words “to learn something new, they must be able to connect it to something they
already know” (Martin, 1997, p. 166). The more learning experiences students
have to choose from, the easier it is for them to comprehend new and/or more
difficult concepts. “They (children) must construct personal meaning of the new
material either by assimilating it into existing schemata, or by accommodating it
through forming new schemata which are connected to existing ones” (Martin,
This facilitation of learning makes it easier for the students because they are
provided with the opportunity to use knowledge they already possess to help
them relate and understand the new, more difficult concepts. If students can
take a concept that they are familiar with, and use it to supply the basis for a
more complex concept, the process of constructing the new knowledge should
be more meaningful for the student (Mintzes, Wandersee, & Novak, 1997, p.
413).

Because student understanding is built, or constructed, effective teaching
must focus not only on the learner’s acquisition of content knowledge but also on
the skills used to acquire and to apply that knowledge.

All teachers must uphold the claims of knowledge; yet strive to build
spacious avenues from such knowledge to students’
understanding. There is likewise a tendency to frame teaching either in terms of imparting valuable knowledge or as encouraging the acquisition of skills. But knowledge and skill are not disjoint. Knowledge -- in the form of specific facts and organizing principles -- is necessary to the exercise of most skills, just as a range of skills is necessary to the acquisition and construction of knowledge. Knowledge and skill cannot be pulled apart, nor can one assume pride of place over the other. (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 5)

In a constructivist classroom the teacher has the role of providing an environment in which he is the facilitator of student learning, rather than the transmitter of knowledge. The environment has to include the opportunity for the students to reflect and test their ideas with peers and the teacher (Jakubowski, 1993, p. 139). Such an environment is clearly not teacher centered, but is a social arena that encourages interaction. This interaction provides a more meaningful construction of knowledge by the students, allowing them to build on their prior knowledge.

Constructivism suggests that learning is a social process of making sense of experience in terms of what is already known. In the process learners create perturbations that arise from attempts to give meaning to particular experiences through the imaginative use of existing knowledge. The resolution of these perturbations leads to an equilibrium state whereby new knowledge has been constructed to cohere with a particular experience and prior knowledge. (Tobin & Tippins, 1993, p. 10)

Even though this constructivist classroom is not teacher centered, discussion and/or lecturing still have significance. Discussion and/or lecturing allow the opportunity for the teacher to introduce new ideas or concepts that students have not encountered previously. Mintzes, Wandersee, and Novak (1997) write, “a learner’s prior knowledge interacts with knowledge presented in formal instruction, resulting in a diverse set of unintended learning outcomes”
(Mintzes, Wandersee, and Novak, 1997, p. 411). It is the role of the teacher to challenge the students to use their prior knowledge to address concepts or ideas that are new to them. The teacher encourages the students to explore how new concepts can be linked to extant knowledge (von Glasersfeld, 1993, p. 32).

The teacher does not simply pass text meaning on to the student reader or composition skills on to the student author. Instead, he provides support for his students’ learning within the zone of proximal development as they collectively build bridges of understanding through social interaction. While the teacher is interacting with the student, he continuously analyzes how the student thinks and what strategies the student uses to solve problems and construct meaning. From this analysis, the teacher decides how much and what type of support to provide for his students. (Dixon-Krauss, 1996, p. 20)

Laboratory activities and demonstrations are useful tools in the construction of this link from extant knowledge to new concepts. This is because each of these practices provides a forum by which students can link knowledge to practical applications. Students are given the opportunity to experience the application of what they are learning which allows them to construct meaning. Labs and demonstrations also reinforce knowledge construction through active engagement (Roth, 1993, p. 146).

In laboratories and activities students should be given the opportunity to not only present their findings, but also more importantly tell how they arrived at their conclusions. “Successful thinking is more important than ‘correct’ answers” (von Glasersfeld, 1993, p. 33). This analysis of how the answers are derived leads to higher order thinking skills. “Accomplished teachers realize that higher-order thinking is the hallmark of successful learning at all levels” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 5). “All teachers must concern themselves with higher-order skills, with the executive functions of reasoning, and with students’ capacities to monitor their own learning” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 6).
When students verbalize their thought process, it also allows the teacher to analyze whether or not there are any misconceptions on the part of the students that need to be addressed. Misconceptions need to be dealt with so that valid constructions can be made (Cobern, 1993, p. 54).

Teachers must regularly assess student progress. Teachers must evaluate student learning continuously and design lessons accordingly. Teachers frequently do not assign grades, for evaluation is not always for the purpose of recording grades; rather, it allows students and teachers to assess where they stand. Teachers also assess students to determine how much they have learned from a unit of instruction, be it a week on seeds, a semester of photography, or a year of athletic training. Student responses then contribute to teachers' decisions about whether to reteach, review or move on. By continually adding to their repertoire of methods for assessing what students have learned, as well as constantly monitoring student progress, accomplished teachers are able to provide constructive feedback to students, parents and themselves. Finally, such teachers help their students to engage in self-assessment, instilling in them a sense of responsibility for monitoring their own learning. (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 15)

Monitoring student progress is inherent in a constructivist classroom. Assigning grades is a more difficult task. How does a teacher assign a grade to a student that is learning in a constructivist manner? The dilemma that teachers face on a daily basis is “to decide whether we want students to develop their ability to think or merely to handle standard procedures and give standard answers in a limited set of situations” (von Glasersfeld, 1993, p. 36).

…historically the major function of educational measurements has been to apply standards to student performance in order to differentiate the positions of individual students on a distribution. One major objective of norm-referenced tests is to facilitate the
comparison of students. Even in criterion-referenced testing, the aim is comparison, though not by comparing student to student, but rather student to criterion. What these two approaches to testing have in common is that they are both comparative in that they are comparative with respect to a fixed or common criterion. (Eisner, 1998, p. 102)

When assigning grades teachers have to account for societal and institutional pressures while, at the same time, evaluating whether or not the students have learned the material rather than the simple regurgitation of answers. Although the qualitative evaluation of learning is ongoing in a constructivist classroom, quantitative assessment is inherently more difficult.

The distinction between memory and comprehension tasks must be viewed as a matter of degree. Some tasks are weighted toward verbatim reproduction of the language used in instruction. Other tasks are weighted in the direction of paraphrases or inferences. In addition, comprehension items under some circumstances may be answerable by recall, thereby allowing memory to be a route to accomplishing what is nominally a comprehensive task. If, for instance, an item that requires a person to give an example of a concept can be answered by reproducing an example used in instruction, then the item can be answered by memory. In such a case it is not necessarily appropriate to infer comprehension from a correct answer. (Doyle, 1983, p. 165)

Summary

Effective teaching results in student learning and acquiring the skills to continue to construct knowledge. “Successful science learners develop elaborate, strongly hierarchical, well-differentiated, and highly integrated frameworks of related concepts as they construct meaning” (Cobern, 1993, p.51). Constructivism can be the basis for effective teaching, “it is pedagogy that is learner centered but teacher controlled in a way that there is always something
the learners are called on to construct” (Fensham, Gunstone, & White, 1994, p. 6).
CHAPTER 3

METHODS AND PROCEDURES

Introduction

A great tool for every teacher would be a handbook that provides written lists as to “how to be an effective teacher”. However, such a “how to” book would be unreliable because there could not be a simple list that would cover all aspects of teaching, all situations for all students, and all teachers. Instead of a handbook, teachers can use their own experiences as a guide to improving their practice. As Selman (1988) states, “The practice of the profession of teaching is similar to learning to ride a bicycle. What must be learned cannot be adequately expressed in language or expressed in usable rules” (p. 191).

This is verified by Russell, Munby, Spatford and Johnston (1988):

Our study of teachers' professional knowledge proceeds from assumptions that (1) professional knowledge consists of more than that which can be told or written on paper and (2) professional learning is something more than a process of using “rules” to make decisions about how to behave in a classroom situation. (p. 67)

So how does a teacher “learn to teach”? How does a teacher examine their effectiveness and effect change? One answer lies in qualitative research that entails reflection and analysis of the teacher’s own experiences. “Qualitative research offers unusual opportunities to practice the arts of perception, reflection, and holistic inquiry. It allows the study of a broad range of educational questions—questions that do not always lend themselves to more conventional research methods” (Rogers, 1988, p. 77). One qualitative research method is the use of an autobiographical case study.

Aaron’s autobiography documents him as a student, as a student teacher, and as a teacher. The student perspective of the autobiography gives a basis of
his definition of effective teaching. The student teacher and beginning teacher aspect documents the struggles encountered in trying to establish a practice of effective teaching. The autobiography will be used to examine by reflection if Aaron has been an effective teacher who is able “to promote conceptual development and change” (Fensham, Gunstone, & White, 1994, p. 6) in students.

In order to define effective teaching and also to analyze whether the subject, Aaron, is an effective teacher, the researcher distances himself in order to evaluate each of these three phases in the autobiography. Being able to look at this information as an outside party enables the researcher to discern whether or not Aaron is becoming an effective teacher over time.

Effective teachers realize students sometimes have trouble comprehending new material in the classroom. Is it the student's fault or does it have something to do with the teacher? Many teachers do not try to or have the ability to facilitate their student's learning by providing a variety of experiences so that all students will have the opportunity to learn. Using constructivism as a framework for teaching and learning provides a vehicle whereby students have the opportunity to construct meaningful comprehension of complex concepts.

Research Question

The questions that this research is seeking to answer are:

- What is an effective teacher?
- Is Aaron becoming an effective teacher?

To answer these questions a combination of case study and autobiographical methods will be used. Using Wolcott’s (1998) definition the researcher will be an active participant. As an active participant, Aaron tells his own story in autobiographical form. Autobiographical stories are useful in reaching a fundamental understanding of the teacher’s perspective and an understanding of the way teachers develop professionally (Brennan, 1994, p. 3). This will be essential to answering the research questions.
This paper uses research specifically known as autoethnography (Ellis & Bochner, 2000, p. 739). In autoethnography, “the author of an evocative narrative writes in the first person, making themselves the object of research and thus breaching the conventional separation of researcher and subjects (Jackson, 1989); the story often focuses on a single case and thus breaches the traditional concerns of research from generalization across cases to generalization within a case (Geertz, 1973)” (Ellis & Bochner, 2000, p. 744). While the main goal is to see if Aaron has become an effective teacher, it is also the intent of this paper to be used by others to read and draw their own conclusions and, perhaps, questions. “This form of presenting research is particularly relevant to the constructivist philosophy because the individual reader easily relates to and confers meaning to the text based on the reader’s own experiences and understandings” (Beyer & Apple, 1988, p. 58).

The analysis of the autobiography is vital to the research. The analysis provides the bridge between reader and researcher and validates the value to the reader. Grundy (1987), quotes Ruddick and Stenhouse “In reporting research I am hoping to persuade you to review your own experience critically and to test the research against your critical assessment of that experience…. Looking at any research findings in these terms there are two questions that you will have to ask yourselves: first, is it generally true? And second, is it true in my case?” (p. 72-73).

Case Studies

The case study was chosen to document whether or not Aaron is becoming an effective teacher. Case study is defined by interest in individual cases. The interest in this case is the evolution of an effective teacher. Stake (2000) states, “a case study is both a process of inquiry about the case and the product of that inquiry” (p. 436). More specifically this case study should be referred to as an intrinsic case study (Stake, 2000, p. 437). An intrinsic case study is “undertaken because, first and last, the researcher wants better understanding of this particular case” or “to provide insight into an issue”, (Stake,
In this instance the understanding that is being referred to is whether or not Aaron is becoming an effective teacher.

In case studies, “issues are chosen partly in terms of what can be learned within the opportunities for study. They will be chosen differently depending on the purpose of the study, and differently by different researchers” (Stake, 2000, p. 440). The case study method was chosen as a self-analysis of whether teaching or learning was occurring in the classroom; is the teacher a facilitator of learning? While the researcher learns an enormous amount while doing this study, the reader’s interpretations may be different.

Researchers use the methods for casework that they actually use to learn enough about their cases to encapsulate complex meanings into finite reports—and thus to describe the cases in sufficient descriptive narrative so that readers can vicariously experience these happenings and draw conclusions (which may differ from those of the researchers). (Stake, 2000, p. 439)

This paper is written from the perspective of a teacher, rather than an educational researcher so that its story will be insightful to a wider audience (Eisner, 1998, p. 102). This is important, as Richardson (1994) wrote:

The “research text” is the story, complete (but open) in itself, largely free of academic jargon and abstracted theory. The authors privilege stories over analysis, allowing and encouraging alternative readings and multiple interpretations. They ask their readers to feel the truth of their stories and to become co-participants engaging the story line morally, emotionally, anesthetically, and intellectually. (Ellis & Bochner, 2000, p.745)

Reflection and Analysis

According to the National Board of Professional Teaching Standards for Adolescent and Young Adult Science, Standard XIII: Reflection (2003), states, “Accomplished science teachers constantly analyze, evaluate, and strengthen their practice in order to improve the quality of their students’ learning
experiences” (p. 66). Reflection is particularly appropriate to answer the two research questions, “What is an effective teacher?” and “Is Aaron becoming an effective teacher?”

Aaron’s own definition of effective teaching stems from his experience as a learner. Evaluation through reflection of his background is key to developing his own definition of effective teaching. Accomplished teachers

…can describe how their particular cultural background, biases, values, and life experiences might limit or promote effectiveness and endeavor constantly to broaden their perspective. They continually analyze their practice, asking themselves such questions as, “What went well? How could I do better?” (NBPTS, Adolescence and Young Adulthood Science, STANDARDS, 2003, p. 66)

Reflection on his practice is also key to following Aaron’s journey to effective teaching. Aaron is documenting his journey to effective teaching by telling his story and then reflecting on that story, analyzing it to answer the question, “Is Aaron becoming an effective teacher?” “The analysis and reflection may overlap although they are not identical. “Analysis” involves interpretation of why the elements or events described are the way they are. “Reflection”, a particular kind of analysis, always suggests self-analysis, or retrospective consideration of one’s practice…”(NBPTS, Adolescence and Young Adulthood Science, PORTFOLIO, 2003, p. 16).

Subject

The subject of this research is myself. I am a 28-year-old male who currently lives in Atlanta, Georgia. I received my undergraduate degree in Biological Sciences in 1997 from Florida State University and immediately entered the Science Education Masters Program at Florida State.

During my first four years at the Florida State University I was a Biological Science/Pre-Med major with ambitions of going to medical school and becoming an orthopedic surgeon. During my senior year I took a job as a teaching
assistant (TA) working under the tutelage of Dr. Ann Lumsden in the Biology Department of FSU. My job was to teach the biology for non-majors lab to incoming freshman for two hours a week. It was working as a TA, in this environment, that made me realize my love for teaching.

As a college student I was well aware of the struggles I had in the classroom. I could learn from some teachers while with others I struggled in every way. Although I received good grades, I didn’t feel as though I was learning the material. I realized that I did well in lab classes but struggled with some lecture classes. The classes I struggled with were classes where the professors lectured at a high rate of speed and expected that learning was simply the memorization of thousands of terms. The classes that I felt I was most successful in were the lab classes.

When I became a TA and started teaching the biology for non-majors lab it felt natural for me to present material in a manner comfortable for my learning style. I chose to model my own teaching using teachers from my past whose classes I enjoyed and learned from. Although I did not realize it at the time, I was teaching the material in a constructivist manner; this was the most natural way for me to teach. I fell in love with teaching, but at the same time, I was very concerned with whether or not I was a good teacher. I wanted to make sure that my students did not have to struggle with my teaching style the same way that I had to struggle with the teaching styles of some of my earlier teachers.

As I began my student teaching, I was no longer teaching solely in a lab format. I found that I sometimes struggled reaching all of my students because I tried to present information, rather than relate the material to concepts the students already knew. While it was not my intent to fail to reach some students, I was ineffective.

My struggles with reaching some students and difficulties teaching some concepts led me to consciously set a goal of becoming a more effective teacher. In order to become more effective and reach more students, I had to discover new images and gain new insights to help facilitate their learning.
Geographical Considerations

My story begins with my first remembrances of teachers. My Dad was in the military so until I enrolled at FSU there were frequent moves. Every two to three years we moved to a new location. I attended schools in Florida, Japan, the Philippines, North Carolina, Mississippi, Cuba, and Kansas. The five years I spent in Tallahassee were the longest I lived in a single location my entire life.

There are many locations where research for this study was done. The first part of my research began when I entered elementary school and continued through high school. This research is what I used to help establish my early memories of teachers and from these memories I establish my beliefs of effective teachers. The next site of research is Florida State University where I did my first teaching in the Biology for non-majors lab, as a teaching assistant (TA) for two years, Aug 1997 - May 1998. The final site is Etowah High School in Woodstock, Georgia. I did my student teaching at Etowah under the tutelage of Mrs. Ann Brennan during the time period of Aug 1998 - Dec 1998. I remained at Etowah after my student teaching and substituted for a semester hoping for a job to come open at the school. I was hired as a Biology teacher in August of 1999 and have been teaching at the school since. Thus, the last part of the research was done at Etowah High School from August 1999 to the present.

Data and Collection

I used many different methods of gathering information so that I will have sufficient data to establish my autobiography. During my pre-college years I am using my own memories to write the autobiographical portion of this paper. Family anecdotes and personal memories were recounted in “My Story”. Self-observations via videotape and journal entries were kept while I was at FSU. The journal entries were written in bound journals or posted on the Internet. During my student teaching, journals were kept on a class web site where other student teachers were encouraged to share their thoughts so that experiences could be pooled and shared. These were reviewed to establish an objective memory of my experiences. I used these memories to write “My Story”. The
memories were sometimes revealing and difficult to write as “Often our accounts of ourselves are unflattering and imperfect, but human and believable. The text is used, then, as an agent of self-understanding and ethical discussion.” (Ellis & Bochner, 2000, p. 748) These “…accounts seek to express the complexities and difficulties of coping and feeling resolved, showing how we changed over time as we struggled to make sense of our experience” (Ellis & Bochner, 2000, p. 749).

Summary

The data will be presented in a literary style as an autobiographical case study. The autobiography will be followed by reflection and analysis of the data leading to assertions as to whether or not I have become an effective teacher. The researcher will step back and analyze the data to answer the research questions of:

- What is an effective teacher?
- Is Aaron becoming an effective teacher?
CHAPTER 4

FINDINGS

Introduction

To analyze the data provided by my autobiography, I will step back and look through a different lens, the lens of the observer. Through this lens I will view the “story” of Aaron Newton in his pursuit to be an effective teacher.

The purpose of this study is to determine if I am becoming effective. In order to answer this question I must first define effective teaching. I will use my experiences as a student as a frame of reference for determining my definition of effective teaching.

The first section, Elementary school, describes my initial introduction to the teaching profession. My early encounters with teachers established my attitudes towards learning. This section introduces different teaching styles of teachers and how each was effective in its own unique way.

Section two, Middle school, describes my views of ineffective teaching. This is visible through my actions and behavior over these three years.

Section three, High School, shows how I was reintroduced to effective teaching. My teachers challenged me to learn and think on my own. I began to enjoy learning and the feelings I had when I was doing it.

Section four, College, was a different learning environment than I had previously encountered. There were many different teaching styles. This is the first time that I am able to put my own teaching style into practice. Graduate studies were totally different than undergraduate studies; I was actually expected to construct ideas and knowledge on my own, without it being spoon-fed to me.

Section five, Student Teaching, was an experience. Under the tutelage of Ann Brennan I was able to step in front of a class and continue my evolution as a
teacher. With Ann’s help I developed strategies towards teaching and began to implement many of the ideas and practices I had learned in Graduate classes into my student teaching.

Section six, Etowah, was supposed to be easier. After my student teaching, I thought that having my own classroom with no one around to pressure me would be easier. I soon found out that being on your own is not as great as it sounds. I struggled with time, having to make my own tests and quizzes in addition to preparing for class on a daily basis while trying to teach effectively.

My Story

My name is Aaron Newton. I was born September 11, 1975. Growing up it was my sister who wanted to be a teacher, not me. I wanted to be a doctor, a pilot, or basically anything other than a teacher. School came easy to me; I never studied much, yet I did well in my classes. What I would do is listen to what the teacher emphasized and I knew that this was the material that would be on the test. The material that was continually repeated was the only thing I would study. I figured out that in order to score well on tests, all I had to do was pay attention to the basic concepts being presented, be able to reproduce them on a test and I would score high. Early in school, most of my teachers did not challenge me to think for myself, they fed me information, and checked to see if I could reproduce it on a test.

Elementary School

My earliest memories of being in school would probably begin with my 3rd grade teacher Mrs. Harrison. Mrs. Harrison was the teacher who introduced me to the concept of being “paid for performance”. She told us that each of us should ask our parents for $1 for every “A”, we had on our report cards. This gave me a lot of motivation to keep getting good grades. I talked my parents into it, so therefore I had $5 every time report cards came out. As I got older, my parents abandoned the “pay for performance” form of motivation in favor of the
“expect nothing less” form of motivation. Mrs. Harrison’s class was very easy because she only tested on things that she would repeat over and over again. It was very easy to get high marks in her class without thinking, all I had to do was memorize.

In 5th grade I had two teachers, Mrs. Rogish and Mrs. Crow. Each teacher taught different subjects so our class would rotate half way through the day. Mrs. Crow taught English and Social Studies while Mrs. Rogish taught Science and Math.

Mrs. Crow was the oldest woman I knew, and one of the toughest. I remember that a lot of kids were afraid of Mrs. Crow because they thought she was mean, what I remember is that she made me think for myself. She would never give me the answers; she would help me find them. Whenever I would ask a question, Mrs. Crow would respond with another question that helped lead me to the answer. Instead of telling you the answer, Mrs. Crow would help guide you so that you could find the answer on your own. She would give hints or clues that would direct you to where you could find the answer. While this was frustrating at times, it helped me to remember the material longer than the couple of seconds I needed it in class. I would remember how I got to the answer, and that helped me to remember the answer for longer than just putting it on a test.

Another thing I remember about Mrs. Crow is that there were only two possibilities for an answer, right or wrong. I remember having many conversations with Mrs. Crow about her lessons trying to show that there was more than one possible answer. As I remember, Mrs. Crow did not like these conversations as she was set in her ways that there was only one right answer for her questions.

The other teacher I had in 5th grade was Mrs. Rogish, the complete opposite of Mrs. Crow. She was young and vibrant and a lot more laid back than Mrs. Crow. One of the things I remember about Mrs. Rogish was that she rewarded and encouraged me to use alternative routes of arriving at an answer. While there might only be one right answer, I could get to it in a number of
different ways. This was very different than Mrs. Crow. Mrs. Rogish was more interested in the thought process than the actual answer.

I can remember doing puzzles in math class where we had to take tiles consisting of different size triangles and try and get them to cover different pictures. I thought these were the neatest things; I would finish a test early just so I could get out these teasers and play with them. I was totally engaged with finding the solutions to these problems so that I didn’t even notice how much my brain was working. It seemed like my brain was always in high gear in Mrs. Rogish’s class.

I clearly remember a project that we had to do in this class because of the initial frustration it caused me, and the pride I felt upon completion of it. The project was for each person to come up with an entirely new counting system, much like the Mayans or Incas did when they first developed a numbering system. This project was difficult. I could not comprehend making up a new number system when the one we had seemed to work so well. Everything I tried was still based on the concept of 1,2,3… I stayed after school one day so that I could get some extra help on this project because I was not getting anywhere with it. Mrs. Rogish explained to me that, just like in class, there were lots of different ways to get to the answer. She showed me that especially with a project like this there was definitely not only one correct answer; there were infinite numbers of possibilities. Mrs. Rogish never did tell me how to do the project but she helped lead me down the right path to getting started. From here I was able to take her clues and develop the “Bad Bug Bugger System”, a numbering system in which different types of bugs were used to establish a numbering system. There was a very elaborate chart and diagram that explained everything. I think this is one of the projects I am still most proud of. I had no idea what the outcome of this project was going to be, it was not simply a project where you sat down with an encyclopedia and copied, it actually wasn’t even that hard after I understood what I was supposed to do, but it was so rewarding to finish it and understand the purpose of the project that I still remember it.
Analysis

The memorable teachers from this time period were memorable for specific reasons. These memories of my first encounters with school would mold my current perception of what is effective teaching and what is not.

Mrs. Harrison was not an effective teacher. She never challenged me to think for myself in her class. She would present information and all I had to do was reproduce it on a test. I did not have to think or conceptualize to get good grades in her class. If I could reproduce the answer, I got an A. Very little thinking or conceptual development had to take place. This is clearly described by NBPTS with “It is not only a truism, but also true, that what is tested in science is what is received” (NBPTS, Adolescent and Young Adulthood Science, STANDARDS, 2003, p. 58).

Mrs. Crow, on the other hand, made me think. She was an effective teacher. She would not give answers as other teachers before her had, you had to find the answer on your own. Mrs. Crow’s method of answering questions using questions is a way that many teachers guide students to discovery. This method of Socratic questioning develops critical thinking. “In Socratic teaching we focus on giving students questions, not answers. We model an inquiring, probing mind by continually probing into the subject with questions” (Socratic Teaching, n.d., p.1). As Hawkins states, Socrates taught, for the most part, by insightful questioning that helped others ‘reduce to order’ their own still-fragmentary knowledge” (Fensham, Gunstone & White, 1994, p. 9). In her class I was responsible for discovering the answer; Mrs. Crow’s role was to help guide me along the way. This method insured that not only would I find the answer, I would remember it. To find the answer on my own I had to build on information that I already knew. As Roth (1993) says “Constructivists recognize that, rather than being transferred from one individual to another, knowledge has to be constructed by each individual through his or her active engagement with the physical and/or social environment” (p. 146). Mrs. Crow’s effectiveness was limited by her tenet that only one right answer could be correct.
My memory of Mrs. Rogish was that she was the most effective teacher that I had in elementary school. Her teaching methods not only engaged my brain, I couldn't wait to get to her class, as it was my favorite. I was constantly challenged to not only think for myself and come up with the answers, but to also build on those answers and use them to work through new problems. By no means was Mrs. Rogish’s class easy, in fact I worked harder in it than all my other classes. This is the class that engaged my brain the most. My brain got a workout each and every day. Such engagement is a standard for effective teaching. “Facilitating student learning is not simply a matter of placing young people in a educative environments, for teachers must also motivate them capturing their minds and hearts and engaging them actively in learning” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 14).

These, the earliest memories of formal schooling, unconsciously began the process of setting my standards of effective teaching.

Middle School

I don’t remember much about the teachers during these years except that I made their lives miserable. It was during these 3 years that I decided that I was smarter than the teachers. I spent three years trying to challenge my teachers with any possible means that I could.

I had a Math teacher, Mrs. Parrish with whom I butted heads on a regular basis. I was never rude to a teacher; I just thought that I knew better ways to do some things. Mrs. Parrish could never pronounce my name; she always called me A-ron, which drove me nuts. Even after I talked to her about it, she always mispronounced it. I began to misbehave by mispronouncing her name, and so it began. Mrs. Parrish had one standing rule in her class; everyone had to write in pencil so that when mistakes were made they could be erased. I informed Mrs. Parrish that this rule should not apply to me, because I didn’t make mistakes. This did not go over well with Mrs. Parrish and Mom and Dad were called for the first time. What really made Mrs. Parrish mad is on test days when I would come in with only a pen, as usual, she would refuse to let me borrow a pencil, and then
she’d really get steamed when I would take the test and ace it. Mrs. Parrish’s
tests were very easy to me because all I had to do was repeat the same
problems we were doing in class the week before. She never used problems
that were any different than the exact ones we did in class. All I had to do was
go through the same steps and come up with the same answers I had already
done and I should have gotten a 100% on the test. I never did get a perfect
score however because points were always deducted for writing in pen. I had
many discussions with Mrs. Parrish about this concept, how could points be
taken off if nothing was wrong? Well, I made it through Mrs. Parrish’s class.

Next up was the student teacher, Ms. Jarrand. Ms. Jarrand was a student
teacher in my 9th grade Algebra class. She was also my best friend’s baby-sitter
when he was younger. I knew lots of inside information about her that I used
against her. She was a very timid teacher who always seemed to be afraid of the
students. It was almost as if she was afraid to make a mistake. One of the
things I would do to Mrs. Jarrand was to ask questions that were completely off
subject. There was usually no point to these questions other than to try to
frustrate Mrs. Jarrand. These questions would frustrate her to the point of tears.
Mom and Dad were getting calls again, so I was already on the defensive when
one day she asked me the following question. “Do you find this class boring?”
“Absolutely”, I replied. “Do you think you could teach this class better than I
can?” “Probably”, I replied. I could see the fire rising from deep inside her. I was
then asked to leave the room. I had embarrassed her in front of the class and I
knew I was in for it at home already, but I was too foolish to let everything stop
right there. As I was leaving she said, “Since you’re so smart, why don’t you do
tomorrow’s homework assignment today”. I turned that assignment in 15
minutes later, walking right back across the class I had just been kicked out of,
and handed it directly to her. Mom and Dad got another phone call that night and
my social life was put on hold for some time. Just like in Mrs. Parrish’s class, Ms.
Jarrand failed to challenge me to think for myself. The problems that we did in
class were the exact same problems that showed up on the tests.
Analysis

In some schools, ineffective teaching is the norm:
Historically, there is an enduring constancy in the organization of schools, of classrooms and of teaching itself. Self-contained classrooms, Whole group, textbook centered instruction, teaching as telling, learning as the passive acquisition of facts, standardized testing – these patterns of schooling are as familiar as chalk dust. They constitute an unintended national curriculum that, as an unrelieved diet, does not adequately serve the educational needs of a diverse and dynamic society. Good teachers, of course, depart in many ways from these routines. (NBPTS, What Teachers Should Know and Be Able to Do, 2002, pg. 5)

During middle school I encountered a plethora of ineffective teachers. Because of the ineffectiveness of these teachers, I acted out and behaved poorly. None of my teachers in middle school challenged me to think. Even if a teacher had challenged me to think during this time period, I don’t know if I would have been open to trying to perform at a level above mediocrity. I understood that as long as I did minimum work, which did not require thinking on my part, only memorization, I would get my A for the class.

Mrs. Parrish was not an effective teacher; she could not reach her students. Certain teachers can alienate themselves from their students. Mrs. Parrish was one of these teachers. There was no active learning in her class. Mrs. Parrish’s class was not conducive to learning because “…effective teachers (of science) create an environment in which they and the students work together as active learners” (National Science Education Standards, 1996, p. 28). Mrs. Parrish could not do that and therefore is classified as not being an effective teacher.

Miss Jarrand was another ineffective teacher. Miss Jarrand’s problem was a lack of confidence in herself. This prevented her from being an effective teacher, because as a student, I immediately identified this as her weakness and
acted as many students do, by trying to disrupt her teaching. Any time Miss Jarrand presented material I would ask questions that either she couldn’t answer, or there were no answers to. Instead of having the confidence to say “I don’t know” and continue with the lesson, Miss Jarrand would get frustrated and this only prompted me to ask more questions. She was ineffective at teaching because she had no self-confidence and therefore could not control her classroom. In contrast, effective teachers “…know how to engage groups of students to ensure a disciplined learning environment…They are adept at setting norms for social interactions among students and between students and teachers. They understand how to motivate students to learn and how to maintain their interest even in the face of temporary failure” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 3). Mrs. Jarrand’s timidity and lack of self-confidence underscored her ineffectiveness.

**High School**

*10th grade.* Something crazy happened over the summer between my freshman and sophomore years, I matured. I don’t know why but I grew up considerably in one summer. Maybe it was because my dad got transferred so I would now be changing schools, going from huge Orlando, FL, to tiny Sasebo, Japan. I went from a class of 600 in Florida to a class of 9 in Japan. The thing I remember most about transferring schools was how small the school was. Many of the classes I was taking in Florida were not being offered in Japan; therefore, I had to take a lot of classes by myself in my new school. I was in Geometry by myself, I was in Social Studies by myself, I was in Spanish by myself, the only two classes I had with other kids were English and Gym. Having classes by myself was not a bad thing for me. I was able to work at my own pace and therefore if I wanted to work ahead great, if I wanted to go at the rate the teacher wanted, no problem either. If I had any questions, the teachers would feed me the answer without ever getting me to think about it on my own. I was not being challenged to think; it was totally up to me. The problem was as a sophomore in high school I was happy getting A’s and doing as little work as possible.
Geometry was the class I remember most from 10th grade. Mr. Kendjierski (Mr. “K”) always had “cookie” problems he would write on the board. The “cookie” problems were brainteaser type questions always dealing with math problems. He would reward the student with the first correct answer in the room with a bag of homemade cookies. Since I was taking the class by myself you might think it was kind of unfair. However, there was a calculus class in the same room, consisting of mostly seniors. Of course in this small school that meant that there were only 7 other kids in the classroom with me. They would get so mad every week when I would figure out the “cookie” problem before they would. What was more fun than getting the cookies, was the fact that I was beating seniors to the answer and they couldn’t do anything about it. Mr. “K” loved it to, you could tell by his expression, those seniors worked so hard to try to beat me, but most of the time they couldn’t. These problems challenged me to think and I noticed that the same was true in Geometry. Because Mr. “K” could not always be in two places at the same time sometimes I was forced to work on problems by myself. If I had a question Mr. “K” did not always have the ability to get to me right away. I began to notice that as the class went on I stopped waiting for him to come over and help me, and instead started to figure out how to do the problems on my own. I think that this was because of the same challenging factor that was involved with the “cookie” problem. Even though I didn’t get cookies I did get the satisfaction of solving the problem on my own.

After my sophomore year my parents and I sat down and decided that the school in Japan was too small for me to stay. Even though I had gotten all “A”s, I had not been challenged to think at all. There were no extracurricular activities that I enjoyed like baseball and wrestling so I was getting bored. The school was just too small. We decided that I would go and finish high school with my Aunt and Uncle in Kansas. Both my Aunt and Uncle were teachers. My Uncle was a high school English teacher who coached football and track. My Aunt was a middle school teacher who taught Physical Education and Health. My Grandparents were also in Kansas so I would be able to see them whenever I wanted as well.
11th grade. Eleventh grade was a pretty normal year; I was back at a larger school and back to participating in sports. School was school and I did what I had to do to get my “A”s. Toward the end of my 11th grade year, my English teacher asked if I wanted to take the gifted English class next year. I told him I wanted to and therefore I was required to take a placement test to see if I would score high enough to get in. If I did well on the test I would be placed in this class. I passed the test and therefore had gifted English my senior year.

12th grade. Gifted English was a lot harder than I was used to. It was not a class of verbatim answers reiterated to the teacher, I actually had to think and analyze the information I had. I hadn’t been required to do this since 5th grade and the “Bad Bug Bugger System”.

I can still picture Ms. Brown today. She was a middle-aged woman, tall, with short-cropped hair, and a confidence that could be seen emanating from her. Whatever she said I accepted as true because there was no way she could be wrong.

By the end of the first quarter, I knew I was in for a long year. We were supposed to read a book outside of class every quarter. In every other previous English class, reading half a book and writing down the names of the characters and a few facts was more than enough to get a good grade on a book report, not here. She shredded my report, I hadn’t talked about any themes in my report, I hadn’t discussed implications; she even questioned whether I read the whole book. She was sharp.

After that I knew that I was going to have to put forth a little more effort, maybe even start really studying. I began to study and, lo and behold, my grades started improving. I remember that Ms. Brown constantly praised me whenever I had a thought or comment that showed thinking was going on. I also remember how quickly Ms. Brown would let me know if I was not thinking as much as I should have been. I remember the last topic we covered that year was poetry; I always thought I was the master of poetry. Wrong again. I tried but I
just wasn’t making the connections that Ms. Brown wanted. She kept challenging me to reach deeper or try harder. I kept trying, challenging myself to think, to draw connections and, sure enough, my grades got better. I remember asking Ms. Brown to sign my yearbook that year and what she wrote made me feel very good about myself. She wrote, “you were really on a roll with this stuff, you really are beginning to think and understand poetry.” This comment meant more to me than anything else. I always thought that was funny considering this is the only class I ever got a “B” in during my four years of high school.

The science classes I took in high school were mostly uninspiring. They were generally taught in such a way that I didn’t have to think on my own. The information was presented, or I was required to adhere to step-by-step instructions. Grades were determined by how well the format was followed. I didn’t have to think or formulate any of my own concepts or ideas; everything was given to me. As long as I could memorize facts, I was fine.

The only science class that was different was my Anatomy and Physiology class. Mr. Schultz was the teacher and he allowed me to construct my own knowledge using the dissections. He would present information and instructions, and then he would sit back as I did my assignments. By allowing me freedom to proceed at my own pace, I was able to discover and construct ample understandings of the material. Anatomy and Physiology was one of the few science classes that challenged me to think on my own. This was due to the labs and dissections, which allowed me to not only proceed at my own pace, but more importantly, to build and form knowledge on my own.

Kindergarten through twelfth grade was pretty easy for me. While I had a few classes that were difficult, the majority of my classes I considered easy based on the fact that I got A’s in all of them with very little work. Like I said earlier, all I had to do was pay attention in class and memorize the major points for each teacher and I received good grades, which made me happy. Very rarely did I have to think on my own; ideas and concepts were given to me and I had to reproduce them on a test. I was not forced to construct any knowledge on my own. I rarely had to use prior knowledge to help me understand new material.
Even more uncommon was the notion that my teachers structured their classes in a way that made me construct knowledge. This left me unprepared for college because I had not been required to develop these skills. I would have to learn them when I got to Florida State. When I graduated from high school I figured that college would be a little more difficult, but I had no idea how much more.

**Analysis**

When I moved to Japan most of the teachers I had were ineffective. If I had any questions the teachers would just give me the answer and keep going. I did not have to do any thinking myself. In my sophomore year there was an exception, Mr. Kendjiorski. Mr. “K” was teaching two classes together, one with me, and one with a group of seniors, all in the same classroom. Being in a class of seniors challenged me to work harder to try to be on their level. Mr. “K”’s cookie problems always got my mind engaged. Not only were the problems puzzles that I enjoyed figuring out, the thrill and satisfaction of solving the puzzles before the seniors only encouraged me. Mr. “K” knew “… that genuine achievement motivates students to continue striving to do their best” (NBPTS, Adolescence and Young Adulthood Science, STANDARDS, 2003, p. 22).

Moving back to Kansas put me back into a more conventional class setting. Ms. Brown, my gifted English teacher, challenged me. Her expectations for students were above anything I had previously encountered. I was forced to analyze literature rather than read and regurgitate. I was challenged to think for myself, on my own. Ms. Brown’s knowledge and confidence were one of the aspects that helped her be an effective teacher. “Teachers in command of their subject understand its substance—factual information as well as its central organizing concepts—and the ways in which new knowledge is created, including the forms of creative investigation that characterize the work of scholars and artists” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 10).

Understanding the ways of knowing within a subject is crucial to the teachers’ ability to teach students to think analytically. Critical thinking does not occur in the abstract, for the thinker is always
reasoning about something. Proficient teachers appreciate the fundamental role played by disciplinary thinking in developing rich, conceptual subject-matter understandings. They are dedicated to exposing their students to different modes of critical thinking and to teaching students to think analytically about content. (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 10)

Anatomy and Physiology was, and still is, one of my favorite classes both as a student and a teacher. Mr. Schultz was an effective teacher in this class because he allowed discovery through lab exercises. Mr. Schultz presented the basic foundation of facts and allowed the students to construct their own understanding of how these facts pertained to the subject. I knew that I was going to have a given amount of time to work on the dissection; in that time period it was my responsibility to take in as much information as possible. The dissections were not only the labeling of organs, but instead were seen as a path to the understanding of form and function. Mr. Schultz’s style of presentation of facts followed by a related activity or lab built conceptual understanding.

Teachers also create a productive learning environment as a result of their organizational decisions…. They establish orderly and workable routines that maximize student time on task. Students know what is expected of them and feel confident and willing to participate because they perceive their explorations in science as serving their own purposes. Teachers invite students to be part of the learning community by assigning open-ended tasks… (NBPTS, Adolescence and Young Adulthood Science, STANDARDS, 2003, p. 26)

Assertion 1: Effective teaching promotes student thinking.

Aaron defines effective teaching by his experiences as a student. The teachers that he remembers as being effective all “made him think”. He describes particular methods and characteristics of these teachers. They were confident, knowledgeable, and each had a style that allowed students to
construct knowledge instead of what Aaron calls “spoon feeding” and “regurgitation”. This is reiterated by Anderson and Smith, “One kind of description of successful (effective) teaching focuses on how students think when they are undergoing conceptual change. Successful teaching is then defined as whatever helps students think appropriately” (Anderson & Smith, 1998, p. 92).

Although Aaron received good grades from elementary school through high school, by his own admission he did it with little effort and few challenges. Aaron was able to ascertain what was required to score well on tests, and he did little more than what was needed. Tobin and Gallagher describe this type of teaching in the Journal of Curriculum Studies, “Work identified as likely to be tested had a higher status than work not so identified; activities assumed importance only if they were associated with learning for an assessment or were directly assessed. Consequently, learning for the tests, copying notes from the chalkboard or from the textbook, completing laboratory reports and homework had a high status in most classrooms” (Tobin & Gallagher, 1987, p. 553).

The most effective teachers were those who prompted Aaron to think for himself. They would present information, they would present a problem, and he would have to use the information to solve the problem. Anderson and Smith (1988) state that effective teaching is whatever helps students to think appropriately, successful instruction must include what teachers do to promote appropriate thinking (p. 92). This method ensured that Aaron had to think for himself, the answer would not just be given to him. Davis and McKnight state direct instruction must be oriented toward processes, which generate meaning (Doyle, 1983, p. 176). This teaching style was frustrating initially, but upon reflection, it was most effective. For example, Mrs. Rogish’s problem of developing the student’s own number system resulted in the “Bad Bug Bugger System”. Mrs. Rogish presented the concept of alternative numbering systems, and it was the student’s responsibility to put the concept into practice. She knew that simply stating the concept is hardly sufficient to bring about conceptual change (Anderson & Smith, 1988, p. 94).
Math lends itself to this style of teaching while other classes may not; English for example (Confrey, 1993, p. 319). Previous English classes presented little challenge to Aaron but Mrs. Brown's English class was very difficult. Aaron was not accustomed to thinking analytically about this subject. Aaron states "in every other (English) class reading half a book and writing down the names of the characters, and a few facts, was more than enough to get a good grade on a book report." Now he was being presented with the information, and he had to construct his own answers. As Doyle states "The use of figurative rather than literal referent in a text requires a reader to shift schema to construct meaning" (Doyle, 1983, p. 171). The teacher presented the material and it was the student's responsibility to analyze and construct meaning. Throughout his story the teachers that Aaron remembers as effective teachers were the teachers that challenged him to seek his own solutions to problems, to think rather than regurgitate answers.

University

Undergraduate. The next year I was off to college at Florida State University. I decided to major in Biological Sciences (Pre-Med). Biology in college was a lot harder than in high school. I would study, but there was always so much information covered on the tests, that a "B" was a great grade for me. In lecture classes it took everything I had and more to get a "B", while in my lab classes, I consistently got "A"'s with little effort. I went in, worked in the lab, used the information and material that I knew and everything turned out great. The lab classes seemed to be more interesting and therefore, I did better in them. The classes seemed more interesting because I could see how the material that I thought was difficult from the lecture was now being used in a manner that I could relate to. In lecture class, I went in, took notes, studied the notes, took the test and prayed for a passing grade. In labs, I would use the given information along with my prior knowledge to solve a problem. I didn’t have to pray for grades in labs, I knew if I finished the lab that I had done it correctly.
One thing I disliked about college was class size. I always felt that I was at a disadvantage in a larger class, I would sit in the front but I always felt as though the teacher was not there for the students, they were just there to present the information. In high school it was never a problem to ask a teacher to explain something, while in college everything had to be explained during office hours. By asking questions in high school, I was able to sort out and make sense of complicated concepts. In college, with the larger class sizes, there often wasn’t enough time to ask questions during normal class time. The smaller the class I took, the better I did. Therefore, my grades actually improved as I got into the so-called harder classes in my field. I was able to talk with the teachers in the smaller environment and therefore I didn’t have to learn everything by studying on my own.

**Teaching (TA “ing”).** It was not until my senior year at FSU that I decided I wanted to teach. I took a job as a teaching assistant (TA) for the Biology for Non-Majors class. My job was to teach the lab section of this course. Once a week for 2 hours at a time, I was responsible for teaching 24 students (most only 2-3 years younger than me), about a certain topic dealing with Biology. I absolutely loved this. I was responsible for presenting material, running labs, and administering quizzes each week. I was in charge of what was happening in this classroom. One of the neatest things about this class was that not one of my students was a science major. Most of them didn’t even like science. What I thought starting out was that if I could make the class interesting and the labs fun my students would become interested.

During my first semester teaching the lab, I thought the most important thing is to be considered the cool teacher to have for this class. I would joke around with the students, give them answers on the lab, and help them get through however I could. Sometimes my students got through without actually learning the material.

The second semester I taught this lab class I changed the way I approached it. I still wanted to be a teacher that was liked, but it was no longer
my top priority. Student learning was now my top priority. Students would no longer be given a free ride just for showing up and breathing. Students would not be given any answers; they were going to have to find them on their own.

I knew that I was going to have to become more knowledgeable about the material so that I could handle any questions presented to me. I also had to become more authoritative. At first I took this too far, I was not as social and I didn’t feel like I was interacting with the students. I realized that this was not working because we were not having any discussions in class. I was acting as though I was the most important person in the class and the students were below me. By doing this I isolated myself portraying myself as above them rather than as someone who was approachable to them. In order to reacquaint myself with my students I realized I was going to have to loosen up. I went back to joking around with the students, when it was appropriate. I went back to talking to them about what was going on outside of class, after we had gone over our lesson. Suddenly things started clicking. As soon as I made myself accessible to the students they started to interact with me and we were able to learn and have fun together. The students began to ask questions, sometimes related to the subject, sometimes not related to the subject, but they were generally good questions that I could tell had required thought.

It was after teaching the second class that I knew I wanted to become a teacher. I tried to find out what I needed to do to become a teacher and found that there were two options: 1. Start over again and get a BS in Education (four years) 2. Work towards a Masters in Science Education (2 years). It was an easy decision; I’d take option 2, be done in two years and be teaching in three.

I didn’t know what to expect going into graduate school. Would graduate school be the same as undergraduate or would it be different? The classes I took for the Master’s program were very enlightening to say the least. Instead of the large lecture classes that I didn’t like, these classes were smaller and student-centered. The class format was generally that of discussion in which we discussed anything from the assigned literature to current events and issues.
The classes were unlike any of my previous college courses; I was challenged by the new class format. With these classes I found myself thinking, questioning, wondering, and mostly learning. I was able to see things in ways I had never seen them before. I was given the opportunity to see things through the eyes of students completely different from myself.

My classmates were of different ethnicities, from different countries, and of different socioeconomic backgrounds. I listened as other students in class described their life growing up. I was given the opportunity to hear how women were treated differently than men. I was able to have a small glimpse of how African Americans were treated differently than I was growing up. I had the opportunity to hear how Latin Americans were treated differently. With the group discussions we had on a regular basis, I was able to listen and absorb the different situations my other classmates encountered in their lives. For the first time, I really began to understand why different people look at different situations and react to them in different ways. I was able now to see how people could look at the same things I had seen my whole life and see them in a totally different perspective. This experience helped me when I began to teach, by reminding me that as Mintzes, Wandersee and Novak (1997), wrote “The alternative conceptions that students bring to formal science instruction cut across age, ability, gender, and cultural boundaries; and furthermore these ideas are often tenacious and resistant to extinction by conventional teaching strategies” (p. 410).

It was in Graduate school that I first heard the term Constructivism. We discussed this topic at great length and I realized that this is how I learn. Constructivism states that people learn by using prior knowledge to understand new material. This foundation of knowledge is started at an early age and is constantly expanded on as people encounter new people, places, obstacles, etc. As I sat in my classes with all of these new fascinating people and stories I could feel myself changing. Until this point, I lacked this part of my foundation of knowledge. The class discussions helped me by adding information I had never encountered into my knowledge base. I now honestly look at situations
differently now than I did entering graduate school. Every day we learn more and encounter new situations, but this first year of graduate studies was a major crash course in a total immersion of learning.

In graduate school I also realized that the teachers that I liked growing up and that I thought were good, effective teachers were teachers that used constructivism in their teaching. The reason that I liked these teachers was because they all used constructivism in some form or another. Some of my teachers used more aspects than others, but the consistent theme throughout all the teachers that I deemed effective was that they were all constructivist in some way.

**Analysis**

Going into college was difficult for me. I was very quickly forced to think on my own and for myself. Teachers were there to present facts and knowledge; it was my responsibility to make sense of it before the test. The classes that I found to be most productive were the lab classes where I could apply the information and construct meaning. While college was difficult, I adapted, learned, and passed my classes to graduate with a degree in Biological Sciences.

When I entered the graduate program of Science Education I was once again in for a major change of mindset. While in undergraduate classes I listened to the professor only, this was the only place that I was introduced to new material. In the graduate courses I learned that it was just as important to glean knowledge from everyone in the classroom so that all viewpoints and experiences could be used to assimilate and construct knowledge. Dealing with different ethnicities “different students perceived the learning environment differently, not because they erred in their descriptions, but because there are different learning environments within any classroom” (Tobin & Fraser, 1988, p. 23).

My first experience with teaching as a teaching assistant (TA) allowed me the opportunity to see for myself what teaching was all about. I found I loved
teaching because of the feeling I got when learning took place in my classroom. It was in my second semester of teaching that I knew that I wanted to become a teacher.

Early on, I was not always an effective teacher because I was more interested in being a friend to my students than interested in whether they were learning or thinking on their own. I was more interested in whether everyone got high grades, and therefore made the class easier than it should have been. All my students had to do was listen and regurgitate answers on a quiz. This was exactly the same type of ineffectiveness I talked about earlier. As I said earlier, “I did not have to think to get good grades in her class…. If I could regurgitate the answer I got an “A”. Very little thinking or conceptual development took place”. By my own criteria of judging ineffective teaching, my own practice in my own classes could be judged as ineffective. My priority was to be a friend to the students and to be well liked. Student learning became a secondary issue.

Before my second semester of teaching, I decided to change my teaching style so that more learning could take place. I overcompensated during this semester and went to the other extreme. I was unapproachable to my students because I was so focused on their learning; I didn’t feel any interaction was appropriate. This was also unsuccessful. I say, “At first I took this too far, I was not as social and I didn’t feel like I was interacting with the students. I realized that this was not working because we were not having any discussions in class. I was acting as though I was the most important person in the class and the students were below me. I isolated myself from the students by portraying myself as above them rather than as someone who was approachable to them.” It became evident that I had to keep student learning as my primary goal, but also had to make myself accessible to the students so that interaction could take place between us. I realized that:

The decisions about content and activity that teachers make, their interaction with students, the selection of assessments, the habits of the mind that teachers demonstrate and nurture among their students, and the attitudes conveyed wittingly and unwittingly all
affect the knowledge, understanding, abilities, and attitudes that students develop. (National Science Education Standards, 1996, p. 28)

During graduate school I was immersed in a different form of learning. Classes were based on student and teacher discussions. Everyone in the class learned, including the teacher. I was introduced to the term constructivism, and I realized that this term describes not only how I learned, but also how I wanted to teach. My models for teaching were the effective teachers from my past. “We each remember the great teachers who touched our lives, kindled our interest and pressed us to do our best. We hold powerful images of such teachers” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 5).

Assertion 2: The philosophy of Constructivism promotes effective teaching.

Aaron goes to Florida State to pursue a degree in Biology. He is met with huge lecture classes in which the professor presents information and it was up to the student to integrate that information with his previous knowledge. The more enjoyable aspect of learning in Aaron’s eyes was the lab where information was applied. He felt that the labs gave him an opportunity to take the knowledge presented in class and apply it. Anderson and Smith (1998), write, “successful teaching for conceptual change provides students with many opportunities to relate the scientific concepts they are studying to real-world phenomena through laboratory activities, demonstrations, audio-visual aids, and discussions of familiar phenomena” (p. 96).

When Aaron is given the opportunity to teach a lab class he has one objective to be perceived by his students as being “cool”, “During my first year teaching the lab I thought that the most important thing is to be considered the ‘cool’ teacher to have for this class.” Was this effective teaching? Aaron didn’t think so. He decided to change the way he was going to handle this class “students would no longer be given a free ride…they were going to have to find them (answers) on their own.”
Aaron liked the idea of teaching so he pursued a graduate degree in education. He is exposed to a teaching philosophy that he recognizes as being effective; “each learner must construct meaning for himself or herself – that the only learning that can take place is that which is connected to already-existing knowledge, experiences or conceptualizations” (Martin, 1997, p. 157). This philosophy is constructivism and he is determined to teach effectively using a constructivist approach.

Student Teaching

Student teaching is an experience I will never forget. Murphy and his laws followed me into Etowah High School. I did my student teaching under the tutelage of Mrs. Ann Brennan. The first two weeks of my teaching I sat and observed how things were done, this was a big switch going from teaching one class per day once a week to five classes per day, five times a week.

Ann was a great teacher. The first thing I noticed was how confident she was. It was not a confidence in that she knew everything, but more in that she knew she could find an answer to anything that was presented to her. She was in charge of the classroom and not the students. I had observed a lot of classes before where the students often ran the class, the teacher tried to corral everyone and keep things orderly, but no actual teaching or learning was taking place, it was more of a baby-sitting service. Ann’s class was nothing like this, the kids understood their role and Ann understood hers. The entire class structure was built on the interaction between teacher and students. The students had a constant barrage of questions and Ann had answers for almost all of them. Ann would present a topic to the class and they would discuss it. Everyone was given the opportunity to voice his or her questions and/or interpretations of the material ensuring that everyone had a firm grasp of the topic. I enjoyed watching Ann teach, but I knew it was going to be my turn soon enough.

I slowly started to take over the classes and began my own teaching. I was teaching three classes of College Preparatory (CP) Biology, and One Basic Biology (a lower level biology class). At first I was really nervous about teaching
because I was afraid to make a mistake. I was afraid the kids would ask a
question that I couldn’t answer. I knew that this was foolish of me to be nervous
about because there is no way I could know everything, but at the same time
there was a sense of pride in the fact that I had been to college for four years and
I should know the material. As time passed, I started to relax a little. When I
stopped worrying so much about knowing everything, I felt that I started to do a
better job of teaching. The kids started to become more comfortable as I was
there longer. At first they were a little uneasy with someone new coming in to
take over the class, so after we had spent some time together they started to
become more at ease, much the same way I had. I started to relax and joke
around with the class and really be myself, which really helped me interact with
the students.

I think one of the reasons I enjoyed watching Ann teach was because she
taught in a manner that I thought was conducive to learning. The students in her
class were active participants in learning and this was something I looked
forward to trying to accomplish in my teaching. Both of us were very dynamic in
our teaching styles and require a lot of feedback from the kids. A silent
classroom drove me crazy. I needed feedback from the class so that I could tell
where we needed to spend more time or what kinds of material we needed to
cover in more detail. This was a good way for me to see the misconceptions of
some students, while also showing the understanding of other students. It was a
surprise for me to see the students helping one another to build an
understanding. Students would interpret the material from different perspectives.
This would help the students who were having trouble understanding the
material. The students used metaphors and/or anecdotes from their own
experiences. By doing this, they helped eliminate misconceptions and made
connections between familiar situations.

Taking cues from the students, I started to use metaphors to relate new
material to topics they were already familiar with. I explained the parts of the cell
using a city as a model. Each cell part was like a distinct part of a city. The
nucleus for example was compared to the city hall where all decisions are made;
the cell membrane was compared to a fence around the city that kept certain things in while keeping other unwanted things out. By describing the cell as a city, the students could take something microscopic like a cell, and think about it on a large-scale model that they could relate to. I used an aquarium ecosystem to discuss Earth ecosystems with the classes. The Basic Biology class was responsible for designing and collecting specimens for the aquarium. By having an example inside the classroom, it gave the kids the opportunity to see a small-scale version of the big-picture.

Setting up the aquarium ecosystem was one of the cool things we did early in the semester. Ann and I, along with the help of our team-teacher, Michelle, took the Basic Biology class on a nature walk through the woods behind the school. On our nature walk we saw crayfish, fish, salamanders, all kinds of plants, bugs, and many other interesting creatures. Ann and I decided that it would be a great idea to have the class build an ecosystem using animals that could be collected from behind the school. I took four students and we began to hunt for critters. We ended up with three crayfish and one salamander. We had an empty aquarium in the classroom. We set up the aquarium to have both a land and a water area for animals. After we set up the aquarium we deposited our animals into their new home. Some of the kids contributed some small fish and we got a fire belly salamander to add to the aquarium. The kids loved it. They thought it was the neatest thing because they were given the opportunity to participate by catching the animals, and setting up the ecosystem. The students felt a sense of ownership over the aquarium and its contents. They were able to relate abstract concepts being presented to real-life situations that were occurring inside the aquarium ecosystem. The aquarium was a great teaching tool that I used to spark interest and discussion in many other topics we covered that semester. We discussed biological systems, photosynthesis, cellular respiration, survival of the fittest, and the nitrogen cycle. We used the animals and the plants to talk about how they interacted with one another and how they benefited or harmed the ecosystem. We used the plants and animals in the aquarium when we discussed photosynthesis and cellular respiration. We
discussed how the two topics were related. Photosynthesis and cellular respiration work in a cycle. The products of photosynthesis are the raw materials for cellular respiration while the products of cellular respiration are the raw materials for photosynthesis. The students were able to understand this complex cycle using the aquarium as an example. We discussed survival of the fittest using the crayfish. We started with three crayfish, and every week or so one of the crayfish disappeared. Three weeks later there was one very large, very well fed crayfish left. The aquarium was a very useful tool that I used quite frequently, and planned to use in the future.

Another tool I used to facilitate student learning was the computer. In the CP Biology classes I used the computer during a lecture on DNA and it was awesome. The students were engaged and stimulated to ask questions. I was given a series of CD-rom discs that were produced by a company called CyberEd. These discs covered almost every topic we were discussing in class. If students were having trouble with material, these would be very helpful presenting the material from another perspective. I decided that I was going to use one to supplement a lecture. This would get the students acquainted with them and maybe they would try to use them on their own. I used a product called an AverKey, which allowed me to hook the computer monitor to a regular television monitor. This would allow me to show the CD like a video, but I could control the rate at which it was being presented. I prepared an outline for the students so that while the CD was running they could follow along. I explained to them that the presentation was going to supplement their lecture and that they needed to take notes. The students really seemed to get into this. It was like watching a movie, which they all love, but at the same time they were actually learning. I could control the rate at which the CD progressed, so we stopped often and discussed what the CD was saying and the material that was being presented. The students were able to ask questions and add comments whenever they wanted to. We could reverse and go back over a section if the class felt they needed review. This was a very good lecture format for the students, the kids got involved and I really had fun presenting the material in this
manner. I remember thinking that this is something that I would be doing more often.

Teaching was going well; I remember I felt as though I was getting better as time went on. I learned to tell if the class was engaged. If the students were engaged, I could look at them and read their expressions. If the students were alert and had their eyes and ears focused on the class discussion, I knew they were engaged with the topic at hand. If some of class had glazed over eyes, or had their heads buried in their book, I knew it was time to try and refocus and get everybody back on track. Other than expression, I could tell by the amount of class interaction whether the students were interested. When the students were motivated and focused on a topic the questions would come at a pretty fast rate. If the students were not interested in the topic the questions would be considerably less. The questions themselves also helped me to tell how involved the students were. When students were involved, the questions would discuss the topic, they would ask for explanation, or they would relate the topic to other familiar concepts. The students might ask how cellular respiration is related to breathing. The connections being made gave the students the ability to ask types of questions that ensured me that they were learning.

As I said earlier, anything and everything that could happen during my student teaching did happen. The first thing happened about six weeks into the first semester. I had a student, who I will call Mike, get arrested for first-degree murder. Mike was in my first period CP Biology class. He was the kid who came to class everyday to get an extra hour of sleep. My first parent/teacher conference was with Mike’s parents. I found out Mike was home a lot by himself because mom and dad were divorced. He lived with his mother. Mike’s mother was an art dealer and was constantly out of town on business. Mike had plenty of time at home to do whatever he wanted to do.

One day in class, Ann and I noticed that Mike had packets of mustard that he was rubbing back and forth on the corner of the desk. They made a squishing sound that Mike thought was the funniest thing he had ever heard. I took the packets away from Mike so he would not be a disturbance to the class, and I
didn’t think anything more about it. That night I heard on the radio that a student from E.T. Booth Middle School, the middle school next to us, was in a coma after being hit in the back of the head by a student from Etowah High School as he got down from the bus. Middle school and high school students ride the same bus. I wondered who the student from Etowah was. The next morning when I got to school, Ann asked me if I had heard the news? She told me about what they had said on the news; it seemed that the fight had started because the high school student was throwing mustard packets at the middle school student. As soon as she said this I knew exactly who it was, Mike. As is always the case, the kids knew before anyone else, and came into school that morning talking up a storm. It is amazing how quickly information can spread through a school from student to student. It spreads like wildfire. Unfortunately the whole story is rarely passed along with the gossip. Ann and I decided that it was probably a good idea to talk with our first period class about the situation. There were no names released as of yet, and as we didn’t know the whole story, we let the kids do most of the talking. We tried to eliminate any of the false rumors that were being circulated.

Unfortunately, the young man that was in the coma did not recover, he died shortly thereafter, and Mike was arrested and charged with first-degree murder. It was a major ordeal; we had no less than three major news vans at the school on a regular basis. Mike was charged as an adult and is now in the hands of the state.

The second major occurrence happened in the last month of my student teaching. One morning as I was sitting in the teacher’s lounge during my planning period, I noticed that there was a lot of commotion coming from the gymnasium. Suddenly a teacher came into the lounge and started saying that the students had told her “he was dead, he just died.” Of course I had no idea what happened, but I wanted to find out, so I made my way to the gym. When I got there, every administrator was already there along with the paramedics and an ambulance. As I walked up, one of the administrators saw me and blocked me from seeing into the gym. He just kept saying, “he’s gone, he’s already gone”, “Who” I asked, and that is when they told me it was the wrestling coach
who had become my friend. I had been coaching wrestling with him for the six weeks. I was the assistant wrestling coach. He had a massive heart attack while playing basketball with his P.E. class and had collapsed in the middle of the gym. I was numb, kids kept coming up to me asking questions, and I couldn’t even think straight. With the help of an administrator, a special meeting was called for the wrestling team and we told them what had happened. Most of the kids already knew but some hadn’t gotten the word yet. The school was a very somber place for a couple of days.

It is a good thing these types of events do not normally happen. I don’t know if I could handle many more semesters like that. And these were only the highlights; we had fire alarms that would go off for two to three hours straight, we had flooding in the science building, we had the main power line cut to the building, and more. The school was under construction to enlarge it and many of these inconveniences were a direct result of construction blunders.

During my first semester I was active in some extracurricular activities away from Etowah. Every home game the Seminoles had I was in Tallahassee. A four and a half hour trip was nothing once every two weeks. I was staying up much too late on Sunday nights trying to finish any paperwork that had to be done before school started again on Monday. This culminated many a weekend.

In addition to the being an assistant coach for the wrestling team, I was also involved with the girl’s fast-pitch softball team at Etowah. We practiced every day from 3:30 until 5:30, and on some days we had games that didn’t start until 7:00. I loved coaching because it was an outlet for me. Sports have always been my outlet, if I’m feeling stressed I go to the driving range and hit golf balls or to the batting cage and hit baseballs. Coaching had the same effect; I could go and be with the kids for a couple of hours and it felt like a weight had been lifted from my shoulders. Of course as soon as I got home and realized how much work I had to do, that weight was put back on, sometimes with a little extra.

Time management was a major issue I had to work on during my student teaching. It was obvious to the kids and especially to me that when I had prepared adequately for class, the lecture went well, and when I had not; I felt
like a deer in headlights. I would sit down at night, usually the night before the lecture, due to time restraints, and write notes using the teacher’s edition book that was given to me. These notes would be the major portion of the lecture; they came directly from the same book the students were using. I would try to incorporate other information, usually trying to find things that the students would find interesting or relevant, from other books. At first it was easy to do this, but as the semester went on the amount of work kept building and building. In the beginning of the semester I was really on the ball, my lectures were well prepared. I knew the material, but I was uneasy with presenting it. I did not have confidence in myself and it showed. The kids would not ask questions, they would just sit there and stare aimlessly at me. As the semester continued, I gained more confidence. I began to understand that there was no reason to be afraid, if the kids asked a question I didn’t know, all I had to do was tell them I would find out for them. The most important thing I learned is you do need to follow up on the questions, not just say you will, because the kids will come back and ask you again and again until you find the answer. As I said earlier, as the semester continued, work started to build up. I was now taking over all the responsibilities of the classroom. This included taking roll, filling out attendance reports, taking care of discipline referrals, filling out progress reports, calculating grades, attending parent/teacher conferences, attending IEP (Individual Educational Programs) meetings, calling parents, locating materials, and setting up and cleaning up labs. At the same time I was still grading papers, preparing lectures, planning lessons, and entering grades in the computer. It seemed like so much going on five hours sleep.

Dr. Weinburgh was assigned to observe me during my student teaching. Dr. Weinburgh is a professor at Georgia State University involved with their education program. Once every 4 weeks or so, Dr. Weinburgh would come to Etowah and observe me for a class or two. Afterwards, we would sit down and discuss what she thought of my teaching and how things were going. These talks helped me a lot. Dr. Weinburgh was always very positive with her feedback, and she always had a smile and lots of energy. She would tell me
what things I needed to work on and then the next time she came to observe me she would say whether or not I had done a good job of improving, or whether I needed more work.

I was also keeping a steady dialogue with the other student teachers from Florida State. As a class we would post messages on the Internet regularly. We would talk about how things were going, what kinds of problems we were having, what was working, or what kinds of things were going on at school. Everyone anticipated my postings, as they wanted to know what was happening at Etowah. We had several discussions on how the unusual situations that I encountered could have been handled.

Being alone in Georgia was difficult at times. I think that I could have used the opportunity to talk face-to-face with some of the other student teachers just to know what kinds of things they were doing. I also know that being in Georgia helped me, because it made me focus. Once I left Tallahassee, I left the college life with it. Being alone in Georgia without other student teachers my age allowed me to be totally focused on the task at hand.

I decided to stay around the next semester and substitute while I was looking for a teaching job. The environment at Etowah was great and I knew that Etowah was going to have some teachers retiring so it would probably be a good spot to look for a job. I really enjoyed the faculty at Etowah and had a positive relationship with everyone there. I felt that the staff respected my opinions and gave me fair opportunity to express my views. I knew that Ann was happy with how I did as a teacher, but I didn’t know how any of the administrators felt about a 22-year-old kid coming on staff. I felt that if I did a semester of substituting, it would keep my face visible to the administrators, and I also needed the money.

Substituting went well and I stayed busy. I usually worked at least four days a week. I already knew some of the kids and the routines of the school, so substituting wasn’t a big deal. On the other hand, I had previously not had the chance to go to different teacher’s rooms to see how other teachers in other subjects taught. One thing that would drive me nuts when I was substituting was a teacher that wouldn’t leave any work for their kids to do. I knew that when I
started teaching I would make sure that if I had a substitute, I would have more than enough work for my students. There is nothing worse than baby-sitting 28 kids who have been told by their teacher that they don’t have to do anything but sit in their seats and talk.

During this spring semester I also had the chance to do something I had always wanted to do, coach baseball. I was an assistant coach on the freshman baseball team. Coaching was really easy this semester because I didn’t have any lesson plans to write and I had no papers to grade.

All summer long I waited for the phone call saying that I had a job at Etowah in the fall. I had been told by everyone; teachers, administrators, other coaches, that I would be hired, but until I signed the contract I was still worrying. I finally got the call the week before school started saying that I needed to come by and sign the paperwork so that I could be put on staff for the upcoming school year.

Analysis

Student teaching gave me the opportunity to implement my beliefs about student learning. This task was made easier with the help of Ann Brennan. Having the ability to work with such an effective, strong teacher that also used constructivism in her practice helped me be successful. “…Successful teachers must have the opportunity to work with colleagues to discuss, share, and increase their knowledge. They are also more likely to succeed if the fundamental beliefs about students and about learning are shared across their school community in all learning domains” (National Science Education Standards, 1996, p. 37).

I chose to emulate Ann’s teaching style when I began to take over her classes. I used feedback from the students in the classroom to help me figure out how fast we should move or whether or not we needed to slow down and spend more time on a topic. I took cues not only from student questions but also by observing student actions. “Successful teachers are skilled observers of
students as well as knowledgeable about science and how it is learned” (National Science Education Standards, 1996, p. 33).

The students also contributed to the learning environment. I noticed that when they would ask questions they often formed analogies with things they were familiar with. Using this feedback from the class, I started to present concepts by relating them to things they are familiar with. I had very good results when I started using these analogies more extensively in my teaching. The cell became a city, an aquarium became the Earth, and any other difficult concept was transformed into a concept that the students already understood and thus, they could use it to relate to the more complex, abstract concepts. According to the National Science Education Standards (1996), teaching standard A: effective teachers “select science content and adapt and design curricula to meet the interests, knowledge, understanding, abilities, and experiences of students” (p. 30).

During my teaching I used technology in presenting complex topics such as DNA, for the first time. I used tools such as computers, AverKey, CyberEd, and others that the students were more accustomed to seeing and using in their world. This really helped focus the students and it allowed them to see and hear information being presented in a manner different from what they were normally used to. As more complex topics are addressed, students cannot always return to the basic phenomena for every conceptual understanding. “Other teaching strategies rely on teachers, texts, and secondary sources – such as video, film, and computer simulations” (National Science Education Standards, 1996, p. 31).

Assertion 3: Effective teaching deals with areas outside the curriculum

One part of student teaching that draws attention in Aaron’s “story” is the distractions that occur during the normal school year. He mentions many distractions during his initial teaching experience. Some had to be dealt with in the classroom. He is finding out that some of an educator’s responsibilities lie outside of the curriculum he learned in college, and fall into a category of “unwritten curriculum” (Wren, 1999, p. 593).
Aaron had two extreme situations that required dealing with the aforementioned “unwritten curriculum”. The first experience was with the student who was accused and later found guilty of murder. Aaron’s next experience was dealing with the death of a friend who was also a beloved wrestling coach with whom he shared coaching responsibilities. These situations are a part of teaching that cannot be covered in an education class; they can only be dealt with and learned from on a case-by-case situation. “…Teaching is work of the most demanding sort, for teachers must make dozens of decisions daily, command a wide body of knowledge and skill, learn to react instantly, and be disposed to act wisely in difficult situations” (NBPTS, What Teachers Should Know and Be Able to Do, 2002, p. 5). Aaron could not avoid confronting these situations in the classroom. In doing so he had to diplomatically deal with adolescent emotions and model ethical and responsible behavior. Even though both of these are extreme situations, he also mentions the more usual distractions, such as power outages, that also give opportunities for dealing with unique situations. Students see how teachers deal with these types of distractions and model their behavior on the teachers.

Students experience an ‘unwritten curriculum’ characterized by informality and lack of conscious planning. In fact, “all students must internalize a specific program of social norms for training in order to function effectively as members of a smaller society, the school, and later on as productive citizens of the larger American society” (Wren, 1999). Thus, teachers’ interactions with students help shape attitudes and ideals (Henry, 1955). (Wren, 1999, p. 594)

**Etowah**

My first year teaching I was assigned four CP Biology classes, and one Basic Biology class. I thought the first semester would be no problem. I had a lot more confidence. I knew that this was now my classroom. I had already done it once, and still had most of my notes from my student teaching. I also knew
that there was no way I was going to have the same kinds of unusual occurrences that I had during my student teaching. Teaching was going smoothly except I forgot one thing. I had to make all new quizzes and tests. During my student teaching, I used many of Ann’s tests and quizzes as a basis for my own. Now I was making my own tests and quizzes. To me this was harder than preparing for class discussions. Making tests and quizzes took some skill and lots of time. I always had trouble predicting how my students would do on the tests or quizzes. If I gave them a test I thought would be too easy they would get low grades on it. If I gave them a test I thought would be too hard they would get high grades on it. I couldn’t understand why this was happening. Later during the semester, I figured out some of it, my students were very good at memorization, just as I was in school. If I gave a quiz or a test that dealt with memorization, the students would do well, if I gave a test or quiz that dealt with using the information, the scores were not as high because they were not accustomed to thinking in this manner. As soon as I figured this out I tried to make tests that did a better job of combining the two aspects, both knowledge and the usage thereof. The students always found humor in my tests, usually because I had written the exact same question twice, or I had left an answer in bold, or one of my personal favorites, I was very good at skipping numbers or writing numbers more than once. I would explain to them how hard it was to type a test at 2:00 in the morning, and they would just roll their eyes in disbelief.

I used the same teaching methods that I had during my student teaching. Classes were based on class discussion and student learning. During my student teaching, if I encountered any problems, Ann was there to make suggestions. Now I was on my own and did not have this crutch at my side. I still talked to Ann on a daily basis, but it was not as convenient as being able to ask questions during class.

I tried to do as many labs or activities as I could. The labs allowed the students to apply the material being presented in class. Labs were the way I learned best, teaching a lab class was what attracted me to teaching. In my student teaching, I was told what labs were available. Now in my own class I
was able to do whatever labs I thought the students would enjoy and learn the most from. The problem I faced with labs was students were accustomed to being fed answers and not having to think on their own. They wanted me to give them the answers. They were not accustomed to applying knowledge they already possessed to make connections with questions that seemed difficult. I had to convince the students that the labs should be approached the same way they approached the class discussions. The students had to make connections using what they already knew to solve the problems at hand.

My first year teaching came to a close and what a relief I felt. I felt as though I was as free as the kids were. When the bell rang letting everybody out for the last day, I wanted to run along with the students. It was too bad I had to come back for post planning.

Second Year Teaching

My second year of teaching, I was assigned basically the same classes I had during my first year. I had one Basic Biology class and four CP Biology classes. I again thought this would be an easy semester. I had all of the notes, and this time I had all of the quizzes and tests already made. The problem I found was that students from class to class do not learn in the same way. Some of my classes were moving fast, while some of the classes were moving slow. It was mind boggling to me. How could classes be so different? How could I be assured that all students were learning in all classes? The class itself was the determining factor. In the past, I had presented all material according to how I thought it should be presented. Now I had to be more flexible when presenting the material. What works in one class may not work in the next, they may require different approaches to accomplish the same goal.

Second semester of my second year I encountered some new experiences. I was awarded the opportunity to teach an Anatomy/Physiology class. I was very excited about this because it was supposed to be an upper level elective class (mainly juniors and seniors). Unfortunately many of the students were there because they failed Chemistry and this was now their
required third unit of science. I thought that I would have the opportunity to do lots of higher level thinking projects with these students. The problem was, about the half the class was unwilling to participate in higher-level activities. This was your classic “slacker” class. Many of the students were there for a free ride, and didn’t have any desire to learn any of the material as long as they knew enough to pass. I became very frustrated with this class. I wanted to do things that I thought would be fun and stimulate their learning, but as a class we had trouble sitting through basic notes. Average test scores were rarely above passing and quiz grades were often lower.

I will begin my third year of teaching next month. I am going to be teaching, three CP Biology, one Anatomy & Physiology, and one Physical Science. I am a little bit apprehensive heading into this year, as I will have two new preps that I will have to take on. This year with the addition of End Of Course Testing (EOCT) all new pressures will be emerging. It will be like my first year all over again, preparation wise. I am also very excited about this year as the students that are moving up and the incoming new students are supposed to be a great group of kids. I am also steadily infusing the use of more and more technology in the classroom. In my journey toward effective teaching I am constantly reaping the benefits of new technology being awarded to me. I now have a LCD monitor permanently attached to my ceiling that I can plug my laptop directly into and run PowerPoint lectures from anywhere in the room with the help of my cordless mouse. Wish me luck.

Analysis

I now move on to my first year of teaching. I now face the same problems without the support of my teaching supervisor. I face the responsibility of assessing and assigning grades, which becomes a conundrum. Would monitoring classroom discussion be sufficient to recognize understanding? Intellectually I know that as stated in the NBPTS Standards, “assessment and the daily flow of instructional activity are difficult to separate or distinguish from one another. Assessment takes place before, during, and after instruction and
interacts with it " (NBPTS, Adolescence and Young Adulthood Science, STANDARDS, 2003, p. 45). Am I able to assess understanding through multiple methods, including student participation, written work, tests and quizzes?

Having to make my own tests and quizzes became a challenge and a chore. I struggled with the aspect of at what level of Bloom’s Taxonomy do I need to test? I also needed to know if the basic concepts were understood. Did I want to use a standard multiple-choice test or did I want to use an essay/short-answer test? Was a test the only way to evaluate progress? Did I want to test for content knowledge or for understanding and application? I realized that each was important and that each had to be tested in order to evaluate student progress and thus, the effectiveness of my teaching. If students did not know the basic concepts of the material being tested, they would have no chance of application of the concept.

To learn science with understanding, students generate a model or an explanation that organizes information into a coherent structure, and that relates the information to their knowledge and experience. Comprehension of science information involves building two types of relations, (i) among the parts of the new information; and (ii) between the new information and the learner’s knowledge and experience. (Fensham, Gunstone, & White, 1994, p. 33)

Am I capable of helping students to build that connection? If the students didn’t memorize the vocabulary, they could not understand the questions. The easier form of testing was the memorization form, but this didn’t show the student’s comprehension and synthesis of the material. When I changed the form of my tests and teaching style from memorization to comprehension, the students resisted and tested poorly. The students were accustomed to being fed information and then having to regurgitate it to receive favorable grades. Many students had never been tested for comprehension of material; they had only been tested for memorization (Tobin & Gallagher, 1987, p. 550). I understood the student’s frustration as I had felt the same feelings when I was a student in school. I talk about my frustrations when I write about my gifted English class, “I
tried but I just wasn’t making the connections that she wanted, but she kept trying to get me to reach deeper or try harder.”

During my student teaching I had a lot of support inside the classroom in the form of resources borrowed from Ann. I didn’t realize how much time was involved in preparing activities, labs, tests and quizzes because Ann and I had worked together on these. Now I was on my own and the responsibility was all mine. Ann and the other teachers were available for help and generous with their resources, but ultimately it was all on me.

Time became an issue. There was so much to do and so little time to do it in. My entire life needed to be focused on the teaching. This is exemplified with test writing. “The students always found humor in my tests, usually because I had written the exact same question twice, or I had left an answer in bold, or one of my personal favorites, I was very good at skipping numbers or writing numbers more than once. I would explain to them how hard it was to type a test at 2:00 in the morning, and they would just roll their eyes in disbelief.”

Assertion 4: Effective teaching is time consuming and difficult.

Aaron’s internship at Etowah High School was his introduction to putting his philosophy to work. He found that although he knew intellectually what he had to do, putting his philosophy into practice was not so easy. “Discipline specific pedagogical knowledge and pedagogical knowledge together are seen as crucial ingredients of successful teaching. Neither is sufficient alone, and each is required if students are to attain the elusive goal of learning high-level cognitive science outcomes (Tobin & Fraser, 1988, p. 18). His supervising teacher, Ann, modeled his vision of an effective classroom. Rogers (1988) states, preservice and in-service teachers must be exposed to teachers and educational settings in which these characteristics are practiced and valued (p. 72). Aaron echoes this idea when he says, “one of the reasons I enjoyed watching Ann teach is that we taught in the same manner.” He learned to take cues from the students about how successful he was in holding their attention,
To teach well, one must learn to see with all of one’s senses…To teach, teachers must know the people who populate their world in and out of schools. Such knowing depends on one’s ability to see and understand the subtle cues and signals given by children, colleagues, and others with whom one comes in contact both in and out of school settings. (Rogers, 1988, p. 70)

He used analogies to situations the students could relate to. For example, the use of the aquarium to represent ecosystems, then using the inhabitants of that ecosystem to discuss topics such as, photosynthesis, cellular respiration, and parts of the cells.

What is also needed is knowledge of the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations-in a word, the ways of representing and formulating the subject that make it comprehensible to others” (Shulman, 1986, p. 9).

Aaron used multiple methods of presenting information to accommodate varying abilities (Pinar et. al., 1995, p. 749). As Fensham, Gunstone, and White (1994) state, “teaching involves judgments about how much and what form of guidance is best for any topic and any group of learners, and when to provide it” (p. 6). He was utilizing the philosophy of Constructivism, but he still didn’t feel as though he was reaching all his students. Aaron felt that he had islands of success in oceans of mediocrity. He felt overwhelmed by time constraints. Preparation was hard work and time consuming. Aaron’s own assessment of his student teaching was that he had improved throughout the semester, but he still had far to go to consider himself an effective teacher.

Conclusions
The purpose of this research is to answer two questions:

• What is an effective teacher?
• Is Aaron becoming an effective teacher?
The autobiography is a compelling story of teaching and learning. It starts with Aaron's own experiences with learning. He describes his memories of teachers from elementary school through high school. He catalogues each described teacher as being effective or ineffective. Although there are several examples of effective teaching, each teacher had their own style. The definition forms from the outcome of the teaching rather than the teaching itself. That outcome is reflected in Assertion 1: Effective teaching promote student learning.

The journey continues through his undergraduate and graduate school years at FSU. Here he becomes enamored with teaching as a career and we follow his path to fulfilling that pursuit. Aaron's first experience with teaching defines his goal of becoming as effective teacher. He experiments with different styles and finds that he requires interactivity with his students. He still does not have a clear vision of himself as an effective teacher. Graduate school helps him define effective teaching from a philosophical and academic viewpoint (Assertion 2) but it isn't until his student teaching internship that he has a vision of effective teaching. He finds that he can fit himself into that vision but that teaching extends beyond the academics. This leads to Assertion 3: Effective teaching deals with areas outside the curriculum. Along with the many common distractions that happen during a school day, Aaron is faced with two frightfully uncommon events. A student is accused and found guilty of murder and the unexpected death of a colleague and friend. In both cases he is closely involved. First as the teacher who must make some sense of the murder to the other students and next as the assistant coach to athletes who have lost a beloved coach.

The journey continues to Aaron's first years of teaching. He has a vision and is working towards fitting into that vision. He finds that there are many practical aspects of becoming an effective teacher. Assessment becomes an obstacle. He is torn between ways of assessment and the value of each. He finds that what works with one class may not be appropriate for another. He finds that there is never enough time. These concerns are reflected in Assertion 4: Effective teaching is time consuming and difficult.
Has the second research question been answered? The NBPTS states in the NBPTS, Adolescence and Young Adulthood Science, PORTFOLIO (2003), “Thinking analytically about teaching is complicated because teaching itself is complicated” (p. 13). It is important to note that Aaron is now beginning to use the standards set forth by the NBPTS to determine if he is becoming an effective teachers. The standards set forth by the NBPTS are seen as standards for all effective teachers. These are the same standards that Aaron is focusing on trying to obtain and master. Aaron’s journey does not seem to be at an end, but perhaps the journey is the goal.
CHAPTER 5

CONCLUSIONS

The purpose of this study was to examine and understand my own teaching through a self–reflective autobiography. The study documents one teacher’s journey toward effective teaching. I am that teacher. Before the actual journey begins effective teaching must be defined from my own perspective using my own experiences as a learner. With this vision of effective teaching the journey toward effective teaching begins. I discover constructivism and use it as the paradigm to reach my goal. The reflection and the introspection that the study requires allows me to analyze in depth my own practice and philosophy. The results have been revealing and enlightening.

I began this project in 1998. My goal was to use an autobiographical approach to tell a story. The story was to show how I have evolved as a teacher becoming more effective as I integrated constructivist methods into my teaching repertoire. For one reason or another, the completion of the paper has been postponed annually. The project has proven to be much more difficult than I first anticipated. The initial difficulty found was determining what autobiographical aspects were relevant to becoming an effective teacher. Using an autobiography, could I answer questions such as: What is an effective teacher? When had I encountered effective teaching? Why were those teachers effective? Was I an effective teacher? What did I need to change to become an effective teacher? Can anyone ever be completely effective? The paper has evolved into a thoughtful, comprehensive work. I wrote as I would a story, attempting to paint a picture of myself through vignettes and descriptions. With the autobiography written the next task was to analyze the research. It was a complicated task separating my emotional self from my analytical self. This was accomplished by changing from the first person autobiography and reflection to the third person.
analysis, thereby distancing the storyteller from the researcher. This became both an enlightening and humiliating task.

*Implication:* The research itself has become part of the process of change. The autobiographical context and analysis is self-reflective.

This research was focused on becoming a better teacher using constructivism as a referent. The methodology is self-reflection through autobiography. The story follows the evolution of a naïve constructivist to a more mature constructivist. This is a story of teacher change. The naïve constructivist sees the philosophy as a method. He is confident and eager to pioneer the teaching revolution, but he is not having the success that he expects. Aaron is given guidance from his supervising teacher to use alternatives in his teaching. He gains confidence over time and is able to manipulate available methods and devise new ones that enable him to strive towards becoming a more effective teacher.

Is the process of change complete? Definitely not! I have learned from the research that while I have become more effective, the idea of being completely effective in all aspects of teaching is a never-ending journey. It is the responsibility of all teachers to try to pursue this unending journey. Continually analyzing yourself and your practice while fine-tuning the parts that need to be improved can only make you a more effective teacher. “Teachers need also to be aware of themselves as learners, and that their constructions of meaning for these are never complete” (Fensham, Gunstone, & White, 1994, pg. 7).

The NBPTS, *What Teachers Should Know and Be Able to Do* (2002), has enumerated the fundamental requirements of effective teaching:

The fundamental requirements for proficient teaching are relatively clear; a broad grounding in the liberal arts and sciences; knowledge of the subject to be taught, of the skills to be developed, and the curricular arrangements and materials that organize and embody that content; knowledge of the general and subject-specific methods for teaching and for evaluating student learning;
knowledge of students and human development; skills in effectively teaching students from racially, ethnically, and socioeconomically diverse backgrounds; and the skills, capacities and dispositions to employ such knowledge wisely in the interest of the students. (p. 2)

Interestingly they continue,

This enumeration suggests the broad base for expertise in teaching but conceals the complexities, uncertainties and dilemmas of the work. The formal knowledge teachers rely on accumulates steadily, yet provides insufficient guidance in many situations. Teaching ultimately requires judgment, improvisation, and conversation about the means and ends. Human qualities, expert knowledge and skill, and professional commitment together compose excellence in this craft. (p. 2)

It is my hope that my research provides and contributes to conversation about excellence in this craft.

Interestingly enough, a change has recently occurred at Etowah High School. A new principal has been assigned to Etowah who is a strong proponent of constructivist teaching. This is the antithesis of the past administration. This has been a major wake up call for the students and staff of Etowah. Teachers are now required to continually improve and revamp their teaching styles. With these demands it is this new principal that has allowed myself to employ all the great new technology that has helped bridge the gap between my students and myself.

Students who were comfortable with the old teaching methods used by some teachers are now being forced to step up their own thinking and learning. The students are being challenged to think. It will take a few semesters before the students are comfortable. I find the changes to these new ideals very comforting. This is exactly what I am trying to accomplish in my classroom.
REFERENCES


BIOGRAPHICAL SKETCH

Aaron Newton was born September 11, 1975 in Gardner, Kansas. He graduated from Olathe South High School in 1993. Aaron graduated from Florida State University in 1997 with a BS in Biological Sciences. Aaron is currently teaching Biology and Anatomy at Etowah High School. Etowah is located in Woodstock, Georgia. He is currently in his 6th year of teaching.