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AUTHENTIC INSTRUCTION: A COMPARATIVE CASE STUDY OF THREE URBAN HIGH SCHOOLS

A Dissertation APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

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ABSTRACT

Research demonstrates that authentic instruction is an effective form of teaching and raising student achievement. The purpose of this study was to examine five high school math or science teachers who had a high interest in learning and/or using authentic teaching in their classroom settings. In addition, the researcher sought to discover what practices helped them become more successful users of authentic instruction and what barriers hindered their use of authentic instruction.

All five of these teachers were part of the National Science Foundation (NSF) sponsored (grant #0086415) Authentic Teaching Alliance (ATA) which involved public school teachers, graduate and advanced undergraduate fellows, and university faculty at the University of Oklahoma. The secondary school math and science teachers who were part of ATA and the fellows worked together to create and implement authentic tasks in their classrooms on a regular basis.

The three settings in this study were a traditional high school, an alternative school for parenting teens, and a public charter high school. Each school was located in a large urban school district and contained a large population of lower socioeconomic level students. The schools were chosen for this study based on their participation in ATA and contrast of size and organizational structure. Each classroom was qualitatively studied, through observations of instruction, interviews with teachers, fellows, and administrators, and examination of journals written by fellows.

Findings included that a quality teacher in every classroom was more essential than the school setting. However, some elements of school setting were also seen as positively influencing an authentic climate, such as smaller schools, smaller class sizes,

and planning periods at the same time for departments to allow for more collaborative planning. In addition, professional development, a professional learning community, and lesson study were suggestions that, if put in place effectively, could have enhanced and built on authentic instruction in a school.

It was the intent of this researcher that the study's findings be used:

a. for other teachers in similar settings;
b. to see what worked in different classroom environments and with different teachers;
c. to examine the impact of the university-school partnership (ATA) in its first two years.

Ultimately, the goal was to see how authentic instruction, if at all, benefited student learning in different environments, if it worked the same in contrasting environments, and how teachers were overcoming barriers and effectively implementing authentic instruction.

DEDICATION

This work is dedicated to my loving and supportive family. First, to my daughter, Callie Claire Dennis, and my nephews, Benjamin and Nicholas Johnson, who were two and three at the time this project was finished. I wish for them the best education and teachers our schools can offer; they are special children and deserving of the knowledge and freedom that come from the gift of learning. May they learn the value of education and always seek to learn more.

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CHAPTER 1

Introduction to the Study

Statement of the Problem

Authentic pedagogy is one piece of an education reform movement that has been sweeping the country since A Nation at Risk was published in 1983 by the National Commission on Excellence in Education. This report, while widely criticized and debated, told of a public school system in need of a complete overhaul and sparked the movement of change in education across the country (Furst, 1997). Authentic pedagogy is the combination of instruction and assessment that is designed to bolster student achievement through lessons which are taught at a higher intellectual level and that contain information and skills that are of value beyond school (Newmann and Associates, 1996).

If teachers, students, or just about any layperson were asked what they thought students should be learning in school—their answer would most likely include a belief about school being meaningful and relevant to society, or "the real world." All too often, in today's schools and in our official curriculum guides, meaningful, in-depth understanding, and applications to the world beyond school are not being taught to achieve intellectual quality, which is the essence of authentic pedagogy. Rather, student learning is often based on rote memorization of useless facts, skills taught in isolation that students are unable to apply to their daily living, or meaningless trivia that has no value outside of school (Marx, Blumenfeld, and Krajcik, 1997; Newmann, 1991; Onosko, 1990).

Authentic pedagogy, rooted in constructivism (Newmann, Marks, and Gamoran, 1996), is not new, but it is a "buzz word" in the educational realm. However, while it, and similar alternative approaches are often discussed, they are not often practiced in the classroom (Roelofs and Terwel, 1999). The definition to follow describes components of teaching that most would agree with, but the practice does not seem to be growing at a rapid rate. Authentic achievement consists of three criteria: construction of knowledge, disciplined inquiry, and learning that is of value beyond school (Newmann and Associates, 1996). Construction of knowledge involves students producing original work, such as through writing or art. In a traditional setting, students are mainly asked to reproduce the knowledge they gain, such as demonstration of memorization of facts on a multiple choice or matching test. Disciplined inquiry involves students using their prior knowledge in an attempt to understand on a deeper level, rather than a superficial level. Value beyond school is exactly what it states—students should be able to use the knowledge and processes that they learn at school in other aspects of their lives.

The three components of authentic achievement may seem like a repeat of constructivism, but they actually take the constructivism methodology and extend it. Newmann (1996) noted the differences in the following passage:

> …authentic intellectual achievement requires 'construction' to reach beyond retrieval and imitation of knowledge previously produced by the self or others. Authentic construction of knowledge involves application, manipulation, interpretation, or analysis of prior knowledge to solve a problem that cannot be solved simply by routine retrieval or reproduction. (p. 286)

While constructivism includes construction of knowledge by integrating it with prior experiences and making learning relevant and practical, it has not included the depth of knowledge and the appropriateness and significance of knowledge that are critical to the authentic pedagogy standards (Newmann et al., 1996). The studies reviewed in chapter two are from both constructivism and the authentic pedagogy genre. While they do differ, their core beliefs are the same and their similarities outweigh their differences.

Authentic pedagogy is an overwhelming undertaking and shift in style for teachers and schools, especially for those still using traditional approaches. It has been noted that instruction that emphasizes meaning and understanding is demanding on teachers and not all teachers are willing to use these practices (Knapp et al., 1992). However, its effectiveness in improving student achievement has been shown in numerous studies (Brendefur, 1999; D'Agostino, 1996; Newmann and Associates, 1996; Onosko, 1990; Petrella, 2000). It is also known that authentic pedagogy is not easily implemented; higher-order thinking skills and connecting material to the outside world have been noted as two of the more difficult components to emphasize when using this method (D'Agostino, 1996).

As cited in the previous paragraph, research has already established that authentic pedagogy can improve student achievement, but that it is difficult for teachers to implement. Therefore, this study focused on teachers who were using the practice and issues surrounding its implementation in classrooms, rather than validating the practice itself. It examined the current use of authentic instruction, if the authentic pedagogy standards were being met, the level of support given from school administrators, and if the school setting had an impact on its success or failure. Information was needed about

the successes of authentic pedagogy, as well as its shortcomings from observing its use in actual classrooms. In addition, an attempt was made to determine where this method worked best and what level of support was needed for the program to be successful.

Background of the Problem

Authentic achievement is a relatively new term, which is used in Fred Newmann's (1996) work and is the title of one of his books: Authentic Achievement: Restructuring Schools for Intellectual Quality. Newmann's work served as the theoretical framework for this study. Essentially, authentic achievement wasn't new at all, but merely a new phrase for an expanded form of the constructivist approach to education. The following history will demonstrate how authentic achievement has evolved from the behaviorist movement to Dewey and Piaget and into Newmann's more current writings.

In the late 19th and early 20th centuries, behaviorism was the dominant learning theory of the times. Abbott and Ryan (1999) discussed how the behaviorists saw the brain as a blank slate. The behaviorists believed that intelligence was inherited and that rewards should be given for learning. This model reflected the industrialized and factory-dominated society of the times. Students were expected to learn basic skills and do tasks in an orderly fashion, while creativity and freethinking were not encouraged in daily work. Much of our current educational methodologies are grounded in this tradition and can still be seen in more traditional classrooms today. For example, many elementary school teachers still use reward systems, such as a token economy or stickers on papers for a job well done. In addition, learning that is orderly and without creativity can be seen easily by walking through the halls of many, if not most, secondary schools.

The theory of constructivism, the precursor of authentic achievement, is based on the research of Jean Piaget, who believed that children learn by interacting with people and objects in their environment (Anderson, 1996). Inquiry-based instruction can be traced back to John Dewey (Dewey, 1938). Dewey believed that children learned from their experiences and from discussion with others. He also believed that children learned better by solving practical problems to which they could relate with on their level. According to Newmann (1996), one of the three characteristics of authentic achievement included learning having value beyond school. That idea was seen in Dewey's inquiry-based instruction. Dewey (1902/1956) also noted, many years ago, the distinction between the behaviorism vs. constructivism debate, which still exists today: Is education aimed at the child or the curriculum? As states and school districts scramble to develop and revise their mandated curriculum guides and meet No Child Left Behind standards, it becomes easy to wonder, as Dewey did, to whom they are aiming their education.

As the ideas of less rote and drill work and more learning with others through real-world events gained acceptance, the 1970's and 80's brought about "hands-on learning" and "cooperative learning", especially in the discipline of science. However, the effects of these early reforms were often limited. While the projects got the students doing, seeing, and feeling through various experiments, they most often had predetermined outcomes and did not relate to prior knowledge or everyday experiences. While students were on task, much of their work was focused on carrying out the procedures, rather than learning new concepts. Moreover, work on activities was often characterized as "hands-on, but not necessarily minds-on" (Tobin, Tippins, and Gallard, 1994). In contrast, authentic pedagogy keeps students actively engaged in their work, but

also requires higher-order thinking, the use of problem-solving skills, and overall intellectual quality in student work.

So why is the traditional behaviorist approach being questioned? As previously mentioned, the 1980's report, A Nation at Risk (National Commission on Excellence in Education, 1983), brought about a new wave of criticism of our modern educational system, warning that "a rising tide of mediocrity in the educational system threatened the nation's security" (Newmann and Associates, 1996, p. 3). It can be argued that there were serious flaws in this report, as indicated in more recent research (Sandia National Laboratories, 1993). However, it served as a springboard for discussion and opened up a national debate as to what is wrong with our public schools. As a result, as in other times in our history, a climate for educational reform has been established. Also out of this movement, came a focus on specific outcomes and curriculum targets and standardized testing, which can make for an even more difficult environment in which to support creativity and value beyond school learning (Newmann and Associates, 1996).

The 1990's brought about new brain research that dealt with how children should be taught based on how the brain works. Abbott and Ryan (1999) note the following about constructivism and the brain:

> Growing evidence suggests that a constructivist form of learning matches the brain's natural learning patterns. Constructivist learning dictates that learning arrangements must move beyond what occurs in a classroom; it requires a whole new understanding of a learning community—and that involves everyone, not just teachers. Constructivism provides the debating points for those involved in

education reform and those responsible for the revitalization of communities. (p. 69)

Constructivism, or authentic achievement, while having existed for several decades, is once again in the forefront of educational reform. This pedagogy promotes students who can think, ask questions, collaborate with others, and develop new and original ideas and products (Newmann and Associates, 1996). Information has become so abundant that mere memorization of facts or isolated pieces of information is no longer practical, but teaching students how to access that information and apply it in a productive manner should be the goal of educating our youth.

Need for the Study

While authentic achievement improves student achievement according to numerous studies (Brendefur, 1999; D'Agostino, 1996; Newmann and Associates, 1996; Onosko, 1990; Petrella, 2000), its use is still not widely seen. There are several barriers to implementing this type of pedagogy. Two of the major challenges include time and meeting curriculum guidelines while incorporating new in-depth approaches (Marx et al., 1997). This study was needed in order to determine how and why some teachers were successful users of authentic pedagogy. The information was collected so it could be shared with other educators, so that more students may benefit from it.

This study included an in-depth examination of five teachers that indicated an interest in authentic teaching, through their participation in the Authentic Teaching Alliance, and were attempting to implement authentic strategies in their classrooms. It attempted to determine how other teachers could use these methods with success and how administrators could support them in their efforts. In addition, as the researcher

examined the barriers that these teachers confronted in implementing their practice, it was noted if and how they overcame them, and how other teachers might benefit from what these educators learned.

Purpose of the Study

The purpose of this study was to examine five high school math or science teachers who have a high interest in learning and using authentic teaching in their classroom settings and to discover what practices most helped them be more successful users of authentic teaching. All five of these teachers were part of the National Science Foundation (NSF) sponsored (grant #0086415) Authentic Teaching Alliance (ATA) which involved public school teachers, graduate and advanced undergraduate fellows, and university faculty at the University of Oklahoma. The secondary school math and science teachers who were part of ATA and the fellows worked together to create and implement authentic tasks in their classrooms. The study also examined the difficulties and barriers that these teachers faced in using the authentic teaching method in their unique settings and in their daily plans while still teaching the mandated curriculum.

The three settings in this study were an alternative school for parenting teens, a charter high school, and a traditional high school. Each of these schools was located in a large urban school district and contained a large population of lower socioeconomic level students. They were chosen based on their participation in ATA and because of the contrasts in each of their school environments.

It is the hope of this researcher that the data collected in this study will be useful:

a. for other teachers in similar settings;

b. to see what is working in these different classroom environments and with different teachers;

c. to examine the overall impact of the university-school partnership (ATA) in its first two years at the three sites.

Ultimately, the goal was to see how ATA, if at all, benefited student learning in different environments, if it worked the same in contrasting environments and how teachers overcame barriers and still effectively implemented authentic instruction.

Research Questions

In order to achieve the purposes of this study, it was necessary to seek answers to the following research questions:

1. How does authentic instruction compare across three different urban high school settings--from an alternative school, to a charter school, to a conventional school?
2. What were the barriers of teaching authentically as perceived by the teachers and fellows involved in this study and were they able to overcome those barriers? If so, how?

Assumptions

This study was conducted within the boundaries of the following assumptions:

1. The five teachers in this study believed in the authentic teaching methodology and were interested in increasing their knowledge and use of it, as signified through their involvement in the Authentic Teaching Alliance at the University of Oklahoma.
2. The teachers, administrators, and fellows interviewed in this study were honest about their perceptions and attitudes toward authentic teaching.

Implications for Practice

The results of this study should provide useful information for other teachers, administrators, and teacher preparation programs as they strive to implement authentic teaching practices in their own classrooms and schools. They will be able to see what was effective and what was not effective in other classrooms, through five teachers who were using authentic instruction, the barriers that they faced, and how they overcame them.

This study will also be relevant to teacher preparation programs and school administrators, as they attempt to relate the concepts of authentic teaching to their students and staffs. Administrators will be able to examine the issues of class size, length of classes (i.e. block scheduling), and the curriculum coverage dilemma (i.e. breadth vs. depth). In addition, teacher preparation programs will benefit from seeing the use of university fellows in the public schools and what their impact is in implementing authentic pedagogy.

This study added a variation to the literature by focusing on a comparative case study approach in three unique settings. It was different in that it consisted of an in-depth qualitative look, over two years, at five teachers to determine if and how authentic teaching was successful for them.

Definitions of Terms

Authentic Teaching Alliance (ATA)- The ATA grant was sponsored by the National Science Foundation. The program combined undergraduate and graduate students to serve as fellows in mathematics and science classrooms of authentic educators in a large urban public school system. The grant was written by professors in the fields of

engineering and education at the University of Oklahoma. The goal was for the professors, fellows, and teachers to work together to develop and design authentic lessons to implement in the public school mathematics and science classrooms.

Authentic Achievement- Dependent on "three criteria critical to significant intellectual accomplishment: construction of knowledge, disciplined inquiry, and the value of achievement beyond school" (Newmann and Associates, 1996, p. 24). As with constructivism, students are to construct their own meaning and learn material that is relevant to their daily lives, but also they must have intellectual quality in their learning. For example, many teachers believe that when student interest and participation increases, their quality of instruction must be increasing, but one must look deeper into the lesson or assignment to determine the level or quality of learning taking place. A teacher might believe that because students are working in a group setting, that she has created a more authentic work environment. But, if the group work was one person doing all the work and the other students copying the answers, or if the work merely consisted of looking up answers out of a textbook to place on worksheets, then neither intellectual quality nor authentic achievement has been accomplished.

Authentic Pedagogy- A combination of two types of measurement—instruction and assessment (Newmann, et al., 1996). It is measured by the three components of authentic achievement that are listed in the previous definition and each will be defined below.

Construction of Knowledge- "Students should hone their skills and knowledge through guided practice in producing original conversation and writing, repairing and building of physical objects, or performing artistically…student construction of knowledge must be based on a foundation of prior knowledge" (Newmann and Associates, 1996, p. 24).

According to Newmann and Wehlage (1995) tasks that include construction of knowledge should meet one or both of the following standards:

1. Organization of Information. The task asks students to organize, synthesize, interpret, explain, or evaluate complex information in addressing a concept, problem, or issue.
2. Consideration of Alternatives. The task asks students to consider alternative solutions, strategies, perspectives, or points of view in addressing a concept, problem, or issue. (p.14)

Constructivism- A philosophy which "…holds that learning is essentially active. A person learning something new brings to that experience all his or her previous knowledge and current mental patterns. Each new fact or experience is assimilated into a living web of understanding that already exists in that person's mind" (Abbott, 1999, p. 67). This definition signifies the importance of each child's background, or prior knowledge, when learning new information. Teachers must be able to relate the new knowledge to a previous event or experience for the new material to make sense. However, as pointed out in Newmann's work (1996, p. 163): "All persons, regardless of their formal education 'construct meaning,' but the point of education is to improve the quality of the meanings that students construct or to help them to 'use their minds well.'" This is how authentic pedagogy provides an enhancement to the constructivist approach—adding intellectual quality to construction of meaning produces authentic achievement.

Disciplined Inquiry- "…consists of three main features: (1) use of a prior knowledge base, (2) striving for in-depth understanding rather than superficial awareness, and (3)

expressing one's ideas and findings through elaborated communication" (Newmann and Associates, 1996, pp. 24-5). This component requires students to seek deeper meaning in their work and to be able to express it orally, such as through a speech or presentation, or in written form. Again, striving for intellectual quality is the goal.

Value Beyond School- This component "asks students to address a concept, problem, or issue that is similar to one that they have encountered or are likely to encounter in life beyond the classroom." The student might also be asked "to communicate their knowledge, present a product or performance, or take some action for an audience beyond the teacher, classroom, and school building" (Newmann and Associates, 1996, p. 29). This feature allows students to see relevance in their work. Teachers should attempt to create assignments that students can use in their daily life now, or one that they might use when they join the working world.

Charter School-There are various types of charter schools across the country. The charter school described in this study began in the 2001-02 school year and is under the following Oklahoma state guidelines: it isa public charter school funded through federal sources, all students are eligible to attend, with preference given to children living in the school district. If there is an over-enrollment, a random selection method is used. The charter school is located in an area in which 60% or more of the children qualify for free or reduced-price lunch and all students are required to participate in the Oklahoma School Testing Program (www.edreform.com/charter_schools/laws/Oklahoma.htm). In addition, the charter school in this study was a high school, which served only freshmen for the 2001-02 school year; added sophomores for the 2002-03 school year; added

juniors during the 2003-04 school year; and added seniors in the 2004-05 school year. A middle school was also added during the 2003-04 school year.

Traditional School-The traditional school involved in this study was classified as such due to the fact that it housed grades 9-12 and operated in a largely conventional manner (i.e. students lived in the surrounding neighborhoods, it was not a magnet school and did not serve a certain population other than the district boundaries.)

Alternative School-There are many types of alternative schools across the country; the one used in this study was for expectant and parenting teens. It was unique because of the 100% female population it served and it was located in a large urban school district.

Limitations of the Study

This study was conducted within the parameters of several limitations.

1. The study reflected the views of five teachers and their personal experiences. They may or may not translate to others in similar situations.
2. The study was completed in one large urban school district, in three different schools. The results may or may not translate to other schools and districts.
3. Observations and interviews were conducted with teachers in two subject areas, math and science. A similar study focusing on different subject areas could yield different results.
4. Three schools were compared, but only five classrooms were part of this study. Generalizations about the schools were strictly reflective of observations of these classrooms, interviews with ATA teachers, building administrators, and five ATA fellows and a review of journals kept by the ATA fellows.

Chapter Summary

The pedagogy that is used to educate our youth must not remain stagnant. Authentic pedagogy promotes a progressive direction for our students to learn with a higher level of intellectual quality and in a more meaningful environment. It is already known that teaching authentically can increase student achievement, but if teachers are not using it, what good is it? It was the intent of this study to observe teachers that were using authentic instruction and examine how they overcame barriers in teaching authentically. By using a qualitative approach to observe and interview five teachers in three different settings, this researcher hoped to see if and how authentic teaching made a difference in these teachers' classrooms.

Chapter two discusses the research studies that exist, which reflect the effectiveness and quality of authentic pedagogy. Certainly, more research is needed to show how to use it effectively in a variety of settings without adding to a teacher's workload. Chapter two also provides evidence that students need to be taught in ways that stimulate their intellectual curiosity, to think, to problem-solve, to be able to tackle any task, and to relate what they are learning in school to the world around them. Chapter three includes an in-depth discussion of the methodology that was used in this study, the procedure in which the study was conducted, and how it was unique to this topic. Chapter four provides a broad look at the data collected from each teacher and school. Chapter five provides an in-depth cross-case analysis of the data collected and how it pertains to the research questions. Chapter six contains discussion, conclusions, and suggestions for future research.

CHAPTER 2

Review of the Literature

Introduction

The purpose of this chapter is to explain the literature surrounding authentic achievement and instruction, to include previous studies that substantiate its role in improving student achievement, and to review literature relating to challenges and barriers of authentic pedagogy. In addition, literature connected to learning and different school settings will also be discussed. The intent of this chapter is to focus on the literature previously written about authentic pedagogy and to conclude with how and why this study will be an important addition to that literature.

Authentic Pedagogy: A Review of Fred Newmann's Work

As previously reviewed in chapter one, authentic pedagogy came from the constructivist movement, which traces back to Dewey and Piaget. However, it is Newmann's work that now encompasses the phrase "authentic achievement," which served as the theoretical framework for this study. Newmann stated that authentic achievement must consist of construction of knowledge, disciplined inquiry and value beyond school. The following will summarize Newmann's work on these three components of authentic achievement.

Construction of knowledge comes from constructivism and means that students should produce their own knowledge, rather than reproducing the work of others. For example, students constructing their own knowledge might be seen creating their own original writings, performances, or musical compositions. Examples of reproductions of knowledge, which are often used in a traditional school setting, include matching

definitions on a test, looking up answers in a textbook to complete a worksheet, or memorizing states and capitals (Newmann, Marks, and Gamoran, 1996). While a baseline of factual knowledge is often necessary, it should be the preliminary foundation to a unit of study, which should continue into students using that knowledge to construct their own original work.

Construction of knowledge should include two standards: organization of information and consideration of alternatives. Organization of information includes students' use of higher order thinking skills—synthesizing, evaluating, and interpreting information to address a problem, concept, or issue. Consideration of alternatives involves asking students to look into different perspectives and alternative strategies when attempting to solve problems or address issues (Newmann and Wehlage, 1995).

Disciplined inquiry, the second component of Newmann's authentic pedagogy, involves three standards: an adequate prior knowledge base, in-depth understanding, and elaborated communication. These standards exemplify ways in which students can use their knowledge in a meaningful way.

An adequate prior knowledge base is essential in which to build upon. The teacher must establish that this exists before they can proceed into the other facets of authentic pedagogy—such as construction of knowledge, in-depth understanding and elaborated communication. For example, in math, mastery of multiplication facts should be prior knowledge before asking students to solve more authentic word problems, which would require the use of multiplication. In science, a prior knowledge of scientific vocabulary before covering a new topic or experiment is helpful before in-depth understanding can occur.

In-depth understanding involves not merely understanding bits and pieces or minute details of information, but rather a working knowledge of an entire concept and a more complex understanding of its use. For example, in a traditional social studies class, students might study about a country by learning its exports and imports, its national anthem, the colors of its flag, and its official language and currency. But an authentic instructor might have their students learn why the country exports and imports certain products, how and why the official language came to be, or compare and contrast the country to our own; thus not learning merely factual information, but learning on a more in-depth level. A student who can take those facts and then apply them to their original work—by constructing their own knowledge and communicating their understanding—is learning authentically.

Elaborated communication is the end result in how the student showcases their work. In the adult world, many occupations require the use of complex forms of communication. For example, attorneys must use both verbal and written skills to argue their points, doctors give out oral explanations and instructions, journalists must be effective writers, and the list goes on. In school, however, students are all too often required to give merely true/false, fill in the blank, or multiple-choice answers (Newmann, Marks, and Gamoran, 1996). Elaborated communication requires students to put their in-depth understanding into practice.

Lastly, the standard of value beyond school is an essential component in authentic achievement. Students should be able to use their knowledge outside of school—"…authentic achievements have aesthetic, utilitarian, or personal value apart from documenting the competence of the learner" (Newmann, Marks, and Gamoran, 1996, p.

284). Part of this standard is ensuring that schoolwork has more meaning than success in school, or grades. Teachers that connect with their students by explaining how their work has value beyond school and how it can benefit them personally or in their future might even see a greater benefit of creating greater motivation and excitement towards learning.

Newmann pointed out that all three standards are not necessary all the time. Of course, ideally, all three components are present in every assignment, but that is not always practical or realistic. Newmann, Marks, and Gamoran noted, "The point is not to abandon all traditional forms of schoolwork but to keep authentic achievement clearly in view as the valued end" (1996, p. 288). They attempted to clarify this point by recognizing the need for some conventional methods, and continually focusing their attention on improving intellectual quality in schools. They noted that they were deliberately trying to avoid the debates of "…recitation versus discussion, worksheets versus essays, phonics versus whole language, use of textbooks versus primary sources, or teaching aimed mainly toward the learning of facts and skills versus thinking and problem solving" (p. 308). Thus, not endorsing any particular method, although many would consider authentic pedagogy a method, but keeping the improvement of student achievement and the quality of their learning at the forefront.

Now that the framework of authentic pedagogy has been explained, the research study by Newmann and Associates (1996) and the results can be explored. This study was called the School Restructuring Study (SRS). First, the term restructuring must be defined. The Center on Organization and Restructuring of Schools explained it as follows:

> …a continuum of departures from conventional practice, from a greater to a lesser extent, rather than as simply restructured or conventional. Restructuring can occur when schools make major changes from conventional practice, but new schools established to implement significant departures from familiar patterns can also be considered examples of school restructuring (Newmann and Associates, 1996, p.6).

In the SRS, twenty-four schools were selected, and all had varying ways in which they had departed from conventional practices, or were restructured. Some of the more common forms of restructuring of the schools in the study included: looping (students staying with the same teacher for more than one year), advisory groups (usually meeting weekly with the same teacher to discuss personal and school issues), teaming (one group of teachers serving the same set of students), extended time periods for classes, heterogeneous grouping of students, increased local control over curriculum, budgeting, and staffing, and community-based learning (examples include volunteering and internships for career studies) (Newmann and Associates, 1996). While each school restructured in its own way, they all departed from conventional practice in some form, in an attempt to improve teaching and learning.

The SRS included six research questions, but the results of the first one, which pertained most to this study is closely examined, "How can school restructuring nurture authentic forms of student achievement?" (Newmann and Associates, 1996, p.8). The study focused on eight elementary, eight middle, and eight high schools located in 16 states and 22 districts, mostly in urban settings. The schools also had diverse ethnic backgrounds and 37% of the students received free or reduced price lunches. In addition,

all of the schools had been in the restructuring process for at least three years. Each school was studied for two years and included on-site observations and interviews of key stakeholders; teachers, parents, and administrators. About 130 mathematics and social studies classrooms were scored on the basis of student work and teaching, according to the standards of authentic achievement (Newmann and Associates, 1996).

The results brought about some intriguing and promising findings. Students not only benefited from the increased intellectual level of their work, but an unexpected benefit of increased standardized test scores followed as well. "Regardless of race or gender, an average student would increase from about the thirtieth percentile to about the sixtieth percentile as a result of experiencing high versus low authentic pedagogy" (Newmann and Associates, 1996, p. 58). The research also revealed that authentic pedagogy could benefit students from all ethnic backgrounds, genders, and socioeconomic status, and even greater benefits were found for high-achieving students; noting even more gains when authentic pedagogy was used (Newmann and Associates, 1996, p. 68). In addition, improvements were seen at all grade levels and in both mathematics and social studies.

On the down side, the overall use of authentic pedagogy, at a high level and in accordance with the standards, was not frequently seen in this study. However, some schools did display significant use of authentic pedagogy, demonstrating that it is possible to raise the intellectual quality of teaching in our schools. An important point to note is that the teachers in this study were not aware that the researchers were specifically looking for the authentic pedagogy standards. And, this study did not attempt to determine if student performance could be raised when teachers were deliberately trying

to use the standards of authentic pedagogy. Because improved student performance occurred when checking for authentic pedagogy while teachers were unaware why they were being observed, there is an excellent case to look at teachers' use of authentic pedagogy standards when they are making an attempt to use them.

Beyond Newmann's School Restructuring Study, some of his most recent writings, together with Bruce King, have been in the area of professional development. King and Newmann asserted that:

> Teacher learning is most likely to occur when teachers can concentrate on instruction and student outcomes in the specific contexts in which they teach…when teachers have sustained opportunities to study, to experiment with, and to receive helpful feedback on specific innovations…when teachers collaborate with professional peers both within and outside of their schools…Teacher learning is most likely when teachers have influence over the substance and process of professional development (2000, p. 576).

These points directly relate to some of the strengths and some of the weaknesses in this study that are discussed in the final chapter. Professional development can be a major factor in implementation of any new program.

Newmann's more recent work has been in the area of authentic instruction and how it affects standardized test scores (Newmann, Bryk, and Nagaoka, 2001). This study, researched in Chicago's public schools, revealed that students who received authentic assignments, requiring work at a higher intellectual level, achieved greater than average gains on the Iowa Test of Basic Skills in reading and math and higher scores in reading, math, and writing on the Illinois Goals Assessment Program. This finding backs

up the claims in the School Restructuring Study and gives teachers permission to teach authentically and know that standardized test scores can still rise.

In summary, Newmann's work has revealed that authentic pedagogy can improve student achievement and test scores, and that students from varying socioeconomic and ethnic backgrounds can show gains when the standards are put in place. However, adequate professional development should be in place with implementation of any new teaching strategy or program. The following section will discuss the implications and results of other studies that relate to constructivism and authentic pedagogy.

Additional Research Related to Authentic Instruction and Improved Student Achievement

There have been numerous studies about authentic instruction and constructivist teaching methodologies and their relationship to improved student achievement. The following paragraphs will provide a brief overview of studies, other than Newmann's work, that substantiate how constructivist learning, and related forms of authentic instruction, improves student achievement, thus validating the need for further research in this area.

A 1992 study by Knapp and others noted the effectiveness of instruction that emphasized meaning and understanding (an important aspect of authentic instruction). This consisted of a three-year study in 140 classrooms across 15 schools serving low-income students. Among other things, the findings indicated that "Teachers who emphasize meaning and understanding in their teaching are most likely to find ways of connecting instruction to students' home lives, thereby engaging students more successfully in academic learning" (p. ii). Connecting to the students' personal world is directly related to Newmann's third standard—value beyond school. This study also

found that, “Students extensively exposed to instruction emphasizing meaning and understanding perform better on tests of advanced academic skills at the end of the school year, even after initial differences in student achievement and poverty level are taken into account” (p. iii). Not only did the researchers determine the benefits of teaching beyond factual information, but also, as did Newmann, found that it better served students from lower socioeconomic backgrounds.

Jerome D’Agostino published a study in 1996 that looked at authentic instruction in Title I classrooms. Only one reading and one math lesson were observed in 52 classrooms, a methodological weakness in the study. But the results reported, as Newmann’s study did, that, “higher-order skill learning and material connected to out-of-school experiences, were rarely emphasized” (p.150). However, when emphasis was placed on teaching authentically, math skills increased in both computation and problem solving. The researcher recommended increasing teachers’ use of authentic teaching, further studies over a longer period of time in non-Title I classrooms, and an examination of ways in which teachers can incorporate the strategies in their present instructional approach. The research in the study to follow attempted to assist teachers in adding authentic methods to their current approach, and includes observations and specific interview questions concerning how teachers are using authentic teaching while overcoming the barriers of time and covering the required curriculum.

In another study showing the relationship between authentic instruction and student achievement, Joseph Petrella’s dissertation research (2000), modeled after Newmann’s School Restructuring Study, examined a restructured elementary school for the components of authentic pedagogy. He found that his study upheld Newmann’s

"assertion that student achievement can be enhanced by authentic instruction" (p. 80). He also found that teachers who taught their students questioning strategies scored much higher in the construction of knowledge category than teachers who did not. In addition, Petrella found, though not surprising, that students who learned to apply their classroom knowledge to the real-world were more inclined to see learning as "legitimate, useful, and important" (p. 82). This study, along with Knapp's and D'Agostino's, simply reaffirmed Newmann's work and demonstrated that authentic instruction has a positive influence on student learning and achievement and gives added reason for the topic to be explored further in this research study.

Authentic instruction also improves student achievement because students are more actively engaged in their learning. "Students who are engaged with school are more likely to learn, to find the experience rewarding, to graduate, and to pursue higher education" (Marks, 2000, p. 154). Marks believes that when students expend more effort in learning, as is the case in authentic instruction, it increases their attention and interest in their work. She found that student engagement is lower as grade level increases (a valid reason for studying authentic instruction in the high school setting) and that girls are usually more engaged in instruction than boys are. She also found that there were no racial or ethnic effects on engagement and that prior achievement is not a significant factor in whether or not a student becomes more engaged in their learning at a later date. She commented, "…more authentic work brings about greater engagement" (p.173). Thus, authentic instruction increases engagement, and greater student engagement can only lead to greater learning in the classroom.

Yair (2000) concurred with Marks study and also related authentic instruction to a student's level of motivation:

> …high quality learning experiences are indeed authentic, allow choice, and demand student skills. Boring and alienated experiences are produced when these instructional characteristics are absent. The findings suggest that the structures of instruction that disaffect students are overwhelmingly represented in students' daily school life; those that spark their hearts are not frequent enough to motivate students…they perceive their experience to be highly influenced by specific structural characteristics of instruction (p. 191).

Thus, stating that the methodology that a teacher uses for instruction can affect the motivation level of the student and enhance student learning.

Research Related to Teachers' Beliefs and Teaching Practice

A study published in 1990 by Joseph J. Onosko, which was funded by the Wisconsin Center for Education Research and reviewed by Newmann, offers insight into how teachers think they teach and how they actually teach. Ten social studies teachers were selected based on their thinking about their own practice. Six teachers who emphasized thinking as an instructional goal and who wrote well-developed conceptions of thinking were selected along with six teachers who were weaker in these two areas. This quantitative and qualitative study involved observations, interviews, and a numerical scoring of the lessons observed. The researchers found that teachers who already placed emphasis on thinking—the high-scorers—were more likely to use whole-group discussions and primary sources, rather than textbooks. They also covered less content, but at greater depth. The teachers who did not score as high when asked about their

views on thinking—the lower-scorers—were more likely to use lecture and recitation formats and used textbooks more frequently.

While Onosko's study was researched in social studies classrooms, a 1999 dissertation by Jonathan Brendefur examined mathematics teachers' beliefs about learning and how it directly related to authentic teaching. This dissertation was at the University of Wisconsin-Madison and Fred Newmann served as a committee member. Brendefur's work corroborated Onosko's findings: "The more a teacher's beliefs were rated authentic, the more his or her instruction was rated authentic" (p. 176).

These studies support the common belief that what teachers believe about instruction is often what they practice in their own classroom. It relates to this study because the teachers/participants selected have an interest and positive attitude towards authentic teaching, as displayed through their involvement in the Authentic Teaching Alliance. According to Onosko and Brendefur, they should be more inclined to use authentic teaching since they have a belief that students need it to be more successful learners.

Barriers to Authentic Instruction: Why Aren't More Teachers Using It?

Little research has been accomplished in seeking the answer to why, since we know authentic instruction can improve student achievement, more teachers are not using this approach in their classroom. Newmann's School Restructuring Study revealed that even in restructured schools, there were not high levels of authentic pedagogy (Newmann and Associates, 1996). Similarly, the Netherlands mandated a new program for teachers to implement during the 1993-94 school year called Application, Skills, and Connectedness (ASC). This program called for teachers to make learning more relevant

and active on the part of the student. Students were to learn how to research, express opinions, and apply what they learned in school to various professional practices.

Roelofs and Terwel (1999) published a comparative case study of three large high schools to examine to what degree the characteristics of authentic pedagogy could be found in the year the program was implemented and again three years after the implementation. Their results revealed, as did Newmann's, that "the characteristics of authentic pedagogy were not found to any real extent" (p. 218). In addition, their study pointed out that "…students were less positive about their teachers' pedagogy than were the teachers themselves. Whereas teachers indicated that they regularly or often practiced certain aspects of authentic pedagogy, the students indicated that teachers did so infrequently or very infrequently" (p. 218). They also noted that very little contact with outside professionals took place and authentic media, such as newspapers or current events from television news clips, was rarely used.

However, the question remains—why was there little evidence of authentic pedagogy after it had been mandated as part of the national curriculum? Some of the barriers noted by Roelofs and Terwel that came from a teacher survey included: instructional time blocks not being long enough, lack of cooperation among departments for a flexible time schedule, and inadequate access to media—newspaper, radio, and television. In addition, lack of time was given as a reason for not using more in-depth assignments, due to the overloaded curriculum. This study also noted that training in authentic pedagogy could have been helpful in getting more teachers to use it. It is important to point out that there was no intervention in this study; it was strictly a descriptive one to see if authentic pedagogy existed in the time period studied. Also,

interviews were conducted over the use of textbooks, but only surveys were used to indicate the teachers' and students' thoughts about authentic pedagogy and its usefulness.

A follow-up study, by Roelofs and Visser (2001) researched teacher preferences in learning and discovered "…constructivist learning environments are rarely implemented. Teachers tend to stick to expository and structured learning environments…" (p. 1). However, they also found that secondary school teachers are much less likely than elementary or vocational teachers to implement an authentic approach. Their rationale for this was that the different subjects taught by different teachers went against the philosophy of constructive learning in forming a learning community and in showing the interrelationship among subjects.

In Knapp's 1992 study, it was noted that non-conventional forms of instruction could "demand a lot of teachers" and that most teachers who did use alternative practices "emphasized meaning and understanding in one or two subject areas while offering a more conventional form of instruction in others" (p. ii). They also remarked that

> …not all teachers will want, or feel prepared, to engage in these practices. Policy makers and those who support instruction should realize how much is required to make instruction of this sort work, plan support systems accordingly, and carefully consider the implications of policies that impinge on curriculum and instruction. (p. 43)

The two most significant barriers that were repeated again and again were time and the related challenge of covering the required curriculum. The challenge of time when teaching authentically, or using a project-based approach, often included research, more discussion time, and more in-depth study, which often took longer to accomplish

(Marx, Blumenfield, and Krajcik, 1997). When a great deal of time was spent on one topic, difficulty in accomplishing the entire required curriculum also came into play.

Mark Windschitl (2002) commented, "Classroom teachers are finding the implementation of constructivist instruction far more difficult than the reform community acknowledges" (p. 131). He wrote about four dilemma categories of constructivism: conceptual dilemmas, pedagogical dilemmas, cultural dilemmas, and political dilemmas. Conceptual dilemmas concern the teacher's understanding of the basic philosophy of constructivism. Pedagogical dilemmas are about the teacher's ability to design constructivist curriculum. Cultural dilemmas are about the change that the classroom undergoes and the difference in roles between the student and teacher when going through the transformation to a constructivist classroom. Political dilemmas relate to the resistance that is sometimes seen among stakeholders when such a change in instruction is undertaken (Windschitl, 2002, p. 132).

School Structure and Authentic Instruction

The third research question in this study focused on comparing and contrasting the use of authentic instruction among three very different high schools. A traditional school, an alternative school for expectant and parenting teens, and a new charter school were all included in this study in hopes of discovering if the structure of the school had an impact, or if it hindered or helped, when using authentic instruction. This study was unique from the other studies on authentic pedagogy in that only one of the schools—the charter school—could be considered a restructured school.

While there was no specific research on how authentic instruction affected different school structures, there was some literature worth noting about

traditional/conventional schools, alternative schools, and charter schools in general. First, conventional schools will be examined. The following describes the roles of teachers and students in the conventional school setting:

> …teachers are responsible for the teaching and learning that occurs in their classroom…They are responsible for students while the students are in their classroom…teachers in conventional schools work in isolation from other teachers, with little collaboration or professional interaction across classes or grades occurring. The curriculum is prescribed by the district's formal curriculum document and by textbooks, with teachers occasionally interjecting a unit on a favorite topic…Teachers in conventional schools view the principal as being responsible for school wide leadership, for managing the smooth operation of the school, for maintaining discipline in the school's common areas, and for supporting them in severe classroom discipline cases. The expectation for students in conventional schools is that they are passively receptive to the teaching and directives of the school. Students are provided few opportunities to be responsible for their own learning. Rather, they are told what to do and provided with knowledge, which they are expected to absorb as a result of listening and schoolwork. (O'Hair, McLaughlin, and Reitzug, 2000, pp. 400-401)

This description reflects a typical conventional school and what many secondary schools are like today.

In addition, conventional schools have mostly conventional teachers who use conventional methods:

> Transmission teaching is much simpler. Teachers can 'get through' texts and workbooks. Classroom routines are straightforward; controls are easier to enforce. There is a sense of certainty and accomplishment when a lecture has been given, a list of facts covered, or a chapter finished, even if the result is little learning for students. (Darling-Hammond, 1997, p. 13)

This quote reflects one of the reasons teachers are not changing their teaching methods at a rapid rate. It would seem, from the above quote, that conventional methods are easier to use and control; higher order thinking is not required on the part of the student when completing the work or on the part of the teacher when making the lesson plans. Most students still receive their education in this environment; students attending alternative schools and charter schools make up a small minority of the population. Therefore, having a more conventional school in this study is important not only to compare it to the alternative and charter schools in this study, but also it is important because it is the type of school that most students in this country attend.

Charter schools and various forms of alternative schools have been growing in recent years. Each state has its own charter school laws, which vary widely from state to state. Charter schools have many forms and varieties, but mostly they are created so that they aren't under the abundance of laws and regulations that govern regular public schools. They were also created to offer a wide variety of schools and more choices to parents and students. They have been somewhat like pilot programs of many different types of schools popping up in different places in hopes that one will make an impact on student learning.

Critics of charter schools argue that their creation takes money away from existing schools and that if lifting regulations helps charters schools, then they should be lifted from the regular public schools also (O'Hair, McLaughlin, and Reitzug, 2000). One critic reflected on the history of alternative schools, which should be noted by policymaker's:

> Although charters may be useful as a small-scale approach to change, they are not likely by themselves to transform the system. Of the thousands of new experimental, alternative, and demonstration schools created with special dispensations in each previous era of reform, most came and went quickly because policymakers did little to change the system as a whole—to increase the supply of knowledgeable teachers, to reallocate funding, and to revise or abolish regulations that shape 'regular' schools. (Darling-Hammond, 1997)

Lubienski (2003) also noted that "…a comprehensive review of practices in charter schools indicates that, although some organizational innovations are evident, classroom strategies tend toward the familiar" (p. 395). Policymakers should continue to fund research that tracks these new schools to determine their effectiveness and if their practices should be carried over into the regular public schools.

In a more dramatic interpretation of an advantage to charter schools, one author notes,

> …it is the first 'official' recognition that the present system is unrescuable; that is, it is a system inimical to change. The system is antichange, it is an obstacle to innovation, it is incapable of self-correction or self-improvement. A school has to depart from the system if it is to achieve its purposes." (Sarason, 2000, p. 194)

These comments, while bleak, reflect the feelings of many that have tried and failed in their innovative approaches in the current system.

It is not yet known whether charter schools will continue to grow and exist as the future of public education or if it is just another reform movement that will one day go away. However, the charter school in this study was beneficial in that it allowed us to put authentic instruction in a more isolated environment to see what varying effects, if any, it had on students in a different school setting.

School Size and Class Size

Recently, there has been literature discussing student achievement and the size of schools. One study concluded that students learn more in smaller high schools, placing the ideal sized school at 600-900 students (Lee, 2001). Another recent study, which looked at five new smaller schools, that had replaced one large conventional school, demonstrated better attendance and higher graduation and college-going rates (Darling-Hammond, Ancess, and Ort, 2002). These studies are mentioned because two of the schools in this research were smaller schools—the alternative school and the charter school, while the conventional school was considered large. School size may, or may not, have impacts on the practicality and usefulness of authentic instruction, but it was examined as part of the comparison among the three school sites.

Class size was also analyzed to see if it made a difference in teachers' use of authentic instruction. The research on class size is abundant. However, it has largely been focused on primary grades. "There is no longer any argument about whether reducing class size in the primary grades increases student achievement. The research evidence is quite clear: it does" (Molnar, 2000, p. 53). Tennessee's STAR project,

Wisconsin's Student Achievement Guarantee in Education (SAGE), and California's Class Size Reduction (CSR) program have all demonstrated positive results in reducing class size. Smaller classes are more effective learning environments because children are able to get more help from their teacher, teachers spend less time on classroom management, classes include more "hands-on" activities, and students are more able to become actively engaged in the smaller environment (Molnar, 2000).

Tennessee's STAR project recorded higher achievement scores through the eighth grade when students were placed in smaller classes from Kindergarten through third grade in all sizes and types of districts. They also found that minorities and students in inner-city schools performed better than whites in some instances. In addition, these students were also more likely to take college entrance exams and graduate from high school on schedule (Nye, Hedges, and Konstantopoulos, 2000).

Wisconsin's SAGE program was implemented to make class sizes 15:1 for grades K-3 in the lowest socioeconomic schools. The achievement results, as in the STAR study, were positive. African-American students performed at higher levels than whites, increasing their total score by 52 points, compared to the white students increase by 46 points. In addition, qualitative data from this study revealed that "…teachers in SAGE classrooms have greater knowledge of each of their students, spend less time managing their classes, have more time for instruction, and use more individualized instruction" (Molnar, 2000, p.50). These data provide sound reasoning for examining how class size affects the use of authentic instruction in the secondary schools involved in this study.

California's CSR program, while indicating a small positive relationship in class size and student achievement, did not demonstrate results as strong as those documented

in the STAR or SAGE studies. The study reported an increase of two to three points in the percentage of students above the 50th national percentile rank. The gains were reflected in all students, regardless of race or background (Bohrnstedt and Stecher, 1999).

While each of these studies indicated improved gains in student achievement, none of them were conducted in secondary schools and only one reported qualitative data. This study will qualitatively examine secondary school teachers and will report whether or not students benefited more greatly from authentic instruction in a smaller classroom.

Implementation and Risk Taking

Authentic instruction can be a large task to implement, especially when changing from a traditional approach. It can also be a huge risk. The literature regarding implementation and risk taking was reviewed to see what type of impact these two elements might have had on this study.

Implementation of any new curriculum takes proper planning before it can be useful. "Effective implementation…requires time, personal interaction and contacts, in-service training, and other forms of people based support" (Fullan and Pomfret, 1977, p. 391). The ATA seemed to have provided for these fundamentals. Personal interaction and contacts were ongoing through the fellows, who were at the schools on a more than weekly basis, and through the ATA administration by having meetings for the teachers and administrators involved. Extensive training of the fellows before and during their classroom experiences also added to this "people based support" that is crucial in implementing new curriculum.

In addition to the personal approach, there are other essential items that can aid in the implementation process: "…new approaches to educational change should include longer time perspectives, more small-scale intensive projects, more resources, time, and mechanisms for contact among would-be implementers…" (pp. 391-392). The ATA started small, with only a handful of schools, and one or two teachers in each building. Two fellows in each classroom allowed for an ongoing dialogue between the classroom and the university, and money for materials in the classroom was provided as well. The ATA seemed to be an ideal group to investigate, since the essential components of implementation were already present.

The element of risk taking, and the literature surrounding it, should also be considered in this study. The teachers involved were risk takers: "When teachers embark on dramatic changes in the way they teach, they take a big risk" (Marx, Blumenfeld, and Krajcik, 1997, p. 354). A large part of whether they were willing to take the risk depended on their school environment, administrators, and students. The teachers in the schools, in which the whole faculty was not involved, were attempting to make changes that they hoped would benefit their students and allow themselves to grow professionally.

The administrators in this study were also risk takers. The Marx study, previously cited, is one that examined how a project-based science program was implemented into schools. They noted that one reason school administrators might be reluctant to opening their building to community members or sending students into the community, a critical part of making the curriculum have value beyond school, is because it leads to more scrutiny of their school. The school administrators in this study were risk takers for

allowing ATA fellows to come into their schools and observe and assist teachers with authentic instruction.

Each school was different in whether or not it provided an environment for risk taking. Some suggestions for implementing project-based science that could also be applied to authentic instruction included, supporting teachers by allowing for planning time with others and/or providing longer blocks of time for classes (Marx, Blumenfeld, and Krajcik, 1997). These are just two of the strategies that the literature suggested to allow for an easier change to authentic instruction.

Summary

The review of literature that was conducted in this chapter demonstrated that the effectiveness of authentic instruction on student achievement has already been established in previous research. Also, it has been determined, through numerous studies, that authentic instruction is not easy to implement and that barriers do exist in preventing teachers from using it effectively. It was the goal of this study to add to the literature by observing teachers in different school settings, to see if authentic instruction can functionally exist, if the barriers in the literature can be overcome and how, and if there was a difference in its usefulness among the three varying sites.

The following chapter discusses the methodology that was used to conduct this study. It includes a description of the schools and the teachers that were participants. Details of the procedures and methods of data analysis that were used are also included.

CHAPTER 3

Design of the Study

Introduction

This chapter provides the basis of how this research study was designed and the methods that were used to gather and interpret the data. Procedures for participant selection and data collection are revealed, as well as the types of data that were used. The method of data analysis as it related to this study and the limitations of the study are also discussed.

Research Design and Methodology

The methodology for this study was a qualitative comparative case study that focused on three high schools. A case study is defined as, "…an intensive, holistic description and analysis of a single instance, phenomenon, or social unit" (Merriam, 1988, p.21). In this case, the "holistic description" of three schools and five teachers that are all involved in the Authentic Teaching Alliance (ATA) and their use of authentic instruction in these three varying environments encompass the "case". Yin (1994) views the use of case study as advantageous when a "how" or "why" question is being asked about a contemporary set of events over which the investigator has little or no control" (p. 9). In this study, many "how" questions were asked and the researcher had no control over the teachers being examined.

Case studies, according to Merriam, should also include three components. They should be particularistic, descriptive, and heuristic (1998). This study was particularistic in that it focused on a specific problem and a particular group of people. It was descriptive because it detailed the results of qualitative data that included observations,

interviews, and a review of related documents. It was heuristic in that it "…brings about the discovery of new meaning, extends the reader's experience, or confirms what is known" (p. 30). Yin (1994) stated that the case study should focus more on a situation than on data, rely on multiple sources of information, and use a developed theory to guide the collection and analysis of data (p. 13). In this case, Fred Newmann's work (Newmann and Associates, 1996) regarding authentic instruction was the developed theory that guided the collection and analysis of data for this study.

This multiple site study used a comparative case study approach to compare and contrast three sites and five teachers. Merriam noted, "The more cases included in a study, and the greater the variation across the cases, the more compelling an interpretation is likely to be…" (p. 40). The diversity among the schools, and the teachers, in this study provided for rich and interesting data that added a variation to the existing literature. The comparative case study methodology was chosen because it matched the structure of this study, and because it produced results that could benefit educators by examining the work of practitioners in the field.

Research Questions

In this study, three different high school settings were examined to see how authentic instruction was defined and implemented in an attempt to answer the following two major research questions:

1. How does authentic instruction compare across three different urban high school settings--from an alternative school, to a charter school, to a conventional school?

2. What were the barriers of teaching authentically as perceived by the teachers and fellows involved in this study and were they able to overcome those barriers? If so, how?

Several other questions helped guide the study. According to Merriam (1998), the research questions reflect the researcher's thinking on the most significant factors to study" (p. 60), as reflected above. The following additional questions helped guide this researcher through a systematic form of data collection.

1. According to the teachers' own perceptions, this researcher's observations, and the fellows' observations of the classrooms in this study, to what extent were the characteristics of authentic pedagogy found?
    a. To what extent was construction of knowledge implemented in instruction?
    b. To what extent was disciplined inquiry implemented in instruction?
    c. To what extent was value beyond school implemented in instruction?
2. How did the size of the school impact authentic instruction?
3. How did classroom size impact authentic instruction?
4. How did school administrators support and affect the implementation of authentic instruction?
5. What initial impact did the Authentic Teaching Alliance (ATA) make in the five classrooms in this study, after two years of involvement in the program?

The first question was a necessity to be addressed before all others—to see if authentic instruction was present in the classrooms that were observed. The questions relating to school size and class size came from the literature review and had direct relevance to the schools in this study, since they varied in school size and class size.

Administrative support was seen as an important area to address to see if it had any influence on the way authentic instruction was implemented in these schools. Lastly, it was important to address the impact of the ATA program as a whole, so that a similar program might benefit from examining their strengths and weaknesses.

It should be noted that there were many "how" questions in this study, which, as stated above, made for an appropriate use of the case study methodology (Yin, 1994). Also to be noted is that qualitative research was necessary to answer these complex questions. A quantitative survey, for example, would not have given the in-depth answers or insight into the people in this study that these questions required. The comparative case study methodology was the obvious choice for examining these questions in three different settings.

School and Teacher Selection

The participants involved in this study were predetermined when the criterion for the study was established, which included using three different high schools—an alternative school, charter school, and conventional school. It was quickly determined that only one of each type of school was involved in ATA. ATA only had one charter school, one alternative school, and one conventional school at the time of this study. In addition, the five teachers in this study were the only five teachers that were members of ATA at these three schools, so they automatically became the participants, as well as the fellows that worked with them and their principals.

Description of Case Study Sites and Participants

Three school sites, which included five teachers and three administrators, participated in this study. All schools were from a large urban school district in

Oklahoma. Each of the three schools--an alternative, conventional, and charter--are described in brief below.

Alternative School

The alternative school was a school within a school, which included many types of alternative programs. Everything from behavioral problems, to attendance problems, to the focus of the one in this study—a school for parenting and soon to be parenting teens—were housed at one site. Enrollment fluctuated, but averaged approximately 200 students throughout the school year. Uniforms were required and consisted of khaki, denim, or black pants and a white shirt. The school served a low socioeconomic population, with 99% of its students qualifying for free or reduced lunch. The ethnic makeup of 47% black, 24% white, 20% Hispanic, 7% American Indian, and 2% Asian made for a diverse population. The student body was also unique in that it was 100% female. The average class size consisted of eight students.

The alternative school had two ATA science teachers that participated in the study. The male teacher is referred to as Teacher A and the female teacher as Teacher B. Teacher A had been teaching for seven years. He came to the public schools after a career in the military and after completing undergraduate and graduate work in science. Teacher B had been teaching for 22 years. She initially worked as an advocate for children by assisting with the placement of children through interracial adoptions. Through her advocacy, she met the other science teacher at the alternative school, who convinced her to enter the teaching profession. Both of the teachers at the alternative school taught a variety of science courses at many levels, due to the transient population and different grade levels of the students.

Charter School

The charter school opened its doors during the 2001-02 school year with freshmen only; one grade was added each year thereafter, with the first graduating class in 2005. It was a public charter school opened to students who were selected by a lottery method. School uniforms were required and consisted of a shirt with the school logo or school colors and black, khaki, or denim pants. Enrollment fluctuated throughout this study, since a new grade was added each year, but included 290 students during its second year with both ninth and tenth grade. The school had a large Hispanic population, about 60%, with approximately 30% Caucasian, 7% African-American, 3% American Indian, and less than 1% Asian. About 91% of the school population received a free or reduced-priced lunch. The average class size was 17 students per class.

The charter school also had two ATA teachers. Teacher C was a science teacher. He has taught since the age of seventeen years, when he began his teaching career in Venezuela. He completed a Bachelor and Master's degree in Geology, along with his Ph.D. He worked at the university and high school levels and had a significant contribution in writing the science curriculum in Venezuela. During this study, he taught Physical Science and Biology I. Teacher D was a math teacher at the charter school. He had been teaching for a short time and was pursuing his Ph.D. in Math Education. He taught Algebra I and Geometry during this study.

Conventional School

The conventional school in this study was made up of approximately 1,100 students and was a public high school, serving grades 9-12. No school uniform was required. Students that received free or reduced lunches made-up 48% of the school

population. The ethnic breakdown of the school was 72% African-American, 21% white, 4% Hispanic, 2% American Indian, and 1% Asian. The average class size was 19 students per class.

The conventional school had one ATA teacher. Teacher E was a female math teacher who had a total of 23 years of teaching experience. She had been at the same school for approximately 15 years. She was African-American and was teaching in a school that was 72% African-American.

Table 1

School Information

Name of School	Grades/# Enrolled	Avg. Class Size	Free/Reduced Lunch	Uniform Required?
School A	9-12/200	8	99%	Yes
School B	9-10/290	17	91%	Yes
School C	9-12/1,100	19	48%	No

Table 2

School Ethnicity

Name of School	African-American	Asian	Caucasian	Hispanic	Native American
School A	47%	2%	24%	20%	7%
School B	7%	<1%	30%	60%	3%
School C	72%	1%	21%	4%	2%

Table 3

Teacher Participant Information

Name of Teacher	Gender	Race	Years Experience	Highest Degree Held
Teacher A	M	African-American	7	Bachelor of Science
Teacher B	F	Caucasian	22	Bachelor of Science
Teacher C	M	Hispanic	40+	Doctor of Philosophy
Teacher D	M	Caucasian	3	Master of Science
Teacher E	F	African-American	23	Master of Education

Instrumentation

The data in this study were triangulated to help ensure credibility and consisted of observations, interviews, and document interpretation. According to Merriam (1998), all three means of data collection—observations, interviews, and document analysis—are usually included when employing the case study method. An observation instrument (Appendix A) was used to help gather the data. It was developed by Newmann, et al (1995), and was used to rate the level of authentic instruction from each observed lesson.

Newmann, Secada, and Wehlage's, (1995) observation instrument, which was used in the School Restructuring Study (SRS), was used as a tool to measure authentic instruction in each lesson observed. Fifteen lessons (three from each teacher) were observed and evaluated to obtain an overall picture of the extent that the characteristics of authentic pedagogy existed. Four standards were measured with this instrument: higher order thinking, deep knowledge, substantive conversation, and connections to the world beyond the classroom. While the observation instrument did assign a numerical score to each lesson, these data, along with descriptive notes documenting the evidence, was used as a guideline to qualitatively describe the instruction examined in each classroom.

Data Collection

The data for this yearlong study were collected in the following manner. First, initial interviews with the participants were conducted in the spring semester of 2002, along with one observation in each classroom. Second, two additional observations in each classroom, along with a final interview of each teacher and each building administrator were completed during the fall semester of 2002. Third, five ATA fellows and the ATA coordinator were interviewed for their perspective on the overall impact of

the program and the advantages and disadvantages that ATA may or may not have had on the teachers involved. Journals kept by ATA fellows were analyzed as an additional source of information. All of the data sources were triangulated to decipher conclusions and recommendations from this study.

Observations

Observations are a valuable tool in qualitative research. They offer two distinct advantages. One is that it takes place in the "natural field setting" and two, it gives the researcher a "firsthand encounter with the phenomenon of interest" (Merriam, 1998, p. 94). Thus, observations provide unique insight that cannot be obtained from an interview or document analysis. However, when observation data is combined with that which is collected from interviews and document analysis, the researcher has a more complete picture of their study.

Observations in this study were conducted three times in each of the five classrooms at approximately 60 minutes each, or the duration of one class period. Teachers were notified ahead of time which week their visit would be conducted, but were not given the specific day or time. This was done to ensure that there wasn't going to be non-instructional activities going on at the time of the visit, such as standardized testing or a school assembly. The observer was seated in the back of the classroom and tried to be as inconspicuous as possible.

Each observation was scored using Newmann's observation rubric (Appendix A). Specific attention was given to the rating of the content of the lesson in the following four areas: higher order thinking, deep knowledge, substantive conversation, and connections to the real world beyond the classroom (Newmann, Secada, and Wehlage, 1995).

Detailed notes were taken to support the findings in the observation instrument. The notes also reflected a description of the overall classroom environment, classroom management skills of the teacher, outside disturbances that affected the students, and other relevant data that influenced the instruction in the classroom.

Interviews

Interviewing is one of the most common methods of data collection in qualitative research. Interviews allow the researcher to get information that they cannot observe and to get people to discuss their feelings about the research in question. It is considered the best technique to use when conducting a case study of a few individuals (Merriam, 1998, p.72).

The interviews in this study were semi structured, that is they were "guided by a set of questions and issues to be explored, but neither the exact wording nor the order of questions is predetermined" (p.93). Some interview questions were predetermined, but based on the information gathered, questioning often went in a different direction, and then back to the predetermined question list. The questions that were written were based on the research questions and were designed to assist the researcher in answering the research questions. Interview questions for teachers before the observations began are attached as Appendix B, questions after observations are attached as Appendix C, administrator questions are attached as Appendix D, and questions for the university fellows are attached as Appendix E.

Interviews were conducted at the beginning and the end of the study with each of the five teachers. In addition, one interview with each of the three building administrators and one interview with each of the five fellows (each fellow was assigned

to one of the five teachers) were completed towards the end of the study. Interview questions were developed from the research questions. Each interview lasted from approximately 45-60 minutes and all of the interviews were tape recorded and transcribed. Each participant was informed that confidentiality would be maintained and pseudonyms would be assigned to protect their identity.

Document Analysis

Personal documents "refer to any first-person narrative that describes an individual's actions, experiences, and beliefs" (Bogdan and Biklen, 1992, p. 132). These documents can tell the researcher about the "inner meaning of everyday events…and are a reliable source of data concerning a person's attitudes, beliefs, and view of the world" (Merriam, 1998, p. 116). Merriam also noted the benefits of including document analysis as part of a qualitative study: "One of the greatest advantages in using documentary material is its stability. Unlike interviewing and observation, the presence of the investigator does not alter what is being studied. Documentary data are 'objective' sources of data compared to other sources" (p. 126).

The portfolios/journals that were kept by the ATA fellows were used as a personal document source in this study. They began as an assignment for their class during their first semester of working with the ATA program in the fall of 2001. They included journals of their initial site visits, lessons that they created for the class, and a reflection essay on their first semester in the program. These documents provided a unique insight into the first impressions of the ATA fellows. Each journal was examined to give additional insight into the teacher participants based on the fellows' observations

and work with the teachers in this study. The journals were also valuable artifacts in confirming data that was collected in the observations and interviews.

The Role of the Researcher

Qualitative research involves the human researcher as the primary instrument of collecting data, thus allowing for changes to be made along the way when the researcher sees that it is appropriate. Conversely, there can also be error due to human mistakes (Merriam, 1998). Merriam went on to identify three important characteristics of a good qualitative researcher. She stated that "…the qualitative researcher must have an enormous tolerance of ambiguity…must be sensitive to the context and all the variables within it…the qualitative research investigator must also be a good communicator" (pp. 20-23). The researcher in this study attempted to keep these traits in mind throughout the data collection process in this study.

This researcher was a high school counselor and had been in education for seven years at the time of this study. She had no affiliation with the school district, schools, or participants prior to this study. However, the co-chairpersons of the committee supervising this work were instrumental in writing and supervising the ATA grant that was studied in this research. However, neither chairperson interfered nor offered suggestions that would sway the presentation of the data in any manner, in fact, they were keenly interested in the results of the study and possible improvements that could be made to the program.

Data Analysis

In qualitative research, data collection and analysis is a simultaneous activity (Merriam, 1998). It is an ongoing process in which the direction of the study can change

as the data is gathered. The initial interviews and observations can lead to new questions or confirm the initial hypothesis. In this case, the interview questions remained relatively the same as they were planned before data collection began.

The data analysis method for this study was the constant comparative approach, developed by Glaser and Strauss (1967). It was originally used for the development of grounded theory, but is now considered compatible with all qualitative research (Merriam, 1998). The basic strategy is, just as it says, to constantly compare the data from the observations, interviews, and document analysis. When multiple cases are involved, as in this study, each case was looked at individually as a separate case, and then a cross-case analysis was completed to form generalizations. Miles and Huberman suggested that the researcher attempt to see "processes and outcomes that occur across many cases, to understand how they are qualified by local conditions, and thus develop more sophisticated descriptions and more powerful explanations" (1994, p. 172). Therefore, while authentic instruction was seen and measured in every school, the multiple sites allowed for the technique to be seen in different settings to determine if these varying atmospheres had an impact on the way authentic instruction was used.

Creswell (1998) stated that the data must be organized and classified before the researcher can begin interpreting data. He detailed a four-step process which included, (1) reading the data and identifying major themes, (2) examining the data to provide detailed descriptions, (3) categorizing data into themes, and (4) interpreting data into general conclusions. This was the basic process that was used in this study. Each data set—observation notes, interview transcripts, and ATA journals--in this study were coded by the researcher and placed into categories based on the seven research questions. The

research questions provided general categories of information into which the data was sorted. The data was organized as it pertained to each research question and in each case, and was presented in chapter five. Other themes and conclusions were also derived from the data and were discussed in chapter six.

Throughout this study, pseudonyms were used for each school, teacher, and fellow. The alternative school was referred to as School A, the charter school as School B, and the conventional school as School C. The male teacher at School A was called Teacher A and the female teacher was Teacher B. The science teacher at School B was Teacher C and the math teacher was Teacher D. The math teacher at School C was Teacher E. The fellows' pseudonyms corresponded to the teacher that they worked with, such as Teacher A's fellow was referred to as Fellow A.

After the data was presented following each research question in chapter five, the literature from chapter two, as well as new literature that related to the findings were discussed in chapter six and brought additional meaning to the study.

Theoretical Framework

Newmann's work on authentic achievement (Newmann and Associates, 1996) served as the theoretical framework of this study. The main purpose of this study was to examine teachers using authentic instruction in their classrooms and to see what barriers and challenges they faced, as well as what worked for them and made their planning and teaching easier. In order to do that, the level of authentic instruction was surveyed first, to see if it was in fact taking place and to what degree.

Newmann stated that authentic achievement must consist of construction of knowledge, disciplined inquiry and value beyond school (Newmann and Associates,

1996). These three elements were looked for in every observation and were scored using Newmann's scoring device (Newmann, Secada, and Wehlage, 1995). Newmann's work, along with other studies, noted that authentic instruction could improve student achievement (Brendefur, 1999; D'Agostino, 1996; Newmann and Associates, 1996; Onosko, 1990; Petrella, 2000). Newmann's standards and scoring device were used as a springboard to gage if and to what extent these practices were being used in the ATA classrooms and then to tell other educators how they could be more easily implemented into their classrooms.

Validity and Reliability

Issues surrounding validity and reliability in case study research, and all qualitative research, involve being able to trust the research results (Merriam, 1998). The following will explain both internal and external validity, as well as reliability, and how they relate to this qualitative case study.

There are several ways to check for internal validity--defined by Merriam (1998) as how well one's finding's match reality--in a study. One of the best ways, and probably the most well known method, is through triangulation. Triangulation involves using multiple sources of data to come up with conclusions in a study (Merriam, 1998, p. 204). It is a form of cross validation; by using several data sets to see if the findings are consistent from one to the other, the researcher can validate his or her findings by showing replication among the data sets.

This study employed three data sources—observations, interviews, and document analysis—that were triangulated to increase the internal validity. An additional source of internal validity is long-term observation at the research site or repeated observations of

the same phenomenon (Merriam, 1998, p. 204). This study was completed over a year's length of time and fifteen observations (three from each teacher) were reviewed. This allowed the researcher to get a more accurate picture of the participants' teaching and to separate what might have been a one-time occurrence from what was the norm. These observations, along with the interviews from the fellows, who were in the classrooms even more frequently, provided a good picture of what the classrooms were like on a daily basis.

Merriam (1998) stated that, "External validity is concerned with the extent to which the findings of one study can be applied to other situations" (p. 207). Generalizing the findings of the study to the reader's own situation, or user generalizability, involves the reader asking, "…what is there in this study that I can apply to my own situation, and what clearly does not apply?" (Walker, 1980, p.34).

Merriam (1998) suggested two strategies that were employed in this study to improve external validity:

> Rich, thick description—providing enough description so that readers will be able to determine how closely their situations match the research situation, and hence, whether findings can be transferred.
>
> Multi-site designs—using several sites, cases, situations, especially those that maximize diversity in the phenomenon of interest; this will allow the results to be applied by readers to a greater range of other situations (pp. 211-212).

This case study used much description to closely convey the classroom environment and teaching methods of the participants in this study. A multi-site design was also used and

should strengthen the validity of this case by providing the reader more examples in which they can generalize to their own situation.

According to Merriam (1998), "Reliability refers to the extent to which research findings can be replicated" (p. 205). As Merriam points out, you can have repeated measures in study after study, but we know that when examining human behavior, people can also be repeatedly wrong. She goes on to say that, "achieving reliability in the traditional sense is not only fanciful but impossible" (p. 206). Thus, instead of attempting to find the same results, the researcher should focus on "whether the results are consistent with the data collected" (p. 206). Merriam (1998) suggested three factors, which were also used in this study, to ensure that results were dependable. First, the investigator's position should be made known (as noted above under the role of the researcher), second, triangulation should be incorporated (using several sets of data), and third, an audit trail should be left by the researcher (describing in detail how the data was collected and analyzed, as was done in this chapter) (pp. 206-207).

Summary

This chapter described the methodology, the comparative case study, and concluded that it was the most appropriate way to evaluate the research questions in this study. Each participating school and teacher was described in detail and criterion was given for his or her selection. The instrumentation to be used, the observation instrument, was explained and rationale was given for its use. The procedures for data collection, utilizing interviews, observations, and document analysis were detailed and the constant comparative method of data analysis was explained.

Chapter four includes a presentation of the data collected in each separate case, while chapter five includes an in-depth analysis and cross-case analysis of the data as it pertains to each research question, thus using the replication approach for multiple-case studies, as suggested by Yin (1994). Chapter six provides major findings of the study, significance of the study, and recommendations for further research.

CHAPTER 4

Presentation and Analysis of Data

Introduction

This chapter presents the data collected in this study, along with some analysis and interpretation of the data from each school site. The data presented attempts to fully describe each school setting and each teacher and administrator in the study. Each school will be presented as a separate case to include findings from the observations, teacher interviews, an administrator interview, fellow interviews, and a review of journals kept by ATA fellows. After the three cases are presented, a cross-case analysis is presented in chapter five to attempt to answer the research questions as presented in chapter one.

Case A: The Alternative School

The alternative school was one large school that involved several alternative educational programs in one building. The program that was participating in ATA was one for expectant teen mothers and parenting teens, so obviously the school consisted of only female students. The school was approximately 47% African-American, 24% Caucasian, 20% Hispanic, 7% American Indian, and 2% Asian. The school had 99% of its student population enrolled in the federal free and reduced lunch program. The average enrollment was around 200 students and the girls ranged in age from 14-19.

The school was set in the downtown area of a large city. The building appeared to be very old and somewhat run-down on the outside, but was neat and clean on the inside. Outside the school building, stood a portable metal building that contained the on-site daycare facility for the students. The school functioned on a 4X4 block class schedule, meaning that the students had a total of four classes, which changed each nine-

weeks. This schedule allowed students the opportunity to earn two credits each nine-week grading period and up to 8 per school year. The mission statement, or philosophy of the school was as follows: "The (Alternative School) staff is dedicated to providing high quality and equitable instruction in a caring atmosphere. It is our goal to promote positive student self-concepts while generating excellence in student achievement." The following focuses on the school administrator and two teachers that made up the science department and how they and their classrooms have been impacted by ATA.

School Leadership

The school principal was a middle-aged African-American woman with over 25 years of experience in education. She had her doctorate in Education Administration and had been a teacher, middle school assistant principal, middle school principal, and, at the time of the interview, was serving her first year as the principal at this alternative school. She described her leadership style as being a facilitator and encourager to "help guide and support."

Her office was located next door to Teacher A's room, and she commented that she was able to hear much of what went on in his classroom. She noted that the ATA program had started before she arrived at the school, and she saw the program as a way for the students to "get a lot of experience in labs." She also recalled from her previous experiences in conventional schools, "…that some teachers find it laborious to set it up and to do it (labs) and, depending on what their schedule is, they just don't really get into it because they have to shift and that causes a little bit of added stress in their lives." She liked the experience that the students received from ATA and believed they, and their

teachers, were benefiting from it. She also believed that the smaller class sizes were of benefit to the teachers and students in doing the hands-on lessons.

When asked about her feelings on how ATA had affected the rest of the school, she believed that it was "pretty self-contained" in the science department, and doesn't have much effect on the school as a whole. She would like to see ATA expand into the math department if the teachers would "buy into it." Overall, this administrator seemed positive about the work ATA was doing in her school, but was not overly involved in the process.

Teacher A

Teacher A was one of two science teachers at School A that participated in ATA. He received his B.S. in science in 1983 and worked on his Ph.D. at the University of Oklahoma from 1993-1996, but never completed it. He did not take many education courses because he received a science degree and then was alternatively certified to get his teaching certificate. He believed that his background made his teaching style unique and different from the status quo.

Teacher A enjoyed his position in the alternative school because he believed it offered him "a lot of latitude for experimentation for learning." He also liked the fact that he was able to incorporate life and social skills along with science. He constantly sought opportunities to relate the student's world to science, and he found them on a daily basis, as will be discussed in the observations below. He also believed that his school setting made authentic teaching a "necessity." Since he taught all secondary grade levels and science subjects in one classroom, he said that, "authentic teaching is the way…I have to teach in order to meet those objectives that I want to get."

Teacher A appreciated his opportunity to work with the ATA program because he enjoyed sharing his classroom and knowledge and maintaining a link to the university. He believed that one of the greatest benefits of being a part of ATA was the "extra bodies," or fellows who were around to help with the "time issue" in getting students more individual attention and in setting up and assisting with laboratories. He also noted that they "helped to enhance some of the projects that we had already established" and he was most appreciative of the fellows that came in to assist with the laboratories and the additional preparatory time that they required. He also commented that, "they (the fellows) bring in more activities, so they're bringing in some activities that I probably would not have had the time to put in…time to put things together during the time that I want to do it." For him, time was his biggest barrier in using authentic instruction as much as he would have liked, although, he did integrate authentic instruction quite extensively into his daily lessons.

Observations of Teacher A

Based on the observations of Teacher A, it was evident that the school setting played a major role in his teaching. Student turnover and attendance was a huge issue in his room. During one observation, out of the 14 students enrolled in the class, only 7 were present. Another challenge was that each student worked independently and many were enrolled in different subjects; students were enrolled in Chemistry, Zoology, Physical Science, or Biology.

During some observations, the students were working on individual assignments, with the teacher working the room, spending individual questioning time with each student to determine their level of understanding. At first glance it looked like a rather

traditional, text-based classroom. However, after sitting in the room for some time, it became apparent that this teacher was deeply interested in what his students were learning and if they could apply it to their daily lives. He never sat at his desk during class time, he was always working with one of the students, asking her questions to determine her level of understanding and asking how she could use the information in the real world.

On other days, a lab would be in progress. One of the labs observed involved trying to determine the iron content in breakfast cereals. The students used the triple beam balance to weigh the cereal, a mortar and pestle to crush it, and then after shaking the cereal, used a magnet to look for iron, which appeared as little black specks. Along with determining iron levels, students also learned how to read food labels and figure nutritional values of vitamins and minerals in food. Since all of the students were already mothers, or were currently pregnant, this information provided a high level of use for their everyday lives. In addition, the lesson met scientific P.A.S.S. objectives that the teacher was required to cover. This lesson received 15 out of 20 points on Newmann's Standards and Scoring Criteria for Assessment tasks, Classroom Instruction, and Student Performance (Newmann, Secada, and Wehlage, 1995). The four criteria included in the scoring are: use of higher order thinking skills, level of deep knowledge, substantive conversation, and connections made to the real world. This criterion is attached as Appendix A.

Perspective from the Alternative School Fellows of Teacher A

Teacher A had two fellows that worked with him on a consistent basis. I will call them Fellow A and Fellow B. Fellow A was a bright, bubbly, female graduate student in

education. She had high goals and from her interview and reading her journal, she seemed to be an overachiever who was extremely interested in making ATA a success. She chose to work with Teacher A because of the instant rapport that she saw that he had with his students the first time she witnessed them entering his classroom; this is what she noted in her journal:

> "A cluster of seven girls noisily enters the room. Each girl greets [Teacher A] with enthusiasm. Their voices sound together, "Hey [Teacher A], what's going down, Good morning [Teacher A]! Did you miss us [Teacher A], [Teacher A], I told my mom about the plant we are growing and she wants a clipping, How are you doing today [Teacher A]?…I immediately want to be a part of his room. I know I could learn and grow in a place like this."

She observed that the relationships that he built with his students, particularly with this group of girls, are the first steps that must be established before learning can begin, adding that, "Students learn best in non-threatening classrooms with personable teachers."

Fellow A also noted, as did I in my own observations, that Teacher A never directly answered the students' questions, but he guided them in finding out how to answer their own questions. He had a unique talent for making at-risk, and largely low-level, learners want to learn. He had just the right balance of rapport, to make them want to work for him, and intellect, to know how to reach them, rather than give them the information.

Fellow B is an undergraduate engineering student. He too believed that Teacher A "ranks high up there", but he also felt that he, as a fellow, had contributed to the

success of this classroom. He noted that Teacher A's job was more difficult due to the fact that he taught a variety of subjects to students in a variety of grades all at the same time. He liked the practical lessons that were presented to the class and he even assisted in developing an authentic lesson on pH levels in household products to teach the teenage moms about safety issues.

Fellow B saw irregular attendance as the biggest barrier at School A, adding that it made it difficult to do any type of long-term lesson or project and even more difficult to assess and evaluate students. He also saw the lack of materials to teach authentically and the small amount of planning time as a barrier as well. He noted in his journal that, "…time constraints and P.A.S.S. requirements make it impossible to implement those (hands-on) teaching activities."

This fellow also saw the alternative school setting as a barrier to the authentic teaching process because of the varying subjects and grade levels. He noted the following:

> "I think the easiest setting would probably be a traditional school where attendance is regular, where you have a classroom where they're all studying the same thing at the same time so that way you can look into next week and see what they're going to cover and do an authentic thing for that next week, whereas this week, if I were saying what are they doing next week, I'd probably have eight things…I think that the alternative format is a major hindrance…"

He later added that the small class size was helpful, so that students received more of the one on one assistance that they needed since they were working on individual lessons. Overall, Fellow B said that the program made him "feel really good" in that he believed

he made an impact with some of the students. He also believed that authentic instruction had increased due to his presence and the time that he was able to give to putting together labs and lesson plans.

Fellow B had somewhat of a negative and hopeless attitude. It seemed that School A and Teacher A had an excellent consistency of implementing authentic instruction, despite overwhelming barriers and obstacles due to the difficult circumstances of the students. This school, and teacher, was by far using authentic instruction the most before ATA ever entered the picture, and yet it seemed that they excelled to even greater heights with the assistance that ATA provided.

Teacher B

Teacher B was one of two teachers at School A. She became interested with ATA after seeing the benefits of Teacher A's involvement. She and Teacher A did a great deal of team teaching and their classes were somewhat similar. They had a superb working relationship and the students seemed to enjoy the overall setup of the science department.

Teacher B became a teacher in a rather unusual way. As an adoptive parent, she became involved in a support group for hard to place children and was interested in working with pregnant teenagers. This led to her first teaching job at School A, where she worked under an emergency certificate, since she already had a degree in science. She found the job so rewarding that she decided to get her teaching credentials and she has been working at School A on and off since 1977.

Teacher B defined authentic teaching as "true teaching…basically teaching that has value, teaching that is usable, teaching that walks out of the room with the student rather than left in the notebook at school." After observing her classroom, it was evident

that she truly believed and practiced her philosophy. She also noted that she had no formal training or knew of the term of authentic instruction before her involvement with ATA, but that it was, in her words, "…what we were always supposed to be doing."

Teacher B had a true sense of caring and compassion for the students that she worked with at School A. She used authentic instruction because she believed that it worked and that it would help her students. For example, when she taught about cells, she used DNA paternity testing as a springboard for discussion, a topic that many of her students could relate to as a real-life example. She used newspapers to discuss current events in science, like forensics and bio-terrorism. She also has had some professional development training in the business world. She has been on site at 5 different science-related jobs, so she could take back the knowledge of how science applies on the job to her students. She, along with Teacher A, tried to tie everything to the students' role as parents by teaching such topics as child development, safety, and health through the science curriculum. In that sense, it was obvious to see how authentic instruction was so easily developed and used in this particular alternative setting.

Teacher B believed the school setting allowed herself and Teacher A to "…develop authentic teaching before we ever heard the terminology authentic teaching, because to reach the group of students…you had to make that connection…and so to get them to respond to your attempts to teach them, we would do parenting types of activities with science…" Teacher B also added that, "it's maybe easier for us in an alternative setting because there is that perception that alternative means we take other avenues or other approaches to teaching, so I think we've kind of always been on the cutting edge in trying to find ways to teach students that the traditional schools were not able to

teach…the idea of doing things differently flies a little bit easier here." She went on to say that the small number of students in this setting also added to the ease of implementing authentic instruction.

Despite the ease of implementation of authentic instruction at this alternative school, Teacher B still noted that time and money were major barriers that made authentic instruction difficult at times. She especially felt that the lack of planning time was a hindrance and this is where she believed that the ATA fellows had greatly contributed to their program. She would have liked to see double planning periods, to include a common planning time for their department, and more team teaching to achieve authentic instruction to an even greater degree in her classroom. She went on to say:

> It's hard to work collaboratively when you don't really have the time to plan together and you kind of go different directions…we're so much more effective as a pair than we would be singly…there is no reason to duplicate the effort to have two teachers planning two different sets of lessons trying to deal with the same objectives as we teach the same things."

She also believed that to keep students on task, "requires more than one pair of eyes in the class." In addition, their lack of a budget and discretionary money made it difficult to set up labs on a consistent basis. She was very appreciative that ATA had been able to make some materials available as well as provide extra people to help with the planning, set up, and teaching of the lessons. She also said, "…I think it is of all of the things that have come and gone, this one has more potential to get us where we want to go." This was a powerful statement that related to the impact of the ATA program during its first two years.

Observations of Teacher B

Due to the nature of this alternative school, students were constantly transferring in and out of the program, so they were all on different levels, in different grades, and studying different subjects. Since they were able to keep the class sizes small, Teacher B did a lot of individual instruction. Like Teacher A, Teacher B did a great deal of one-on-one questioning and she excelled in making the students come up with answers to their own questions, rather than spoon-feeding them the correct answers, she forced the students to work for it. One example was when a student asked Teacher B, "What does photosynthesis mean?" Teacher B told her to look in her textbook, so the student dutifully turned to the glossary and read the definition of photosynthesis aloud. Teacher B then said, "What does that mean?" The student replied, "I don't know." She then reassigned the pages to be read from the text, and later in the hour the student was able to explain the meaning of photosynthesis in her own words. Each day I observed, Teacher B was at the desk of each student questioning her for understanding. She used many sources, not just one textbook, to assist the students in deriving their answers.

It was also evident that the socioeconomic level of the students was fairly low, although many of them managed to wear artificial fingernails. During one observation, a student had just finished taking a nationally standardized test when she asked, "It's about computers, I don't even have a computer. How am I supposed to know about that?"

It was also observed that this school involved outside sources from the community. A local OB/GYN doctor voluntarily stopped by each week to assist with the science classrooms and answer questions from the students. On one of the days that this researcher observed, she brought in an actual placenta and umbilical cord from the

hospital so the girls could see what it looked like. Teacher B also mentioned that they walk over to a neighboring garden attraction and assist with plant care on occasion. These were just two examples of how Teacher B used authentic instruction by bringing the outside world in and by taking her students out into the community.

Teacher B's Perspective of the Fellows

The fellows that worked with Teacher B were the same ones that worked with Teacher A, because she was later getting into the ATA program, she did not have one fellow devoted to her during the time frame in which this study was conducted. However, more data was retrieved from Teacher B about the fellows, than from the fellows about Teacher B because there was not just one fellow assigned to her room at the time this data were gathered.

Teacher B described the fellows as, "nothing but an asset to our classes and they try to teach the kids and to communicate with the kids." She also noted that she learned something from each fellow that came into her room. She recalled the following about one fellow, "…being a chemist, she held the perspective that she had this information, and I listened to her and learned from her how she authentically connects to these kids so I can steal from each person that's come in." Speaking about another fellow, Teacher B said, "…he's just a natural teacher. He's walking and has his hands in his pocket and all of a sudden, he's doing a lesson, and I don't think he has necessarily planned it." Overall, Teacher B was extremely pleased with having the fellows in her classroom. She felt that they provided an extra set of eyes to help with classroom supervision, an extra set of hands to help with classroom instruction, and an extra set of legs to help with the

legwork of preparing a laboratory and getting all of the supplies and materials together. She believed they were the key component to the success of the ATA program.

Case B: The Charter School

The charter school was brand new and in its first year of operation when data collection first began in 2002. The school consisted of freshmen only its first year; they added a grade each year and graduated their first senior class in 2005. They also added a middle school. This was a public charter school and was designed to attract students from the south part of a large metropolitan area. The school population was largely Hispanic—60%, followed by Caucasian at 30%, African-American at 7%, American Indian at 3%, and Asian at less than 1%. The school had 91% of its students registered in the free and reduced lunch program.

The first year the school was in a family life center of a church. The second year, the school had moved to a larger facility—a YMCA building—and they shared space with the fitness facility. The school now occupies a former elementary school. The school had an average class size of 17 students and one principal and one counselor.

School Leadership

The charter school's principal was young, dynamic, and truly believed he could make a difference through his role as a leader of a charter school. He began his career as a vocal music teacher and coach. He has been in school administration since 1999 and has worked as principal of the charter school since 2001, and he called it his "opportunity to put up or shut up about everything I had always said I was for." He used a democratic form of school leadership and saw himself as a "facilitator, not a boss." He believed that hiring the right teachers were key to success in his school.

This principal also believed that ATA had a positive effect on his school. He saw the extra educators and professional stimulation for the teachers involved as the greatest benefits. He also noted that implementing change in his building was easier because of the small school size and the fact that there was only one administrator, so changes could be implemented more quickly than in a more conventional school setting.

In addition, his school had a strong belief in professional development and using innovative teaching practices. The students did not attend schools on Friday because they were reserved for faculty meetings and professional growth. He said, "…it's far easier to do it (ATA) in a charter setting and probably the people (teachers) that come here share a like mentality that is far more conducive to being more creative and they have a passion for learning and want to make a difference." In essence, he believed his faculty was more open to trying new things and spending extra time for innovative programs, like ATA, than a conventional school faculty. Overall, this principal went out of his way to accommodate the ATA program in his building and attend the initial start-up workshops. He even attended a nationwide National Science Foundation (NSF) meeting as the only principal from ATA. Being a new principal with a new school, and with a small school atmosphere, he seemed to have an added interest and he had more direct participation with ATA than did the other administrators in this study.

Teacher C

Teacher C was a science teacher who has had a long career in education. He was originally from South America and had a heavy accent, which sometimes made it difficult for others to understand him, and also explains some of the English usage in his quotes that follow. He received his higher education in the United States, with an

undergraduate degree in science and curriculum and he also holds a Ph.D. He did some teaching at the university level and currently teaches science at the charter school in this study.

Teacher C was chosen as an ATA teacher at the inception of this program. When he was asked about ATA and using authentic instruction in his classroom, he responded, "I'm dedicated to this. I don't do anything for my personal life." He believed that science must be taught in a lab setting, noting, "the book is something that is information…you can not learn theory in science without experiencing the phenomenon." He also said, "If they do it in the lab, they have an idea. If they copy directly from the book, they forget." These comments detail some of what this teacher's philosophy is toward teaching science, but his ideas did not always match the way he taught, as will be discussed later under observations.

Teacher C also believed that the student population that was served in this charter school—students that he perceived as at-risk and/or apathetic—were often easier to reach when authentic instruction was used, rather than a more traditional approach. Most of the students came from the surrounding neighborhoods and were lower middle to low income and many were on free or reduced lunch (91%).

The fact that Teacher C was teaching in a charter school led to the question of how the charter school setting affects his use of authentic instruction. He replied, "I think I can teach better in a charter school. We have independence from the district and other authorities." He also believed that his principal was more of a hands-on leader, commenting that his principal took time to attend the first meetings of ATA so he would also have a good understanding of the program.

While Teacher C did not comment on the time barrier specifically, I believe he too saw it as significant from the following quotes: “It’s (teaching authentically) too much work, but I like it...I dedicate hours and hours to try to do this right…I made 40 lab guides and they work with them.” From his perspective, he believed in what he thought authentic instruction entailed and he worked hard to present material in a way that he felt was in the best interest of his students.

Observations of Teacher C

Teacher C was observed on three separate occasions. While this researcher observed him only one time during the spring semester and twice the following fall, there was a noticeable difference in this teacher’s instructional methods and his overall attitude toward his students. This was confirmed after speaking with the fellows that worked with Teacher C, who were with Teacher C on a weekly basis, and this will be detailed further in the following section.

The first observation was exactly what I expected to see—a new school in its first year of operation, students that were eager to be there, and a teacher excited to give them the knowledge they yearned for. The lesson was for ninth grade physical science and involved constructing circuits with batteries and wires. The students were diligently on task and working together in pairs. The teacher carried on meaningful dialogue with the students about the lab and he gave frequent positive praise to the students when they were successful. Both the students and the teacher seemed to enjoy this lesson. This lesson received 16 points out of 20 on Newmann’s Standards and Scoring Criteria for Assessment tasks, Classroom Instruction, and Student Performance (Newmann, Secada, and Wehlage, 1995). The four criteria included in the scoring are: use of higher order

thinking skills, level of deep knowledge, substantive conversation, and connections made to the real world.

The second observation that occurred the following fall was in a new school setting. The charter school had moved from an old church family center to a YMCA building. They had also added a grade, so Teacher C was now teaching tenth grade Biology I. At the beginning of the class period, it was surprising to see that the students copied notes off the board with blanks that they periodically filled in as they read their textbook assignment. The students were studying the human genome and answering almost entirely factual content questions (i.e. How many sex chromosomes does a male have?, What is a pedigree chart?). After the students finished their work independently, the class went over the answers as the teacher called on different students to answer the questions. He offered very little discussion to tie the lesson to the real world, which was especially disconcerting since this lesson could have created much student interest and learning if it had been presented in a different way. In addition, the students were disrespectful—speaking out of turn and interrupting the teacher and other students. This lesson received an overall score of 7 out of 20 points on Newmann's scale.

The third and final observation, about a month after the second observation, took place in Teacher C's Honor's Biology I classroom. This lesson included classifying ten different organisms and using the microscopes to look at the organisms. The directions were somewhat confusing, but the students proceeded to look at the organisms in a rather disorderly manner. They soon determined that they could identify the ten organisms without actually looking in the microscopes and many of the students never got up and looked at the slides, rather they used their textbook to fill in the worksheet. Once again,

the students were both loud and rude towards other students and Teacher C. Teacher C's method of handling the misbehavior was to ignore it, but it did not go away. This lesson received 10 out of 20 possible points on Newmann's scale.

It is interesting to note that Teacher C showed promise when he first began with ATA, but he somehow decided to stop using authentic instruction in his classroom. In his interviews, he maintained that he was still using it, but it was obvious both from the observations and from discussions with his fellows that he was no longer using the methods in a consistent way. The following section will further detail and possibly explain the differences that were seen from one semester to the next.

Perspective from the Charter School Fellows of Teacher C

Teacher C had two fellows that worked with him on a consistent basis. I will call them Fellow C and Fellow D. Fellow C is a vivacious young woman and an engineering student who became interested in ATA because her own recollection of effective teachers, "…(they) were the ones who really got us involved…" She also believed that students were appreciative when, "…somebody comes in other than their teacher once in a while…and teaches them something that they are doing in the real world." These two things motivated her to become involved as an ATA fellow.

Fellow C believed that Teacher C, although he had good intentions, had difficulty getting students to respond to him as a teacher. She saw his classroom management style as a definite hindrance to learning taking place. She noted in her journal early on, after her second observation, that "…maybe he doesn't want to be a disciplinarian, but a teacher." She even went as far as to say, "I think he wants to enjoy it, but he can't stand those students." She saw his failure to connect with the students, partly due to his

language barrier, as having caused him to be ineffective in getting the lesson content through to the students.

She did believe that some authentic instruction took place, but, "…that the majority of the authenticity probably comes from when we (the fellows) are there." And, that, "…a lot of the time he (Teacher C) just goes by what he finds in the textbook or what comes with the textbook." When she asked the students what would make their science class more interesting, "They all said that they wanted to do more stuff, instead of just plowing through the textbook." Fellow C also said that Teacher C believed he was teaching authentically when he made a fill-in-the-blank worksheet, and that "He just really doesn't get what it (authentic teaching) is."

Fellow C saw time as the major barrier in getting any teacher to use more authentic instruction, but she also saw that "once you develop a stockpile of lessons, you always have that to go back to." In essence, if you've been a practicing teacher for sometime, your "stockpile of lessons" has already been developed and it would take a lot of time and effort to start over.

On a more positive note, Fellow C believed that the administration at School B was more involved than most of the other schools in ATA. She noted that, "…he (the school principal) came to almost all of our ATA classes and was really involved and was really enthusiastic about the program and really cared." She could also see that when the new school was started, it was easier to hire teachers with similar philosophies and that the school as a whole seemed to have an "overall willingness to try new things."

Fellow D is a graduate education fellow in ATA. He became involved when he was already a classroom teacher and noted that it was "something I was looking to try to

do in my own classroom…I feel like as a teacher I have been able to grow." Fellow D has completed his Master's degree and is now working on his Ph.D.

Fellow D began his work with Teacher C in the spring of 2002, and he also noticed a remarkable difference in him from the spring to the fall semester: "The first semester that I worked with him…he was very authentic. He had hands on lessons practically everyday and the students responded to him…The second semester…very different…He went strictly traditional lecture and note taking." While he felt like he had an impact on the increased usage of authentic instruction in the spring, he felt like he had no impact in the fall. Like Fellow C, Fellow D saw "a lot of disruptions, discipline issues" and he believed that it caused Teacher C to have a poor attitude toward his students. After Fellow D voiced his concerns over his lack of using authentic methods, Teacher C cited that the students' grades were better with the more traditional style of teaching. This was the only reason that he ever gave for his change in teaching methods.

Fellow D saw time and money as the two major barriers to authentic instruction. He saw a need for more preparation time and the fact that the lessons often took longer to teach, so less overall course material was covered in a semester, which put added pressure on the teacher in trying to cover all of the objectives required for standardized tests. He also pointed out that money, "especially in science," to buy equipment and materials was quite costly.

While Fellow D believed time and money were major barriers to authentic instruction in general, he saw a lack of flexibility and a traditional teacher education training background as specific barriers to Teacher C's use of authentic instruction. He also noted that, "He (Teacher C) was really hands on, but there is a difference between

hands on and authentic. He would really never take it that next step and push them to think about how the experiment or activity related to the real world."

Although Fellow D was somewhat critical of Teacher C, he did have positive comments about School B overall. He observed that the charter school had fewer limitations than the more traditional schools. He commented that the administration was more willing to, "let ATA in, rearrange schedules, give us more time when we needed more time, provided materials, and provided more classrooms…I feel that being a charter school played a big role in authenticity." He also remarked that the smaller class sizes in the school made it "…easier to implement the authentic activities" and provided for more "…one on one individualized instruction."

Teacher D

Teacher D was a mathematics teacher at School B. He had a Master of Science degree in Mathematics and was working towards his Ph.D. in Math Education. He seemed to have a passion for his subject area and in finding the right methods to convey it to his students. From observing his classroom, it was quickly noted that he had excellent rapport with his students and was willing to try whatever means to get them to learn new concepts. At the time of this study, he had taught only three years and after his first year, he had the opportunity to transfer from a small public high school to this new charter school (School B) to "develop an innovative mathematics program."

He grappled with the term "authentic" and stated that "Some of my students gained greatly in the mathematics learning because of the activities we developed, but many did not, and saw the lessons and activities as hoops to go through. The activities were no more real to these students than if I was asking them to memorize a formula and

plug in some numbers." His initial work with ATA was positive and upbeat. He was even instrumental in the hiring of one of the ATA fellows that had worked with him as a teacher at School B. He was excited about the program and tried to use authentic lessons with his students. However, during his second year with the program, he became frustrated and disheartened. He began to realize that authentic instruction was not a magic pill, but merely one method that worked for some students, but not for all students all of the time.

His frustration eventually led to his resignation from the ATA program. He noted, "Teaching isn't about creating a great 'looking' lesson, it is about how the students interact, in the complexities of their lived lives, with the lesson and the teacher(s), within the classroom and greater community." It seemed that he held the basic philosophies of what most authentic instructors believe in, yet he simply got frustrated with other aspects of ATA. His perception was that it was a top down organization and that there was a "lack of concern for the inefficiency of not maintaining the human relations element" and he believed that authentic instruction was "oversimplified" as "the" answer to creating better math instruction. However, overall, Teacher D was one of the best in conveying his lessons authentically to his students, as noted below.

Observations of Teacher D

Upon entering Teacher D's classroom, the size of the class was immediately noted. The most students observed in his room were 14 and the least was 7—a manageable amount for working with upper level mathematics. It was obvious that Teacher D had excellent rapport with his students, as they freely asked questions and had

great exchange about their subject matter. Teacher D made everyone's question seem valid and he knowledgeably answered everything he was asked in a nonjudgmental way.

Teacher D frequently used higher order thinking questions and provided real world examples to explain mathematical concepts. For example, when he taught how to measure angles, his students made clinometers—instruments for measuring angles of slope--out of paper and took them outside to take different measurements. And, when he taught how to measure the area of a circle, he brought in real world objects, such as a paper towel roll, pencil holder, and a compact disc, for students to measure. The students seemed to enjoy working with the objects and discussing the lesson with each other while they worked. This lesson received 12 out of 20 points on Newmann's scale.

Another lesson that was observed in Teacher D's classroom received 19 out of 20 possible points on Newmann's scale. This lesson was the highest of all that were observed in this study. Teacher D created an involved 9 -weeks project in which his class did a community needs survey to see what type of community building could be built to best serve the needs of their surrounding area. The students had to figure area to buy bricks, siding, wallpaper, and carpet. They also used a 3-D software package to draw a floor plan for their building. One group came up with a multipurpose building to house several social services, to include a homeless shelter that also provided educational services. This group also presented their ideas at a city council meeting—making their project have connections to the world beyond the classroom—one of Newmann's standards for authentic achievement. This was a unique lesson that truly brought all of the elements of authentic instruction together.

Perspective from the Charter School Fellows of Teacher D

Teacher D worked with several different fellows throughout his time with the ATA program, but not any one person for a long period of time. One lesson that was observed by a fellow involved students choosing a frozen or refrigerated food item and finding out how many of them would fit into their classroom, which was his imaginary freezer or refrigerator for the "company" they were creating. This lesson was another example of a unique authentic lesson taught by Teacher D. The fellow that observed this also noted the following in her journal, "[Teacher D] is already an authentic teacher with an authentic theory-based curriculum. He wants to use the ATA Fellows to find real-world problems so that the students can see how math is used outside of the classroom and begin to apply what they have learned." This quote refers to the level of authentic teaching that was already present in this classroom before ATA fellows came in and how drastically different the teachers in this study are in terms of their prior knowledge and use of authentic instruction.

Another fellow observed that the students "seemed to feel more comfortable being themselves, and he obviously had a strong rapport with most of the students because they paid close attention to his examples. He was even able to include those students who did not seem to want to be there by relating the concepts to special interests of those students. The students left [Teacher D's] class having learned an important mathematical concept but also having had fun in the process." This was another fellow, who commented in his journal about Teacher D's excellent rapport with his students and his teaching talents.

Case C: The Conventional School

The conventional school, a traditional large urban high school, was 72% African-American and the remaining students were mostly Caucasian. The school had approximately 48% of its student population enrolled in the federal free and reduced lunch program and they were a targeted assistance school for Title I funds. The school was set in a lower-middle class neighborhood and was built in the 1960's. The large school building was neat and clean throughout. Every person, upon entering the building, was required to pass through a metal detector-screening device and security personnel could be seen in the hallways as well. The school operated on an A/B block schedule, meaning that the students had a total of 8 classes, which alternated in meeting for one and a half-hour blocks every other day. The mission statement of the school was as follows: "…students will graduate with the skills and background for living as lifelong learners, analytical thinkers, and responsible citizens." This case focused on a math teacher, the only ATA teacher in the building, and the difference, or lack of a difference, that ATA made in her as a teacher and her classroom.

School Leadership

The school principal was a young female and former science teacher and coach, who was in her second year serving as a principal. She described herself as a "collaborative leader," she believed in working with her teachers and in them working with one another. The core-subject teachers all had a common planning time to work together, for example, the math teachers had the same planning time and the science teachers had a common planning time.

She exemplified her belief in authentic instruction through the following statement, "I think that all instruction needs to be relevant to kids…they need to be able to see relevance in what they're doing." She also believed that ATA had a positive influence in her building, "I've seen the number of student complaints go down in the classroom where ATA is involved because the students are engaged. It all goes back to achievement takes care of discipline and you don't have all these other problems when students are interested and engaged in what they're doing."

In addition, she felt that ATA had a positive effect on the ATA teacher in her building as well as some other teachers at the school. She commented that the ATA teacher in her building "…shares it with all of those other teachers in her department." She also noticed that ATA directly benefited students because they were "…exposed to equipment and ideas that they may not have had a chance to see otherwise." And, she saw the ATA fellows, many of whom were minority college students, coming into the building as an unintended benefit, in that they might have been viewed as role models to the heavy population of minority students at this school.

Overall, this school leader believed that "the access to resources, the access to ideas, access to people who are on the cutting edge of listening to that research, the engineering students who are in the midst of hearing those things…the networking and the resources are the most positive." She was very supportive of ATA being in her school and would like to see the program expand to include more of her faculty in the future. The ATA teacher at this school also had positive remarks about this administrator. Teacher E commented that she "is always behind what we're doing. She's always for the kids, so I think it makes a big difference."

Teacher E

The conventional school had one math teacher as part of the ATA. This teacher--Teacher E--was an African-American female with 23 years of teaching experience, 15 years of that occurred at this school. She was also the head of the math department. She had a pleasant personality and seemed to have genuinely enjoyed her involvement with the ATA program. She particularly noted how much she appreciated the equipment she received and the extra help in the classroom from the ATA fellows.

Teacher E mentioned several authentic lessons that were tried in her classroom since becoming involved with ATA. One lesson developed by the ATA fellows, involved using geometry to construct toys and then presenting them to the class through commercials that they designed to sell their toys. Another lesson, also designed by the ATA fellows, involved measuring sound. They went to various locations in the school—the kitchen, gym, and music room—to measure sound with sound measuring devices that were provided through ATA grant money and the school was able to keep the equipment for future use.

When asked about barriers to using authentic instruction on her own, Teacher E believed that not having materials was the greatest barrier. She felt that time was somewhat of an issue, but that it did not prevent her from teaching authentically. She noted, "…authentic teaching should not take extra time. You should be able to incorporate a mini project into a lesson, and not change the time required to teach that lesson."

Teacher E felt the major problem with her school setting—a conventional inner city school—was attendance. She stated, "…attendance is a problem…A group of students start a project, then half of them are gone when it's time to do something. It presents a problem for the students that are here…but I don't know what we can do about it."

She noted that class size, when her classes are close to 30, can also be a problem when the ATA fellows are not present. She said the fellows have "made my life very nice" and the students "look forward to the extra help that they get." She also confirmed that she was more likely to do authentic projects when the fellows were present because "I have the extra hands. If I didn't have the extra hands, there would probably be a lot of things that we wouldn't get to do…Sometimes you've got to show, and you've got to show one-on-one. When there is one teacher in the room with 28 or 32 kids, that can be tough on a time line…When there's three to 30 kids, instead of one to 30 kids, you've got a lot more time."

When Teacher E was questioned about some authentic lessons that she had accomplished without the fellows, she gave two examples. One lesson involved the use of straws cut in varying lengths to form triangles to test the equality theorem and another lesson involved using paper plates to learn the degrees of a circle

Overall, Teacher E believed that ATA "made me more confidant in what I do…It's made me a better teacher. Not that I'm not still learning and growing, but I still think it's made me a better me."

Observations of Teacher E

Upon walking into Teacher E's classroom, one noticed the fairly traditional arrangement of the desks in two rows with a long center aisle facing two other rows, along with the teacher's desk and white board at the front of the room. The classroom bulletin boards and walls were decorated with slogan posters, such as "Get a life. Get an education." and "Be a problem solver, not a problem maker." When students walked in the room there were math review problems written on the board for them to work on while attendance was being taken, papers were passed out, and announcements were read.

The first observation included an Algebra I class of about 15 students working on a probability assignment. The teacher presented the lesson on the board, while the students took notes. The classroom was fairly noisy while the lesson was presented and some students were calling each other inappropriate names. The teacher ignored the behavior and continued with her lesson. The teacher used real-world examples of figuring probability when tossing a coin, rolling dice, drawing different colored marbles out of a bag, and finding artifacts at an archaeological site. This lesson received 13 out of 20 points on Newmann's Standards and Scoring Criteria for Assessment tasks, Classroom Instruction, and Student Performance (Newmann, Secada, and Wehlage, 1995) and was the highest scoring lesson that was observed from this teacher. The four criteria included in the scoring were: use of higher order thinking skills, level of deep knowledge, substantive conversation, and connections made to the real world.

The Geometry lesson that followed the next hour contained about 18 students and the teacher presented a lesson on finding the geometric mean using cross multiplication,

the side-splitted theorem, and the bisector theorem. Approximately 25% of the students were off task, the teacher continued to ignore the inappropriate remarks and talkativeness of the class. This lesson received 9 out of 20 points.

The second observation involved about 12 students in a Trigonometry class, 6 students (1/3 of the class) were absent. The lesson over double angles and half angles was taught in a traditional manner, while the teacher worked sample problems on the board and called on students to work out the steps with her. The students asked questions and the teacher was helpful in making sure that they understood the lesson. This lesson scored 6 out of 20 points.

The third and final observation was in an Algebra II class. Thirteen students were present, seven of those were tardy, and seven more students were absent. The lesson began with a review of the quadratic formula and the "FOIL" method. After the problems were assigned from the textbook, less than half of the students worked on the assignment. A group of five students were sitting together discussing drug use and other activities from their weekend. Many inappropriate discussions were going on around the room and the teacher again seemed to ignore the behavior. The lesson scored a mere 6 points on the Newmann scoring scale.

Perspective from the Conventional School Fellow

The ATA Fellow that worked with Teacher E, Fellow E, was a graduate student in Engineering. She worked in this classroom for two years and added an important perspective to the data, since she has been in and out of the classroom on a regular basis. After reviewing her ATA portfolio and reading her journal, it was clear that her observations were very similar to the ones previously discussed, in that Teacher E

consistently followed a traditional teaching approach with a touch of authentic instruction thrown in occasionally.

When asked to rate Teacher E on a scale of 1 to 10, the Fellow E gave her "…about a 3 or 4 because she really doesn't do that much authentic stuff." The fellow in this case believed that the only authentic instruction that occurred in the conventional school was the lessons that had been brought in by the fellows working with ATA. She believed the biggest barrier for authentic instruction was the time factor. She noted that "It's easier just to find a book and find some problems and say, ok do this, and send them on to their next class…the time that is required to write authentic lessons is what keeps teachers from doing it more often." She stated that Teacher E had done some small authentic lessons here and there, but not on a consistent basis. She also added that the class size of 20+ students was difficult when only one teacher was there. She went on to say that when the fellows were there, three adults were in the room, and that made the job much easier when you had so many students needing further explanation. This fellow also believed that it would be hard for Teacher E to change her teaching methodology due to the fact that she is older and eligible for retirement in two years. She believed in authentic instruction and wished that the teacher involved did more to promote it. She noted that, "It seems like they (the students) understand more when we do it that way (authentically)…a lot of them aren't getting it and it's kind of sad because they have to keep moving up…"

Overall, when asked about the ATA program in general, she felt it was harder for her at first because, as an engineering major, she was not familiar with writing lesson

plans. She believed that the program needed more education majors involved. However, the NSF grant would not allow for more education fellows.

The data collected from this fellow about Teacher E seemed to concur with the data collected by this researcher. Interestingly, neither Teacher E nor the school principal saw the definite lack of authentic instruction in this classroom.

Summary

This chapter provided the initial presentation of data from each of the three school sites and from each of the five teachers in this study. Data was presented from the teacher's interviews, observations, and fellow's interviews and journals. The next chapter provides a more in-depth analysis and cross-case analysis of the data. Each research question is discussed and data interpretation follows each question.

CHAPTER 5

Cross-Case Analysis and Interpretation of Data

Introduction

This chapter will interpret and evaluate the data from each school site and each teacher in relation to the research questions that were presented in chapter one and additional questions that guided this study that were presented in chapter three. It also relates the literature, which was reviewed in chapter two, and some new literature that relates to the data collected, and the study as a whole. Each question is presented and followed by an analysis of the data that pertains to that question.

Research Question 1: How does authentic instruction compare across three different urban high school settings--from an alternative school, to a charter school, to a conventional school?

Each school setting in this study—the alternative school, charter school, and conventional school—provided a unique look at authentic pedagogy and how is was used and perceived by teachers in different instructional environments. Of course, the setting did not entirely determine the use of authentic instruction, but it was found to have an impact, in some cases negative and in some cases positive, on the use of authentic instruction in the schools in this study.

The Alternative School

The alternative school, School A, had several advantages. It was small, both in school size and in class size, the teachers were already using authentic instruction to a large degree, and the overall culture of the school was open and willing to new programs

and outsiders coming in their school. The disadvantages included the varying subjects and ages that were taught in one classroom, the constant turnover in student enrollment, and the horrendous attendance problems of the students.

Teacher A called the use of authentic instruction a "necessity" for learning to take place in their school environment. Teacher B remarked that it's

> …easier for us in an alternative setting because there is that perception that alternative means we take other avenues…so I think we've kind of always been on the cutting edge in trying to find ways to teach students that the traditional schools were not able to teach…the idea of doing things differently flies a little bit easier here.

This was a major factor in why ATA had a positive impact in this environment. There were two willing teachers who were already implementing authentic instruction to a large degree (even though they didn't call it that) and they were in a school environment with a supportive administrator that was receptive to change.

Interestingly, one of the fellows, Fellow B, saw the alternative school setting as a hindrance to authentic instruction. He remarked,

> I think the easiest setting would probably be a traditional school where attendance is regular, where you have a classroom where they're all studying the same thing at the same time so that way you can look into next week and see what they're going to cover and do an authentic thing for that next week. Whereas this week, if I were saying what are they doing next week, I'd probably have eight things…I think that the alternative format is a major hindrance…

While it was true that the different subjects and grade levels of the students were a problem at this school, attendance was just as bad, if not worse, at the conventional school in this study. The large classes at the conventional school were as much of a hindrance as the different levels at the alternative school. This researcher, having observed in all three settings, saw the alternative school setting as more of a benefit than a detriment to using authentic instruction. In addition, the literature also points to the advantages of a smaller school setting--stating that students learn more, have better attendance, and higher graduation and college-going rates in smaller schools (Lee, 2001; Darling-Hammond, Ancess, and Ort, 2002). Smaller class size is also noted as a distinct advantage in the literature (Molnar, 2000; Nye, Hedges, and Konstantopoulos, 2000; Borhrnstedt and Stecher, 1999). While this school has its share of problems, this researcher believes that the problems would be magnified to a greater degree if this were a large school with large class sizes.

The Charter School

The Charter School seemed to have all of the right elements for implementing authentic instruction—it was a new school, it was small in school size and classroom size, and it had an effective administrative leader. It also had much more autonomy in choosing its curriculum, making decisions about the school budget and hiring staff that understood the mission of the school. However, the two teachers that were involved in ATA at this site were very different. One (Teacher D) was already a skilled authentic teacher, while the other (Teacher C) had difficulty with understanding the authentic instruction concept.

Teacher C, although not as effective as Teacher D, did note that there was a difference in teaching in the charter school setting. He said, "I think I can teach better in a charter school. We have independence from the district and other authorities." This alluded to the fact that there was less bureaucracy and fewer regulations with the charter school. For example, they had the flexibility to arrange their school day in a different manner and did not have to follow many district guidelines. The charter school concept was created to be different from, and to be an alternative to, conventional schools.

School B's fellows also observed a different climate at the charter school. Fellow C commented that when the new school was started, it was easier to hire teachers with similar philosophies and that the school as a whole seemed to have an "overall willingness to try new things." Fellow D observed that the charter school had fewer limitations than the more traditional schools. He commented that the administration was more willing to, "let ATA in, rearrange schedules, give us more time when we needed more time, provided materials, and provided more classrooms…I feel that being a charter school played a big role in authenticity." He also remarked that the smaller class sizes in the school made it "…easier to implement the authentic activities" and provided for more "…one on one individualized instruction."

Overall it seemed that School B was probably the model school environment, of the three schools in this study, to grow and implement what ATA had to offer. However, one of the teachers was not as effective at teaching in general, nor was he open to changing his lifelong methods of instruction. The result of having these two very different teachers revealed that authentic instruction is more dependent on the individual teacher's classroom than the overall school setting. There could be the most innovative

and challenging school in the world, but if there were an ineffective teacher in one classroom, then those students would not be receiving the full benefits of being in that school. As the literature suggested in chapter two:

> Although charters may be useful as a small-scale approach to change, they are not likely by themselves to transform the system. Of the thousands of new experimental, alternative, and demonstration schools created with special dispensations in each previous era of reform, most came and went quickly because policymakers did little to change the system as a whole—to increase the supply of knowledgeable teachers, to reallocate funding, and to revise or abolish regulations that shape 'regular' schools. (Darling-Hammond, 1997)

This school, while it offered some valuable change from the traditional school setting, could still not overcome having an ineffective teacher.

The Conventional School

The conventional school involved only one ATA teacher, so it was somewhat more difficult to generalize about the entire school, but some observations were made as to how authentic instruction was perceived and used in this setting.

It was interesting to note that the principal and the teacher had all of the "right" answers about using authentic instruction. However, the observations and the interviews with the fellow did not reflect that much authentic instruction was taking place or that Teacher E was making an effort to teach authentically. This was probably more likely to happen in a large conventional school setting. The principal of this large of a school, while wanting new and innovative programs in her building, did not truly have the time to see what type of change was really occurring with this teacher and her classroom.

Attendance problems, while not unique to the conventional school setting, also created a disturbance in the use of authentic instruction. Teacher E, as quoted earlier, stated that "…attendance is a problem…A group of students start a project, then half of them are gone when it's time to do something. It presents a problem for the students that are here…but I don't know what we can do about it." Although the alternative school also had attendance as an issue, it was for different reasons. Attendance seemed more difficult in this larger school where it was easier to lose track of individual students and harder to keep up with their excuses for being absent.

Class size was also an issue in the conventional school. This school had large classes, especially in comparison to the alternative school and the charter school. Both the teacher and the fellow noted their concerns in separate interviews. They both said that it was much easier when the three fellows were present for any given lesson, due to the number of students that were in the room and that most of them needed assistance. Teacher E even admitted that she preferred to do authentic lessons when the fellows were present. It seemed that she was unable to coordinate everything to do a project type lesson on her own and that traditional methods were simply easier and less time consuming. As noted earlier:

> Transmission teaching is much simpler. Teachers can 'get through' texts and workbooks. Classroom routines are straightforward; controls are easier to enforce. There is a sense of certainty and accomplishment when a lecture has been given, a list of facts covered, or a chapter finished, even if the result is little learning for students. (Darling-Hammond, 1997, p. 13)

This philosophy and method of teaching was evident in Teacher E's classroom. Even with the encouragement from ATA and the fellows, it did not seem that she would ever change her method of teaching, especially since she was very close to retirement.

Research Question 2: What were the barriers of teaching authentically as perceived by the teachers and fellows involved in this study and were they able to overcome those barriers? If so, how?

The following were all listed as barriers to using authentic instruction in the most useful manner: time, poor attendance, lack of materials and money, large class size, and inflexible and traditionally trained teachers. The first four (time, poor attendance, lack of materials and money, and large class sizes) were noted more than once by both teachers and fellows. However, only fellows noted the last barrier (inflexible and traditionally trained teachers). The following will discuss each barrier and observations of how each barrier was overcome, to varying degrees or in some cases, not at all.

Time

Time was the most frequent barrier mentioned. Included in this category was a lack of time to cover the required state objectives and a lack of preparation and planning time. Two studies previously mentioned in chapter two, Roelofs and Terwel (1999) and Marx, Blumenfeld, and Krajcik (1997), also noted the negative factor that time can have when attempting to implement authentic instruction. Fellow B noted in his journal that, "…time constraints and P.A.S.S. requirements make it impossible to implement those (hands-on) teaching activities." While Fellow D commented similarly that the lessons often took longer to teach, so less overall course material was covered in a semester,

which put added pressure on the teacher in trying to cover all of the objectives required for standardized tests.

In addition to a lack of time to cover required material, the teachers and fellows also noted that teaching authentic lessons often involved more planning and preparation time. Two of the five teachers and four of the five fellows mentioned that more planning time would greatly aid their ability to teach authentically in a more effective manner. Teacher C commented that he spent hours at home working on lessons and Fellow E noted that it was much easier to assign work out of the book than to spend hours planning a more creative authentic lesson. While this barrier was mentioned the most often, it also had the most possible solutions revealed through the interviews and journals.

Teacher A, Teacher B, and Fellow B (all part of School A) noted that the fellows were invaluable contributors in helping with planning time. Teacher A remarked that, "they (the fellows) bring in more activities, so they're bringing in some activities that I probably would not have had the time to put in…time to put things together during the time that I want to do it." Fellow B said that he felt authentic instruction has increased due to his presence and the time that he was able to give to putting together labs and lesson plans. Teacher B also noted that the fellows were great in helping plan lessons, but she also noted a few other solutions that her school could help with when developing the school schedule.

Teacher B believed that double planning periods, or at the very least, a common planning period for the department could help in giving time to plan more authentic lessons. She believed in teaching cooperatively and she often did with Teacher A. She commented that, "we're so much more effective as a pair than we would be singly…there

is no reason to duplicate the effort to have two teachers planning two different sets of lessons trying to deal with the same objectives as we teach the same things." Other schools could also benefit from cooperative planning times for departments as one way to overcome the time barrier when planning authentic lessons.

One other solution that was mentioned in overcoming the time barrier for planning was that it would get easier year after year. Like anything that is planned for the first time, it takes longer, but after it's been done year after year, teachers should get better and shouldn't have to "reinvent the wheel" every year when they are developing lesson plans. Fellow C noted this when she said, "once you develop a stockpile of lessons, you always have that to go back to." ATA is currently in the process of testing and developing authentic lesson plans for teachers to use in their classrooms. They are also developing a database so they can easily access the plans when needed throughout the school year.

Attendance

While time was a significant barrier mentioned by those in this study, poor attendance was also a severe problem when trying to teach an authentic lesson that lasted over more than a one-day period of time. Teacher E remarked, "…attendance is a problem…A group of students start a project, then half of them are gone when it's time to do something. It presents a problem for the students that are here…but I don't know what we can do about it."

The teachers and fellows at School A also noted that attendance was particularly a problem for them due to the alternative school setting for parenting teens. Students enroll and checkout throughout the school year, going back and forth from their home school to

the alternative school. In addition, there were many absences due to pregnancy-related illnesses, maternity leave time, and when their babies were sick. While no immediate solutions were offered to overcoming these attendance problems, it would seem that if students were more interested and could see the practicality in their education, and authentic instruction was being utilized in every classroom, that they would naturally have a stronger desire to learn and to want to be at school.

One recent study (Darling-Hammond, 2002) took one failing comprehensive high school and created five new schools, thus allowing for smaller numbers. The results of this study found substantially better attendance, which was attributed to the personalization and stronger relationships that were built in the smaller school setting. The attendance issues in this study were the greatest at the large conventional school and the alternative school. However, the attendance problems at the alternative school were largely related to issues relating to pregnancy and illnesses in young children. The attendance issues at the conventional school could very likely be attributed to the impersonal and large environment, in which it was much easier to go unnoticed and where many students probably did not have a strong interpersonal relationship with a caring adult at the school.

Lack of Materials and Funding

Authentic instruction often required more materials, which in turn required more funding, especially in the science classrooms. Two teachers and two fellows commented on the lack of funds available for teachers when trying to develop and teach more

authentic lessons. The teachers expressed gratitude to ATA in providing some funding for materials for their classroom.

Teacher E noted that ATA bought sound machines for her classes to use in measuring sound. They went to various locations in the school—the kitchen, gym, and music room—to measure sound with sound machines that were provided through ATA grant money and the school was able to keep the equipment for future use. Teacher B, at School A, also remarked that she appreciated the funding that her school had received from ATA. Grants, such as the one that ATA is under, can be seen as one possible solution to inadequate school funding.

It should also be noted that Teacher D was allowed to buy math manipulatives and other appropriate supplies to assist with teaching math authentically in lieu of purchasing math textbooks. There is a great deal of money spent out of school budgets on textbooks that rarely implement authentic instructional strategies. This was a novel idea that was easier to accomplish in the charter school setting, due to less bureaucracy, only one person to convince (the principal), and being a new school, the money had not already been budgeted for that specific purpose.

Large Class Size

Large class size was also seen as a barrier to authentic instruction. Since class size is an additional question that was addressed, it is discussed below under its own heading.

Inflexible and Traditionally Trained Teachers

Overall attitude, a willingness to try new instructional strategies and one's educational background were also seen as barriers to authentic instruction. Fellow D,

who worked with Teacher C at the charter school, and Fellow E, who worked with Teacher E at the conventional school, observed these barriers.

While Fellow D saw time and money as major barriers to authentic instruction in general, he saw a lack of flexibility and a traditional teacher education training background as specific barriers to Teacher C's use of authentic instruction. He felt that a more recently trained teacher that was open to new ideas would have been more effective in implementing authentic instruction and in following the ATA guidelines.

Fellow E observed a similar attitude toward authentic instruction in Teacher E at the conventional school. She commented that it would be difficult for Teacher E to change her teaching methodology due to the fact that she is older and eligible for retirement in two years. She did not believe that Teacher E would make major changes in her classroom and put in the extra time and effort to teach authentically. This researcher concurred with Fellow E based on observations and interviews. While it did seem that she agreed with the ideology of the program, and especially enjoyed the fellows coming in and creating and teaching the lessons for her, it did not seem that she was willing to take on the role of becoming an authentic instructor on her own.

The weakest authentic teachers in this study—Teachers C and E—were also the oldest and the most set in their ways. They had not received a great deal of training on using authentic instruction, but they agreed with its premise and were willing to make the attempt. Mark Windschitl (2002) noted in his research that, "One of the most powerful determinants of whether constructivist approaches flourish or flounder in classrooms is the degree to which individual teachers understand the concept of constructivism" (p.

138). The data in this study reflected that neither Teacher C nor Teacher E understood the concept of constructivism in a way that they could apply it to their own classrooms.

In addition to the two major research questions, several other questions helped guide this study and were conducive to the organization of the data. The additional questions and their answers are below.

According to the teachers' own perceptions, this researcher's observations, and the fellows' observations of the classrooms in this study, to what extent were the characteristics of authentic pedagogy found?

a. To what extent was construction of knowledge implemented in instruction?

b. To what extent was disciplined inquiry implemented in instruction?

c. To what extent was value beyond school implemented in instruction?

This question is broken into three parts. The first facet of authentic pedagogy to be addressed is construction of knowledge. According to Newmann (1996), construction of knowledge is based on prior knowledge and involves students producing original work, organizing and interpreting information, and considering alternative solutions and points of view. Examples of this were clearly seen in the classrooms of Teacher A, B, and D.

Teacher A and B were at their best in demonstrating construction of knowledge through individual questioning of their students. They both excelled at pulling meaning about their subject from their students by verbally questioning them. Since most of the students at School A were lower level, they did not do as well on paper and pencil type assignments, but when questioned by their teachers individually, they were able to

verbalize how they were constructing their knowledge. Teacher D displayed his use of construction of knowledge in every observation and at the highest levels. Each observation included the students' use of some type of tool for them to use their prior knowledge to gain a better understanding of a new concept. For example, the students' use of clinometers to understand how angles are measured, was an excellent example of students constructing new knowledge about angles based on their prior knowledge. I did not see any examples of construction of knowledge in Teacher C's classroom and Teacher E had some examples, but they were from lessons that the fellows produced, rather than the teacher, such as using the sound machines to measure sound waves at various locations in the school.

The second component of authentic pedagogy—disciplined inquiry—focuses on seeking in-depth understanding and expressing that understanding through elaborated communication, rather than fill-in-the-blank worksheets or true/false tests (Newmann and Associates, 1996). This component was only partly found in Teachers A and B's classrooms. While the students gained in-depth understanding through communication with the teachers and from participating in laboratories, there was not a large amount of elaborate communication present in the lessons. The teachers often took grades based on their verbal conversations and didn't require extensive writing. It is possible that due to the lack of background skills that the students came to them with, that they wanted to spend the limited time that they had focusing on their science content, rather than teaching writing and speech skills. Teacher C's classroom did not have any evidence of disciplined-inquiry. Teacher D's classroom had the best use of disciplined inquiry. In one assignment, his students completed an extensive community needs survey, figured

the costs to buy bricks, siding, wallpaper, carpet, etc, and then used a 3-D software package to "elaborately communicate" their ideas of a multipurpose community building to their class. One group even went on to present their project to the city council meeting. Teacher E's class demonstrated some use of disciplined inquiry, but again, it was through a lesson developed by the fellows. They used geometry to construct toys and presented them to the class through commercials that were designed to sell their toys. This provided in-depth understanding of how geometry could be used in a real-world setting and the commercial creation was a good example of elaborate communication.

The third facet of authentic pedagogy—assuring the lessons have value beyond school was provided for at some point by every teacher, although more extensively from some teachers. Teachers A and B provided the best examples in this area, partly due to the needs of their students who were all expecting a child, or already had a child. These teachers provided connections to the real world by having a gynecologist visit the classroom each week, doing their experiment that demonstrated the iron content of breakfast cereals, thus helping the girls to choose the more nutritious brands, and constantly relating their science content to pregnancy or raising children. Teacher C related concepts to the real world in his first observation through having his students construct circuits with batteries and wires—the students received a hands-on lesson and were able to see visually how this real-world event worked. Teacher D connected each of his lessons to the real world from using the clinometer, to measuring objects in the classroom, to creating the construction design for the community building. He was able to provide a real world connection in every lesson observed. Teacher E provided a real world connection when she taught her probability lesson. She showed students how to

figure probability when rolling dice and tossing a coin—maybe there was a future gambler in the room or maybe it discouraged someone from gambling when he or she saw the reality of the odds!

The following chart is a summation of the observations and displays how each teacher faired in each category at each observation. Appendix A details the method of the scoring; five is the highest score and one is the lowest score in each category. The chart reflects that Teacher D had the most authentic lessons, followed by Teachers A and B, Teacher C, and lastly, Teacher E. Ironically, what this researcher thought was the easiest category, making connections to the real world, revealed itself as the lowest scoring category. However, to receive the maximum score of five points in this category, the students had to share their information outside of the classroom setting, and this was only accomplished in one of the observed lessons (Teacher D's class attending the city council meeting).

Table 4

Scoring for Classroom Observations

	Higher Order Thinking	Deep Knowledge	Substantive Conversation	Connection to the Real World
Teacher A Observation 1	4	4	5	4
Observation 2	3	3	3	3
Observation 3	3	4	4	4
Teacher B Observation 1	4	4	5	4
Observation 2	3	3	3	3
Observation 3	3	4	4	4
Teacher C Observation 1	4	3	4	4
Observation 2	2	2	1	2
Observation 3	4	4	1	1
Teacher D Observation 1	4	4	3	4
Observation 2	3	4	3	2
Observation 3	5	5	4	5
Teacher E Observation 1	3	3	3	2
Observation 2	1	2	2	1
Observation 3	1	2	2	1

Teacher D was the best example of implementing all of the practices of authentic pedagogy. Teachers A and B provided a good example of working with challenging students and still maintaining high expectations. Teachers C and E were not authentic teachers and did not seem to want to change their teaching practices, although the use of fellows was valuable in their classrooms, especially for Teacher E. She had no problem letting the fellows come in and teach her class with authentic activities, but she did not seem able or willing to implement them on her own in a consistent manner.

How did the size of the school impact authentic instruction?

School size, while probably not directly impacting authentic instruction, did seem to impose an indirect benefit to having a special program, such as ATA, become successful. The literature has concluded, in more than one study, that smaller schools are more effective and can improve student achievement (Darling-Hammond, 2002; Howley and Bickel, 2000; Lee, 2001; Raywid, 1996; Wasley et al., 2000). One recent study concluded that students learned more in smaller high schools, placing the ideal sized school at 600-900 students (Lee, 2001). A different study recommended only 100 students per grade (Bill and Melinda Gates Foundation, 2003).

School size can also be accomplished by creating smaller schools within one large facility and can be rewarding in both the academic and social aspects of schools. One study, which looked at five new smaller schools, that had replaced one large conventional school, demonstrated better attendance and higher graduation and college-going rates (Darling-Hammond, Ancess, and Ort, 2002). And, studies of small schools in Chicago, New York, and Philadelphia have also found higher grade point averages and lower

dropout rates (Wasley et al., 2000; Raywid, 1996). In addition, small schools have been found to have fewer incidents of violence and report fewer discipline problems than large schools (Wasley et al., 2000). The benefits that students receive in smaller schools also include higher motivation and feeling a greater sense of belonging, and are thus more likely to remain in school (Vander Ark, 2002). Another study found that "student-teacher relationships in the small schools were deeper and more supportive, both academically and personally, than is typical in larger, comprehensive schools" (Bill and Melinda Gates Foundation, 2003, p. 8). This researcher also noted the more familiar and "at home" atmosphere among the students and teachers at the small schools—Schools A and B. These two schools and classrooms were overall more friendly and relaxed, as opposed to the more structured environment at School C.

Small schools have also been shown to more greatly assist economically disadvantaged students. A study of schools in four states found that students in less-affluent areas achieve at higher levels when they attend small schools. The correlation of poverty to low achievement is as much as 10 times stronger in larger schools, as opposed to smaller ones (Howley and Bickel, 2000). The alternative school and the charter school in this study received almost all of their students from large conventional urban high schools and the teachers at the smaller schools in this study concluded that the smaller environment was a key difference and benefit to their students.

Through observations and interviews in this study, it seemed that the smaller schools had an easier time facilitating having new people in their building and adjusting their schedules for special projects when needed. The principal of the charter school specifically noted that implementing change in his building was easier because of the

small school size and the fact that there was only one administrator, so changes could be implemented more quickly and with less bureaucracy than in a more conventional school setting. The flexibility and creativity that he was afforded through this smaller environment was a benefit to having ATA work more effectively in this building.

How did classroom size impact authentic instruction?

Too many students in a class were seen as another barrier to authentic instruction when trying to effectively teach in an authentic manner. Two of the schools, School A and School B, were able to benefit from smaller class sizes. The teachers, administrators, and fellows commented that it was helpful in giving more individualized instruction and in teaching hands-on lessons. Research has also conveyed that there are benefits to smaller class sizes (Bohrnstedt and Stecher, 1999; Molnar, 2000; and Nye, Hedges, and Konstantopoulos, 2000).

However, at School C, the conventional school, class size was an issue, where classes with 30+ students were common. Both Teacher E and Fellow E remarked on how much easier it was when the fellows were in the classroom so more students could get the assistance that they needed. Teacher E said that the fellows have "made my life very nice" and the students "look forward to the extra help that they get." She also confirmed that she was more likely to do authentic projects when the fellows were present because "I have the extra hands. If I didn't have the extra hands, there would probably be a lot of things that we wouldn't get to do…Sometimes you've got to show, and you've got to show one-on-one. When there is one teacher in the room with 28 or 32 kids, that can be tough on a time line…When there's three to 30 kids, instead of one to 30 kids, you've got a lot more time." Fellow E also noted that when the fellows were there, three adults were

in the room, and that made the job much easier when you had so many students needing further explanation. For School C, the fellows were seen as a solution to assisting with their overly crowded classrooms.

How did school administrators support and affect the implementation of authentic instruction?

The administration at each of the three schools was very different. During the startup phase of ATA, there were meetings for the principals and teachers to attend together to learn about the program. From this beginning phase, there were varying levels of involvement at each school. Some principals attended every meeting they were required to attend and some even attended the classes for the fellows that they were not required to attend. Naturally, each had their own style of leadership and handled the program differently depending on their own unique situation.

At School A, the Alternative School, there was a change in administrators over the two years this study was conducted. The first principal was a strong leader with definite opinions on anything that was asked of her. The second principal was somewhat more relaxed and easy going. Both principals were supportive of ATA being in their building, but neither had much direct involvement. The second principal described her role, as an administrator, as one to "help guide and support." She liked the extra lab experience her students received and noted that they often did not get that at more conventional schools. She seemed willing to support the program in any way, but was not actively involved with ATA or her teachers—she just knew it was there and believed it was benefiting students.

School B, the Charter School, had the most involved administrator of the three schools. This principal attended the regularly scheduled meetings that the principals were invited to attend and even made an extra effort to attend the class that was required for the ATA fellows to take their first semester. This principal was passionate about his new school and believed that his school's involvement in ATA was a valuable tool to making his school great. The school fellow's also noted his enthusiasm, Fellow C commented that, "…he came to almost all of our ATA classes and was really involved and was really enthusiastic about the program and really cared." It was evident that the excitement and leadership from this principal trickled down to his teachers and the fellows that worked at this school site.

The principal at School B had a shared decision making philosophy with his faculty. Shared decision making, "…permits members of the school community to collectively decide which decisions are consistent with the school's purpose, core values, and learning principles…" (O'Hair, McLaughlin, and Reitzug, 2000). This principal allowed his teachers to teach authentically, allowed them a voice in the way school funds were spent, and made them feel that they were a part of the decision making process for issues that affected the entire school. Lee (2001) noted that teachers should be more active decision-makers and that, "…teachers feel more effective when they control curriculum, teaching methods, and the classroom environment…" (p. 83). This principal seemed to embody these principles and allowed his teachers to be participants in all decisions that affected their school. It was evident from the observations and interviews with the teachers and fellows that the leadership at this school was a shared process and that the school leader was respected and valued for it.

School C, the Conventional School, also had a strong leader that seemed to care that they were a part of this unique program. The ATA coordinator, in her interview, commented that "…even (School C), as big as it is, we've been in contact with the principal quite a bit, and she's been very supportive." This principal also left a good impression on this researcher, but the teacher at this school was not very effective. It's probable that in this case that while there was a supportive and effective leader, there was not a strong and innovative teacher in the classroom, so the change that was desired to directly affect the students simply did not occur.

In summary, all three administrators were supportive of the teachers and ATA in general. However, it did not seem to affect the implementation in the isolated classrooms because the administrators did not hold their teachers accountable for maintaining an authentic classroom. Whether or not there was growth in authentic instruction in the classrooms involved was much more dependent on the individual teacher. However, it must be noted that without support from these administrators, ATA most likely would not have been in these schools at all.

What initial impact did the Authentic Teaching Alliance (ATA) make in the five classrooms in this study, after two years of involvement in the program?

The impact that the Authentic Teaching Alliance had on those that were involved in this study was great. ATA made a difference in these five classrooms, with these five teachers and the ATA fellows, and most importantly, with the students that benefited from the authentic instruction that they received.

The five teachers benefited to varying degrees, dependent on their teaching philosophy before ATA began. Teachers A, B, and D provided the most authentic

instruction before ATA was introduced to them. These teachers seemed to flourish even more in their authenticity with the assistance that was provided to them. They took advantage of the extra "hands" (the fellows), the extra money, and the extra time (with the fellows doing some of the work) that they received through this program and their lessons reflected the time and effort that was put in by more than just one teacher. At the end of the two years, these good teachers were even better teachers.

At the other end of the spectrum, Teachers C and E were the least authentic before joining ATA and never seemed to fully understand the goals that ATA was trying to accomplish. Professional development and more supervision could have possibly aided their understanding. They relied heavily on the fellows in their classrooms to make the work authentic for them, but they did very little on their own. It was highly unlikely that these two teachers continued to implement authentic lessons when the fellows left their classrooms.

The students of Teachers A, B, and D benefited from these three challenging teachers that were effective at communicating their content area in a more interesting and authentic manner and became even better at doing so throughout the two years of this study. The students of Teachers C and E benefited more from the fellows and the extra equipment that their teachers received to make their lessons more authentic. These students learned in a more traditional environment on a daily basis, so when the fellows came to their classrooms they appreciated the extra effort and real-world meaning that they brought to their studies. The school administrator at School C noted an extra benefit, as did this researcher, that the students in this study received. She believed that the ATA fellows, which included several minority college students, coming into the

building provided an unintended benefit, in that they may have been viewed as role models to the large population of minority students at this school. This researcher also noticed, through observations that the students in these classrooms responded well to the college students (fellows) when they were working with them. In several observations, this researcher noted the students asking for the fellows to assist them with their work. It seemed that they enjoyed having someone closer to their age, and someone with whom they felt had a great deal of math and science knowledge—since many were college engineering students—and they sought out and respected their help.

The ATA fellows were another group that benefited from the ATA program. This unique group of undergraduate and graduate students from the fields of education and engineering were able to get valuable and authentic work experience in their chosen fields. The engineering students valued the education students when they were required to write lesson plans and the education students appreciated the vast science and math background that the engineering students brought with them. The fellows were given a rare opportunity to learn about teaching, lesson planning, and classroom management first hand. They also discovered the varying types of teachers, schools, and school administrators and how to adjust to different needs, depending on the culture of each classroom and school. The fellows learned that they had knowledge and ideas that could be contributed to the ATA classrooms and that their opinions were valued and respected. The ATA teacher/fellow relationship seemed to be one of mutual respect and each learned from the other.

Overall, the teachers that already had authentic teaching values, whether they called it that or not, (Teachers A, B, and D) met the goals of the ATA program to be able

to take the fellows out of the classrooms once the teachers felt comfortable doing the lessons on their own. The more traditional teachers (Teachers C and E) were probably not going to change no matter what was done and were most likely not good choices for the program from the beginning.

Summary

This chapter attempted to answer each of the seven research questions by using data from all three cases, and thus provided a cross-case analysis of the data. Each question was carefully examined and each data set was used to provide the most accurate answers from the data collected in this study.

The next chapter, chapter six, is a discussion chapter and offers recommendations for future research. Significance of the study along with implications for teacher preparation programs and school administrators are discussed.

CHAPTER 6

Discussion

Introduction

This two-year qualitative study of three schools that included five ATA teachers and their fellows revealed five unique stories of how authentic instruction was implemented, what barriers were faced, and how some of those barriers were overcome. The teachers and fellows that participated in this study provided a glance into five very different classrooms, which all had their unique problems and successes while attempting to implement authentic instruction.

The literature reviewed in chapter two provided a background and body of research that guided this study. Each of the data sources—classroom observations, teacher interviews, principal interviews, fellow interviews, and fellow journals—collectively provided insight into each case and were valuable in answering the research questions in chapter five. The following section discusses the major findings in this study, the significance of this study, and implications for practice, preparation of teachers and administrators, and future research.

Major Findings

A Quality Teacher in Every Classroom

The National Governor's Association (2005) recently documented their "Action Agenda for Improving America's High Schools." In this document, they included five statements that they called on state leaders to implement. One of those statements was, "Give high schools the excellent teachers and principals they need." This also included giving teachers and principals incentives to work in schools with the most need. There

has been much talk and research in recent years towards reading and the lower grades, but it now seems that American high schools are getting the attention that they have so desperately needed and a major focus is on placing a quality teacher in every classroom.

This study reaffirmed the belief that the classroom teacher is still the most critical element to improving student achievement (Darling-Hammond, 2000; Sanders and Rivers, 1996). In simple terms, this study included three teachers who were effective in their attempts to implement authentic instruction and two who were not. One observation noted by this researcher was method of teacher selection for ATA. If the teacher selection process could have included teacher observations before the final selection of teachers into the program to better determine teachers that would "fit" the needs of the program. There were valuable incentives for being involved in ATA; fellows, funding for materials and projects, and a stipend were all included with being selected as an ATA teacher. It seemed that a more targeted method of selecting teachers who not only talked about authentic instruction, but also actually implemented it in their classroom, could have resulted in a greater usage of authentic instruction at the ATA schools.

This study focused on school setting as one of its primary research questions, and the setting was found to be important, but not as important as the classroom teacher is when it comes to student achievement. The ideal setting for authentic instruction (and probably all instruction) would be a small school, a small class, an excellent teacher, outstanding administrative support, extra time for planning, and additional funds for supplies. However, the literature still points to the fact that the quality of the teacher in the classroom is more strongly related to student achievement than class sizes, overall spending levels, and teacher salaries (Darling-Hammond, 2000). The ATA grant allowed

for some additional funds and the fellows provided some assistance in planning. Each school varied in the other facets, but in all three cases, the setting was not the answer as to why authentic instruction succeeded or failed. Again, the teacher was the key factor to the degree of authentic instruction that was accomplished in each classroom.

Yair (2000) also confirmed that reforms, such as authentic instruction, could be started with each individual teacher, and not necessarily as whole-school reform. He noted, "Teachers vary, and thus make a difference. Consequently, reform efforts need to focus on enabling teachers to use authentic, voluntary, engaging and challenging tasks and instructional strategies…to wait for whole-school reform may deprive many students of the initiative of teachers as independent, professional educators" (p. 205). Thus, while school structure and administrative support can enhance implementation, whole-school reform can be a lengthy and arduous process and individual teachers should take the initiative in ensuring the best possible instruction for their students.

The charter school and the alternative school were viewed as somewhat better settings because of the smaller school and smaller class sizes. In addition, they each had one administrator who seemed to be more involved and aware of ATA in their buildings. However, one of the teachers in the charter school was much more effective at implementing authentic instruction. This simply reiterates the fact that the teacher must be viewed as the central component of effectiveness over the school setting.

Collaboration and Shared Vision

Collaboration among teachers, fellows, school principals, and university professors was an important element in this study. Lee (2001) commented, "A link between professional cooperation and student learning rests on the assumption that such

interactions either improve instruction or reduce teacher stress and burnout caused by professional isolation. Both improved instruction and reduced stress are assumed to increase student learning" (pp. 82-83). The collaboration that was observed in this study was largely between the teachers and fellows. However, one school, School A, had a strong collaborative relationship between two of its teachers and this was seen as a definite benefit in their implementation of authentic instruction.

One of the key research questions in this study involved overcoming barriers that affected the implementation of authentic instruction. Time was seen as the major barrier and several possible solutions to this barrier were found. First, collaboration with the fellows was seen as key to aiding in greater usage of authentic instruction. While the fellows could not be in every classroom at all times, it did provoke the thought that smaller classes or more team teaching in the schools could accomplish some of what the fellows were able to do for the teachers in this study. In Newmann's (1996) study, teachers commented that benefits of collaboration included learning from one another, planning together, and discussing previous and upcoming lessons. Teaching with another person, rather than in isolation, seemed to make the teacher's job easier, less time-consuming, and more enjoyable. In addition, extra planning time, or at the very least, a common planning time for departments, would allow for the creation of more complex lessons through team collaboration. Lastly, it was noted that the time barrier should ease over time. As teachers implement authentic instruction year after year, they will have lessons to reuse and less planning time will be required as teachers have more practice over years of implementation.

All five of the classrooms in this study had many low-level learners. This researcher observed that authentic instruction was easily modified and adapted to fit any type of learner. This concurs with a comment in Brendefur's (1999) qualitative dissertation in which a teacher commented that "low-ability students needed authentic instruction more than high-ability students" (p. 185). The alternative school, School A, provided an excellent use of authentic instruction in mostly oral and hands-on work. The two teachers at this site were effectively able to communicate higher-level scientific concepts through their collaboration and use of authentic instruction to a challenging group of students. Their joint effort was seen as a driving force in more effectively working with these challenging students. For example, Teacher A would ask Teacher B, and vice versa, about a specific student, and they could decide together what worked best for that student, since they both worked with all of the science students. They seemed to embody Darling-Hammond's (1997) description of team planning: "…teachers fill in gaps in one another's base of knowledge and experience…help one another plan what they will do in their classrooms, serve as sounding boards for ideas, and add disciplinary and pedagogical expertise" (pp. 166-167). Teachers A and B worked as a team to implement authentic instruction. Their collaboration made the process easier and their students benefited from their efforts.

The university fellows were also found to be a valuable component of the collaborative process. They worked closely with the ATA teachers in developing authentic lessons that fit with the prescribed curriculum. They created most all of the authentic instruction that was taught in the weaker teachers classrooms and they made the "good" teachers even better by bringing in their own creations of authentic lessons and

providing an extra set of eyes and hands during instruction. The fellows studied authentic instruction extensively and had quality training from the university engineering and education professors to assist them in developing authentic lessons, but their collaboration with the ATA teachers was the essential element to their success in the classroom.

Professional Development

Professional development is often considered "the" answer for improving our schools, but it has not been successful in many cases, due to the fact that "key conditions for teacher learning," are often violated. King and Newmann (2000) identified four key conditions for teacher learning and contend that it is most likely to occur when teachers:

(1) can concentrate on instruction and student outcomes in the specific contexts in which they teach.

(2) have sustained opportunities to study, to experiment with, and to receive helpful feedback on specific innovations.

(3) collaborate with professional peers, both within and outside of their schools, and when they gain further expertise through access to external researchers and program developers.

(4) have influence over the substance and process of professional development (p.576).

These four conditions, when applied to the ATA program, were largely met. Teachers were able to implement the authentic instruction strategies in their own classroom, thus it had direct relevance to their day-to-day job. Teachers also had a long period of time to experiment with, get feedback, and make improvements to their authentic instruction.

Statement three deals with collaboration both inside and outside of the school. ATA provided a great deal of collaboration with experts outside of the school, but the ATA teachers were relatively isolated inside the school, with the exception of School A. Teachers A and B had a strong collaborative working relationship and it definitely added to the quality of instruction that they provided to their students. It is possible that if Teacher E had another math teacher in her building that was part of ATA and if Teacher C had another science teacher in his building that was part of ATA, that their results would have been different. These two teachers needed additional support to implement authentic instruction in their classrooms.

Statement four was provided for in that the ATA teachers were volunteers and none of them were forced to participate. Each of them claimed to have a belief in authentic instruction before beginning with ATA and thus, already had a belief system that supported what was being taught.

The teachers involved had some direct training through ATA meetings, but it seemed that more extensive professional development for the teachers would have allowed for greater growth, especially for the two weaker teachers. However, ATA expected that the teachers involved in their program were already authentic teachers and did not need much training. If the teachers had been given more professional development, perhaps they could have become more authentic on their own and less dependent on the fellows, thus creating more confidence to continue applying authentic instruction independently after the fellows left their classrooms. However, both of the teachers that had difficulty with implementation of authentic instruction faced conceptual and pedagogical dilemmas (Windschitl, 2002). That is, they did not seem to understand

the philosophical background of constructivism and they were challenged with creating and teaching a more complex curriculum. They needed more assistance than ATA was designed to provide.

Professional Learning Communities

All three of the schools in this study could have benefited from a stronger professional learning community. Newmann and Wehlage (1995) stated that, "Organizational capacity is enhanced when schools are shaped into professional communities. Just as authentic achievement provides a vision to inspire student learning of high intellectual quality, an image of the school as a professional community can help cultivate organizational capacity" (p. 30). They go on to define the three general features of a professional community:

(1) Teachers pursue a clear shared purpose for all students' learning.

(2) Teachers engage in collaborative activity to achieve the purpose.

(3) Teachers take collective responsibility for student learning (p. 30).

Professional learning communities, like authentic instruction, have also been found to improve student learning (Cate, 2004; Newmann and Wehlage, 1995). However, they must be implemented school wide and this would be a project beyond the scope of ATA as it now exists.

School B came closest to having a professional learning community environment, from the observations and interviews that this researcher saw and heard, it did seem that the principal was attempting to create this type of atmosphere in his school. In addition, this small school environment, was able to build stronger "connections and relationships" with its students and parents, which ultimately created a more democratic school

atmosphere, in that, all teachers felt a collective responsibility for all students (O'Hair, McLaughlin, and Reitzug, 2000, p. 46). In the beginning stages, when there were just one or two grades, almost every teacher had every student. This allowed for conversation among teachers about students and allowed them to collaborate and problem-solve about particular students and their learning and/or discipline issues.

It would be interesting, perhaps in future research, to see ATA implemented in an entire building and include the tenets of a professional learning community along with implementation of authentic instruction. The two combined would likely yield even greater results.

Lesson Study

Lesson study, the process of planning, conducting, and discussing the research lesson for teachers to study, was started in Japan and is gaining popularity in the United States (Lewis, 2002). It is another method helping teachers to grow professionally and work collaboratively with other teachers to help improve student achievement. Lewis discussed four components of lesson study has it is practiced in Japan:

(1) A shared long-term goal;

(2) Important subject matter;

(3) Study of students;

(4) Shared observation of live lessons (p. 7).

This researcher can especially see its use in studying authentic lessons. To begin with, teachers must decide on a research theme or focus, which must relate to academic outcomes. Then, they focus on a specific content area, often one that is a weakness in student learning. Next, teachers gather evidence from students as to what types of

learning seem to work best. Last, teachers observe each other in a live lesson and comment on strengths and weaknesses of the lesson. The following relates how lesson study might work with authentic instruction or ATA. Teachers would work collaboratively in observing each others lessons and offering suggestions for improvement to ensure that each lesson involved higher order thinking, deep knowledge, substantive conversation, and connections to the world beyond the classroom (Newmann, Secada, and Wehlage, 1995). They would have opportunities to meet, develop lessons, observe each other, and collaborate on ways to improve the intellectual quality of their instruction. Implementation of these strategies would provide for collaboration, professional growth, and the beginnings of a professional learning community.

A quality teacher in every classroom, collaborative planning, professional development, a professional learning community, and lesson study are all strategies that, if put in place effectively, could enhance and build on authentic instruction in a school. Each should be considered when implementation of authentic instruction is occurring in a school.

Significance of the Study

This study was based on the fact that authentic instruction has already been shown to be a powerful tool for bolstering student achievement in numerous studies (Brendefur, 1999; D'Agostino, 1996; Newmann and Associates, 1996; Onosko, 1990; Petrella, 2000). It is also known that it is not easily implemented (D'Agostino, 1996) and not widely used (Knapp et al., 1992). After considering the aforementioned facts, this researcher decided to focus this study on what does work in authentic classrooms and how some of the hurdles of authentic teaching can be overcome.

This study is significant because it qualitatively looked into real-world classrooms that were using authentic instruction and noted the day-to-day challenges and how some of those challenges could be overcome. This study revealed the barriers that authentic educators faced in their classrooms and how they were able to overcome some of those barriers. It is also significant because a variety of schools and classrooms were observed and teachers, fellows, and school administrators were interviewed. This provided a glance at how different teachers in different school settings were able (or not able) to effectively use authentic instruction.

The ATA grant made this study significant because it provided a concentrated group of teachers and fellows that had a built-in support system to serve as participants. The grant allowed for the teachers to have assistants (fellows) to help with planning and implementation, while also allowing for some additional funds to purchase necessary supplies and equipment to effectively implement the authentic teaching strategies. Without the ATA grant, this study would have been difficult to accomplish.

The overall significance of this study is that teachers and administrators can now read the stories of other teachers in similar settings. They are able to see the successes and failures of others attempting to use authentic instruction and they can gain insight into how they can better use it in their own school or classroom. In addition, strategies to support authentic instruction—strong professional development, a professional community, and lesson study—were cited as possible improvements to bolster implementation of authentic instruction.

Implications

This study is relevant to a variety of people in the field of education. Implications that follow are given for teachers, school leaders, and those who work in teacher and administrator preparatory programs. In addition, implications for future research are also noted. Each of these is intended to imply the practical use of this study and how practitioners may apply it in their current setting.

Teachers

This study provided a great deal of insight from ATA teachers in a real-world setting that other teachers can view to see what worked and what failed. Some solutions were offered in helping teachers overcome barriers against time and finding money for materials. Teachers should know before delving into authentic instruction that it is a time consuming endeavor, especially at first. However, this process could be made easier by working collaboratively with another teacher during a common planning time, or another less likely solution, by having a teacher's assistant. In addition, it should be noted that authentic instruction gets easier as lessons are developed and can be reused from year to year.

Two methods of funding supplies for authentic instruction were also mentioned. Teachers could apply for grant money from various organizations or schools could allocate money reserved for traditional teaching supplies, such as textbooks, to supplies to support authentic instruction. While time and money are often the most frequently mentioned barriers to many new programs in education, there are creative and innovative solutions to these issues.

School Leaders

The ATA program provided a good example of involving school leaders before and during implementation of a new program in a school. From the very beginning, the school principals were involved in the preparation for ATA, as well as throughout the program. This study also included the principals from each site. They were all interviewed and their input was included as part of this study.

This study revealed a need for common planning times or longer planning times to benefit the implementation of authentic instruction, greater access to pre-made authentic lessons, and more assistance in the classroom. These are often items that are out of teachers' hands, but they are areas that principals can assist with when planning the school schedule and budget. They need to be aware of the positive aspects that these items can have on breaking down the barriers to using authentic instruction.

Educational leaders could also learn from the principal at School B, who went above and beyond the requirements of the program. The enthusiasm that Principal B displayed for the program did not go unnoticed. The fellows and teachers that were assigned to School B both commented in their interviews that they appreciated his support and interest in what they were doing. He exemplified excellent qualities of an instructional leader who practiced shared-decision making and was not just a principal that worried about discipline and other non-instructional issues. It is important that other educational leaders, while they definitely have a host of other issues to engage in, not forget their most important job—to be an effective instructional leader and to ensure a high quality of instruction for their students.

Teacher and Administrator Preparation Programs

Teacher preparation programs could also benefit from reading this study. In one study teacher quality was shown to be a stronger variable in relation to student achievement than class sizes, overall spending levels, and teacher salaries (Darling-Hammond, 2000). In addition, the percentage of teachers with full certification and a major in the field was a more powerful predictor of student achievement than the teachers' level of education, such as holding a master's degree (Darling-Hammond, 2000). Darling-Hammond (2000) also commented that, "It stands to reason that student learning should be enhanced by the efforts of teachers who are more knowledgeable in their field and are skillful at teaching it to others" (p. 38). These data suggest that in order to have a quality teacher in every classroom, they need to first be trained in a quality teacher preparation program. Authentic instruction, along with other methods that have been shown to increase student achievement, should be emphasized in these pre-service programs.

In addition to pre-service programs producing quality teachers, the research has also suggested that the more training prospective teachers receive, the more likely they are to stay in education (Darling-Hammond, 2003). The research also suggested that the length of time teachers stay in teaching after the first year was directly related to the degree to which the teacher felt they were prepared to teach. Teacher preparation programs can better prepare teachers by making sure they are prepared to teach authentically and have practice creating and teaching authentic lessons.

Administrator preparation programs could also benefit by noting the qualities of the school principals in this study that made them more effective at supporting the

teachers in this study, and the suggestions that were made to improve their support. Planning for adequate professional development, creating a professional learning community, and lesson study were all suggested as ideas to support the development and implementation of authentic instruction. It is important that principals in training are aware of these topics and are taught skills for effectively implementing them in their schools.

Future Research

Windschitl's (2002) research discussed four dilemmas in constructivist education—conceptual, pedagogical, cultural, and political. This study delved into only some of the topics that related to conceptual and pedagogical dilemmas. Cultural and political dilemmas in constructivism are an area that has had little research and could provide possible answers as to why authentic instruction is not more widely used and how barriers can be overcome as well.

Additional research into how and if pre-service teacher preparation programs are teaching authentic instruction philosophies is another needed area of research. A study is needed to see the effects of teachers that were taught how to teach authentically from the beginning, and the issues and impacts they experienced when selected for their first teaching job.

A quantitative study using many teachers across subject areas and student socioeconomic levels is also needed. This study included only two subjects (math and science) and five teachers and a low socioeconomic level of students. It would be interesting to see the results of a quantitative study looking at implementation and

barriers of a large group of teachers with a more heterogeneous group of students that had received extensive professional development training in authentic instruction.

This study looked only at urban schools. A similar study in a rural or suburban setting might produce different results. Beeson and Strange (2003) noted that rural schools have different issues that affect their educational systems, such as computer use, administrative costs, and the cost of transportation. They also often have difficulty finding quality teachers and principals. Authentic instruction implementation issues and barriers might look differently in a rural setting. In addition, suburban schools and schools with a higher socioeconomic level of students might also produce different results. Attendance and money issues could be less of a problem in this setting, yet there would probably be other factors that were not as big of a problem in the urban setting. Research in different settings should continue to see if the cases in this study could be generalized to other cases.

Summary

This chapter provided a glance at the major findings of this study, the significance of this study, implications for teachers, implications for school leaders, implications for teacher preparation programs, and implications for future research. While there is still much to be done in the area of authentic instruction research, this study provided an in-depth look at how teachers were implementing authentic instruction, the barriers that they faced, and how they overcame those barriers. It is important that research is continued in this area so that this form of instruction can continue to benefit students in increasing achievement and improving the quality of learning in schools.

REFERENCES

Abbott, J., & Ryan, T. (1999). Constructing knowledge, reconstructing schooling. *Educational Leadership, 57* (3), 66-69.

Anderson, T. (1996). What in the world is constructivism? *Learning 24* (2), 48-51.

Bill and Melinda Gates Foundation. (2003). *High time for high school reform: Early findings from the evaluation of the national school district and network grants program* (Report No. RC-024-017). Menlo Park, CA: American Institute for Research. (ERIC Document Reproduction Service No. ED476004).

Beeson, E. & Strange, M. (2003). *Why rural matters, 2003: The continuing need for every state to take action on rural education* (Report No. RC-023-922). Washington D.C.: Rural School and Community Trust. (ERIC Document Reproduction Service No. ED473551).

Bogdan, R.C., and Biklen, S.K. *Qualitative Research for Education: An Introduction to Theory and Methods*. (2nd ed.) Needham Heights, Mass.: Allyn & Bacon, 1992.

Bohrnstedt, G.W. & Stecher, B.M. (Eds.). (1999). *Class size reduction in California: Early evaluation findings, 1996-1998*. Santa Monica, California: RAND Distribution Services.

Brendefur, J.L. (1999). High school mathematics teachers' beliefs about learning, pedagogy, and mathematics and their relationship to teaching authentically (Doctoral dissertation, University of Wisconsin-Madison, 1999). *Dissertation Abstracts International, 60,* 06A.

Brooks, J.G. & Brooks, M.G. (1993). *The case for constructivist classrooms.* Alexandria, Virginia: Association for Supervision and Curriculum Development.

Cate, J.L. (2004). Evolution of a high-achieving school: Building community through learning, leading and practices (Doctoral dissertation, University of Oklahoma, 2004). *Dissertation Abstracts International, 65,* 02A. (UMI No. 3122311).

Clinchy, E. (Ed.). (2000). *Creating new schools: How small schools are changing American education*. New York: Teachers College Press.

Creswell, J.W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

D'Agostino, J.V. (1996). Authentic instruction and academic achievement in compensatory education classrooms. *Studies in Educational Evaluation 22* (2), 139-155.

Darling-Hammond, L. (1997). *The right to learn*. San Francisco: Jossey-Bass Publishers.

Darling-Hammond, L. (2000). Teacher quality and student achievement. *Education Policy Analysis Archives 8* (1), 1-49.

Darling-Hammond, L., Ancess, J. & Ort, S.W. (2002). Reinventing high school: Outcomes of the coalition campus schools project. *American Educational Research Journal 39* (3), 639-673.

Dewey, J. (1902/1956). *The child and the curriculum and the school and society.* Chicago: University of Chicago Press.

Dewey, J. (1938). *The school and society*. In M. Dworkin (Ed.), Dewey on education. New York: Teachers College Press.

Fullan, M. and Pomfret, A. (1977). Research on curriculum and instruction implementation. *Review of Educational Research, 47* (1), 335-397.

Furst, L.G. (1997). Rethinking schools. *The American School Board Journal 184*, 51+.

Glaser, B.G., and Strauss, A.L. (1967). *The discovery of grounded theory*. Chicago: Aldine.

Howley, C.B. and Bickel, R. (2000, February). *Results of four-state study: Smaller schools reduce harmful impact of poverty on student achievement* [Online]. The Rural School and Community Trust. Available: www.ruraledu.org/nat%5fsum.html<http://www.ruraledu.org/nat%5fsum.html>.

King, M. B., and Newmann, F. M. (2000). Will teacher learning advance school goals? *Phi Delta Kappan 81*, (8), 576-581.

Knapp, M.S. and others (1992). *Academic challenge for the children of poverty. Study of academic instruction for disadvantaged students. Summary report*. District of Columbia: U.S. Department of Education, Office of Policy and Planning. (ERIC Document Reproduction Service No. ED 353 355).

Lee, V.E. (2001). *Restructuring high schools for equity and excellence: What works*. New York: Teachers College Press.

Lewis, C. (2002). Does lesson study have a future in the United States? (Report No. TM-034-717). *Nagoya Journal of Education and Human Development 1*. (ERIC Document Reproduction Service No. ED472163).

Lubienski, C. (2003). Innovation in education markets: Theory and evidence on the impact of competition and choice in charter schools. *American Educational Research Journal 40*, (2), 395-443.

Marks, H. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal 37*, (1), 153-184.

Marx, R.W., Blumenfeld, P.C., & Krajcik, J.S. (1997). Enacting project-based science. *The Elementary School Journal, 97* (4), 341-358.

Merriam, S.B. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.

Merriam, S.B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.

Miles, M.B. and Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook.* (2nd ed.) Thousand Oaks, California: Sage.

Molnar, A. (2000). *Vouchers, class size reduction, and student achievement: Considering the evidence*. Bloomington, Indiana: Phi Delta Kappa Educational Foundation.

National Commission on Excellence in Education (1983 April). *A Nation at Risk: The Imperative for Educational Reform*. Washington, D.C.: U.S. Department of Education.

National Governor's Association. (2005). *Action agenda for improving America's high schools*. Retrieved March 22, 2005. Web site: www.nga.org/common/issueBriefDetailPrint/1,1434,803500.html.

Newmann, F.M. (1991). Linking restructuring to authentic student achievement. *Phi Delta Kappan 72*, 458-463.

Newmann, F.M., & Associates. (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco: Jossey-Bass.

Newmann, F.M., Bryk, A.S., and Nagaoka, J.K. (2001). *Authentic intellectual work and standardized tests: Conflict or coexistence? Improving Chicago's schools* (Report No. TM-034-521). Chicago, IL: Consortium on Chicago School Research. (ERIC Document Reproduction Service No. ED470299).

Newmann, F.M., King, M.B., & Youngs, P. (2000). Professional development that addresses school capacity: Lessons from urban elementary schools. *American Journal of Education 108*, 259-300.

Newmann, F.M., Marks, H.M., & Gamoran, A. (1996). Authentic pedagogy and student performance. *American Journal of Education 104*, 280-312.

Newmann, F.M., Secada, W.G., & Wehlage, G.G. (1995). *A guide to authentic instruction and assessment: vision, standards and scoring*. Madison: Wisconsin Center for Education Research.

Newmann, F.M., and Wehlage, G.G. (1995). *Successful school restructuring: A report to the public and educators by the center on organization and restructuring of schools*. Madison: Wisconsin Center for Education Research.

Nye, B., Hedges, L.V., & Konstantopoulos, S. (2000). The effects of small classes on academic achievement: The results of the Tennessee class size experiment. *American Educational Research Journal 37* (1), 123-151.

O'Hair, M.J., McLaughlin, H.J. & Reitzug, U.C. (2000). *Foundations of democratic education*. Fort Worth: Harcourt College Publishers.

Onosko, J.J. (1990). Comparing teachers' instruction to promote students' thinking. *Journal of Curriculum Studies 22* (5), 443-461.

Petrella, J.A. (2000). Implementation of authentic instruction at the elementary level of selected public school site (Doctoral dissertation, University of Pittsburgh, 2000). *Dissertation Abstracts International, 61,* 12A.

Raywid, M.A. (1996, April). *Taking stock: The movement to create mini-schools, schools-within-schools, and separate small schools.* New York: ERIC Clearinghouse on Urban Education. Available:< http://eric-web.tc.columbia.edu/monographs/uds108>.

Roelofs, E. and Terwel, J. (1999). Constructivism and authentic pedagogy: state of the art and recent developments in the Dutch national curriculum in secondary education. *Journal of Curriculum Studies 31* (2), 201-227.

Roelofs, E. and Visser, J. (2001). *Preferences for various learning environments: Teachers' and parents' perceptions*. Unpublished.

Sanders, W.L. and Rivers, J.C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Sandia National Laboratories. (1993). Perspectives on education in America: An annotated briefing. *Journal of Educational Research, 86* (5), 259-310.

Sarason, S. (2000). Contexts of productive learning, governance, charter schools, pilot schools, the creation of settings, and the wailing wall. In Evans Clinchy (Ed.), *Creating new schools: How small schools are changing American education* (pp. 191-202). New York: Teachers College Press.

Tobin, K., Tippins, D.J., & Gallard, A.J. (1994). Research on instructional strategies for teaching science. In D.L. Gabel (Ed.), *Handbook of research on science teaching and learning* (pp.45-93). New York: Macmillan.

Vander Ark, T. (2002). The case for small high schools. *Educational Leadership, 59* (5), 55-59.

Walker, R. (1980). The Conduct of Educational Case Studies: Ethics, Theory and Procedures. In W.B. Dockerell and D. Hamilton (Eds.), *Rethinking educational research*. London: Hodder & Stoughton.

Wasley, P., Fine, M., Gladdon, M., Holland, N.E., King, S.P., Mosak, E., & Powell, L.C. (2000, June 20). *Small schools: Great strides: A study of new small schools in Chicago*: New York: Bank Street College of Education. Available: www.bankstreet.edu/html/news<http://www.bankstreet.edu/html/news>/SmallSchools.pdf.

Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research, 72* (2), 131-175.

Yair, G. (2000). Reforming motivation: How the structure of instruction affects students' learning experiences. *British Educational Research Journal, 26* (2), 191-211.

Yin, R.K. (1994). *Case study research: Design and methods*. Thousand Oaks, California: Sage Publications.

APPENDICES

APPENDIX A

PART II: CLASSROOM INSTRUCTION

Overview and General Rules

The four standards for classroom instruction reflect the three more general standards for authentic achievement as follows:

Construction of Knowledge:	Higher Order Thinking
	Substantive Conversation
Disciplined Inquiry:	Deep Knowledge
	Substantive Conversation
Value Beyond School:	Connections to the World Beyond The Classroom

A. The descriptions for scores 1-5 on each standard constitute the minimum criteria for that score. When in doubt between two scores, make the decision by asking whether the minimum conditions of the higher score have been met. If not, use the lower score. In determining scores for each standard, the observer should consider only the evidence observed during the lesson observation. "Many" students refers to at least 1/3 of the students in a class; "most" refers to more than half; "almost all" should be interpreted as all but a "few."

B. Scores should take into account what students can reasonably be expected to do at the grade level.

Standard 1: Higher Order Thinking

Instruction involves students in manipulating information and ideas by synthesizing, generalizing, explaining, hypothesizing, or arriving at conclusions that produce new meanings and understandings for them.

Higher order thinking (HOT) requires students to manipulate information and ideas in ways that transform their meaning and implications. This occurs when students combine facts and ideas in order to synthesize, generalize, explain, hypothesize or arrive at some conclusion or interpretation. Manipulating information and

ideas through these processes allows students to solve problems and discover new (for them) meanings and understandings. When students engage in HOT, an element of uncertainty is introduced into the instructional process and makes instructional outcomes not always predictable; i.e., the teacher is not certain what students will say. In helping students become constructors of knowledge, the teacher's main instructional task is to create activities or environments that allow them opportunities to engage in HOT.

Lower order thinking (LOT) occurs when students are asked to receive or recite factual information, or to employ rules and algorithms through repetitive routines. As information receivers, students are given pre-specified knowledge ranging from simple facts and information to more complex concepts. Students are not required to do much intellectual work, since the purpose of instruction is simply to transmit knowledge or to practice procedural routines. Students are in a similar role when they are reciting previously acquired knowledge; i.e., responding to test-type questions that require recall of pre-specified knowledge. Even more complex activities may involve LOT if students only need to follow pre-specified steps and routines or employ algorithms in a rote fashion.

5 = Almost all students, almost all of the time, are performing HOT.

4 = Students are engaged in at least one major activity during the lesson in which they perform HOT operations. This activity occupies a substantial portion of the lesson and many students are performing HOT.

3 = Students are primarily engaged in routine LOT operations during a good share of the lesson. There is at least one significant question or activity in which some students perform some HOT operations.

2 = Students are primarily engaged in LOT, but at some point they perform HOT as a minor diversion within the lesson.

1 = Students are engaged only in LOT operations; i.e., they either receive, or recite, or participate in routine practice, and in no activities during the lesson do students go beyond LOT.

Standard 2: Deep Knowledge

Instruction addresses central ideas of a topic or discipline with enough thoroughness to explore connections and relationships and to produce relatively complex understandings.

Knowledge is deep when central ideas of a topic or discipline are explored in considerable detail that shows interconnections and relationships. Knowledge is deep when, instead of being able to recite only fragmented pieces of information, students express relatively systematic, integrated or holistic understandings of central concepts. Mastery is demonstrated by students discussing relationships, solving problems, constructing explanations, and drawing conclusions.

Knowledge is superficial or thin when it does not deal with significant concepts or central ideas of a topic or discipline. Knowledge is also shallow when important, central ideas have been trivialized or when knowledge is presented as nonproblematic. Knowledge is thin when important ideas are covered in a way that gives students only a surface acquaintance with their meaning. This superficiality can occur when teachers cover large quantities of fragmented ideas and bits of information that are unconnected to other knowledge. Evidence of shallow knowledge exists when students do not, or cannot, use knowledge to make clear distinctions or arguments, to solve problems, or to develop more complex understandings of other related phenomena.

Depth of knowledge and understanding can be indicated by the substantive character of the ideas that the teacher presents in the lesson, and by the level of understanding that students demonstrate as they consider these ideas. It is possible to have a lesson which contains substantively important, deep knowledge, but where students do not become engaged or where they fail to show understanding of the complexity or the significance of the ideas. The criteria below ask observers to consider both the depth of the knowledge presented by the teacher and the depth of understanding that students develop of that content.

5 = Knowledge is very deep because during the lesson almost all students do at least one of the following: sustain a focus on a

significant topic; or demonstrate their understanding of the problematic nature of information and/or ideas; or demonstrate complex understanding by arriving at a reasoned, supported conclusion; or explain how they solved a complex problem. In general, students' reasoning, explanations and arguments demonstrate fullness and complexity of understanding.

4 = Knowledge is relatively deep because either the teacher or the students provide information, arguments or reasoning that demonstrate the complexity of an important idea. During the lesson many students do at least one of the following: sustain a focus on a significant topic for a period of time; or demonstrate their understanding of the problematic nature of information and/or ideas; or demonstrate understanding by arriving at a reasoned, supported conclusion; or explain how they solved a relatively complex problem.

3 = Knowledge is treated unevenly during instruction; i.e., deep understanding of something is countered by superficial understanding of other ideas. At least one significant idea may be presented in depth and its significance grasped, but in general the focus is not sustained.

2 = Knowledge remains superficial and fragmented; while some key concepts and ideas are mentioned or covered, only a superficial acquaintance or understanding of these complex ideas is evident.

1 = Knowledge is very thin because it does not deal with significant topics or ideas; the teacher and students are involved in the coverage of simple information which they are to remember.

Standard 3: Substantive Conversation

Students engage in extended conversational exchanges with the teacher and/or with their peers about subject matter, in a way that builds an improved and shared understanding of ideas or topics.

In classes characterized by high levels of substantive conversation, there is sustained teacher-student and/or sustained

student-student interaction about a topic; the interaction is reciprocal, and it promotes coherent shared understanding.

Substantive conversation has three features:

1) The talk is about subject matter in the discipline and includes higher order thinking, such as making distinctions, applying ideas, forming generalizations, or raising questions; not just reporting of experiences, facts, definitions, or procedures.
2) The conversation involves sharing of ideas and is not completely scripted or controlled by one party (as in teacher-led recitation). Sharing is best illustrated when participants explain themselves or ask questions in complete sentences, and when they respond directly to comments of previous speakers.
3) The dialogue builds coherently on participants' ideas to promote improved collective understanding of a theme or topic (which does not necessarily require an explicit summary statement).

In short, substantive conversation resembles the kind of sustained exploration of content that is characteristic of a good seminar, where student contributions lead to shared understandings.

In classes where there is little or no substantive conversation, teacher-student interaction typically consists of a lecture with recitation, where the teacher deviates very little from delivering a preplanned body of information and set of questions. Students give very short answers. Because the teacher's questions are motivated principally by a preplanned checklist of questions, facts, and concepts, the discourse is frequently choppy, rather than coherent; there is often little or no follow-up of student responses. Such discourse is the oral equivalent of fill-in-the-blank or short-answer study questions. Student-to-student interaction can also reflect these qualities.[2]

To recognize substantive conversation, we first define an interchange as a statement by one person and a response by another. Interchanges can occur between teacher and student or student and student. Sustained conversation is defined as at least three consecutive interchanges. The interchanges need not be between the same two people, but they must be linked substantively as consecutive responses.

To score 2 or above, conversation must focus on subject matter as defined in feature 1.

5 = All three features of substantive conversation occur, with at least one example of sustained conversation, and almost all students participate.

4 = All three features of substantive conversation occur, with at least one example of sustained conversation, and many students participate.

3 = Features 2 (sharing) and/or 3 (coherent promotion of collective understanding) occur and involve at least one example of sustained conversation (i.e., at least 3 consecutive interchanges).

2 = Features 2 and/or 3 occur briefly and involve at least one example of two consecutive interchanges.

1 = Virtually no features or substantive conversation occur during the lesson.

Standard 4: Connections to the World Beyond the Classroom

Students make connections between substantive knowledge and either public problems or personal experiences.

A lesson gains in authenticity the more there is a connection to the larger social context in which students live. There are at least three ways in which student activity in classrooms can reflect some connections to life beyond school. First, lessons might focus on understanding a real world public problem of some contemporary significance; for example, applying statistical analysis in preparing a report on the homeless to the city council. Second, lessons can build upon students' personal experiences to teach important ideas in the disciplines; for example, by comparing approaches to conflict resolution between people and nations. Finally, if students attempt to communicate their knowledge to others beyond the classroom, to influence or to assist others, school knowledge is more likely to have value beyond simply achieving success in school. High

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is potential value in the knowledge being studied because it relates to the world beyond the classroom. For example, students are told that understanding Middle East history is important for contemporary politicians trying to bring peace to the region; however, the connection is unspecified and there is no evidence that students make the connection.

1 = The lesson topic and activities have no clear connection to anything beyond themselves; the teacher offers no justification beyond the need to perform well in school.

APPENDIX B

Appendix B

Teacher Interview Questions (Beginning of Study)

Introductory questions:

1. What is your career history in education?
2. Describe your school population.
3. Describe the leadership at your school.

Questions regarding teaching methods:

1. Authentic pedagogy has been defined as "engaging students in the personal construction of new knowledge, students conduct disciplined inquiry about the topic at hand, and learning has some value beyond the school," what is your definition of authentic teaching?
2. Describe some examples, if there are any, of how you have used authentic teaching in your classroom in prior years.
3. Describe some examples, if there are any, of how you have used authentic assessment in your classroom in prior years.
4. Some people would say that authentic teaching is another fad or something that can't be done while still accomplishing the required curriculum. What would you say to them?
5. How, if at all, do you think authentic teaching and/or technology allows for inclusion of higher order thinking skills (e.g. Bloom's taxonomy—synthesis and evaluation)?
6. How, if at all, do you think technology changes or enhances the authentic teaching process?
7. What, if any, professional development training have you received on authentic teaching and how, if at all, has it changed the way you teach?

Questions regarding student learning:

1. How do you think authentic teaching and/or technology will affect student achievement?
2. Describe an example of how students can make connections beyond the classroom in your subject area.

Questions regarding the grant from the National Science Foundation and the partnership with the Authentic Teaching Alliance:

1. What assistance do you expect and need from the ATA with this grant?
2. What do you believe will be the most positive part of being associated with this program?
3. What do you believe will be the most negative part of being associated with this program?

Summary Question:

1. Is there anything else you would like to add about your expectations for this school year involving this program?

Teacher Interview Questions (End of Study)

Introductory questions:

1. Give a general overview of the events of the past two years that involve the grant from NSF and your involvement with the ATA.

Questions regarding Research Question #1: <u>According to the teachers' own perceptions and from the researcher's observations of their classrooms, to what extent were the characteristics of authentic instruction found?</u>

1. Describe some examples of how you have used "construction of knowledge" in your classroom.
2. Describe some examples of how you have used "disciplined inquiry" in your classroom this semester.
3. Describe some examples of how you have made your instruction have "value beyond school."

Questions regarding Research Question #2: <u>How are teachers involved in this study able to overcome barriers to teaching authentically?</u>

1. Do you feel that time is a barrier in teaching authentically more frequently? How so?
2. Do you feel that teaching authentically helps or hinders you in covering the PASS objectives? How so?
3. Do you perceive any other barriers to teaching authentically in your environment?

Questions regarding Research Question #3: <u>What are the differences in the way authentic instruction is used and perceived in different school settings?</u>

1. Do you feel that your particular school setting (alternative, traditional, or charter) makes it easier or harder to use authentic instruction in your classroom?
2. Do you feel that the size of your school impacts your use of authentic instruction?
3. Do you feel that the size of your classes impacts your use of authentic instruction?
4. Do you feel that the leadership style of your administrator(s) impacts your use of authentic instruction?
5. Has you school administration been supportive in your efforts? If yes, how so? If no, what could they do to help more?

Questions regarding the grant from the National Science Foundation and the partnership with the Authentic Teaching Alliance:

1. How have the university fellows hindered or enhanced your authentic teaching capabilities?
2. Do the fellows make a difference in your implementation of authentic teaching?(Do you think you use it more because they are there?)
3. How do you perceive the initial two-year impact that ATA has had directly on your school and/or students?
4. Do you feel that you have grown in your use of authentic instruction from your initial involvement with ATA until now? Why or why not?

Questions regarding expansion of the program:

1. What questions, if any, have you entertained from colleagues regarding your work with this project?
2. Do you think this teaching method would be well received by the rest of your school, why or why not?

Summary Question:

1. What has been you overall impression of the grant from the NSF and your involvement with the ATA?
2. Is there anything else you would like to add about your involvement with this program?

APPENDIX C

Appendix C

Interview Questions for Administrators

1. What is your career history in education?
2. Describe your school population.
3. Describe your leadership style.
4. What is your definition of authentic instruction?
5. How, if at all, do you think authentic instruction has affected student achievement at this school?
6. How are the teachers from your building benefiting, if at all, from being involved with this program?
7. How are the students from your building benefiting, if at all, from being involved with this program?
8. Do you think every teacher could implement authentic teaching? If so, how would you implement this in your building?
9. Describe your direct involvement with this grant and the Authentic Teaching Alliance.
10. What was the most positive part of being associated with ATA?
11. What was the most negative part of being associated with ATA?
12. How, if at all, has ATA affected the rest of your faculty?
13. Is there anything else you would like to add about your involvement with ATA?

APPENDIX D

Appendix D

Interview Questions for ATA Fellows

1. When did you begin your fellowship with ATA?
2. On a scale of 1-10, with 10 being the highest, how would you rate the teacher(s) you worked with in their use of authentic instruction? Why?
3. Do you believe your presence and the ATA program have increased the teachers' use of authentic instruction? Why or why not?
4. What do you see as barriers that keep teachers from using authentic instruction more frequently?
5. Do you believe the setting of the school (alternative, charter, or traditional) has an impact on the use of authentic instruction?
6. Do you believe the school size or class size has an impact on the use of authentic instruction?
7. What changes have you seen, if any, from when you first started until now?
8. Have you seen growth in the use of authentic instruction from when you first began your fellowship until now?