

**A Case Study of Three High Achieving Urban Fringe High
Schools: Factors and Structures That Lead To High Achievement**

by

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Submitted to the Graduate Faculty of

The Graduate School of Education in partial

fulfillment for the degree of

Edd in Administration and Policy Studies

University of Pittsburgh, Pittsburgh, Pennsylvania

2004

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF EDUCATION

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A CASE STUDY OF THREE HIGH ACHIEVING URBAN FRINGE HIGH SCHOOLS: FACTORS AND STRUCTURES THAT LEAD TO HIGH ACHIEVEMENT

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This case study of three high achieving urban fringe high schools was an investigation into the attitudes, structural components and leadership qualities that characterize the three target high schools. Each of the three high schools chosen for the investigation was noted for high academic achievement for a wide range of students from diverse socio-economic backgrounds. The researcher interviewed administrators, teachers and low achieving students. Attention was paid to the concept of student voice and the personalization of the learning process. Students and teachers were administered the Assessment of Learner-Centered Practices (ALCP) as developed by Professor Barbara McCombs of Denver University. The results suggest that structural innovations such as hybrid scheduling, standards based common assessments, personalized approaches to school organization and consistent beliefs and leadership are the elements that enable schools to perform at a high level for a wide range of students. The survey of learner-centered practices was found to be a tool of professional reflection for teachers as they develop personalized approaches to instruction.

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CHAPTER I

Introduction

The impact of Learner Centered Practices as identified and defined by the American Psychological Association on the sustaining and improvement of student achievement is the focus of this case study. Three urban fringe high schools have been identified as being successful in the raising of student achievement across a wide spectrum of socio-economic and intellectual levels and are the focus of the study. The schools are located on the urban fringe of Pittsburgh, another small city in Western Pennsylvania and a city located in Eastern Ohio.

The investigator will observe teacher practices; investigate the structural operation of the high school (alternative scheduling, mentoring programs, and individualized educational programs for students), interview low achieving students as well as teachers of mathematics. The investigator will survey low achieving and high achieving students and all teachers at the three target case study schools. The investigator will attempt to identify the practices employed in each school that have positively impacted student achievement. The investigator will specifically search for the presence of the following learner-centered practices:

- 1) A school and classroom environment that allows for the development of positive personal relationships and a caring school and classroom environment.

- 2) A school and classroom environment that allows for and respects “student voice”.
- 3) The presence of metacognitive, problem solving and student self regulating instructional practices.
- 4) The presence of specific adaptations to the learning styles, cultures, social backgrounds and developmental differences of students.

The investigator will focus more intensely on the subject area of mathematics, a notoriously difficult area for improved student achievement. The investigator will observe mathematics classroom practices and will interview the mathematics department chairperson as well as front line teachers in the subject area concerning curricular and pedagogical approaches.

Student voice will be a significant component of the project. High school students are the most independent clients in the K-12 educational system and their opinions must be solicited in order to obtain an accurate picture of those factors that influence student achievement. The No Child Left Behind legislation has changed the educational landscape from educational success as a shared community responsibility to education as a fundamental civil right and school responsibility. This fundamental shift underscored the long term societal and economic implications of an educated populace and the devastating personal negative impact of ignorance and lack of formal educational credentials. The investigator will interview the lowest performing students in each school in order to ascertain whether or not the programs and instructional approaches employed in these schools has actually impacted these low performing students. If the rhetoric of No Child Left Behind is to become a reality then the answer to total school achievement can possibly be discovered within this group of the least successful students.

The investigator will interview a maximum number of 45 students at the three target (15 low achieving students) chosen from the bottom 10% of the Class of 2004. Interviews will consist of ten questions emphasizing the high school oriented principles identified in the literature on learner-Centered Practices (See Appendix C). Students found at higher achievement levels will not be interviewed as part of this research. The quest is to discover whether or not learner centered practices impact the instructional lives of low achieving students at the three target schools.

Teachers of mathematics will be interviewed using questions similar to those asked of students (See Appendix B). Student responses and teacher responses will be compared on questions that address similar issues. In addition, the investigator will interview the building principal(s).

All staff members at each selected high school will be administered the Assessment of Learner-Centered Practices (ALCP) developed by Professor Barbara McCombs, Ph.D. of Denver University. The researcher is indebted to Professor McCombs for her willingness to assist in the study as well as for timely advice concerning the subject of Learner-Centered Practices.

Low achieving and a comparison group of high achieving students will be surveyed using the student version of the Assessment of Learner-Centered Practice (ALCP). The low achieving group will be gleaned from the lowest 10% of the graduating class of 2004. Negative bias will be controlled by the exclusion of students not slated to graduate in the administration of the ALCP survey. Comparisons between the response patterns from both groups will be made in the

description of research results for each school and among all schools participating in the investigation.

Purpose of Study

The purpose of the case study is to describe the structural, instructional and student learning practices that combine to create a school environment where a large percentage of students achieve at a high level. Three urban fringe high schools have been selected for the study. The investigator will focus on the actual use (or non-usage) of specific learner centered practices in the mathematics classes at those schools to develop the relationships (if any) between specific learner centered practices and student achievement.

Elements of the Study

- 1) What are the unique structural and operational characteristics of the schools identified as having made changes that positively impact student achievement?
- 2) What learner centered practices are identifiable in the instructional practices of teacher of mathematics at the three high schools?
- 3) What data are used to define and monitor achievement at the three selected schools?
- 4) What are the patterns and responses of low achieving students at the three high schools to the:
 - a) structural and operational practices
 - b) instructional practices

- c) learner-centered practices
- 5) What are the patterns and responses of mathematics teachers at the three high schools to:
- a) structural and operational practices
 - b) instructional practices
 - c) learner-centered practices
- 6) What are the relationships between the patterns and responses of both teachers and students at the three high schools to the:
- a) structural and operational practices
 - b) instructional practices
 - c) learner-centered practices

Methodology

The investigator will conduct a multi case approach to the study. Each high school program will be described in detail as to **when**, **how** and **why** the program was implemented. The approach will allow for a description of the each school demographic and achievement profile as well as its overall school culture. Attention will be paid to the impact on achievement of identified processes within each school and mathematics classroom. This will be a heuristic approach in the search for “previously unknown relationships and variables” (Stake, 1981 p.47). The investigator will research achievement data, interview mathematics teachers, survey the entire instructional staff, interview and survey volunteer student subjects and interview school administration.

Teachers of mathematics and volunteer low achieving students will be targeted. Interviews of mathematics teachers will be conducted after the scripted observation of mathematics classes. The researcher believed that the informal observations will allow the researcher to establish a more personal relationship between the observer and the classroom teacher. A further justification will be to seek the actual relationships between the content of the teacher interviews and actual classroom practice. Interview questions will focus on effective instructional practices employed by the teacher and the perceived role of learner-centered practices in the teacher's classroom.

Student interviews will focus on student attitude towards school. Students will be questioned concerning their awareness of any learner-centered practices employed in the school. Students who are identified as being in the lowest 10% of their graduating class are being targeted in this study. It was believed that this student group would provide the strongest indicators of the impact of the programs found in the three identified high schools.

All surveys required participants to respond to a series of questions using a Likert scale of A (Almost Never) to D (Almost Always). A mean response will be calculated for each question and free written responses (if any) will be grouped as "positive", "negative" or "neutral". The researcher is strongly indebted to Professor Barbara McCombs for her assistance with this research. It was with her permission and timely advice that the data collection phase of the research coalesced into a comprehensible study. Professor McCombs also permitted the researcher to employ the student and teacher versions of "The Assessment of Learner-Centered

Practices” survey for this research. Table 1, seen below, is an example of the data analysis used throughout the study.

Table 1 All Students, High School #1-ALCP Survey

N=25

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	3.26	.88	.91	3.09	.70	.88
Student Voice	2.86	.98	.86	2.97	.61	.79
Higher Order Think	2.55	1.16	.94	2.90	.70	.84
Individual Differences	2.63	1.01	.75	2.50	.71	.73
Self-Efficacy	2.96	1.02	.69	3.05	.68	.81
Epistemic Curiosity	2.52	1.07	.52	2.75	.63	.75
Active Learning Strategies	2.79	1.42	.53	2.79	.61	.80
Effort Avoidance Strategies	2.36	1.01	.81	2.13	.62	.77
Task Mastery Goals	2.80	1.05	.90	2.86	.72	.84
Performance Oriented Goals	2.55	1.13	.62	2.37	.72	.76
Work Avoidance Goals	2.57	.99	.76	2.31	.68	.75

The researcher performed his analysis not only on a composite of the mean scores that were derived from the survey on each variable, but also focused on the five variables identified by Professor McCombs that were indicative of high student achievement and motivation. The variables related to the development of positive relationships, attention to student voice, the employment of higher order thinking skills, the use of active learning strategies and attention to individual differences were of special interest to the researcher.

The researcher gathered data from low achieving and high achieving students in each case study school and compared the results of the data analysis with similar results gathered nationally by Professor McCombs. In addition, the researcher compared data collected from the faculty of each case study site for analysis and comparison with nationally compiled data.

Procedures

The procedures employed in this study evolved as the study progressed from the planning stage to the implementation stage. Originally, the researcher had designed his own surveys for use in the study. These surveys are found in Appendix A and B of this document and represent an initial phase of thought in the study. Discussions with the Dissertation Committee and with Professor Barbara McCombs led the researcher to believe that his study would be greatly enhanced through the use of the Assessment of Learner-Centered Practice Survey (ALCP). In addition, the researcher lessened his emphasis on school climate at the suggestion of his committee and centered his research on Learner-Centered Practices as defined by the American Psychological Association. The researcher developed his study according to the following schedule:

- 1) **Design** student interview questions.
- 2) **Employ** ALCP Student Survey
- 3) **Design** teacher interview questions.
- 4) **Employ** ALCP Teacher Survey
- 5) **Design** Principal Interview Questions

- 6) **Interview** principal of school in order to describe structural components of the school. See Appendix C)
- 7) **Investigate** the achievement data available to the investigator.
- 8) **Observe** targeted mathematics classes using scripted approach to the observations.
- 9) **Interview** mathematics teachers using a questioner and interview subject approach.
(See Appendix D)
- 10) **Interview** volunteer low achieving students using a questioner and interview subject approach. (See Appendix C)
- 11) **Administer** student survey at the completion of the student interview.
- 12) **Administer** teacher survey to entire instructional staff. Identify responses of teachers of mathematics.
- 13) **Analyze** data from surveys (calculate mean and median scores), develop appropriate tables for individual school and comparative data.

Develop conclusions based upon survey results.
- 14) **Analyze** interview responses in order to develop similar and differing responses to related questions. Note similarities and differences. Compare responses of students, teachers and administrators from each school. The investigator will compare responses to related questions from each school in the study.

Construction of Cases

Each high school will be described in detail in a separate chapter of the dissertation. Each high school is a unique entity which has chosen to approach the concept of high student

achievement in a variety of definable ways. The emphasis of each chapter will be on the structural and operational setting of the school and its relationship to achievement specific to the subject area of mathematics and low achieving students. The chapter will focus not only on achievement data and structural issues, but also on the opinions and beliefs of low achieving students and mathematics teachers.

Comparisons will be made between student and faculty responses on the ALCP survey as well as the questions prepared for teacher and student interviews. The High School Faculty Interview questions and the High School Student questions are similar in nature with the exception of the customized questions intended to match the target audiences. Comparisons will also be made between interview responses to questions directly related to Learner-Centered Practices. Responses to the following questions will be compared between students and mathematics teachers.

Figure 1 – Comparison of Responses – Students and Faculty Interview

Teacher Question	Student Question
#1- Student opinion	#1- Student opinion
#2- Positive relationship	#2- Positive relationship
#3- Student success	#3 – Student success
#4 – Trust and respect	#4 – Trust and respect
#5 – Problem solving	#5 – Problem solving
#6 – Interesting work	#6 – Interesting work
#7 – rules and fairness	#7 – Rules and fairness
#9 – Define “success”	#9 – Define “success”

A final chapter will describe the unifying characteristics of each high school from a structural, instructional practice, cultural or personal perspective. The investigator will evaluate the impact of specific learner centered practices on the achievement of students at the three high schools.

Each school represents an urban fringe high school that possesses a population of students from a wide range of socio-economic levels and ethnic groups. The study of successful high schools that serve diverse populations becomes of great importance as the demographic composition of America changes and becomes itself, more diverse.

Limitations of the Study

The investigator understands that the study focused on three high schools that have been identified as having instituted effective programs that allow for high achievement by a wide range of students. The study is not meant to imply that the investigator will discover the ‘silver bullet’ of student achievement, but rather is intended to extract insight as to the constitution of a high achieving urban fringe high school.

The study is limited in scope within three urban fringe high schools and within subject area and targeted student subjects. Teachers of mathematics will be interviewed. Additional teachers at each school site will not be interviewed. Low achieving senior year students will be interviewed. No attempt will be made to interview high achieving students in any of the three schools. The opinions of a wider group of students will not be represented in this study.

The researcher recognized that the opinions and survey results gathered represented only a small percentage of the student body. In one case study, the opinions and survey results were limited to a total of six low achieving students. This number is well below the desired number of participants contemplated for this project. The opinions and survey results of this small group were very powerful. The researcher recognized that a much more intense study of similar students in this case study school could lead to greater insights into the successes of the program.

This study is not longitudinal in nature. It is, however, a snapshot in time of three successful programs. Each program stands on its own merits. The researcher believed that this approach to the study of high achieving urban fringe high schools will provide valuable insights into the attitudes, programs and practices that lead to high achievement.

Chapter II

Research Findings

The goal of this chapter is to describe the current educational climate that has enveloped the nation's schools and to describe in detail an alternate strategy for long term improvement in academic achievement for the schools in the United States. The current educational climate is clearly the result of a long standing national interest in the quality and overall goals of the K-12 educational system. The Passage of the No Child Left Behind Act of 2001, as a reauthorization of the Elementary and Secondary Education Act of 1965, set the stage for a climate of accountability, high stakes testing, and sanctions that pervades the American educational scene.

The author will then define and elaborate on the research supporting the adoption of Learner Centered Principles as an approach to maintaining and improving academic achievement in K-12 education. The investigator's interests lie in the application of the Learner Centered Principles to the high school setting. The development of learner centered principles has led the researcher to an investigation of what has been termed academic engagement in high schools. The concept of academic engagement is closely linked to the fourteen principles of learner centered practice. The investigator will then integrate the concepts defined under learner centered practices, educational engagement and research concerning improved achievement in the subject area of mathematics. It is the investigator's contention that there are vital links between these three

domains and that the research into the domains supports the implementation of learner centered practices as an effective method of improving and sustaining student achievement at the high school level.

History of School Reform 1950 to No Child Left Behind Legislation 2001

The passage of the No Child Left Behind Act of 2001 most certainly moved education to the forefront of public debate and concern. The act has been greeted with enthusiasm with its passage in 2001 and lately with considerable skepticism from educators and state legislators as both bodies struggle with the implementation of the law. Actually, education had been a national concern since the mid-1950's after the launching of the Sputnik satellite by the Soviet Union and the subsequent commitment of the United States to the "Space Race". Changes to mathematics and science curriculum were implemented with the goal of encouraging more of America's youth to pursue mathematics and science related careers with the hopes of increasing the number of engineers and scientists in the United States. Education was seen as vital to the continuance of the American way of life and in the eventual victory of the United States in the "Cold War" with the Soviet Union and the Communist world.

The launching of the Sputnik satellite signaled a change in attitude about the quality of education in the United States. The nation, believing itself to be under siege from the Communist nations of the world and, specifically, the Soviet Union, undertook a large scale effort to bolster mathematics and science achievement across the nation. President Eisenhower signed the National Defense Education Act of 1957 that injected millions of federal dollars into the public

schools in America. It was supposed that this effort would close the perceived technology gap between the two competing political cultures that was so strongly highlighted by the successful launch of Soviet satellite.

This resulted in the adoption of innovative mathematics and science programming such as the “New Math” and the delivery of science programming via instructional television. The actual achievement results of these efforts were mixed, but it was clear that education was seen as a national priority with implications to national defense and international technological competitiveness.

Federal funding was further extended with the passage of the Elementary and Secondary Education Act (ESEA) of 1965 by President Johnson. This act provided funding for instructional technology, mathematics and science instruction. Additionally, Title I funding was directed towards reading and language arts as a component of Johnson’s “War on Poverty”. The late 1950’s, 1960,s and 1970’s were a time of innovation, the institutionalization of federal funding in school districts, and a belief that the future of the nation was dependent upon the proper education of its youth.

The late 1970’s and early 1980’s saw the rise of a body of educational research that is characterized as the “Effective Schools” movement. This emphasis sought to seek out model schools where high achievement was the norm. Effective schools were discovered in urban, suburban and rural settings. School districts, large and small were encouraged to emulate these effective schools and to adopt practices that had been identified as “effective”. There are

considerable similarities between the characteristics of effective schools movement and the enacted No Child Left Behind Act of 2001.

The belief that the nation's future was tied to the academic development of its youth was further emphasized by the *Nation at Risk* report issued in 1983. The report noted a "rising tide of mediocrity" in the schools across the nation and called for renewal and refocus. Again, the report addressed the need to dramatically improve instruction and achievement in science and mathematics and called for teacher development, increased local spending and equitable access to quality education. It is this call for equity in educational access and the recognition that changing societal conditions called for changing methodologies and school structures that are seen by the investigator as precursors to the "No Child Left Behind" Legislation.

Interestingly, the Reagan Presidency resulted in a diminished role for the federal government in education. The "Block Grant" program not only drastically decreased the number of federal programs but also limited the oversight role of the federal government. States were required not only to take on a greater share of the financial burden of education, but were also asked to take on the regulatory responsibilities that had been previously assumed by the federal government. The concept of the block grant program was to return to the states the control of education (education being a state not federal function) in return for funding under the block grant program that would allow the states to choose their priorities and their level of oversight. The idea was that states and localities would be better able to decide on their priorities and that money could be saved by eliminating the federal educational bureaucracy. This eventually took the form of an

attempt to eliminate the Federal Department of Education during the Reagan presidency. A proposal espoused by many of the conservative thinkers of the era.

President George Bush called the First National Education Summit in 1989. This summit brought federal officials and the governors of the states together to discuss education. This resulted, perhaps indirectly, in the formation of the National Education Goals Panel in 1990. The U.S. Department of Labor issued a report in 1990 entitled, *The Secretary's Commission on Achieving the Necessary Skills*, which enunciated the relationships between “basic academic skills” and the real world of work and career. The “SCANS” report was quoted widely in the continuing movement to reform the educational process and the structure of the American high school.

Educators responded to the re-energized political climate and to the curricular weaknesses discovered in core subject areas. National standards in the subject areas of mathematics and science were being developed in the late 1980's by the National Council of Teachers of Mathematics (NCTM) and the American Association for the Advancement of Science (AAAS). This standards movement was seen by many educators as a necessary step towards improved student achievement and the increased recognition of the professional status of teachers.

The standards movement was embraced in a bi-partisan manner on both a state and national political level as a method of ensuring systemic reform. Indeed, “Systemic Reform” of the entire educational system was characterized as a method of improving education for all students and a

vast improvement over the fragmented approaches of the past. (Smith and O'Day, 1991 and O'Day and Smith, 1993).

The concept of standards themselves can be understood in two ways. Standards can be seen as the specific knowledge and levels of achievement that should be attained by students at certain grade/age levels and/or they can be viewed as descriptions of teaching and assessment practices that need to be adopted in order to achieve improved student competency.

The NCTM released two additional documents following the release of the Curriculum and Evaluation Standards for School Mathematics (1989). The Professional Standards for Teaching Mathematics (1991) and the Assessment Standards for School Mathematics (1995) and the Principal and Standards for School Mathematics (2000) were all released as follow up and improved versions of the 1989 document.

The national standards developed for mathematics, science and technology share common themes. All call for the acknowledgement of students from a variety of backgrounds and socio-economic status. All refer to the belief that “all students can learn” and that teachers must adjust their instructional styles and techniques to match those of the learners present in their classrooms. All emphasize the big ideas and concepts inherent in their respective disciplines and all make a strong case for active learning at all levels and the extension of that learning to real life situations.

The development of standards in all subject areas must be seen in the light of the evolution of school reform beginning with the reforms initiated in the Eisenhower presidency. Indeed, school reform was the emphasis of John Dewey and his writings on the nature of schooling in the 1920s.

The new element in the school reform movement was the strengthening of the continuing relationship between the federal government and the development of national movements of school reform. In addition, the role of the federal government, while diminished after the Reagan presidency, is still part of an ever developing tradition of the gradual nationalization of education. The role of the federal government in financing and influencing educational innovation and policy is well established by the time of the writing of this paper.

The Influence of the “No Child Left Behind” Legislation

On January 8, 2002 President George W. Bush signed the “No Child Left Behind Act” of 2001. This law again re-emphasized the role of the federal government in the reform and revitalization of K-12 education. This role was not revolutionary, but rather evolutionary in that it re-emphasized the active role of the federal government as driving force in educational reform and again re-emphasized the belief that the education of the young is vital to the future of the nation. Specifically, the act called for a revised federal role in education that legislated:

1. accountability for student achievement of academic standards
2. increased flexibility and local control
3. a greater role for parents in their child’s education program
4. greater emphasis on the use of scientifically based instruction

NCLB mandates improvement in student achievement for all students and includes dictates that:

1. Set higher educational standards
2. Provided for the testing of all students to measure their achievement according to those standards
3. Required the analysis of test data to ensure progress
4. Provided for sanctions and rewards for schools that respectively either fail or achieve to meet “adequately yearly progress”.
5. Defined the role of the principal as the person responsible for the achievement levels of the school.

The first and most visible facet of the No Child Left Behind legislation is the importance placed on testing of all students as a measure of achievement. States are expected to develop high benchmarks for each grade level and are expected to develop tests that measure students’ progress towards those high goals. Adequate Yearly Progress (AYP) is to be measured from the results of the tests and the effectiveness of a school is to be based on the achievement of all students within a school. Disaggregated data is to be compiled for each sub-group within the school and the progress of each of these groups is to be measured as a component of Adequate Yearly Progress of the entire school. Schools can be sanctioned should any one sub-group fail to meet the AYP goals.

Yearly testing is to be conducted in math and reading for grades 3-8 with a similar test administered once in grades 9-12. In Pennsylvania, such a test is administered in grade 11.

Participation rates of 95% or better are required of all schools and from all representative groups as students with disabilities, students from low income families, students from major racial and ethnic groups and students with limited English proficiency. Starting in 2002-2003 school year, each state must publish a “report card” on school performance for every district or school within the state. An assessment for achievement in the subject area of science is to be developed for the 2007-2008 school year. Principals are held immediately responsible for the achievement rates at the school level with additional sanctions being applied if the school fails to meet AYP projections.

One of the laws most controversial aspects is the provision for sanctions on schools that do not reach their AYP goals as defined by law. Penalties are to be imposed in a progressive manner on schools that did not reach their yearly achievement targets for two years. These schools are then identified as “in need of improvement”. Schools must then advise the parents of the school’s pupils of their “in need of improvement” status and of the options available to parents. Options include provisions for a limited version of school choice thus allowing parents to opt to transfer a student to a higher performing school in a district or to another district if all schools are poor performing. Students may receive supplemental educational services (tutoring, after-school and before school achievement based activities) from the school. Finally, if by the end of the fourth consecutive year the school is still identified as “needing improvement”, then more severe “corrective action” can be taken which includes replacement of the “staff considered relevant to the failure or even replacement of the management function (restructuring) with a private educational management company. In addition, identified schools must spend at least 10% of their Title I, Part A funding on staff and principal development activities directed related to the

improvement of student achievement in order to meet their AYP goals. The school or district must develop a two year plan to raise the achievement levels to expected norms and can allow for outside agencies to assist the school or district in the development and implementation of the plan.

No Child Left Behind also addressed teacher quality. It is obvious and research implies that the teacher is a vital link to student achievement. The legislation employs the term, "highly qualified" to indicate the level of competence that is required to teach in schools. "Highly qualified" is defined as having obtained full state certification or having passed the state teacher licensing exam. New elementary, middle and secondary teachers must hold a bachelors degree and demonstrate teaching and content area skills.

Paraprofessionals must hold at least a high school diploma and possess an associate's degree or pass a state test demonstrating competency as a paraprofessional. The qualifications apply directly to new hires, but existing employees have four years to comply with the law.

There is a strong connection between the standards movement and NCLB. Standards are by their nature, multi-faceted. Standards can be viewed as being content standards (curriculum), instructional standards (teaching) and assessment standards (testing). In keeping with this view of education, the No Child Left Behind legislation recognizes the need for a high quality curriculum as the basis for high quality student achievement. The legislation employs the term, "scientifically based" programs as a descriptor of high quality programs. Specific curriculum program recommendations are specifically prohibited by the law, but the law does address three

segments of the curriculum program with a majority of the emphasis on reading instruction on the K-3 level. Other areas of emphasis are school library programs, 21st Century Learning Centers Program for academic enrichment during non-school hours and civic and traditional American history programs. These additional programs are available through competitive grants.

NCLB promised vastly increased levels of funding for schools, but has yet to produce legislation that authorizes an amount near to the promise of the original legislation. The proposed 2004 federal budget provides additional funding for education targeted at the least affluent school districts and the 2004 budget request of the State of Pennsylvania increased funding using the NCLB law as the rationale for increased allocations.

The law did provide for greater flexibility in the use of Title I funding and other funding received under competitive grants designated in the legislation. The main emphasis of the funding portion of the law was to allow for greater funding for schools of lesser means and a higher percentage of students from low income schools. Federal funding does not make up a large percentage of the funding resources of any school district and therefore this law may have a peripheral effect on the fiscal resources available to a district.

The overall climate facing the typical public school principal, teacher and student is most certainly influenced by No Child Left Behind and the history of educational reform beginning in the 1950s. The Eisenhower administration set the stage for the consideration of education as a national imperative in order to maintain national competitiveness on the international scene. Modern day educators have witnessed the politicization and the prioritization of education.

Educational achievement has been recognized from a geo-political and a social standpoint as a building block for a stable American democracy.

This continuing (from the 1950s) emphasis on the importance of education to the economic and political future of this nation has not led to a new era of educational innovation and energy. If anything, the initiatives of the past 50 years have led many educators to adopt a very skeptical view of innovation and initiative believing that “this too shall pass”. Pennsylvania educators and perhaps educators across the United States have witnessed the reforms of the “Effective Schools” movement, the outcomes based education movement, the Ten and then Fifteen Quality Goals of Education, expensive educational technologies and still schools seem to remain unchanged. Despite all these initiatives, one can still enter into most schools and recognize the same routines, teaching styles and programs of their youth. The world has changed drastically, while the schools have changed little. Theodore Sizer (1999) called for a “new and more effective form of schooling than the one that Americans have used for almost one hundred years” while realizing that the patterns and rituals of schooling were well entrenched in the American Psyche (p.118).

NCLB philosophically requires that schools successfully service all students. In many ways it requires schools to adopt a “medical model” that applies a diagnostic/prescriptive approach to the problem of achievement in schools. Scientifically based programs are mandated by the legislation as the prescriptive curricular solution to achievement deficiencies, yet the law does not require restructuring except in the most extreme cases. Our quest, under the medical model, leads us to base a school’s success on the achievement rate of its students as hospitals base their

success of long term cure rates. We, like hospitals, must create or bolster programs that serve the non-achiever and create a climate of high achievement for all.

The landscape of education has been altered through the intervention of the NCLB Act. Teachers and building administrators, most acutely, are aware of the goals and objectives found in the legislation and feel great pressure to achieve according to its dictates. Many administrators, teachers and state governmental representatives feel that the achievement goals of the legislation are not only unrealistic, but under funded. It is, however, certain that positive changes in student achievement are necessary and that business as usual will only result in achievement as usual. That level of achievement, by many estimates, is far below the expectations and capacity of the educational system. Change does not necessarily result in the improvement of the educational system. It is our task, as educators, to construct a new educational environment based upon the successes of the past and the promise envisioned through research, experimentation and enlightened leadership.

Principals and teaching staffs throughout the nation report feeling tremendous pressure to improve student test scores. North Carolina provides monetary incentives for classroom teachers whose classes demonstrate AYP. This incentive alone encourages teachers to focus on practicing test questions and it is reported that whole schools spend weeks of class time immediately before the test in preparation and practice for the high stakes assessment. Cawelti and Protheroe (2001) noted a decrease in time spent on subjects unrelated to state tests and reported teacher feelings that too much time was being spent on preparation for the tests. Fear of publicized failure has become a strong motivational factor for many public schools.

To many teachers and administrators the current emphasis on high stakes testing, high school exit exams and yearly promotion based on single test results oversimplifies the complexities of school life and learning. Veteran teachers view this new range of testing as a reincarnation of the failed minimum competency testing that was prevalent in the late 1970's and 1980's. "This too shall pass" is a common refrain among the more veteran staff members. The raising of academic standards without attending to the physical, social-emotional and instructional needs of students may become a destructive force to the very students we are attempting to educate. (American Federation of Teachers, 1997 and Thomas, 2000).

Indications are that the current emphasis on high stakes testing as a measure of the cognitive development has not resulted in higher achievement. Higher rates of absenteeism, disruptive behavior and drop outs have been reported by schools across the nation and American students continue to lag behind their international counterparts when compared with students on such tests as Third International Mathematics and Science Study (TIMSS).

It is time for the pendulum to swing in another direction. A direction that retains high standards of achievement while nurturing and sustaining the natural joys of teaching and learning. A direction that recognizes the holistic nature of education and allows for the a focus on the individual learner, an understanding and application of what we know about the learning process and a definition of essential academic knowledge and skills through subject area and instructional standards. It is time for **Learner Centered Practices** to be considered as essential to the sustained improvements we all wish to experience in the K-12 school setting.

Learner-Centered Practices

The American Psychological Association published a document in 1993 entitled *The Learner-Centered Psychological Principles: A Framework for School Reform and Design*. The document enumerated 14 principles describing the emotional and environmental conditions that are proven to increase student achievement and learning. The principles were developed along with a series of assessment survey tools for use by students and teachers. Teachers who utilized these tools were able to analyze and reflect on their instructional practices and to adjust their practices to be increasingly learner centered. The 14 principles were organized into seven learner related domains of the cognitive, metacognitive, social, emotional, developmental, affective and individual factors that influence learning. The principles (LCPs) are based upon the central concept that educational systems must “focus on the individual learner, reflect an understanding of the learning process and address essential knowledge and skills to be learned” (McCombs, 2003, p.94).

The formal definition of Learner Centered Practices is a result of the American Psychological Association’s (APA) Presidential Task Force in Education formed in 1990. This task force developed a fourteen point document that defined the fourteen Learner-Centered Principles developed by the task force. This task force envisioned these fourteen principles as the

foundation for a “living document” that would be changed and revisited as new research was conducted and new practices were implemented.

In this construct, life and learning are seen as a group of “interconnected and interdependent” relationships. Each of the factors can and do influence student achievement. As Michael Fullan believes, we must create the kinds of caring learning communities that support all learners. (Fullan, 1997, 2000).

The Fourteen Learner Centered Principles

1. The nature of the learning process. *The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience.*
2. The goals of the learning process. *The successful learner over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge.*
3. Construction of knowledge. *The successful learner can link new information with existing knowledge in meaningful ways.*
4. Strategic thinking. *The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals.*
5. Thinking about thinking. *Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.*
6. Context of Learning. *Learning is influenced by environmental factors, including culture, technology and instructional practices*
7. Motivational and emotional influences on learning. *What and how much is learned is influenced by the learner's motivation. Motivation to learn, in turn, is influenced by the learner's emotional states, beliefs, interests and goals, and habits of thinking.*
8. Intrinsic motivation to learn. *The learner's creativity, higher order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control.*

9. Effects of motivation on effort. *Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without learner's motivation to learn, the willingness to exert this effort is unlikely without coercion.*
10. Developmental influences on learning. *As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.*
11. Social influences on learning. *Learning is influenced by social interactions, interpersonal relations, and communication with others.*
12. Individual differences in learning. *Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity.*
13. Learning and diversity. *Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account.*
14. Standards and assessment. *Setting appropriately high and challenging standards and assessing the learner as well as the learning progress—including diagnostic, process and outcome assessment—are integral parts of the learning process.*

Source: APA Work Group of the Board of Educational Affairs (1997, November)

The School as an Ecological/Transactional Organism

The investigator views the processes involved in 9-12 education as a complex living organism. Edward Humes (2003) in his book about the lives of students at Whitney High School in Cerritos, California, *School of Dreams*, described a school as:

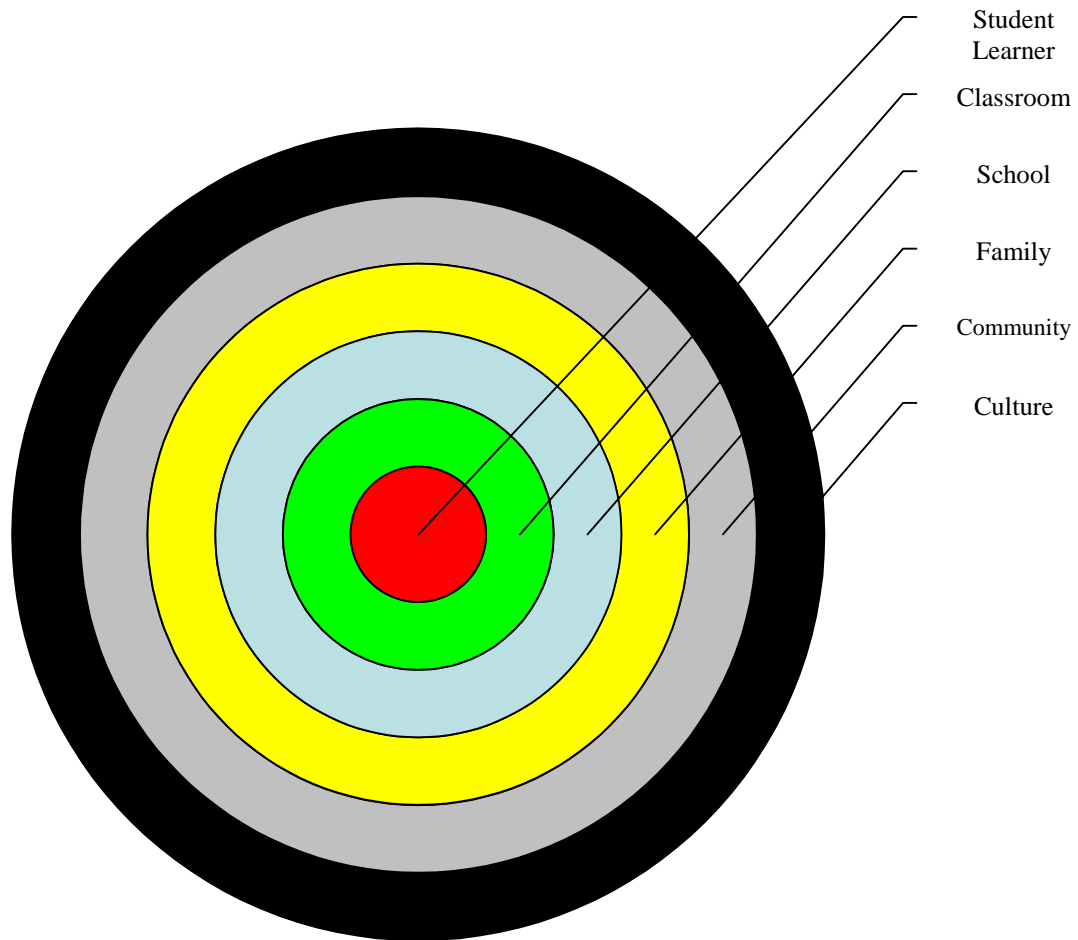
... like an organism, living, breathing, complex, impossible to know in its entirety. A thousand dramas unfold daily, endless storylines, alliances, jockeying, heartbreaks, victories, and secrets—oh so many secrets—small and large. The physics experiment unfolds, some kids are rapt, others are discreetly working on another class's homework, one kid is playing Worm on his computerized calculator and , another is daydreaming about next year—and this incredible human mosaic, rich and unwieldy and only sometimes expected , repeats in every other classroom, every period, every day.

(p.194)

J. L. Lemke also portrayed change and learning through the lens of a complex living system (Lemke, 2002; Wheatley, 1999a, 1999b). The “organs” of this living system are the act of learning itself, the cognitive and emotional needs of learners and the supports necessary to nurture and sustain life long learning. Bronfenbrenner (1979) and Cichetti & Toth (1997) described an “ecological/transactional” model that framed the students’ world as comprised of three levels: a macrosystem of values, beliefs and ideologies, a mesosystem of social structures that affect the student. Students are not necessarily included in the mesosystem and these can be best described as the influences of cultural traditions, historical practices and beliefs. The final

component of this framework is a microsystem comprised of immediate contacts such as peers and teachers within the school environment. These models are similar representations of the influences that mold student behavior and academic achievement.

This organism is described graphically in this illustration. The illustration places the student as the center of the educational world.



Student centered approaches begin with the student and relate all other components of the living system to their impact on the student and his/her learning. The student is unto his/herself a

complex organism capable of learning, acting on desires and making choices about the future. The student is not preprogrammed to act in any specific way and can be positively or negatively influenced by the environment within which the student exists.

Educationally, the student exists in the immediate realm of the classroom. Students at the high school level spend most of their day in a classroom setting and, most certainly, that environment has a direct impact on student achievement. The student is joined in the classroom environment by his/her teacher. Teachers bring into the classroom environment their expectations, personal history, formal educational background and work experiences. Connell and Wellborn (1991) demonstrated that the cognitive, social and emotional engagement of students was strongly related to their feeling of acceptance by teachers and the school.

Outside the classroom is the larger entity, the school itself. Schools can be characterized by their size, their daily schedule (block, eight period days etc), the quality of their extracurricular programs, the school culture and the school climate. Each of these elements plays a significant role in the student achievement.

Each student leaves and returns to some form of family structure or custodial care. Numerous studies have indicated that there is a high correlation between parental involvement of low income students and educational achievement (Clark, 1983; Cooper & Datnow, 2000). Equally important to the student is the peer group. Peer groups for adolescents have been found to become a replacement for the family and often times the values of the peer group positively or negatively influence academic achievement. For instance, peer acceptance through repudiation of

the values of the school has been found to be significant in lower income youth (Luthar, 1995). Victims of bullying and those who have experienced negative peer interactions have been found to be less willing to engage in school activities and to suffer long term psychological damage from such interactions. The Socio-economic status of the family most certainly has been found to have a pervasive influence on school achievement (McLoyd & Wilson 1990). Low socio-economic status generally translates into poor achievement even though the effects of low socio-economic status have been positively impacted by teachers possess high pedagogical skill, positive student relationships outside the classroom and a strong content area background (McLaughlin & Talbert, 1993).

Encompassing the family is the community that supports the school. The concept of the community is a fluid one in the United States. Economic forces reshape the American community as factories close, business relocate and families become more transient and less connected to their specific locale. The typical American child changes schools on an average of three times during the elementary years and therefore the community can appear to be yet another fixture on the ever changing mobile American landscape. Community demographics do influence the school and since financial support is dependent upon local taxation local politics definitely play a role in the school. Often times, the community high school is the most visible symbol of the community ethos and therefore maintains high visibility in its day to day operation.

Surrounding all the rings is the culture that influences today's youth. Today's highly technological, electronically connected; mobile culture is a far cry from the small town

environment or rural that was common previous to World War II. Post modern students are influenced by a culture that markets to their needs and desires, stresses instant gratification, values entertainment, rewards extreme consumption while simultaneously maintaining a traditional belief structure that is as “American as apple pie”. Once again to quote Edward Humes (2003):

Parents very often have no idea what life is like in an American high school today; their own high school journeys of twenty or thirty years ago might as well have been a century earlier. Their experience is utterly divorced from their children’s, these schools of the Internet and chat rooms and sexual imagery everywhere, of junk-food lunches and Starbucks dinners and laughable television ads beamed into every classroom telling kids that buying pot supports terrorism and that cola should be their drink of choice and that one, big, cool adventure is waiting for them right around the corner if they would only join the “life accelerator” and sign up for four years with the U.S. Navy. (p.194)

Each of the rings in the illustration influences the student both positively and negatively in different ways and in differing time frames. Peer groups are extremely important to early adolescent teens, but the influence of these groups wanes in later years. The culture places enormous pressures on the student to conform to the fashion dictates of the times and to the behavioral expectations of youth. Each ring flexes in terms of influences, but yet one cannot consider learning and achievement without seriously contemplating the influence of all the components of this living organism. A learner centered approach considers all aspects of life and culture as components in the development of a life long learner.

Weinberger and McCombs have applied learner centered principles to the high school educational process and have found that the application of learner centered principles increased student achievement and learning. Surveys of high school students indicated that students respond positively to teachers who are willing to “create positive personal relationships and a caring classroom environment, honor student voice, support students’ development of higher order thinking, problem solving and self regulated learning skills and can adapt to a wide range of individual differences in development, culture, background and learning differences” (Weinberger and McCombs, 2001, p.119).

Weinberger and McCombs also found that there is a perception gap between the beliefs of teachers and those of students. They found that high school students’ perceptions of teacher’s instructional practices influence student motivation and learning more than teacher perceptions of instructional practices. Research has demonstrated the belief that students who feel that their teachers encourage them to succeed are personally more driven to succeed and more academically successful (Murdock, 1999).

High school administrators and instructional staff can use the results of this research to develop methods of increasing learner centered practices in their respective buildings. Both authors stated that such a task begins with a self- assessment of student centered practice by individual faculty members. This self-assessment is to be presented by administrators in a non-threatening manner. Teachers can then reflect on the results of their self-assessment and can begin to develop ways to increase student centered activities in their learning plans.

A strong case is presented for the inclusion of “student voice” in the establishment of a learner centered environment. This voice can be heard through the use of surveys or through the establishment of a student forum. Research findings include the point that that large numbers of students feel alienated from the general culture and “question their existence, purpose and meaning of life”. (McCombs, 2001, in press). Alienation in school is a direct result of the stifling of “student voice”. Participation in school activities that allow for the expression of student voice can be a powerful factor in decreasing the possibility of alienated youth. Rossi and Montgomery (1994) have shown that students who fail to identify, participate and succeed in school activities are increasingly at risk of academic failure, increased alienation and dropping out of school. Alienation decreases student motivation and negatively impacts effort and achievement and can lead to potentially violent situations as occurred at Columbine High School.

Finally, Weinberger and McCombs believe strongly that teachers should serve not only as master teachers, but also as models of expert learners. The most effective learner centered teachers move easily between the dual roles of expert learner and master teacher. Students can then work in collaborative partnerships with their teachers and, in turn, model their teacher’s expert learning styles. Such partnerships not only increase student achievement and learning, but also allow for the development of positive personal relationships between students and their instructors.

Teaching is hard work. A task made much more difficult when students feel isolated, stressed and alone. Teachers, by adapting the learner-centered principles to their instructional plan, will

find the task of teaching more enjoyable, more rewarding, less stressful, less threatening and more satisfying.

The challenge put forth by McCombs and many others is to actually change the American High School so as to create a supportive environment that would develop the positive psychological and sociological traits of adolescents. This healthy environment would allow for the personal growth of intelligence capacity for all students and would defy the description of high schools as adolescent societies where alienation is common (Bronfenbrenner, 1974).

Each of these factors (classroom, school, family, community, and culture) influences student achievement in a dynamic fashion throughout the high school years. Learner centered practices recognize the powerful forces that shape our youth and attempts to provide a framework to positively, yet holistically influence student achievement.

The quest is to conduct research with the overall goal of creating a comprehensive plan of school improvement for a local high school. It would be a plan that would improve the climate, culture and sustain ever increasing levels of student achievement. Discovering those reforms, defining the environments that will permit reform and developing an implementation plan for actual reform of an existing high school is the goal of this report. As you will see, Learner-Centered Practices lie at the foundation of long term improvement in school achievement.

Site Examples of Learner-Centered Schools

A major characteristic of a learner centered educational environment is a well defined focus on the student not the subject matter. Learning will take place in a sustained and continuously improving fashion only with the inclusion of positive, personalized relationships within the school day and year. Teachers are charged with knowing not only their subject matter, but also their students well. Principal Ian Strachan of the Thomas Haney Secondary Centre in Maple Ridge, British Columbia states, “Any school in the 21st century that does not include an advisement system in its growth plans is doing a disservice to students” (Jenkins & Keefe, p.451).

Advisor-advisee programs were and are a signature element of classic middle school implementation, but remain a point of great controversy at the high school level. High school teachers see themselves as masters of the instructional practice related to their subject matter and often refer to middle schools as “play schools” where students are “coddled” and permitted to achieve high grades without effort or accountability. Advisor programs are not seen as essential to the subject and instructionally oriented high school and therefore become a difficult sell to high school faculties. Nevertheless, the emphasis on the personalization of the learning process is an essential beginning point for the development of a learner centered institution.

Jenkins and Keefe (2000) describe six basic elements of personalized instruction, These elements are:

- 1) A dual teacher role as coach and advisor

- 2) The diagnosis of relevant student learning characteristics
- 3) A collegial school culture
- 4) An interactive learning environment
- 5) Flexible scheduling and pacing
- 6) Authentic assessment (pp.450-452).

It would be difficult, but not impossible, to find high schools that actually employ all of the six principles in a systematic and designed manner, but these principles do provide the reader with a construct for the implementation of a learner centered school structure. My research (Jenkins & Keefe, 2000) has led me to two different high schools. One school is located in Canada and is actually a 9-14 secondary center that includes a junior college component and the other is a charter school outside of Boston, Massachusetts that not only possesses the characteristics of a learner centered environment, but also maintains a higher achievement rate on the MCAS (Massachusetts Comprehensive Assessment System) than 22 of the 25 feeder schools that provide students to the charter school.

Each school has developed a design based upon the six stated principles and have experienced a high rate of success in their settings. Could it be that sustained student achievement may actually be based on providing a healthy setting for achievement to take place? Could American high schools use the innovations successfully implemented in these two schools to create a more positive learning environment?

It is instructive to compare the two schools in their implementation of the six principles defined previously.

Principle 1: Implementing Personalized Instruction

Both schools provide significant time for teachers to act as academic coaches and mentors. Thomas Haney School schedules ten teacher/student meetings a week. This allows for continuous student monitoring as students work their way through self-paced learning modules with the assistance of their teachers.

Francis Parker School also allows for thirty minutes of teacher/student advisor/advisee contact every day with an hour of contact time on Friday. Students at Francis Parker are on a first name basis with the staff in keeping with Glasser's belief in basing successful teaching on positive relationships. Glasser (1990) believed that discipline should be replaced with "connecting". Positive relationships and personal intervention to solve interpersonal problems replace the common detention-suspension cycle found in the typical high school.

Principal 2: Diagnosis of Student Characteristics

Students at Thomas Haney develop their own Personalized Educational Plan in conjunction with their advisor. Students also take a Learning Style Profile as part of the plan to delineate their learning strengths and weaknesses. The Educational plan contains developmental information about the student as well as past achievement data and information gleaned from the learning

style profile. The plan is open for revision the entire school year and students are required to complete a daily learning plan in a personal planner for each week of the school year.

Parker students are diagnosed in terms of standards and rubrics. Students are required to demonstrate mastery of specific standards in three distinct age grouping or “divisions”, 7-8, 9-10 and 11-12. Student must create a variety of exhibitions and defend their portfolios as the end of each school year.

Principle 3: A culture of collegiality

Students and teachers at Thomas Haney work as teams and in groups of differing sizes. Teachers work in departmental teams and students work together in pairs or small groups in order to complete the many project based assignments. Teachers are electronically tied together using computers to access student data on previous achievement as well as data that track current progress. Students in Thomas Haney state that they work harder than their previous school because they “must do the work and do it well before receiving creditWe aren’t competing against each other”. (Jenkins & Keefe, p. 451)

Collaboration is the main theme of the Parker Charter School. Teachers are provided with a minimum of two hours a day to work with their colleagues to design curriculum, develop assessments, meet with parents and students and participate in school governance issues.

It is very important that I highlight the fact that students at Parker are also involved in school wide governance issues. Students serve as members of the school operations committee, a school-community congress and a school justice committee.

Principle 4: An interactive and thoughtful learning environment

Teachers at Haney Secondary Centre develop learning guides for each of their students. These guides are based upon the standards mandated by the British Columbia Ministry of Education and are quite rigorous. The guides form the basis of instruction at Haney and allow for adaptation for differing learning styles, group in individual projects and continuous assessment. Teachers are therefore true “guides on the side” intervening when necessary, but being careful to allow for student independence and responsibility for learning.

A unique feature of this system is the use of “Teacher Markers” as a means of providing individualized assessments each academic quarter. Teacher markers provide individual feedback based on quarterly comprehensive exams and monitor student progress throughout the academic year.

The inquiry approach would characterize learning at Parker Charter. Teachers meet frequently with students in their advisory groups to provide feedback, assessment and direction. Students are asked to discover the “why” of their answer and to provide the research that gives academic validity to their beliefs. The school emphasizes an interdisciplinary approach to all study emphasizing the connections between the academic disciplines.

Principle 5: Flexible scheduling and pacing

The typical American high school is characterized by a seven or eight period day. Students generally are enrolled in six or seven classes with a study hall scheduled in addition to a 30 minute lunch period. Classes meet from 40 to 50 minutes a day five days a week with little variation.

The scheduling of students in high school is a major activity that takes place throughout the school year. Counselors strive to provide the closest match between student/parental course selections and the time crucial scheduled classes. Class conflicts are resolved during the first two weeks of school resulting in lost class time and learning. Course selection encompasses a portion of the spring semester and also results in more lost class time.

Alternative scheduling options have been employed in a variety of high schools in the United States. Block scheduling is the most prevalent alternative currently in use. Block scheduling allows a student to concentrate on four subjects each semester. Classes meet for approximately 90 minutes and students are scheduled tightly into the four periods. Ideally, study halls no longer exist. One advantage of the block schedule is that teachers are provided with one block (90 minutes) of planning time on a daily basis. This allows for a more collaborative teaching environment than is found in the standard eight period high school day. A variation on the block schedule is the creation of a five period day combined with a trimester approach to the school year. In this time configuration, students take the equivalent of a year long course in two of the

three trimesters. This arrangement allows for acceleration and remediation based on student needs and provided for a wider range of course taking patterns beyond the basics and allowed students to enroll in additional and more advanced courses than are currently available under the traditional eight period day. Enrollment in more advanced and rigorous courses has been shown to significantly improve student achievement in mathematics and science (Williams, Atash & Chaney, 1995).

Administrators point to a decrease in behavior problems because students are in class a greater portion of the day and there is less opportunity for disruption due to less frequent class changes.

The schedule at Haney is characterized by the concept of meeting based upon the demands of the learners and subject matter. Some subjects require up to three meetings per week and a series of seminars while others require much less frequent formal meeting and more frequent small group and one on one instructional sessions. Frequent monitoring of student progress, active and early instructional intervention and flexible scheduling adaptations to meet the needs of the individual learner are hallmarks of the Haney system.

Parker students appear to be scheduled for formal meetings in groups of 10 to 50 students, sometimes with one or two teachers depending upon the demands of the subject matter. Students are not required to stay in one locale for the entire period but are expected to move to the areas of the school that contain the necessary resources for the accomplishment of their academic goals. Time is available for both formal meetings as well as well as student-teacher collaborations.

Principle 6: Authentic Assessment

Assessments in the Thomas Haney School are many and varied. Students are assessed by teacher made tests in this alternate learning environment. Students, however, take the tests when they have completed the required materials and must retake the test until all errors are corrected. Teachers provide one on one feedback and remediation and grades are not compiled as an averaged result of varied achievement over time. There is no competition with other students and accomplishment is measured by the achievement of school standards. Students also demonstrate proficiency through a variety of projects and presentations that are assessed by the professional staff.

Standards, scoring rubrics and portfolios are the hallmarks of assessment at Parker Charter. The school operates without grades, academic honors, rewards and quality point or grade rankings. The school faculty sets the “Criteria for Excellence” and students must perform up to the standards set by the school. This requires in-depth inquiry and deep understanding of subject matter and fulfills the founding parents wish for a school grounded in “greater intellectual challenge” for students.

Students must develop and present “Gateway Projects” as proof that they are ready to move to the succeeding school division. Seniors are required to complete a Capstone Senior Project as a bridge between high school and post secondary work.

The existence of “break the mold” schools as were called for in the landmark report, *Breaking Ranks: Changing an American Institution*, sponsored by the National Association of Secondary School Principals and the Carnegie Foundation for the Advancement of teaching has never been in question. The fact that the American high school remains a basically unchanged institution after many years is evidence of the entrenched cultures and traditions that exist within its walls. The high school has always been the most difficult educational arena to reform and, certainly, the most resistant to change. Calvert (2002) spoke about the “structural issues” that prevent a more personalized and effective form of high school education. He stated that class schedule and time restraints prohibit the development of a student role in their own education. Cook-Sather (2002) stated that students are rarely if ever asked how the educational system should be designed and operated. Teachers often see themselves as lacking power in the school setting and are naturally reluctant to allow students any voice in the governance of the building. Fear of personal violence and increasingly disruptive behaviors fuel the belief that more repressive discipline is the only way to address today’s youth. Security guards and the presence of armed police officers are common sights in the post modern high school. Calls for greater accountability, high stakes testing and strong sanctions for “failing schools” add to the stress of the high school day.

The answer to sustained achievement and safe educational environments is not ever increasing calls for achievement measured in one dimensional testing nor increasingly repressive regimes. The answer is, most certainly, not in the return to the familiar traditions of the past. The answer can be found in the development of academically rigorous schools that take into account

the cognitive, metacognitive, affective, motivational, social, developmental and individual differences of each of our students. Then, truly, can we say that no child will be left behind.

The experience as a faculty member at a relatively large (1200 students) secondary school that was an initial adopter (1970) of modular scheduling was enlightening. This particular style of scheduling allowed for a maximum of 60 % class time for instructors. The remaining 40% of the school day was used to foster departmental and interdepartmental collaboration. In addition, students' schedules were developed that provided sufficient time for independent study, individualized and small group meetings, authentic assessments and advisory sessions. The principles of personalization, student accountability, rigorous academic expectations and varied expressions of knowledge were hallmarks of the school. A deteriorating funding base followed by a rapid turnover of administrators and a lack of continuing staff development doomed this attempt to personalize the high school environment. One wonders what would have been the next step in the evolution of that school had the funding, leadership and staff development been provided on an adequate basis. It is my belief that the next step would have been an environment closely aligned with the exemplary schools and the learner centered principles presented in this paper. The two institutions that I have compared and highlighted in this paper are actual living examples of what can be done if the will is present to incorporate learner centered principles.

The practices employed in the two schools that have adopted the principles of learner centered schools seem radical for today's school environment, yet they are but another manifestation of the dream of personalized, individualized education espoused by so many educators throughout the 20th Century.

Student Engagement in Schools

The American high school is, most certainly, an icon of modern American culture. Movies such as, *Ferris Beuller's Day Off*, *The Breakfast Club*, *Risky Business*, *Fast Times at Ridgemont High* and many others satirize the day to day lives of teenagers as they live their adolescence in the American high school. Even *South Park*, the widely popular cartoon is based upon the experiences of the two cartoonists who grew up in Littleton, Colorado, the site of the shootings at Columbine High School.

The modern American High School is the direct descendent of the institutionalization of education that occurred in the United States during the late 1800's. The nation was faced with increasing numbers of large urban and small city residents due to the immigration patterns of the time and the migration of laborers from the South. Education was envisioned as a method of "Americanizing" a large population of immigrant and farm children and provided for the basic educational needs of American industry. The responsibility for educating America's youth shifted from the family and the one-room school house to the much larger institutionalized school. The trend towards increasing urbanization continues unabated today with the growth of urban centers, related urban sprawl and the abandonment of rural homesteads. Less than 2% of the American population is gainfully employed in agriculture in 2003 and fewer and fewer young adults are choosing farming as a career. The National Youth Employment Coalition found that only 15% of the existing jobs in the United States could be filled by unskilled labor. This was in comparison to a 60% rate in 1950 (National Youth Employment Coalition, 1999). It is

commonly believed that persons who cannot employ mathematical concepts and are not competent with the use of computers will be at a significant disadvantage in the emerging information society. Education for the urban and suburban youth is seen as a main path to personal fulfillment and career success.

Several anthropological and sociological studies have been conducted over the years describing the high school as a mini adolescent-society within the larger adult culture. Bronfenbrenner (1974) described high schools as breeding grounds for alienation. Additional studies have found that 40-60 percent of high school students are chronically bored, disengaged, inattentive, exert little effort, fail to complete tasks and claim to be bored (Marks, 2000).

High schools could be characterized as hospitals operating in reverse. We spend a great deal of time, money and effort on those who achieve and believe that the quality of the school is based upon the success of its most talented teenage members. This belief is opposite the research that indicated that “performance is much more psychologically based than anything else” and that intelligence develops over time (Good, 2003).

If hospitals were high schools, hospitals would improve the health of the well and would publicly reward those same clients. Doctors would treat the well to ensure that they would become healthier. News releases would be filled with articles about how the healthy got even healthier during their stay at the institution. Doctors would be praised for being helpful to the fit.

Our best instructors tend to work with our best students. Expectations of an ideal class size and first rate instructional materials are greatest for the classes that contain the Advanced Placement (AP) student. We tend not to “count” those that have improved greatly, but rather those who have been successful throughout their high school years. Practices such as class rank, pep rallies for the athletically gifted, the selection of valedictorian and salutatorian for each graduating class as well as the appointment to the national honor society tend to reinforce the belief that the purpose of schooling is to provide for the success and reward of the academically and athletically talented. Despite studies that demonstrate little relationship between success in adult life and academic success in high school, we continue to believe in the model described in this paragraph.

It is my belief and the belief of the investigators from the National Academy of the Sciences who wrote the report entitled, “*Engaging Schools*” that imposing high standards on students who are performing poorly as the **only intervention** will result in an increase in alienation or disengagement from school rather than the motivation to exert more effort (Futrell and Rotberg, 2002). The report further claims that “under the right circumstances, challenging students to learn more demanding curricula increases their motivation and engagement... Significant reforms will be needed to motivate all students to be significantly engaged in their schoolwork to meet more demanding expectations” (p.16).

The high school is an American institution. The processes and day to day operations of a school are part of the experiences of most Americans. An institution constructed and designed to

meet the challenges of the late 19th and early industrial 20th Centuries continues to be a signature landmark of the nation's willingness to educate their youth.

Recently, the effectiveness of this great American institution has been questioned. Commissions and reports released from a wide variety of philosophical camps have underscored the lack of achievement by large numbers of high school students. The value of the high school diploma is a most recent example of this assessment of the practical worth of high school education (The Diploma Project, 2003) and it is generally accepted that an additional two years of education beyond high school is required for success in modern society. Large numbers of college students are required to take remedial courses upon acceptance at the university level and graduation rates at state sponsored universities are often less than 50% of the original freshman class. Critics cite the results of the NAEP and the TIMSS assessments of student achievement as well as the results of the mandated testing required under the federal No Child Left Behind Act as evidence of poor achievement at the high school level and an overall lack of excellence in the system.

Much has been written about "achievement gaps" between ethnic groups and socio-economic levels. Many see American education in a state of crisis and either in need of major reform or, perhaps, a total restructuring of the processes and control of education itself.

Instances of well publicized violence have pushed parents and school administrators to establish personal security as a major goal. The "gun culture" has penetrated the school and

many school districts have established and enforced “zero tolerance” policies towards gun/weapons possession by students.

Despite the bleak picture being presented in research, the media and in the realm of national politics, the American high school continues to exist on a day to day basis. Teachers still teach, students are still required to attend and administrators still work diligently to improve the “old engine of education”.

It is highly unlikely that this investigator will see the dissolution of the American High School in his lifetime. Cultural icons possess a great ability to survive despite serious threats to their existence.

Therefore, this investigator has investigated the concept of **engagement** in the American High School in the hopes of improving the lives of students, teachers, parents and administrators. The necessity of developing an “engaging” environment in today’s schools comes not from the need for academic achievement, even though this is the ultimate goal, but rather from an understanding of the origins of “adolescence” itself. Adolescence, like the existence of the high school, is not natural creation but rather a cultural one. The original meaning of adolescence comes from the medieval period when the word literally meant, “he who grows up (on his own)” and was attributed to the young man who left home to make his way to the city to earn his living in a trade (Shahar, 1992). Adolescence took on a new meaning in the mid-1800s when it came to mean a young person who stayed in school beyond pubescence. In 1904, G. Stanley Hall proclaimed that adolescence was a “natural stage in human development marked by emotional

turmoil because of the fact that the adolescent was adapting to conditions that were emotionally and socially different from those that characterized the world of childhood” (Danesi, 2004, p.5)

Anderson would call adolescence a “socially constructed reality” that exists because of the demands of the society to define its existence. Plainly stated, there is no period of adolescence in non-industrialized cultures and therefore adolescence as a formal stage does not exist except in the industrial context. Young adulthood is an obvious stage as one learns the ways of adult participating in society, but adolescence is a cultural fantasy.

The investigator cannot help but ponder the purpose of adolescence. Preparation for participation in an industrial world must be part of the answer, but today’s American adolescent does not live in an industrial world. Preparation for participation in a post-industrial, information and technologically driven society can seem to be a justification, but technology has proven itself to be a great liberator of thought and power. Today’s “adolescents” possess and are more technologically astute and competent than most adults and therefore what are actually well prepared to learn the skills and knowledge necessary for success in a highly technological society.

It becomes obvious that engaging the technologically astute young adult learner in high school is much more challenging than it was in the industrial world. There is no longer a direct path between high school and the factory. Students cannot simply be engaged in acquiring basic literacy skills required for industrial work, most high school students are thoroughly “Americanized” and the educational requirements of a technological society are higher for this

generation than ever before. The job market has become internationalized and American students are vying for jobs with students from around the globe. Engaging young adults as life-long learners is an important, yet extremely challenging national priority.

The industrialization of this nation and of other nation states throughout the world created an adolescent culture where none existed before in the history of mankind. This creation has led to the development and construction of the high school as a way station for adulthood. We have created a set of expectations and assumptions about the nature and purpose of adolescence and now we must find a way to gainfully engage our high school youth while they “progress” towards adulthood. We already know and recognize the products of disengagement (drop out rates, poor achievement, alienation, boredom and an increasing possibility of violence) and therefore engagement is not only a rational, but also a survival imperative for those who work with the young high school age adults in America.

The No Child Left Behind legislation placed in law the concept that **all** American students could achieve at high levels by the year 2014. Practically, this may be a legislated realization of our dependency on the increasing productivity and skill of an ever decreasing, yet better educated work force. By the year 2014, the productivity and resultant wages of the equivalent of two workers will support the vast numbers of aging “baby boomers” in this society. It is estimated that only two workers will support the large numbers of retirees slated to leave the workforce in the next decade. Literally, this nation cannot waste the precious intellectual resources that exist. To do so is to invite disaster in the future. Every disengaged youth who “turns off and drops out” is a significant loss to the nation and its citizens.

Eccles and Wigfield (1992) stated that motivation and academic achievement decline as students progress from elementary, to middle and later to high school. The Kaiser Foundation asserted that in today's society, adolescent youth who are bored and distracted have the means to make decisions that may negatively impact their older adult lives. Disengaged and bored adolescents most certainly have access to a wide range of alternate activities (work for pay, sports, video games, social activities and less societally acceptable pursuits). The foundation reported that, on the average, 40% of white students work three hours a day while black teenagers average four hours of work per day and that the average teenager watches television three hours per day. Ultimately, at an age specified by state law, disengaged young adults can drop out of school if they wish

High school students, as adolescents, can exert little power over their academic and home based lives. They are generally dependent upon their parents for food, clothing and shelter and upon their school for "education". Certainly, inside the confines of the typical American high school, students are afforded little access to the powerful and play, at best, a minor role in the governance of the high school. In addition, the competitive environment prevalent in high school can lead to continued poor performance and a sense of alienation amongst low achieving students. (Cohen, 1994)

The investigator has often interacted with teachers who wish the administrator to act in such a way so as to strip the student of any power to control or influence their destiny in order to reinforce arbitrary rulings in the classroom. Blauner (1964) suggested that alienation, not

engagement is the result of powerlessness in any situation where productivity is a goal and a desired outcome. Thus, power struggles between students and teachers result in alienation, not engagement whereas high student engagement has been found in classroom situations that provide students with opportunities to participate and contribute. (Berand, 1992, 1997).

Changes in family structure embodied in ever higher divorce rates, increasing rates of poverty for single provider families and ever increasing societal residential mobility are social realities facing the faculty and administration of the high school. McLanahan (1985) found that poverty and the stress associated with family disruption accounted for almost all of the negative effects on student achievement in single parent white households. Guo (1999) found that poverty in adolescence had a greater impact on student achievement than poverty earlier in life.

Despite, the encouraging results of a recently conducted survey by Metropolitan Life Insurance Company (2001) of high school students that indicated that 89% of those surveyed indicated that they “really wanted to learn in school” and another survey by the same organization (2002) in which 84% of those surveyed responded that, “they worry about doing well in school”, the achievement results nationwide are not encouraging. The 1976 NAEP results indicated that 40% of urban youth scored below basic while 35% of rural and 32% of urban fringe and suburban youth scored at that level. In 1999, on the same national assessment instrument, 17 year old African-American and Latino students on average scored the same as 13 year old white students indicating the continued existence of an achievement gap between the major ethnic groups.

The dedicated school teacher and school administrator would have good reason to become disheartened given that “report card” of the results of their professional efforts. This investigator would claim that his research indicates that there are significant actions that can be taken by the school in order to decrease the percentage of non-achieving or under-achieving students in a high school. It would be unreasonable to believe that the poor results achieved to this date and the atmosphere of alienation and lack of motivation is the result of the efforts or dedicated teachers and administrators, but is rather the result of the accumulation and tradition of practices, policies and procedures that lead to such results.

A recent report published by the National Research Council on Medicine opined that, “significant reforms will be needed to motivate all students to be sufficiently engaged in their school work to meet more demanding expectations” (p. 16). Newman (1992, P.12) defines **engagement** as, “the student’s psychological investment in and efforts towards learning, understanding and mastering the knowledge, skills or crafts that academic work are supposed to promote”. This definition is closely related to the Learner Centered Principles as defined earlier in this work by the American Psychological Association and published in 1993 as *The Learner-Centered Psychological Principles: A Framework for School Reform and Design*. (McCombs, 2003) and illustrates the potentially broad alliance that may lead to significant school reform.

If engagement is largely a psychological construct and engagement is a central component of student achievement. It is important for the school administrator to assess the nature of school climate when evaluating achievement at the high school level. Engaging schools are those that, “promote positive development by addressing needs of safety, love, belonging, caring

relationships with adults, maintaining positive and high expectations and providing students with opportunities to participate and contribute”. (Berand, 1992, 1997)

The motivation to learn and to become academically engaged has been found to depend upon a complex mix of social relationships between students and their friends, teachers and family. Each social group plays a positive role in encouraging achievement when each supports academic involvement (Cohen and Ball, 1999).

Teachers play a strong collective and individual role in establishing a positive classroom/school climate. Studies have shown that attendance patterns are positive when students are engaged and encouraged by teachers. Davidson (1999) noted significant variations in attendance at the classroom level with students skipping some classes more than others. Ferguson (2002) found that African-American students were particularly responsive to teachers who showed that they cared about student learning. McLaughlin and Talbert (2001) divided teachers into three categories:

1. Teachers who watered down the subject material with the result that students did not experience significant gains in knowledge or skills
2. Teachers who kept teaching the same curriculum, making no adjustments during the school year with the results that students experienced low motivation, believed that the subject matter was inaccessible and low skill development
3. Teachers who built upon students’ existing skills and level of understanding AND pushed the students to master the curriculum. (pp.1-12)

Davidson and Phelan (1999) identified that there are two styles of teacher behavior that are effective and important to students. They were:

1. Learning about a student's life outside of school
2. Speaking to students on a regular basis about their academic achievement

In addition, Wentzel (1997) developed a profile of caring and non-caring teachers. Caring teachers exhibited the following traits; tried to make the class interesting; talked and listened to students; was honest and fair in judgments; showed concern for the individual student in that the teacher inquired as to their problems and understood if something was wrong.

The skill of the teacher to differentiate instruction to meet the existing skill levels of is yet another teacher specific characteristic that relates directly to achievement. The National Research Council Report on How Children Learn (1999) noted that students base their understandings on pre-existing knowledge and that teachers must base their instruction first on an analysis of this pre-existing knowledge base.

Teachers also contribute greatly to a student's sense of belonging. Teachers assist students in developing identification with the "values and goals of schooling as well as feelings of connectiveness to others in school". (NRC, 2004, p. 43). Students interviewed in 1999 by Davidson and Phelan spoke to the importance of meaningful relationships with teachers and in another survey, it was found that 64% of students stated that their learning would improve if teachers "personally cared about his students as people (Public Agenda, 1997). Interestingly,

only 30% of the surveyed students stated that they believed their teachers cared about them as people.

Teachers are a significant, but often individually isolated participant in the lives of students. Teachers are members of a larger corporate body that is the high school. The attitudes of administrators, the belief about the competency of the principal, the disciplinary traditions of the school and the unwritten, but ever present school culture play a strong role in the academic achievement of students.

Lee (2000) found that high schools with a “communal focus” that is a focus on reformed instructional practices, a sharing of governance and authority and a collective commitment and belief in student achievement experienced considerable gains in student achievement and, as importantly, “nearly eliminated class differences among students”. Coburn (2001) reinforced the impact of a “strong professional teaching community” where teachers worked collaboratively, shared a sense of purpose, focused on student learning and were reflective about their collective practice that scores on the NAEP in mathematics and reading were higher in such schools.

The school environment does not necessarily need to be openly and completely democratic. In fact, there are few schools that actually practice a fully democratic model. Phillips (1997) found that it was what he called the “level of academic press” (demanding curriculum offerings, high expectations for all learners without pressuring performance or undermining autonomy) was a powerful predictor of student learning. Rutter, Maughan, Mortimore, Ouston and Smith (1979) found that schools that exhibited high consensus on rules along with a high consistency of

enforcement had higher attendance and less attendant “juvenile delinquency”. Schools should not attempt to develop a *Liaise Faire* attitude about the academic environment and should set limits and provide for choice within a clear set of limitations. Studies have shown that authoritarian discipline policies, limitations to academic options or choices, rigid and distrustful teachers and teachers who did not allow for student expression heightened student alienation and diminished to potential for high achievement.

The high school is a complex social system characterized by many policies, procedures and written and unwritten rules. Anthropological studies have shown that it is the unwritten rules and culture of the school that dictates school climate and ultimately student behavior and achievement. Certainly, the majority of the studies researched in this piece speak to those rules, feeling and attitudes. Improvements to student achievement for all students as envisioned under the No Child Left Behind legislation seem accomplishable by a series of reforms that take into account the cultural and pedagogical aspects of the high school. State and national standards are one of many significant components that influence and measure student achievement. As the high school must be seen as a complex social body, so to must the efforts to positively influence student achievement be perceived as equally complex and most certainly related to the psychological and sociological make up of the high school itself.

Student Achievement in Mathematics

The subject area of mathematics is, in the estimation of the investigator, the most difficult area to impact in terms of student achievement. This necessity of strong mathematical skills is

readily apparent in this highly technological, international society. The acquisition of mathematical skills has been identified as “gatekeeper skills” leading to improved and varied careers. Early federal initiatives in the Eisenhower era established mathematics and science achievement as crucial to national security and economic growth.

The mathematical skills of the American high school student have been in doubt since the “A Nation at Risk” report issued in 1983 (National Commission on Excellence in Education) . At that point in time, the average Scholastic Aptitude Test score of college bound seniors had reached an all-time low. The Federal Government authored a report that stated clearly that without a renewed effort the nation was at risk in terms of its competitive edge in relation to other world economic powers. Since that time, scores in mathematics have slowly risen to a level experienced in 1967 (Education Next, 2004). The results of the National Assessment of Educational Progress (NAEP) indicated a stagnant pattern of achievement, while results of the Third International Mathematics and Science Study (1999) revealed that students in the United States are not competitive with many of their international brethren.

The result of the reforms of the “new basics” curriculum espoused by the federal government through the report (*A Nation at Risk*) has been an increase in the number of academic courses students have chosen . The National Center for Education Statistics (2003) reported a more than four fold increase in the number of academic courses chosen by students since the date of the report. This represented an increase from 14% in 1983 to over 56% in 1998 when the statistics were compiled.

The increase in the number of academic courses taken by high school students does not necessarily translate into greater understanding and achievement in the area of mathematics. Williams, Atash and Cheney (1995) found that achievement was more strongly related to the number of advanced courses taken beyond the basics. The increase in academic course selection has also not resulted in a requisite increase in achievement as measured through standardized testing or through international tests of mathematics achievement. The fact is that achievement as measured by SAT scores, scores on the NAEP or the recent results of the TIMSS assessment has remained stagnant.

Research into the correlations between math achievement and the variables that influence such achievement has provided us with insight into the processes involved. The Wisconsin Center for Educational Research (WCER) of the School of Education at the University of Wisconsin found that in a review of 50 years of research that:

1. Teacher knowledge of student thinking is critical
2. Teachers need themselves to understand the structures of the mathematical domains as defined in the NCTM Standards.
3. The design of instruction needs to be based on the teacher's understanding of students' level of thinking and how that thinking relates to the domains.
4. Professional Development for teachers cannot be done in isolation and must be group collaboration (Romberg, 2002, p.3).

Two of the four findings from over fifty years of research can be characterized a student centered while the remaining findings are teacher-centered. Student thinking and the application of student thinking to solve problems in the domains identified by the standards are a major focus of the research findings.

Romberg (2001, p.5) further elaborated on indicators of achievement when he speaks of “mathematizing” in his comparison of language literacy with mathematical literacy. He believed that mathematizing is a “primary goal” of mathematics education for all students. The act of becoming mathematically literate implies that, “students must not only learn the concepts and procedures of mathematics (its design features), but they must learn to use such ideas to solve the non-routine problems and learn to mathematize in a variety of situations (Romberg, 2001, p.5). Students should develop fluency with the language of mathematics so that they can apply their mathematical language skills to new, novel and interdisciplinary situations. Thompson and Thompson (1994) highlighted the role of language as being critical to understanding. Relationships between existing knowledge and an integration of related experiences must be constructed so as to develop students’ ability to speak about and solve problems in unique ways. An immediate application of such a mathematizing ability would be the use of mathematical language to solve problems in the chemistry classroom. Chemistry teachers are known to complain that students do not remember enough basic algebra to be able to solve chemical equation problems. The complaint belies the lack of depth of understanding of basic mathematics principles and the inability of students to employ the language of mathematics in new and novel ways.

Wiske and Levinson (1993) referred to the necessity of curricular change in order to successfully implement the NCTM standards in the classroom. They spoke of the concept that classrooms should develop a “feeling of family” placing greater emphasis on the development of positive teacher-student relationships, an establishment of a greater sense of student responsibility for their learning and a willingness to assist one’s peers as being essential.

It struck the investigator that the reform movement called for in the NCTM Standards documents make reference to student centered principles such as those found in the APA document on student centered learning. Recognition of authentic student voice is found throughout the research findings of Romberg. The development of a feeling of family relates directly to the Motivational and Affective Factors delineated in the Learner Centered Principles developed by the American Psychological Association. The call for an understanding of student thinking is directed associated with the Cognitive and Metacognitive factors found in that document (APA, 1997).

Student centeredness takes place within the confines of a classroom and of a school on a more global level. The classroom is generally the domain of the subject area teacher and the school is reflective of the leadership and culture of the building. Research provides us with indicators of classroom environments, teacher behaviors and building level characteristics that lead to improved achievement specific to the area of mathematics.

Once again, Romberg’s research provides us with indications about the attitudes, knowledge and structures that can provide for a mathematically literate student. Primary to his argument is

his belief that “*all students can learn important mathematical concepts with understanding*”. (Romberg, 2002, p.2). This is in keeping with the belief proposed in “No Child Left Behind” legislation and the democratic principles upon which this nation and the public school system were founded.

Students in mathematics are also to be involved in activities that encourage students to use language that enables them to solve real world problems that “are subject to measurement and quantification, that embody quantifiable change and variation, involve specifiable uncertainty and involve our place in space and the spatial features of the world we inhabit or construct” (Romberg, 2002, p.2). The emphasis is on new skills and new forms of communication that can empower today’s students. Student centeredness is at the core of the implementation of the reform of mathematics instruction.

Students do not typically work in isolation from or on an individualized basis with their teacher. In fact, Romberg and others speak of the necessity of mathematically based communication and language as well as the community aspect of mathematics. The classroom is the most immediate and apparent manifestation of community for the high school student. Classrooms are a product of the educational environment fostered by the classroom teacher. The structure and management of the classroom environment can be a powerful agent in the improvement of achievement in mathematics and other subject areas. Romberg states that, “Learning with understanding is a product of interactions over time with teachers and other students in a classroom environment that encourages and values exploration of problem situations, modeling and argumentation” (Romberg, 2002, p.2).

The NCTM Standards called for mathematical literacy “put into functional use in a multitude of different situations and contexts in varied, reflectful and insightful ways.” (Romberg, 2001, p. 5)

Unfortunately, the typical mathematics classroom has not been found to be such a rich and communicative environment. Davis and Hersh (1981) found that mathematical presentations in books and in classrooms were often authoritarian in nature. The implied answer to problems was the fact that the “teacher said so”. The pedagogy found in typical mathematics classrooms was generally a set sequence of familiar events as either a problem to be solved, followed by the presentation of a method of explanation or a theorem to be proved that is placed on the board. The teacher assumes understanding and facility with the concept if the problems are solved, if the calculations are correct or if the theorem is proved (Davis and Hersh, 1981). Alfred Lord Whitehead stated that in the mathematics classroom, “fundamental ideas are not explained to the student disentangled from the technical procedure which has been invented to facilitate the exact presentation in particular instances. The unfortunate learner finds himself struggling to acquire knowledge of a mass of details which are not illuminated by any general conception” (Whitehead 1911/1948, pp.1-2).

Weller (1991) found a pattern to instruction in the mathematics classroom. The lesson typically contained three parts: a review, a presentation of new material and a period of individualized study or individual teacher/student collaboration on problem solving. Weller characterized such an all too familiar procedure as the “rhythm of instruction”. Romberg (1997) stated that coverage of material rather than learning formed the criterion for American schools in the past and remains a powerful force in today’s classroom.

This is not the student centered classroom envisioned by Romberg or the authors of the NCTM Standards, but it is a close approximation of the “typical” mathematics classroom in the high schools across the United States. Human learning cannot be simply seen as accomplished by breaking problems into smaller parts in order to be able to put them together again according to a pre-set pattern and the brain is not simply another muscle that needs exercised through a series of daily problems, solutions and practice in class and at home.

Classrooms that successfully implement the NCTM Standards are found to possess certain characteristics. These classrooms are found to employ:

1. Induction rather than memorization
2. Guided Inquiry rather than didactic instruction
3. Open ended assessments rather than machine scorable tests (Wiske & Levinson, 1993).

Cuevas and Driscoll (1993) found that learning is facilitated when students employed higher order thinking skills, problem solving with real world based problems and engaged in substantial conversation. The Orange County School District in Florida has developed a “*Comprehensive Academic Achievement Plan for K-12 Mathematics*” which specifies “A learner-centered, supportive environment”. Furthermore, the document stated that “By providing students with a risk-free, learner-centered environment, teacher will be able to meet the demands of engaging and challenging all students” (Orange County Public Schools, 2003, p. 13). The report specified further the characteristics of the learner centered mathematics classroom in great detail.

McLaughlin and Talbert (1993), Graves and Sunstein (1992) and Golub (1988) noted three characteristics of effective classroom instruction. These being:

1. Individualization that draws upon the students prior knowledge
2. Classroom collaboration allowing for students to work together in groups
3. The use of authentic assessment instruments where the assessment is the result of work over a period of time rather than a single point in time.

Weglinsky (2002) found that decisions teachers made concerning classroom practices either improve student learning or serve as an impediment to student learning. Weglinsky (2002) found that classroom practices have the greatest impact when measured against other variables such as formal course preparation, years of service, and scores on a vocabulary test, ethnicity, parents' educational attainment, and attitudes towards teaching middle class students. Classroom practices such as individualization, hands on learning, focus on higher order thinking skills, skill with differentiated instruction and the use of formal more traditional tests in addition to portfolios and projects were found to be significant contributors to student achievement.

Teacher characteristics were also found to be an important indicator of student achievement, but not when considered as separate entities. Darling-Hammond (1998) concluded that teacher knowledge and expertise have a significant impact on student learning as does class size and school size to a lesser degree. Wenglinsky (2002) found that most research indicated a lack of a clear connection between student outcomes and teacher inputs with the exception of two factors:

1. The amount of coursework the teacher has pursued in the area
2. The teacher scores on tests of basic skills

Monk (1994) analyzed results of the Longitudinal Study of American Youth and found a positive relationship between the number of college level math courses taken by a teacher and student achievement in mathematics. Goldhaber and Brewer (1995) confirmed Monk's results with the refinement that the teachers they studied majored in mathematics in college. Monk's analysis found that undergraduate courses in mathematics pedagogy "contribute more to pupil performance gains than do courses in undergraduate mathematics (Monk, 1994, p.130). Begle (1979) found that there was a positive relationship between the number of methods courses taken and student performance. Wise (1999) found no relationship between student learning or actual teaching performance and scores on teacher tests of pedagogical knowledge such as the Praxis.

A review of the qualitative research done on teacher effects on student achievement indicate that students of teachers who are capable of conveying both higher order and lower order thinking skills outperform teachers who are capable of only lower order skill transference (Langer & Applebee, 1987).

Socio-economic level is said to be a powerful predictor of academic achievement. Qualitative studies have generally indicated that low socio-economic status outweighs the impact of any specific teacher effect on academic performance. The studies by Wenglinsky (2002) concluded that the effects teaching can be equal to those of socio-economic background and can, in fact, be said to be a greater influence than socio-economic status. Teachers who master and employ the three effective classroom practices (Individualization, collaboration and authentic assessment) as noted before can positively influence the academic achievement of low socio-economic students.

Wenglinsky also concluded that professional development activities were a strong influence on the willingness of teachers to consider and to use more effective methodologies in the classroom. Cohen (1989) argued that new approaches to instruction were a “radical departure” from traditional classroom practices. This belief underscored the necessity of on-going professional development if new more effective methodologies are to be attempted and employed regularly in the classroom.

Teachers who have successfully made the transition from a traditional classroom environment to one that mirrors a community oriented classroom report feelings of “pleasure, purpose and professional renewal” (Wiske & Levinson, 1993). Students and classroom teachers and the environment they share make up a significant portion of a student’s day. These students, their teacher and their physical environment are all part of a larger entity, the high school itself. This larger educational community also influences student achievement through its culture, administrative practices, policies and leadership style of its principal. Policies concerning ability tracking, graduation requirements, remedial courses, professional development opportunities, and access to instructional technology, attention to standards and curricular materials selection, all comprise a significant portion of the school environment that impacts student academic performance.

Oakes (1990) posited that some courses served a “gatekeepers” for future academic opportunity. enrollment in and successful completion of eighth grade algebra and well as

calculus formed the prerequisite for future advanced study and ultimately career opportunities available upon graduation.

Simply increasing graduation requirements will not necessarily result in higher achievement. The investigator has noted previously that recent studies indicate that students are taking more academic courses since 1983, but not necessarily more academically advanced courses. Finn, Gerber and Wang (2002) demonstrated that increased graduation requirements encourage low achieving students to take a greater number of introductory courses. The study found that when high schools offered a wide range of mathematics courses students were more likely to enroll in less introductory courses and more advanced courses. Increased offerings were found to impact the academic track the most, followed by the basic track. Increased offerings had no impact on the vocational track.

Ability tracking is and has been a source of great controversy. Teachers generally approve of ability tracking because of the pacing demands of the curriculum and the fact that there are strong emotional and peer rewards found in teaching the AP, advanced or honors sections. The question for the school community in general is whether ability tracking practices negatively or positively impact the school in general. Gamoran (1992) indicated that the achievement gap between the different tracks becomes greater over time. Gamoran noted that students rarely changed tracks and called for greater flexibility in the system. Gamoran also found that low track or remedial track students could “catch up” if their teachers continued to hold high academic expectations, exerted extra effort for the low track students and provided time within the school day for extensive oral interactions.

Curricular focus is an important factor in improving student achievement in mathematics. In many cases, the purchase of textbooks is the sole curricular decision made by an academic department and most certainly influences positively or negatively student achievement for the shelf lives of the book themselves. Book purchases can and do influence students for many years after purchase and schools have been known to employ the same texts for eight to ten years. American textbooks contain 930% more topics than same subject German textbooks and 433% more topics than corresponding Japanese textbooks. Coincidentally, students of both nations consistently outscore students in the United States on international assessments of academic achievement (Schmidt, McKnight, & Raizen, 1996).

This overabundance of topical material is being addressed in the United States through the adoption of Essential Standards Glendale Union High School near Phoenix Arizona and Adlai Stevenson High School in Lincolnshire, Illinois have each developed year end assessments that are used to assess student achievement and set year long improvement goals. Schmoker and Marzano suggest that schools assemble clear lists of standards and related proficiencies and provide each teacher with a precise manageable list of essential standards. The school faculty and departments can then conduct a review of all performance results, identify patterns of student weakness and then set a clear path to improvement. Fullan (1998, personal communication) stated that assessment is the “coherence maker “in school improvement efforts. Fullan and Hargreaves (1996) cautioned schools to add topics judiciously to ensure that the additional topics can be properly taught and assessed. They make the claim that curricular overload is crippling to improvement efforts.

School leadership is also a factor in school success. The leader must develop common goals and a shared sense of what the organization is attempting to accomplish. Rosenholtz (1991) stated that the establishment of agreed upon goals enhance the organization's capacity for rational planning and action. Leaders must be open to new ideas, find resources for implementation and allow for a risk free environment to encourage innovation.

American schools are seen as one of the few post modern organizations that operate without a clear sense of common goals and with goals that are constantly changing, shifting emphasis and morphing into unrecognizable or untranslatable forms. This creates a chaotic instructional situation where there is too much to teach, too many approaches to teaching and too many options available for teachers and their students. In addition, the result of the past practice in the area of mathematics has resulted in a perception of "math phobia" in many adults. Mathematics is a focus area of concern for teachers and school administrators as they attempt to meet the demands of NCLB and, more importantly, improve the math proficiency of the American high school student.

Peterson (2003) writes that he perceived decline in mathematics proficiency and functional literacy comes in a time when there is an improving social climate. 83% of the population now possesses a minimum of a high school diploma in comparison with 52% in 1970. 25% of the population holds college degrees when compared to the 11% holding such degrees in 1970. The American family is smaller with a decrease of 21% of families of three or more children. 69% of our very young attend pre-school programs and the poverty level has remained relatively

constant since 1970. A significant negative occurrence in this era of general social improvement is the fact that during this time period the American family has changed and today 36% of school age children do not live with in two parent families.

Education has become a powerful political mantra with office holders and aspirants all prescribing solutions to the problems that beset American schools. It is within this mixed backdrop that school teachers and administrators are face with the challenge to improve the achievement levels and math competency of their students. The goal of this section is to delineate what changes to curriculum, teaching methodology and student learning are supported by research and to delineate a series of positive steps that could be taken to improve mathematics instruction and learning,

Conclusions

There are steps that can be taken through enlightened leadership. A leadership that is unafraid to mandate the standards, but also willing to share the authority to implement the standards. The school is a complex social culture and the leadership must provide a model of the community of learner-based classroom if the standards are to be implemented and the assessment goals are to be met. Specifically, tests, textbooks, technology and teacher development should be aligned closely with the adopted standards. Schools and school districts must provide sustained professional development in a learning community style atmosphere and networks of colleagues should be established either in real time or in the virtual world. Schools must be structured to allow for improved achievement by allowing for longer class times, smaller class sizes, access to

technology and sufficient time for collaborative planning and materials acquisition. Leaders must be willing to publicly support the reform of mathematics teaching, classroom environments and assessment of student learning.

The belief that a one dimensional testing scheme tied to teacher/administrator accountability along with monetary sanctions will solve the educational achievement problems in United States is, in the opinion of this investigator, naive. This approach maintains that sanctions and punishment will produce the desired results is, in my opinion, unsophisticated and rather dangerous. Unsophisticated in that such a direct approach is reminiscent of business as usual for schools. Students for the past century have performed under such a system of punishments and the results have been rather unspectacular. Large numbers of students do not perform to their potential and many if not most are bored and disengaged.

High school students are not only intelligent, but capable of making their own personal decisions about their lives. Scholastic Aptitude Tests have not risen dramatically despite an awareness of the necessity of post secondary education and why would one believe that state mandated testing scores would improve simply because the state and federal government say such tests are important? Can schools provide an adequate level of incentives to young adults when schools are struggling to maintain sufficient budgets to provide an adequate educational program?

Learner centered practices when considered in a thoughtful and insightful fashion provides the educator with a method of re-energizing achievement within the schools though the

empowerment of students and professional staff. Our task is to take the initiative provided by No Child Left Behind and provide the learner centered environment that will allow increasing numbers of students the opportunity for academic success.

The research completed for this chapter has taken me through a history of educational reform movements beginning in the 1950's and continuing to the present reincarnation of reform in the No Child Left Behind Legislation of 2001. Schools across this nation have focused almost exclusively on achievement as defined by state testing. This focus has placed increased pressure on school districts, administrators and teachers to produce results in line with the adequate yearly progress dictates of the No Child Left Behind legislation. The educational community has responded by placing ever greater emphasis on improving the results of this testing while eliminating programs that have served students well for years.

The research has led the author to believe that sustained improvement in achievement will require a more complex and sophisticated approach to learning. The author proposes that the principles established as Learner Centered Practices provide educators with a framework for improved achievement and personal growth in high school across the nation. Schools based upon Learner-Centered Practices are in existence in the United States and Canada and the students in these schools not only demonstrate an enthusiasm for learning but also high achievement as measured by state or national testing programs.

Improved achievement in any setting requires the engagement of the learner, the use of engaging curricular materials and a teacher who engages students in the very personal pursuit of

learning. Engagement of learner is a concept deeply embedded in the research on improving and sustaining achievement. The investigator has found engagement of students in their educational process to be an important factor in the overall success of students in the high school setting.

Finally, no other subject area has proven to be as difficult and a self-limiting for students that the study of mathematics. The all too familiar routine of instruction found in mathematics classrooms across the nation will do little to address the problems of poor achievement and limited opportunity to explore the more challenging levels of mathematics. The research has discovered more effective methods of mathematics instruction as well as changes to the structure of mathematics opportunities that can lead to greater understanding. Perhaps, no subject area has such an impact on future career opportunities than mathematics. The imperative to improve understanding and achievement in this area is driven by the engines of an increasingly technological society where mathematics competency is a necessity for gainful employment.

The American high school is a direct descendant of the Industrial era in the United States. There is reason to believe that positive results will not be achieved by tinkering with an old, somewhat obsolete engine of education. There is reason to believe that only a radical restructuring of the American high school will produce the results envisioned in the philosophy behind the legislation that states forcefully “No Child Left Behind”.

Chapter III

Case Study One – An Urban Fringe School in Central Ohio

The Supporting Community

The first urban fringe school selected for this study is located in central Ohio on the edge of a medium size city of approximately 700,000 residents. The community served by the school district encompasses 10.6 square miles and has a population of 32,000 persons. The median house value is \$123,000 which is approximately \$22,000 more than the median house value of the urban area close to the district. The median income of the population of the community is \$51,108 compared with a median income of \$38,000 of the nearby city.

The community's demographic profile specifies that:

- 84% of the population is white, non-Hispanic
- 10.4% of the population is black
- 1.8% is of a mixed racial background
- 1.8% is of Hispanic
- 0.7% is American Indian
- 0.7% is of other racial backgrounds

27.1% of the residents have earned a bachelor's degree with 7.8% holding a professional or graduate degree. The unemployment rate for the community is 3.5%. 56.7% of the population fifteen years or older. The divorce rate in the community is 12.8%. (<http://www.city.data.com>)

The researcher visited the community twice in the spring of 2004 and traversed the surrounding area including the nearby urban area. The community was a collage of housing styles ranging from modest ranch style housing to condominiums and apartments. The northern section of the community seemed to be undergoing change with vacant stores sprinkled among a business district comprised of motels, restaurants and small businesses. The southern section of the community contained a large shopping center and seemed to the researcher to be more prosperous than the business sector located in the north. A large park is also found in the southern section which is well maintained and was the site of many activities during the visitation. A central business area exists in the older section of the community to the west. The vitality of this central business area seemed to be weakened by the shopping area found in the north and south.

The high school vice-principal describes the community as "diverse". She stated that many students move into the district from the nearby urban school system. The community has a African-American population (10.4%) that is above the state average. Several teachers mentioned that students move to the community to "escape" the urban school system and to take advantage of the educational opportunities provided by the community schools.

The High School Setting

The high school is a well maintained facility that has been renovated and additions have been completed to accommodate an increasing student population. Teachers and the vice-principal noted that a significant number of their students are transfers from the adjoining urban school district. They state that they believe that their district is an educational haven for those students and parents. Examples of student art work adorn the main corridor as does a large banner proclaiming the school's recognition for academic excellence from the state of Ohio. The high school was declared an exemplary school for high achievement by the Ohio Department of Education in 2003. A plaque listing the Ten Principles of The Coalition of Essential Schools is prominently displayed. An Academic Hall of Fame is found in the corridor nearest the Media Center. Students pass through this hallway on a daily basis not only during class changes, but also on their way to lunch.

The district has purchased a set of adjoining homes that are in the process of being renovated to accommodate the increasing numbers of students (125 for school year 2004-2005) who are enrolled in the alternative school program ("Trailblazers Program") run by the district. Renovation labor is provided by alternative school students. The main building is not air conditioned and students and faculty alike welcomed the coming summer vacation. The football stadium (grass field) is located next to the high school.

The building is secure. The security of the building is maintained by a male and a female staff member who support the six administrators who manage the building. The community provides a full time school resource police officer. Teachers provide additional support by greeting visitors in the main corridor and providing the visitors with time sensitive security badges that change color after eight hours. The researcher was questioned by staff members when he appeared in the school (7:00 AM) wearing an expired security badge.

The Administrative Team

The administrative team is comprised of five vice-principals and one principal. Each vice principal is responsible for one-fifth of the student body. Each vice principal also maintains responsibility for the observation and evaluation of a portion of the professional staff. The researcher worked primarily with a female vice-principal who guided the visitor through his observations, interviews and surveys. Another vice-principal appeared to be the scheduling expert for the school. A large scheduling board was observed in the vice-principal's office. The researcher did not interview the other four vice-principals during the visitation. The principal did provide time for a one to one interview that provided invaluable insights into the school's culture, educational philosophies and the principal's personal role in the development of the high school program.

The Principal

The principal has requested a transfer to the middle school for the 2004-2005 school year. He cited the need to spend more personal time for recreation and hobbies after a very full schedule as a high school principal and a long career as an educator. The principal stated that he had made a strong effort to appear at as many student activities as possible during his tenure. The principal believed strongly that the students want to know that their principals and their teachers are interested and supportive of their activities. His successor is also a long term educator with the district and the transition seemed to be flowing smoothly.

The principal maintained an “open door” policy for students and staff. A large canister of mints and pretzels were present in the principal’s office. The principal stated that students often drop by for a quick snack and short conversation. He stated that students are willing to discuss problems with him and believes that lines of communication are always open for students and staff. A pleasant administrative assistant worked as the primary contact person at the high school and appeared to successfully screen and sort problems for presentation to the principal. The assistant was very pleasant to the students and visitors who came to the office during my visit.

The researcher interviewed the principal during his second visit to the high school. The intent was to sequentially follow the questions found in Appendix C, however, the discussion that followed ranged over many topical areas beyond the questions. The researcher reviewed his interview notations and decided that this study would provide a narrative account of the interview.

Structural Components that Impact Student Achievement

The principal was asked to describe the structural components that are in place at present that he believed positively impacted student achievement. Specifically, the principal immediately noted the presence of *faculty teaming* as a major factor in the improvement of student achievement. The school is organized along vertical and horizontal team lines. Vertically, the school is organized by department; however, the departments do not have elected department heads. Lead teachers serve as the “point persons” for the departments in close cooperation with the building “Standards Coordinator”. The purpose of this organizational scheme was to re-write the curriculum so as to prepare all students to pass the standards based Ohio Graduation Test (OGT). The standards coordinator and teachers also worked to develop pre-tests in the core subject areas. Core subject area teacher administered common assessments based upon identified essential standards in each core course.

The school is also organized horizontally into six component parts. Grade levels nine and ten are organized into the “**Preparatory Academy**” whose stated purpose is “focused upon personalizing the experiences of 9th and 10th grade so that the transition to high school is successful for every student ”. 11th and 12th grade students are enrolled in the “**Graduation Academy**”. This academy approach is “grounded in the belief that the program curriculum and the variety in delivery methods will increase motivation, improve critical thinking skills, and make learning more relevant to our students’ interests and lives

thus preparing them for the challenges of the future”. The academy approach required entering students to decide on the “level of education he or she plans to pursue after high school”. Students may then choose from the four programs constructed to provide students with the requisite skills to succeed in their chosen level of post-secondary education. The four programs are described in the program of studies as:

1. Trailblazer – Alternative school setting who do not intend on continuing their education and wish a life skills curriculum.
2. Career Center – Vocational school setting off campus in a shared, multi-district facility
3. Community College Preparatory – For students wishing to pursue an associate’s degree at a two year college or technical school
4. University Prep – For students wishing to attend a four year university program

Each Graduation Academy student is assigned a faculty advisor in their junior and senior year. The advisor meets with his/her students a minimum of five times a year. Students may change programs, but are expected to meet all requirements of each program.

The Academic Schedule

The principal also emphasized the construction of the class schedule developed around the programs. The schedule is a hybrid version of a block schedule combining a traditional eight period day with block scheduling concepts. Specific classes may meet for two periods constituting a block of time (approximately 94 minutes) while other classes may meet for the more traditional 47 minute session. The actual scheduling of the school will be discussed in a

later section of this case study. Suffice it to say that the principal believed that the hybrid scheduling was a significant factor in providing the proper allotment of time allowing for improvements in achievement.

Learner Centered Practices

The principal addressed the concept of “student voice”. Four high school students meet with the superintendent of schools once a month to discuss any issues and to communicate about the middle and high schools in the district. In addition, the high school maintains a Student Advisory Council (SAC) that also meets once a month. The purpose of the Student Advisory Council is to bring student concerns directly to the principal. The principal noted that the operation of the school seemed “so smooth” that meetings were not held recently because there were no agenda items to discuss. The principal noted the importance of harmony among the students and stated that he believed student harmony was extremely important. He noted that conflict between students on racial lines or due to divisive social cliques can disrupt a school and change the focus from academic achievement to security concerns. The principal noted that such divisions were not apparent in the school. This opinion was reinforced by the vice-principal during my initial visit to the high school.

The researcher did not hear or see any signs of such divisions during his stay. There was a noticeable positive interaction between students and students and staff. Students were loud and boisterous at times, yet respectful of one another. The researcher did not notice areas of the

building that were claimed as the “turf” of any identifiable group. The researcher noted little negative interactions between students and staff.

During the visit, the researcher spoke with teachers in the faculty lounge for a two hour period. The faculty was unanimous in their belief that there was a tradition of academic achievement at the high school. This belief was echoed by the vice principal and the principal. Each spoke of a “tradition of excellence” at the school.

Further discussion on the subject of student voice led to the revelation that the principal spends a significant portion of his day visible throughout the school and can often be found sitting on a bench in the main hallway. He stated that he solved many problems through visibility and students and teachers often came to him while he was at the bench. He stated that he spends as few minutes as possible in his formal office preferring to be found in the halls or the main hallway.

The school district conducts a satisfaction survey each year. Results are compiled from the surveys returned by staff, students and parents. A report of the survey findings is shared at the administrative retreat that takes place prior to the new school year. The administrative retreat was also the point at which all building administrators shared their achievement data for the previous year and set goals for the coming school year.

The researcher then addressed the structures that allow for positive personal relationships between students and teachers as well as those that lead towards student success. The principal

noted two distinct factors that contributed to student success through positive relationships with adults. The principal spoke specifically about the teamed approach of the **Preparatory Academy** found in the grade nine and ten and the fact that there are small class sizes in mathematics and English. He stated that ninth grade is a critical year and that they place a great deal of emphasis on the successful transition of students from middle school to high school. Finally, he stated that success is celebrated in the building through grade level and academy grouping “Celebrations of Learning”. The researcher noted the presence of student projects on presentation boards in the hallways in preparation for such a celebration. The researcher also drove by the school in the evening and noted a full parking lot on the evening of a celebration.

The principal addressed the issues of trust, responsibility and climate of the school by stating that the students “for the most part, feel safe.” He stated the importance to parents about safety and that he sees student safety as a first priority especially after the Columbine shootings. The principal re-emphasized his belief that administrators and teachers must “get involved in kid’s lives and care about them.” He stated that he believed that his students “want to get a good education” and that the faculty gives the students the opportunity to succeed. In a more formal sense, the students are asked to complete a satisfaction survey at the end of each school year. This instrument not only provided for student voice, but also provided the school with a source of data through which student perceptions are gauged.

The principal concluded the interview with his description of a successful student. His description was of a student who has met or accomplished what he/she believes to be the best that they can do. “A student who can walk out of these doors, survive and accomplish in life.”

He stated that it is not a matter of answering A or B on a test, but rather truly doing the best he/she could and being ready to do something to take care of themselves. We should “mold a kid to meet the world” (Principal, School #1, personal communication, June 2, 2004).

The Vice- Principal

My initial contact the high school was through the vice-principal. Her willingness to permit me to visit the school as a preliminary step for selection and her advocacy of my cause in the second phase of my case study allowed me to more fully grasp the complexity and uniqueness of their approach to secondary education. My initial interview and visitation to the high school provided me with the documentation that I could study previous to my arrival for the second extended visit of three days.

Structural Components that Impact Student Achievement

The vice-principal set aside a two hour block of time for the initial interview. She provided the researcher with insight in to the development of the high school program. The concept was developed from four main concepts:

1. Differentiation of instruction to match or address different learning styles
2. Use of multiple forms of assessment
3. The integration of state standards into every lesson
4. Use time as a variable

These concepts are integral to the program at the high school. The vice-principal consistently referred to the works of Douglas Reeves an author about standards based education and to the value-added related work of Joel Giffin of Maryville Junior high school in Maryville, Tennessee.

Differentiation of instruction was a focus of the vice-principal. The high school staff did not conduct any formal evaluation of learning styles and had no plans to do so in the near future, but did rely upon differentiation of instruction within the classroom to accommodate the differing learning styles.

The Vice-Principal performed “walk throughs” during the school day to note the instructional style that is apparent in the classroom. She provided the teacher with a short form that delineated what was observed during the brief “walk through” in terms of preparation, instruction and classroom management. The vice-principal employed the results of the “walk throughs” as a component of the more formal evaluation that occurs during the school year.

The Vice-Principal provided the researcher with a copy of the master schedule. It is interesting to see how the master schedule integrated block scheduling concepts with the traditional eight period day. Students can choose from four different classroom “delivery styles”. These are:

1. Traditional – Traditional single period class for a year or semester
2. Double-block – two single periods back to back to form a block. One semester in length.
3. Double –Block Every Other Day – 90 minute class meets every other day for entire year.

4. Integrated Dyad – Course meets for two periods for entire year. Students can earn up to two credits for the course.

Teachers and students alike may have a combination of classes on their schedule. Students who choose a block scheduled class are strongly encouraged to schedule all classes in the block or dyad format. In addition to personal planning, teachers may be assigned to hall duty, front lobby visitor check-in, “tardy table” duty or study halls. Only two teachers appeared on the duty sheet for cafeteria duty. The main duty person for the cafeteria was one of the building vice-principals.

Assessment of Student Achievement

The vice-principal did describe in detail the development of common assessments as a priority for the high school. These common assessments are aligned to the state standards in the core subjects. Previous to the 2004-2005 school year, Ohio students were required to demonstrate proficiency on state authored tests in the core subject areas of math, science, citizenship, reading and writing. This test has been replaced by the Ohio Graduation Test (OGT) that a student is required to pass previous to receiving a diploma from the state of Ohio. Students will take the test in grade 10 and will be allowed to re-take the test if they fail to demonstrate proficiency through the spring of their senior year.

High Stakes Graduation Test – The Ohio Graduation Test (OGT)

The OGT replaced the ninth grade proficiency tests with measures of achievement in math, science, social studies, writing and reading. The test (OGT) will be administered in the spring of the 10th grade. All students in Ohio, nonpublic included, must pass the OGT in order to receive a high school diploma or students must satisfy the alternate requirements for receiving a high school diploma. These are:

1. Pass four of the five tests and missed having passed the fifth test by no more than ten points.
2. Have a 97% attendance rate through all four years of high school and not have had an expulsion in high school
3. Have a grade point average of 2.5 out of 4.0 in the subject area missed and have completed the curriculum requirement in the subject area missed;
4. Have participated in any intervention program offered by the school and must have a 97% attendance rate in any program offered outside the normal school day;
5. Obtain letters of recommendation from each teacher in the subject area not yet passed, as well as the principal.

The OGT seemed to be new ground for the administration and teachers of the high school. Several of the staff members that I spoke to informally in the teachers' lounge mentioned that they believed that the OGT was a much more limited test than the previous text of proficiency.

They expressed concern about the results of the tests and the impact of the test on their students. Teachers expressed the viewpoint that the previously administered 9th grade proficiency test was a better test of learning than the Ohio Graduation Test.

Common Assessments across the core curriculum

The high school staff has worked hard to develop a series of common assessments across the core curriculum. Common assessments become the method of assessing student achievement in a fair manner. These common assessments allow each student to be judged according to a common standard rather than according to the styles and assessments developed by individual teacher. Common assessments also provided a method of practicing the “look and feel” of the OGT. Common assessments are given at the semester and at the end of the year. The emphasis on common assessments has led to the development of a “test bank” of questions that can be employed in the development of the tests.

The vice-principal noted that this initiative requires common planning time. Time for common planning is found during “period nine”, the time between the 2:16 PM student dismissal and the 3:00 PM end of the faculty day. The researcher asked how the administration accommodated for coaches and the vice-principal noted that only head coaches of an in-season sport may leave during that time and that this planning time was scheduled only for Tuesday, Wednesday and Thursday of the week. She noted that the administration published a monthly calendar of department meetings and that teachers conducted office hours for student tutorials on days without a scheduled department meeting. The Vice-Principal elaborated on the concept of

“instructional leader” rather than “department head” whose role is to meet with the “Standards Coordinator” to work on matching instructional strategies and student assessment to the Ohio standards. This leader is either a volunteer or an appointee and does not operate as a traditional department head. This may be because of the rather unique “horizontal” structure of the high school with its teaming components for the majority of students in grades 9 and 10 and the four part “Graduation Academy” for grades 11 and 12. Departmental structures may not be as appropriate in this setting in contrast to more traditionally structured high schools.

The Standards Coordinator

Unique to the school system is the concept of a “Standards Coordinator”. Standards Coordinators are appointed for each level of the district and work closely with teachers as mentor, guide and coach to oversee the integration of standards into the curriculum. The coordinator at the high school was a former teacher who worked with the teachers rather than act in a supervisory manner. She stated that her position was rather unique among school districts and that she had received many inquiries about her position and job function. The researcher noted that her position seemed similar to that of the “Technology Coordinator” that developed in the late 1980’s. Perhaps the role of “Standards Coordinator” will become as common as the role of technology coordinator in school districts. This is yet to be realized, but such a position may demonstrate a district’s commitment to differentiated instruction, common assessments and the integration of instructional standards into the curriculum.

Another unique component of assessment was the administration of a reading skills test to all students. The purpose of this assessment is the verification of improved reading skills for **ALL** students, not simply those who demonstrate difficulty with the skill. The district plans to administer the Nelson-Denny test of reading skills to all students K-11. This reading assessment is believed to yield the proper data and to be of sufficient challenge to gauge the reading skills of all students on the intellectual scale. The Vice-Principal stated that it is possible for students to “test out” of reading support classes and the emphasis is meant to support reading in all classes.

Alternative Education Program: The Trailblazer Program

The alternative school operates on a similar schedule so as to accommodate those students who rotate between the alternative center (Trailblazer Program) and the general high school. There is no homeroom period previous to the start of the day. Period three is extended in length serves as a homeroom for attendance, announcements and office visits.

As a component of the interviews conducted for the case study, the researcher was provided the opportunity to speak with the coordinator of the alternative setting, the Trailblazer Program. The coordinator was a former member of the U.S. military and stated that he originally believed that education would be the last place in his career choices. This proved not to be true and he believed that education was now his true calling.

He stated that students from grades nine through twelve who apply to the program do so because of a combination age and repetition of grade levels. Previous to admission, “Intervention Assistance Teams” discuss each applicant to define the “fit” between the

Trailblazer program and student needs. The program is meant to address the needs of “at-risk” students at high school #1. In fact, interviews conducted with Trailblazer students conducted as part of this study indicated that students identified themselves as “at-risk” and saw the program as their “last chance” to obtain a diploma from high school #1.

Potential candidates are interviewed and candidates are asked to reflect on how they got to this point in their educational lives. The various aspects of the program are explained to the students and a schedule is developed that fit’s a students particular family and life situation. Students may split their time between the general high school and the alternative setting or may attend a morning or an afternoon session. Students enrolled in the Trailblazer program may work if they attend a morning or afternoon session. There is the possibility of an independent study option during which students receive learning packets and return to the Trailblazer building for testing, remediation or further academic work. Instructional technology plays a role in the school with the use of the PLATO learning system.

The coordinator stated that it is their philosophy that, “We don’t fail kids”. We provide the students with a degree of autonomy to either receive their diploma or to blend the traditional with the alternative approach or to return to the high school. Specifically, the stated philosophy of the

program is, “when provided a learning environment that is relevant, stimulating, challenging, and responsive to the needs of students, all students can and will learn”.

Junior and senior students have the option to choose the Students-At-Work (S.A.W.) program. This option is “to provide junior and senior students with a non-traditional approach into the world of work by training students in manual and technical knowledge”. Students receive four hours of daily instruction during this time students develop an academic portfolio and receive three hours of instruction of hands-on applications in the building trades.

The program coordinator pointed to several published indicators of the success of the program. Attendance rates have improved from 20% in school year 1998/99 to 87% in the 2002/03 school year. Enrollment has grown from 15 to 140 students in the 2002/2003 school year. The number of at-risk students graduating from the high school has grown from a paltry total of one in 1998/1999 to 52 in 2002/2003. It must be noted that Trailblazer students are held to the same state standards as are all Ohio students and that Trailblazer students must take and pass the common assessments developed for all core subjects.

State proficiency test results are mixed with a significant increase noted in school year 2001/2002. Test scores decreased in 2002/2003 and teachers expressed a concern over the newly created and soon to be administered Ohio Graduation Test. Finally, The number of students progressing to the next grade level increased from 57% of total enrolled students in 1998/99 to 92% of total enrollment in 2002/2003 .

The Trailblazer program is seen as a great success by the staff and administrators of both the program and the school district. This is a viewpoint also shared by the Trailblazer students who were interviewed for this study. Stereotypically, the students and staff members noted that traditional high school students often refer to the students at Trailblazer as “stupid” and they believe that some students of the high school see them as lesser students in terms of program demands and personal capabilities. In many ways, the researcher found the Trailblazer students to be more open, honest and goal directed than their more traditional counterparts. This is, of course, just an impression or a reflection of personal bias, but must be stated as an impression of the Trailblazer students.

The Trailblazer program received support from the district and the local business community. The increased numbers of students who have chosen to enroll in the program attests not only to its success, but its sense of “match” with the lifestyles and life attainment goals of its students. The future of the traditional high school as an effective learning organization has been questioned during the research phase of this case study and the researcher has noted the popularity of the alternative program. The researcher believes that this lends additional credence to the impression that the traditional high school must adapt to meet the changing needs of today’s students or will become increasingly irrelevant to students and therefore increasingly difficult to manage. A question for further study could be the relevancy of the traditional high school program and whether or not alternative programs such as the Trailblazer program should become a vital component of an ever-evolving high school program. Perhaps, the traditional high school setting could

become an environment for a minority of students while the majority may pursue their education through alternative programs.

Student Interviews

The researcher chose to interview low achieving students at each of the three school sites. The question that was being investigated by the researcher was to discover the degree to which the program found in the three high achieving high schools had impacted the least achieving students. The researcher decided to interview low achieving students to gauge their thoughts about the impact of the high school program on their lives as students. The questions used in the interview are found in Appendix A of this document. The questions are a mix of student centered inquiries and questions focused on the high school program itself.

The researcher requested that each of the three high school sites identify 15 low achieving senior students as voluntary participants in a student interview phase of the research. Each school site identified the fifteen students and allowed the researcher access to the students for interview purposes after complying with school district confidentiality and interview protocols. In addition, students were advised of their rights concerning the Institutional Review Board clearances as required for research on human subjects. Students signed the Institutional Review Board releases and parents were advised of the activity. Participation was completely voluntary and students' identities are not identifiable in any way. No attempt was made to identify students by name. Students were identified by number assigned at the interview. The numbers cannot be matched with any characteristics that might allow for identification of the student by name.

Six students agreed to participate in the interview at this Case Study School #1. Senior students were not required to be present at school on the day of the interview and the students that did participate made a special effort to attend the interview. The Vice-Principal had identified the fifteen students and the interviewer believed that ten of the fifteen identified low achieving students would participate in the interview. A total of six students actually participated in the interview process. The group of fifteen low achieving students was selected by Grade Point Average (GPA) that typically comprises the class ranking. Coincidentally, all of the fifteen students identified were participants in the Trailblazer program.

The students were initially questioned about “student voice” and how their opinions were being heard at the high school. Student responses to this question also answered questions two, three and four of the interview.

All the interviewees agreed that students could easily go to their teachers and their coordinator for advice and to express an opinion. Students agreed that the small class size (15 or less) that they experienced naturally allowed for a more open discussion of issues. They believed that there was a level of trust between the students and staff and that the staff members of the program “know us, trust us and respect us” (Anonymous Student, School #1, personal communication, June 2, 2004). They stated that this trust was earned over their time in the program and that they valued this relationship with the staff. They all agreed that their teachers worked to develop a positive relationship with them as persons. They all stated that this applied to “every class and every teacher”. In fact, the students unanimously agreed that the selection of

the “right teachers” was the crucial element in the program and that the Trailblazer program had selected the “right teachers” for the students.

Trailblazer (low achieving) students did feel as if they are part of the total school community with some reservations. Trailblazer students participated in high school activities and the fact that the Trailblazer program was scheduled to coincide with the high school class schedule enabled students to enroll in both Trailblazer and regular high school programs. The high school building is about 50 feet from the side entrance of the high school and the distance is easily traversed.

Three of the six interviewees noted that some high school students “see them as slackers”. Other interviewees noted that, “they don’t know” and that the student body tends to “stereotype it” (the Trailblazer program). Each student agreed that the program had allowed them to stay in school and that they knew that this was their last chance.

The interviewees stated that the program provided them with many opportunities to challenge their ability to solve problems. They noted the S.A.W. program and how the students in that program worked with the staff and local tradesmen to remodel the two ranch style former homes to become classroom spaces. Students related how the classes allowed for more discussion of subject topics and that students felt and were more involved in this setting than was normal in the traditional setting.

The students were quite expressive when asked about the level of personal choice provided to them in the Trailblazer program. One female student mentioned that they were provided many choices about how they might gain knowledge. She specifically noted the use of laptops computers and how they were able to use the software (PLATO) and the internet connection to choose their own source of information and instruction.

A second male student mentioned that Trailblazer provided the student with choices that applied to what “can be done for you”. Another student mentioned the choice of the independent study program and the use of learning packets to complete school work. Finally, another male student mentioned that fact that students can work for half a day and receive credit for their work.

The interviewer moved beyond the pre-designed questions and asked the students what advice they could provide a school principal about the development of a similar program in another high school. A female student noted that the most important component was the hiring of the “good teacher”. She went on to describe the “good teacher” as one who has patience, showed no favoritism, jokes around and “says stuff” that both the teacher and student recognized as “just joking and not disrespectful of the student”.

A second student stated that his advice would be to “figure out the students. To find out what type of students are enrolled in the school and to have a ‘different agenda’ than the regular school” student (School #1, personal communication, June 2, 2004).

All advised that schools should “try it” meaning a program like Trailblazer and see if their is good attendance. They stated that if the program is good then the “word will get out” and attendance in the program would be good.

The researcher was impressed by the level of introspection shown by the low achieving students interviewed at this high school site. Student characterized themselves as “at-risk” and stated that they knew that this program was a “last chance”. They also were well spoken and quite capable of participating in a coherent discussion about themselves and their school. The researcher noted no dissatisfaction with the program or the school district in general and did not note any displays of anger or disrespect for the school, their teachers or towards the researcher.

Finally, four of the six students interviewed planned to attend college. One female student was scheduled to attend a two year community college with the hopes of transferring to a four year college or university. The remaining three students were enrolled in a local state operated four year college. One student wished to enlist in the armed services. Another male student stated that he was going to return to his place of birth (New York City) and “start over”. They all stated that this program was the reason for their future goals and that they believed that they would have not graduated without the program.

The students interviewed confirmed the effectiveness and personal positive impact of the Trailblazer program on the students. The Trailblazer program provided for many of the characteristics of student centeredness and was certainly one method of positively impacting low

achieving students. The program was not seen as separate from the philosophy or programs of the high school, but rather was one integral component of the high school program at this site.

Teacher Interviews and Observations of Teacher Practice

The researcher interviewed eight members of the mathematics department as a component of his research. The researcher chose the mathematics department because the literature search focused on achievement in mathematics as well as on Learner-Centered Practices. The researcher believed that the research indicated that the instructional practices in mathematics may not be in line with learner-centered practices. The researcher proposed that high achieving urban fringe high schools may actually employ learner-centered practices as a component of effective instructional practices. If this supposition is found in practice, then the researcher believed that the learner-centered related practices proposed by T. A Romberg are a major factor in the fostering and maintenance of high student achievement. The researcher quest was to discover the level of learner centered practice by focusing on mathematics classroom practice.

The researcher was able to observe the classroom practices of three of the eight classroom teachers who agreed to the interview. The purpose of the observation at this school was to place a “name with a face” and to actually observe teacher practice. The researcher believed that the number and quality of observations conducted at school one did not provide him with sufficient time and data to reach conclusions about the level of identifiable learner centered practices. Observations were conducted towards the end of the school year and the focus was on the final summative assessments.

The interviews followed the same format as the student interviews. The questions used for the interview are found in Appendix C. Interviews were conducted either individually or in a small group of four to accommodate teacher schedules. Teachers seemed quite willing to participate and assist the researcher in his quest for knowledge about the high school.

The first teacher question concerned “student voice”. Romberg spoke about “mathematizing”, that is speaking in a conversational manner about mathematics and problem solving and the principles of learner-centered practice refer to the necessity of providing for “student voice” in the daily operation of the school. Teachers also referred to “student voice” as an important component of their practice. A teacher who was referred by the vice-principal as being a “really excellent teacher” and one who enabled her students to succeed in class and on the state tests made a strong point when she stated that it was important to, “make it as open as possible. To encourage them to ask questions. The students work in group stations. Students write down how you might solve a problem”.

A second teacher referred to “introducing students (to mathematics) as similar to a foreign language. Students must speak the language. Teachers must model with statements like ‘look at that coefficient’. I hope to awake interest in one of the students by having conversations about mathematics” (Teacher, School #1, personal communication, June 1, 2004).

A third teacher who worked as a member of the “Community College Program” team referred to “student voice” as a part of the process of “forcing them to think through results-to make them

walk through the process”. She noted that her classroom problems were modeled after the Ohio Graduation Test and that it was important to have that focus. Finally, she stated that she had been teaching for only one two years and that her style in the classroom was becoming “less formal” and more conversational in nature.

The researcher did have the opportunity to observe this particular teacher’s classes and the researcher did note the high level of math related conversation occurring in the classroom and the fact that little of the conversation seemed contrived and forced. Students were on task and engaged, yet the atmosphere was indeed informal. This occurred despite the fact that the year was rapidly closing. Student engagement could have been impacted by the fact that students were in final preparation for the common exam that was given to all mathematics students in that program at the end of the year.

Another teacher stated that “The first thing has to do with rapport. I don’t mind taking five minutes in each class and listen to them. They (the students) respond academically. It is key to see that (the connection between listening, rapport and academic response). Students are more comfortable when on a personal level” (Teacher, School #1, personal communication, June 1, 2004).

Four of the eight teachers interviewed spoke about the necessity of “mathematizing”. The teachers each spoke of the necessity of stressing the vocabulary of mathematics and “always talking with (math) words in conversations”. These teachers stated that “vocabulary is the key.

We use the (math) terms and expect the students to use the terms. We look for variety in wording. We always talk with the words and use the words in conversations in the class”.

The issue of caring for the students as individuals was also a very important aspect of the practice of the teachers interviewed at school #1. Teachers noted that demonstration of caring was “the most important part of the job. That students learn that you (the teacher) care”. A second teacher noted that “the class is built around success for students. That students can enjoy mathematics and that they are capable of doing it”. A third teacher stated that it is important to “let Rachael be Rachael”. This comment was a reference to a student who had requested that she be able to place a rocking chair in the classroom for an early morning class. The teacher permitted this request and the student did extremely well and seldom was absent for the class.

Two teachers approached the personalization of the class in a more formal manner. One teacher administered a general survey of student interest and “fears”. This approach allowed the teachers to connect “names to faces” and “made a point of getting to know them”. The second instructor mentioned the importance of “talking to the students and trying deliberately to focus on the quiet kids” in addition to the use of the survey that allowed students “to tell me about yourselves”.

A teacher stated that students positively respond to “a huge amount of humor and sarcasm”. One teacher noted that she had “nothing formal planned” and then said that the classroom was filled with pictures of students. The researcher visited the room and found that indeed the room contained a large bulletin board on which was posted prom pictures, senior pictures and other

types of pictures of students. The teachers goal was to “pull it out of students” through the personalization of the classroom setting.

Finally, one teacher spoke about the positive impact of the networked computer system and the software used to conduct instruction. The software allowed students to receive personalized lessons at the individual computer and allowed the teacher to provide personalized and private feedback to the students. The teacher noted that the system was “great” and that it allowed each student to work at their own pace and to work in private without the personal embarrassment of admitting to ones’ peers that “they did not know”. The teacher was able to conduct private electronic instructional sessions and feedback to the students on an individual basis. The teacher noted that this was of great assistance in the accomplishment of the state proficiency exams.

The teacher interview then shifted gears to the actions that teachers deliberately perform in order to provide for student success. The responses to this question also touched upon the next question in the interview that centered on the development of student trust and responsibility. The responses to question three (how you design success into your activities?) and question four concerning deliberate actions that allow for the development of student trust and responsibility tended to fold together. Teachers stated that the personalization approach was one strategy that developed the atmosphere for success and when questioned, teachers did elaborate further on specific classroom practices.

One teacher employed a “huge calendar for each grading period”. This allowed each student to know exactly what activities and objectives were being stressed and provided for those

students who were absent without taking away from class time. This teacher stressed the importance of “routine”. The routine was ‘lesson-problems-homework-homework quiz’.

A second teacher stated that the approach “varies for different type of class”. The teacher stated that the level of motivation was different for each group. The teacher noted that the geometry students were more self-sufficient and motivated “than the integrated math and mathlab kids”. The teacher stated the need for different approaches to different groups. The teacher emphasized the need for support structures and that “I don’t leave it up to the homework. There are different ways of learning from hands-on, to talking about it, to doing it physically first”. This teacher made certain that parents were contacted as soon as a problem arose and that “checking with guidance and the use of the Intervention Assistance Team were successful methods. This instructor noted that the school itself had a “very positive atmosphere. Parents and students have a lot to say”. Finally, the teacher stated that the 9-10 and 11-12 academy approach was a positive influence as well as the teams of professionals that worked to provide for student success.

Two teachers spoke of the use of “self-tracking sheets” for students so that they might know the extent of their progress. Student data was “transparent” and students would “see success” when it occurred. Students in several classes employed portfolios to track their work, their assignments and their progress. Three teachers provided “guided notes for students”. The teacher also allowed for retakes of all assessments and retaught lessons when the assessment for that unit indicated a poor students understanding of the subject matter. A teacher noted that the classroom was like a “one room schoolhouse”. Students were provided with guided notes and were divided

into groups by ability levels. The groups allowed the teacher to differentiate instruction and to provide for success through lessons designed to meet the needs of the groups that formed in the classroom.

Teachers universally spoke about the difficulty of the assignment of homework. They spoke of the fact that homework reflected the collaborative effort of many students and the fact that e-mail and electronic messaging as well as cell phones allowed students to work collaboratively on what was intended to be individual, independent practice in problem solving. One teacher now no longer collects homework and conducts an authentic assessment of student learning in a conference format with students. Another teacher attempted to “correlate math to everyday life” in the outside assignments. Yet another teacher has discontinued the concept of homework expressing a preference for individual student accountability through portfolios. The teacher stated that accountability “is a problem”. Student accountability and responsibility was noted as a problem by a group of four teachers that were interviewed simultaneously.

Questions five and six were combined due to similar responses to both questions. Question five centered on creative problem solving and interesting assignments while Question Six spoke to independent work and the solution to interesting problems. This question elicited the most “traditional responses” in terms of teacher beliefs. Most interviewees stated that they stress many solutions to the same problem. Teachers admitted that it was very difficult to be creative and to develop challenging and interesting problem to solve. One teacher stated that it was easier to be creative in the remedial “proficiency class” because students could work on solution to real world problems such as loans, taxes and other life skill applications. Four teachers admitted to

the difficulty of creative problem solving and expressed a group belief that despite the fact that there might be different ways to solve problems, students are sometimes not capable of understanding a variety of approaches and need a singular approach. In contrast, a teacher of an advanced math class stated that the use of “lots of creative methods, drove them (the students) crazy”, but that the students were capable of handling the variety of problem solving approaches.

The researcher then moved towards the teachers’ impressions about the climate and atmosphere of the school. The researcher attempted to gauge the teachers’ perceptions of the mix of an orderly climate, the reasonable application of student rules and student achievement. Seven of eight of the interviewees responded in general that the climate of the school did have a positive impact on student achievement. Teachers mentioned the diversity of programming as having a positive impact. The programming provided “something for everybody”. Teacher mentioned that “We try everything for everybody”. Teachers noted that “everyone has high expectations for everybody. We (the teachers) pass this on to the students. When we had new teacher orientation, high expectations were pounded into us. It is the expectation that one year of growth should take place each year in math and reading” (Teacher, School #1, personal communication, June 2, 2004).

Teachers noted that “We are responsible to take the students as far as we can. The atmosphere for teachers is positive, upbeat and the majority of the teachers are on board. The phrase, “Failure is not an option” is on all memos”. The teachers generally agreed that the diversity of the student body was a “big part of the school climate. That is (diversity) impacts the school climate in a positive way”.

Teachers and administrators alike noted that the school climate improved in this last year. They attributed this to a more visible administration, positive setting of boundaries for students and the development of creative behavioral plans that are developed cooperatively with members of the Intervention Team. The teachers and the vice-principal saw the introduction of the “Tardy Table” as a practical and effective step. The “Tardy Table” is set up in the main hallway and serves as the central point for making certain that students are in class and not in the hallway. The table is run by teachers and tardy students are brought to the table by teachers assigned to hall duty. Students are given warnings for initial violations and then receive detentions as a further set of consequences.

Every staff member interviewed did not share the opinion that expectations for students or student discipline was positive. A teacher noted stated “the climate is not strict enough. There are discipline problems”. A second teacher said, “The expectations are too low. Socially and behaviorally. The dress code is too lax. These low expectations are beginning to have a negative impact on school climate” (Teacher, School #1, Personal Communication, June 1 2004).

The question concerning most effective strategies employed in the classroom gained little new insight. This may have been due to the fact that it was late in a long interview process or that many of the ideas had already been expressed as an answer to previous questions, especially the question concerning structuring the classroom for student success. A teacher mentioned that teacher attitude was important. Teachers should emphasize that “students do it for themselves. Teachers should “try to make the students responsible for their performance and to have pride”.

Another made the point that mistakes should be dealt with calmly. When a common mistake is noted the teacher would take the time to state, “don’t let it happen to you” and then explain in detail the mistake being made by a number of students. Many stated that they have ‘no one strategy” or said that they had answered the question previously.

Finally, teachers were asked to describe the characteristics of a successful student in their school. Six of the eight teachers made statements concerning self-sufficiency. Students should be able to, “achieve what they want to achieve. To accomplish their goals. To think for themselves and to understand the implications of their actions”. The researcher felt that the teachers did not believe that success was necessarily the acquisition of specific amounts of information, but rather the acquisition of , the basic skills needed to graduate and that students each had different levels of success”.

Data Analysis

The researcher employed an instrument measuring Learner Centered Practices as defined by the American Psychological Association (APA, 1997). The researcher received permission from Professor Barbara McCombs to use the Assessment of Learner Centered Practices (ALCP) for the study. The survey has been given to over 2000 practicing teachers and 35,000 students (McCombs & Quait, 2002). It is used as a tool for professional reflection by teachers as they investigated their individual instructional practices and related their practices to indicators of high student achievement and motivation. The survey also provided teachers with a “feedback loop” for their students. Student survey results have been shared with individual teachers as a means of communication between learners and teachers.

McCombs stated that the instrument was intended to provide teachers with a means of reflection for personal practice and that the results of the survey indicated that “learner-centeredness’ is a complex interaction of teacher qualities and practices, we have learned that it truly is ‘in the eye of the beholder’. It (Learner-Centeredness) is a meta phenomena that we don’t believe can be reduced to single principles as all 14 principles have to be considered”(B.L. McCombs, personal communication, July, 2004). The relationship between teachers and their students is a complex one. The ALCP survey is intended to provide practitioners with a means to reflect upon their practice and to open lines of communication between learner and instructor. However, McCombs did discover a strong

relationship between five learner-centered principles as measured by the ALCP and student achievement. The researcher will focus on those five variables as part of his analysis of student and teacher responses to the ALCP survey.

The survey consisted of two components. The first component was a student survey comprised of 72 questions querying student opinion concerning the level of student centeredness in the school. In addition, the survey contained three ethnographic questions related to grade level, ethnicity and Gender. The researcher divided his analysis into three sections. The first analysis was performed on the response patterns of all students surveyed. The second analysis was performed on the responses of low achieving students as identified by the case study school. These students were listed as being in the lowest 10% of the class ranking, as computed by Quality Point Average (QPA). The third group of respondents was those of high achieving students. The high achieving students surveyed were chosen from the highest level mathematics class offered at the case.

Students responded to the survey questions with the following options:

A = Almost Never

B = Sometimes

C = Often

D = Almost Always

The researcher also administered the Assessment of Learner-Centered Practices (ALCP): Secondary Level Teacher Survey to the instructional staff of high school #1. This assessment contained 91 questions that required a response choice of:

A = Strongly Disagree

B = Somewhat Disagree

C = Somewhat Agree

D = Strongly Agree

The researcher reported that faculty members from this group indicated that they found the range of responses to be confusing. They stated that they believed that the response choices should have been reversed indicating that the “A” responses should have been labeled as “Strongly Agree” and so forth.

The instrument also contained a section comprised of five vignettes that required four responses to each vignette. A final section of 15 questions provided ethnographic and demographic descriptive information about years of service, gender etc.

Mean scores on both surveys were computed by translating the “A through D” responses found on the form to a “1 through 4” numerical interpretation. Standards deviation was computed and Crombach’s Alpha Test of Reliability was determined for each set of variables. The results of these calculations were then compared to the results of the national student and teacher surveys conducted by Professor McCombs and her associates at Denver University.

The goal of the data collection and subsequent compilation was to compare the responses of the school (teachers and students) to the national data and to determine if similar relationships existed in the data when compared to the national survey results. Survey results were further refined through the identification of a set of five variables that McComb's believed strongly impact achievement and motivation to learn with students of high school age (McCombs, 2004).

The five focus variables were:

- 1) A positive personal relationship and classroom environment
- 2) Motivational support for students in the classroom
- 3) Facilitation of students' learning and thinking skills
- 4) Honoring of student voice
- 5) Provision for individual choice and challenge

Five similar variables were identified from the teacher ALCP survey and comparisons were made between the national data and the data gleaned from the student survey results.

The researcher described the students and faculty who volunteered to complete the survey. The profile developed for this report included only the descriptors of number of students or teachers surveyed, gender, ethnicity and number of years of experience in the case of teachers. All students surveyed for this report were in their senior year and were scheduled to graduate in June of 2004. The researcher was not granted permission by Professor McCombs to include a copy of the student or faculty survey in this document.

Table 1

Profile of students who participated in the ALCP survey at high school #1.

Total Number of student	N=25	Low Achieving = 6	High Achieving = 19
Grade Level	Grade = 12		
Gender	Female = 9	Low Achieving = 2	High Achieving = 6
	Male = 15	Low Achieving = 4	High Achieving = 11
	Unidentified	Low Achieving = 0	High Achieving = 1
Ethnicity	White = 17 Asian = 3	Black = 2 Unidentified = 2	Hispanic = 1

The researcher would have preferred a larger number of alternative students to have participated in the ALCP survey, but participation was totally voluntary. The small number of participants diminished the impact of the data gathered from the low achieving students. The preponderance of students who took the ALCP were white, but the group was of diverse ethnic backgrounds as was the general population of School #1. Students who did not wish to identify ethnic background or gender were included in the data. No attempt was made to coerce the information or to gather the data without the students' permission.

Table 2

Profile of teachers who participated in the ALCP survey at high school #1

Number of Teachers	N=99		
Gender	Male = 66	Female = 31	Unidentified = 2
Ethnicity	Black =6 Asian = 1	White = 81	Hispanic = 5
Years of Experience	1 to 2 = 7 11 or more= 47	3 to 5 = 17 Unidentified = 2	6 to 10 = 22

The faculty of School #1 was predominantly male, white and possessed over eleven years or more of actual teaching experience. An almost equal number of Black and Hispanic teachers was a striking feature of the demographic make-up of the faculty. The faculty is a mature group that has experienced the innovative program at School #1 for a significant number of years and therefore their viewpoints represent a long term opinion about the nature of the program.

The researcher developed tables that compared the mean responses of students and teachers to the components of Learner-Centered Practice. The tables also illustrated comparisons between the standard deviations calculated for each as well as a delineation of the results of Crombach's Alpha test of reliability. Tables were developed to reflect the responses of four groups:

- 1) All students surveyed
- 2) Low Achieving Students surveyed

- 3) High Achieving Students surveyed
- 4) All Teachers Surveyed

The intent was to compare the mean scores of all students with those of the differentiated groups, (High and Low Achieving), in order to develop a comparison with local and national means. The researcher expected that low achieving students would score their teachers low on learner-centered practices and that high achieving students would score their instructors high on learner centered practices. McCombs (2004) had already noted in her research that teachers tended to score themselves higher in learner-centered practices than those scores recorded by students. The researcher believed that a high score by both students and teacher is indicative of a highly motivating environment that resulted in high achievement.

The researcher developed a set of tables that illustrated the scores of all groups in all of the learner-centered domains and then developed a second set of tables that illustrated school scores by group in the areas of learner-centered practice that are believed to positively impact student achievement and motivation to learn.

Table 3 All Students, High School #1-ALCP Survey

N=25

Student Variable	Mean	SD	Alpha	Nat.Mean	Nat. SD	Nat.Alpha
Positive relationship	3.26	.88	.91	3.09	.70	.88
Student Voice	2.86	.98	.86	2.97	.61	.79
Higher Order Think	2.55	1.16	.94	2.90	.70	.84
Individual Differences	2.63	1.01	.75	2.50	.71	.73

Self-Efficacy	2.96	1.02	.69	3.05	.68	.81
Epistemic Curiosity	2.52	1.07	.52	2.75	.63	.75
Active Learning Strategies	2.79	1.42	.53	2.79	.61	.80
Effort Avoidance Strategies	2.36	1.01	.81	2.13	.62	.77
Task Mastery Goals	2.80	1.05	.90	2.86	.72	.84
Performance Oriented Goals	2.55	1.13	.62	2.37	.72	.76
Work Avoidance Goals	2.57	.99	.76	2.31	.68	.75

The researcher was interested to note that the results of the ALCP survey for all students at school #1 were not significantly above the national mean. The researcher expected that the students surveyed from school #1 would be significantly above the national mean. Such a score would indicate that Learner-Centered Practices have a significant impact on student achievement at high school #1. This is made more surprising because the vast majority of students surveyed were high achieving students.

The researcher believed that it was significant that the students surveyed scored higher than the national mean on the two areas of work avoidance and effort avoidance. Such a score may indicate that the students surveyed do try to avoid effort and work to a degree greater than those students surveyed nationally. Once again, the researcher noted that the majority of students surveyed in school #1 were high achieving students.

Table 4 Low Achieving Students, High School #1-ALCP Survey

N=6

Student Variable	Mean	SD	Alpha	Nat.Mean	Nat. SD	Nat.Alpha
Positive relationship	3.64	.58	.69	3.09	.70	.88
Student Voice	3.36	.78	.86	2.97	.61	.79
Higher Order Think	3.31	.75	.61	2.90	.70	.84
Individual Differences	3.27	.88	.62	2.50	.71	.73
Self-Efficacy	3.17	.85	.37	3.05	.68	.81
Epistemic Curiosity	2.31	.79	.51	2.75	.63	.75
Active Learning Strategies	2.98	1.07	.86	2.79	.61	.80
Effort Avoidance Strategies	1.73	.85	.37	2.13	.62	.77
Task Mastery Goals	3.36	.84	.94	2.86	.72	.84
Performance Oriented Goals	2.56	1.08	.55	2.37	.72	.76
Work Avoidance Goals	1.97	.81	.83	2.31	.68	.75

Low achieving students in school #1 scored higher than the national mean in 9 of the eleven variables. These students scored lower in the two areas of effort avoidance and work avoidance. These are actually positive scores that indicated stronger effort and less work avoidance in the approach of the low achieving students surveyed for this case study.

The researcher acknowledges the limited number of students surveyed, but also believes that the random self-selection of the participants may be contributing factor to the high scores.

Table 5 High Achieving Students, High School #1, ALCP Survey

N=19

Student Variable	Mean	SD	Alpha	Nat.Mean	Nat. SD	Nat.Alpha
Positive relationship	3.14	.92	.93	3.09	.70	.88
Student Voice	2.70	.98	.84	2.97	.61	.79
Higher Order Think	2.31	1.15	.96	2.90	.70	.84
Individual Differences	2.43	.95	.72	2.50	.71	.73
Self-Efficacy	2.89	1.04	.74	3.05	.68	.81
Epistemic Curiosity	2.59	1.11	.53	2.75	.63	.75
Active Learning Strategies	2.59	.98	.89	2.79	.61	.80
Effort Avoidance Strategies	2.56	1.00	.77	2.13	.62	.77
Task Mastery Goals	2.63	1.05	.88	2.86	.72	.84
Performance Oriented Goals	2.55	1.11	.80	2.37	.72	.76
Work Avoidance Goals	2.76	.97	.80	2.31	.68	.75

High achieving students in school #1 scored lower than the national mean on 7 of 9 variables. High achieving students scored higher than the national mean on two of the nine variables (positive relationships and performance oriented goals). Significantly, high achieving students scored higher on effort and work avoidance than the national mean. This indicated that the students surveyed may place greater emphasis on work and effort avoidance than their peers surveyed nationally. The researcher was struck by the fact that the mean scores for low achieving students were below the national mean in effort and work avoidance (1.73 vs. 2.13 on effort avoidance and 1.97 vs. 2.31) while the scores of high achieving students were significantly greater than those of the low achieving students. The scores of high achieving students were above the national norm on these two factors (2.56 vs. 2.13 and 2.76 vs. 2.31). The researcher

interprets the findings to mean that the high achieving students in this school are interested in high achievement without greater effort or work while the low achieving students value effort and work as a means to success. This phenomenon has also been noted by teachers of high achieving students employed at the researcher's home school. A teacher of a senior year high level Physics course recently related to the researcher that a very high performing student admitted to him that he had enrolled in the course to build his resume and college transcript and that his intent in the course was to receive a high grade with as little effort and work as possible.

Table 6 All Teachers, High School #1- ALCP Survey

N=99

Learner-Centered Beliefs	Mean	SD	Alpha	Nat.Mean	Nat. SD	Nat.Alpha
Positive relationship	3.10	.94	.68	3.02	.44	.85
Student Voice	3.41	.68	.70	3.20	.44	.76
Higher Order Think	3.32	.71	.70	3.08	.49	.76
Individual Differences	3.29	1.06	.27	2.92	.52	.68
Teacher Self-Efficacy	2.86	.75	.57	2.99	.50	.73
Non-LCP Beliefs @Learner	2.51	.92	.75	2.40	.50	.72
Non-LCP Beliefs@Teach	2.48	.91	.75	2.53	.43	.76
Can Influence Learning	3.20	.71	.20	3.75	.31	.46
Adolescence Diff. Stage	2.89	.82	.74	2.74	.41	.66
Reflective Self-Awareness	3.00	.86	.78	2.96	.48	.85
Moderately Controlling	2.77	.86	.50	2.93	.38	.40
Highly Controlling	3.17	.89	.43	3.07	.43	.47
Moderate Autonomy	2.67	1.55	.22	2.51	.46	.56
High Autonomy	2.76	.87	.54	2.85	.46	.51

As indicated by Professor McCombs teachers at school #1 scored themselves higher than the students who rated their teachers. A further comparison of teacher and student scores on four similar variables indicated that the results of this survey follow the national trend (See Table 7 and Table 10). Teachers scored themselves significantly higher on three of the four similar variables. Teachers of school #1 scored lower on “positive relationships” than the student data indicated (3.10 vs. 3.26). Scores on the three other similar variables indicated significantly lower scores on variables pertaining to student voice, the teaching of higher order thinking skills and attention to individual differences.

The researcher chose five variables from each set of student and teacher data. Those chosen variables related directly to the five areas of teacher practice and attitudes that corresponded to high student motivation and achievement. The research conducted by McCombs indicated that high school students respond positively in terms of achievement and motivation to five areas of classroom practice:

- 1) A positive personal relationship and classroom environment
- 2) Motivational support for students in the classroom
- 3) Facilitation of students’ learning and thinking skills
- 4) Honoring of student voice
- 5) Provision for individual choice and challenge (McCombs, 2004).

The researcher targeted these five areas in order to relate the data from the school to the results of the national survey. The researcher would then draw conclusions about the relationship between learner-centered practices and the high achievement realized in each school.

The researcher chose the variables that were closely related to classroom practices that allowed for a positive student response to learning. Tables were developed that allowed for the comparison of data collected from four groups:

- 1) All students
- 2) Low Achieving students
- 3) High Achieving students
- 4) All teachers

The results are presented in the following four tables

Table 7 - All Students – Achievement Related Variables, School #1

N = 25

Student Variable	Local Mean	National Mean
Positive Relationship	3.26	3.09
Student Voice	2.86	2.97
Individual Differences	2.63	2.50
Active Learning	2.79	2.79
Higher Order Thinking	2.55	2.90

Scores on three of the five variables did exceed the national mean when calculated through the scores of all students surveyed for this project. Students, in general, expressed the belief that their teachers developed positive relationships with their students, paid attention to individual differences and provided an active learning environment. Variables such as

providing for student voice and the development of higher order thinking skills were viewed as lesser characteristics of the teaching staff and school environment. The only variables that all students surveyed scored higher than the national mean were those of positive relationships (+.17) and attention to individual differences (+.13). Other variables scored equal to (active learning) or less than the national mean (higher order thinking skills and student voice).

Table 8 - Low Achieving Students – Achievement Related Variables, School #1

N=6

Student Variable	Local Mean	National Mean
Positive Relationship	3.64	3.09
Student Voice	3.36	2.97
Individual Differences	3.27	2.50
Active Learning	2.98	2.79
Higher Order Thinking	3.31	2.90

Low achieving students scored their teachers and instructional environment significantly higher than the national mean in the areas of positive relationships (+.53), attention to individual differences (+.77) and higher order thinking skills (+.41). The remaining two variables also were scored above the national mean. The researcher is led to believe that the high scores indicate that school #1 has positively influenced the low achieving alternative school students and that their academic achievement is at least partially explained by the student centered approach employed by school #1. This learner-centered approach entailed a vastly different program and learning environment than the environment experienced by the more traditional student. The environment

for the alternative school student combined academic rigor with a more personalized atmosphere that provided for individual differences, allowed for student voice and fostered the development of positive relationships with the teaching staff. Alternative school students when questioned about the most important factor that an educator should consider in the development of a similar program stated emphatically that the selection of the teaching staff was a top priority.

Table 9. High Achieving Students – Achievement Related Variables, School #1

N = 19

Student Variable	Local Mean	National Mean
Positive Relationship	3.14	3.09
Student Voice	2.70	2.97
Individual Differences	2.43	2.50
Active Learning	2.59	2.79
Higher Order Thinking	2.31	2.90

High achieving students ranked their teachers and instructional environment lower than the national mean in four of the five focus areas. This was exceptionally true in the focus area of “higher order thinking skills”. The scores indicated that with the exception of the variable focused on positive relationships all other variables were scored below the national mean. The researcher believed that these high achieving students are less influenced by the five learner-centered variables found in Table 7 than low achieving students. The researcher believed that other variables are at play that explains the high performance of these students. The high performing students were successful in the culture of

schooling and received positive reinforcement for their success from the school and the community. The researcher wished that he could have probed deeper into the motivational factors that resulted in high achievement for this select group of students, but such further research must be left for another effort.

Table 10. All Teachers – Comparative Achievement Related Variables, School #1

N = 99

Student Variable	Local Mean	National Mean
Positive Relationship	3.10	3.02
Student Voice	3.41	3.20
Individual Differences	3.29	2.92
Moderate Control	2.77	2.93
Higher Order Thinking	3.32	3.08

Teachers of school#1 ranked themselves higher than the national mean in four of the five focus areas. They ranked themselves lower than the national mean in the area of “**moderate classroom control**”. The positive differences were not as high as those differences found between the national means and student scores for low achieving students at school #1. This difference again emphasized the positive nature of the school as perceived by low achieving students. The scores of low achieving students were in contrast to the national data collected that indicated that teachers score themselves higher than students in general. This disparity underscores the positive impact of the alternative school program in existence in school #1. The lower score found in the variable, Moderate Control of Classroom, may indicate that a high level of teacher control of the

classroom was viewed positively by the teaching staff. It was noted by the researcher that the variable, High Control of the Classroom, was higher than the national mean (3.17 vs. 3.07) and scored much higher than the mean for Moderate Classroom Control (3.17 vs. 2.77).

Conclusions:

School one has been identified by the Ohio Department of Education as a high achieving urban fringe high school. Personal conversations with three professional colleagues indicated that this school has been a visitation site for fellow administrators who wished to improve their programs. My colleagues visited the school in the past ten years to investigate its unique programs and to duplicate those ideas in their home schools. As an aside, I find it fascinating that three of my professional colleagues have already visited the high school previously and also have found the programs instituted there worthy of emulation in their home schools. The researcher was unaware of their interest in high school #1 previous to a discussion that took place after the researcher visited all three schools.

School #1 was characterized by its unique structural innovations and the consistency of its statement of purpose. The principal stated that their goal was to find a program to fit the student, not to fit the student into the program. The academy structure that has evolved allowed for the personalization of the student's high school experience beginning with the transitional ninth grade year. Student self-efficacy was fostered through the choices made available in the tenth grade year based upon the student's personal post-secondary goals. The four part "Graduation Academy" provided students with different learning environments that were tailored to meet the

needs of the participants. One program format was not expected to serve all students and students and staff expressed satisfaction with the approach.

The data collected at the school site indicated that students enrolled in at least one of the four sections of the “Graduation Academy” responded very positively to the variables thought to be directly related to high achievement and motivation. The students enrolled in the Pathfinder component of the school not only rated their teachers and instructional environment highly, but also were successful students according to their local curriculum based upon the common assessments developed for the core subjects of mathematics, science, social studies and English and the Ohio Tests of Basic Skills. Each student interviewed expressed the desire to continue their education and had made plans to begin their college education at a local “open enrollment” institution.

The responses of the high achieving students at school #1 indicated that they did not rate their teachers or the instructional environment as highly as the students enrolled in the Pathfinder program. These students were enrolled in a more traditional high school setting than the other three components of the “graduation academy” and responded less positively to the variables found to influence achievement and motivation. It can be stated that these were very high achieving students in the school and that there possibly were other factors that provided the motivation for achievement. These exceptional students were well acculturated into the art of schooling and had developed the means to succeed. Success can be said to be its own reward for these students.

The researcher noted that it would have been instructive to administer the same student survey to students from each of the four components of the “graduation academy”. The disparity between the scores of the high achieving and low achieving students in this school setting may be indicative of the presence of a very effective program for low achieving students. This unique environment may be crucial to the success of these students. It might be said that each unique environment in the graduation academy provides the proper setting for academic success and motivation. Such a specialized setting may not be necessary for academic success for high achieving students.

Teacher responses were generally much higher than the high achieving student responses and lower than the response patterns of low achieving students. This pattern of higher responses was found to exist in the nationwide surveys conducted with teachers. Teachers mean scores were actually lower than the mean scores given teachers by the low achieving students in three of the five crucial areas impacting achievement and motivation. Two variables were scored lower (Accommodation to individual differences and the presence of higher order thinking skills) but the differences were .01 and .02 of a point. Teachers scored themselves lower than the national mean in the crucial area of moderate classroom control. The researcher noted that strong classroom control is seen as a positive characteristic of the teaching profession and that moderation in this area is not seen as a positive even though a moderate level of control may result in higher student achievement and motivation.

The researcher has continued to question his employment of the ALCP in light of Professor McCombs admonition that learner centered practices must be considered as a combination of

many factors. The reflective nature of the instrument for practicing teachers was characterized as a primary goal of the ALCP and the researcher believes that much work can still be completed on the impact of reflection on instructional practices. The researcher will leave such an inquiry for a future endeavor.

The clear message apparent to the researcher was that the school maintained a “tradition of excellence” while adapting and adjusting its program to meet the needs of its varied student body. There was a consistency of purpose and a consistency of leadership. Innovation, adaptation and positive approaches to student learning were visible and apparent. Failure of students and of the program itself was not an option. This theme was heard often and was a palpable portion of the school climate and operation.

School one is a school and a school district with a consistent philosophy and a well researched, implemented and effective set of programs that have been proven to meet the needs of a varied student population.

Chapter IV

Case Study Two- A Small City Urban Fringe High School

The Supporting Community

The community that supports the second high school in the study is located in Southwestern Pennsylvania. The district provides educational services for students from urban and suburban settings. The urban area is a “small city” of 4.2 square miles with an estimated population of 15,617. The suburban area encompassed 47.8 square miles and has a estimated population exceeding 7000 persons.

Housing values vary according to location. The average house in the urban area has a Year 2000 value of \$83,500 while a house in the suburban area is appraised at a much higher value. The demographic profiles of the two areas indicate that the population:

Urban	Suburban
92.7 % White	97.8% White
3.9% Black	1.21% Black
0.04% Mixed Race	1.1% Mixed Race
1.1% Hispanic	0.16% Hispanic

The median income of the urban area in the year 2000 was \$30, 324. The median income of the residents of the suburban area was \$34, 467 in the Year 2000. 29.2% of the urban population

holds a bachelor's degree with 10.4% of the population holding professional or graduate degrees. 13% of the suburban population holds a bachelor's degree with 4.8% attaining a graduate or professional degree status. The unemployment rate for the urban area is 6.7%. The divorce rate is 11.7%. The suburban area is predominantly white in racial make-up with 7.75 of the population living in poverty. 4.7% of the families are living under the poverty level (<http://www.city.data.com>).

The urban community has undergone a revival of its center city with the renovation of many buildings and cultural areas. A former steel and coal town with a large German, Italian and Irish population, the city has made the transition to a post-industrial economy that is supported through education, health and social services as well as retail trades and the arts and entertainment industries. The suburban community is a mature suburban area of tract housing and a semi-rural feel.

The researcher spent approximately two weeks at the school district. The researcher was familiar with the area and the school district previous to this phase of the study. The researcher had always been impressed with the stability of the district, the continuity of its programs, its sense of vision and its exceptional reputation for achievement.

The High School Setting

The high school itself is reached by either traversing through a pleasant suburban area or by driving down a pine tree lined lane. The school building is designed in such a way to

match the contour of the land. The building appears to be smaller and more intimate in size and capacity than a building that educates grades nine through twelve and has an enrollment of approximately 1200 students. You enter the building into a well maintained and clean main courtyard. There are no security measures apparent upon entrance to the building. Visitors are directed by signage to report to the administrative area. Security personnel were not present nor noted during the visitation. Visitors did not wear security badges and no extraordinary measure seemed in place.

The administrative area is located at the far end of the courtyard and contains the offices of the principal and two vice-principals as well as an extended area that contains the counseling offices. Three counselors serve the high school. A large auditorium stands on the north side of the building used for school assemblies, presentations and plays. The researcher was present for a very lengthy awards ceremony during a school day. Students were very well behaved during this time and exited the auditorium in an orderly fashion without much direction.

The building is constructed on two levels. The lower level houses the cafeteria, library, gymnasium and fine arts areas. Students move easily between the two levels. The building was completely renovated during the 1991-1993 school years. There are five computer labs indicative of a long standing commitment to the use of technology in the district. A greenhouse is well maintained and an active site of student engagement. The high school is also the site of a Alumni Fitness Center that houses weight and fitness equipment for use by students and community. The principal pointed with pride to the fitness center as an example of community and alumni

involvement and their willingness to actively commit to the excellence of the high school program.

The researcher spent part of his time observing the school operation and noticed that there was little or no graffiti on the walls or in the bathrooms and that the cafeteria area was pleasant. Students seemed well behaved and the orderliness of the school was reinforced by the use of a four block schedule. The faculty room was well furnished and welcoming to staff and visitor. The teaching staff was curious about the role of the researcher and the researcher was able to develop several positive, yet brief personal relationships with staff members. The staff seemed to be pleased with the professional and environmental atmosphere of the high school. Camaraderie was apparent between staff members and there seemed to be few divisive issues between young and old staff members. 74% of the staff has earned advanced degrees and as typical in high schools in Western Pennsylvania over 50% of the staff has 15 or more years of experience. The researcher noted that several staff members were honored at the last faculty meeting for their years of service and due to impending retirement. The Baby Boom Generation has finally reached the time of their retirement!

The Administrative Team

The administrative team of the high school is comprised of one head principal, one male vice-principal and one female vice-principal. The principal was serving in his last year prior to reassignment to the central administration as curriculum director. The male vice-principal retired after the school year with thirty-five years of experience. The female vice-

principal who holds a doctorate in educational administration is set to assume the position of principal. The athletic director was preparing to move to the vice-principal's position and at the time of the visit, there was a vacancy for a second vice-principal. Interestingly, no teacher or administrator expressed concern over the transition nor believed that the program would be diminished in any way. The researcher took this to be an indication of a mature leadership style, consistent philosophy and satisfaction with the evolving academic program at the high school. Interviews with the staff reinforced that impression.

The Principal

The researcher focused on the principal as the main source of information about the academic and extra-curricular programs of the high school. The two vice-principals were busy with their job responsibilities during the visit. The principal was kind enough to make time for the interviews and discussions about school programs despite the need to complete his tour at the high school and the move to central administration.

The principal described the many facets of the program that lead to higher student achievement. He described three facets of the program that he believed positively impacted achievement at the high school. Block scheduling, an emphasis on staff development and the active, designed and deliberate engagement of students were cited by the principal as being the building blocks of student achievement.

Block Scheduling

The high school is scheduled according to a four by four block schedule. As an aside, the principal mentioned that the school had modeled their initial thrusts into block scheduling in the early 1990's after the high school that is described in Case Study #1. The researcher was not aware of this fact prior to his visitation and is now aware of the philosophical and programmatic linkages between the two programs. Students at School Two take four 90 minute classes per day. Students can earn up to 8 credits per year and courses are either one or two quarters (one semester) in length. There are no study halls. The school day runs from 7:40 AM to 2:45 PM with a one half hour lunch. The principal and staff members reinforced the advantages of block scheduling. They cited more time on task in the classroom, less movement and disruption throughout the school day, the opportunity for greater student-teacher personal interaction, the provision for real time tutoring and perhaps most importantly, the opportunity for students to accelerate and advance their studies especially in math and science. Teachers reinforced the principal's contention that it was possible under block scheduling for students to accelerate their studies under block scheduling citing the real possibility that a student could and has enrolled in up to eight full math credits during the four high school years. The possibility of eight full mathematics credits far exceeds the typical four to five credits possible under a more traditional school schedule. The principal stated that "there are no study halls and students must enroll in four classes each term".

Staff Development

A second area of emphasis was the area of staff development. The district employed a full time Director of Professional Development whose role was to “work closely with teachers in programs designed to enhance classroom skills and instructional strategies”. This emphasis has led to the development of standards driven mathematics and language arts classes, an extensive review and revision of the entire mathematics curriculum, the development of literacy skills across the curriculum and the targeted pacing of instruction so as to provide the instructional environment for optimal student success. The principal further stated that the differentiation of instruction was the next area of emphasis with the goal of meeting the instructional needs of the diverse population served by the high school.

The principal stressed that staff development was a key component of an engaging instructional environment and was the method employed by the district to targeted design of instruction focused on the engagement of students. His further statement concerning his supervisory role and the fact that teachers were well aware of the “look fors” that are to be included in each lesson described a strong effort to make supervision meaningful to teaches.

A final structural area of emphasis for the principal was attendance. The principal stated that “in order to educate the kid, we must get him here”. The published attendance rate of 91.7% for the 2001-2002 school year indicated that attendance is an area of improvement for this high school.

The interview continued with the principal responding to the set of questions placed before him. The researcher addressed the area of “student voice”, that is the provision for the expression of student opinion and ideas throughout the school year. The principal stated quite candidly that, “rules without relationships yield rebellion”. He stated that the school makes a special effort to allow “every student to have a voice”. He stressed the visibility of the faculty and administrators and stated that he and his fellow staff members are visible in the halls and that, “students see us most every day in the cafeteria”. He noted that he makes certain that a teacher greets and says good-bye to the vocational-technical education students as they leave for their specialties throughout the school day. He stated that it is important to interact with students and noted that, “kids feel connected”. He noted an effective student government as one structural method of addressing student voice.

As part of this section of the interview, the principal described the role of the counselors in the orientation of the ninth grade class to the high school. He stated that the counselors made a special effort to work with the ninth graders and that the three counselors divided the student body alphabetically so as to allow each counselor to develop a relationship with a broad cross section of the students. This also allowed for the development of long term relationships as students and counselors work together for the entire four year of high school. The principal cited the institution of a “freshman seminar” that meets three times a semester. The seminar matched some of the school’s best teachers with ninth grade students and was intended to provide students with a continuous program of transition throughout their ninth grade year. He also described the “freshman picnic” that is held prior to the school year. He stated that this is an excellent opportunity for the new students to feel comfortable in their new setting and to get to

know the location of important areas of the school through the use of a “scavenger hunt”. The principal answered questions three through six in his statements in responses to question two. Therefore, the researcher inquired into his description of the atmosphere of the school.

The principal described the school in terms of what he called, “management tasks”. He stated that the atmosphere must first be organized. He stated that this may be part of his personality whereby all things must be ready to go on the first day. He stressed and re-stressed the importance of organization. Clear expectations and the stating of clear expectations are a major force in the development of a positive atmosphere in the school. Beyond clear expectations lay the expectation not only to expect “good things to happen” but actually to see or realize those good things that are happening in the school. He stated that he invites student and staff to celebrate their successes.

The atmosphere of clear expectations adds value to the school. I observed nothing in my two weeks of visitations that would lead me to believe that his statements about clear expectations and the celebration of “good things’ was not a reality in the school.

As part of my visitation, I was invited to attend an all school, year end assembly of athletic and scholarship awards. I was impressed by the attentiveness of the students and the sincere expressions of appreciation of student effort put forth by the adult participants. The researcher noted that there were several awards given to students by the parents of recently deceased students. You could hear the pain in the voices of the bereaved parents and you could feel the caring, affective response from the entire audience. One male student was called to receive an

award and he refused to move to the stage. He stated that he was not properly dressed for the event and that he forgot that he was to receive an award. A teacher from the school approached him and inquired into his lack of acceptance of the award. His response was mannerly and appropriate and stated that he had spoken to the parent and that the parent understood his hesitancy. The researcher was impressed by the teacher and by the student in their responses to a somewhat difficult situation. Dismissal from the assembly was orderly, most notably because dismissal was done without the principal announcing dismissal by rows or sections. The students simply left their seats and returned to their next class. There was no disruptive behavior or defiance of adult directions. Teachers stated to me that they were proud of the behavior of their students despite the two hour length of the program.

The researcher saw this positive assembly as a clear reflection of clear expectations and the celebration of “good things” that happen in the school and, in fact, happen in every school. The principal was gracious to provide me with his undivided attention for approximately one hour. I could sense his pride in his school and his students. The pride is, in my opinion, well deserved.

Student Interviews

The principal assisted the researcher not only by providing the low achieving students that were the target audience for the interviews, but also facilitated the clearances necessary for the process to begin. The principal contacted the parents and provided the researcher with the permissions necessary to conduct the interviews. He then arranged a schedule of student

interviews that would not disrupt their class work and would meet the timelines established for the visitation.

A total of eleven low achieving students participated in the interview process. Students were identified by their quality point average as was the case in case study school #1. I had the opportunity at this school to identify 15 low achieving students and actually interviewed 11 of the 15 students.

This group of students was less talkative than previous groups interviewed for this series of case studies. They, however, did provide the researcher with valuable and perhaps unintentional insights into the program at the school. When asked the question concerning “student voice”, the students unanimously stated that there were no formal structures (student council etc.) that they would employ to express their viewpoints about school related issues. There was universal agreement that informal and effective channels existed for the expression of student voice. Six of the eleven students interviewed felt that they could take their concerns to the principal and that he would handle them effectively. One student did not believe “student voice” to be a big issue while another believed that class discussions was an effective way to handle situations.

The low achieving students that were interviewed did not necessarily feel to be part of the school community. When asked to respond to the question, “Do you feel to be part of your school community”, two students responded in the positive without reservation and the remainder responded in a more non-committal manner. Two students complained about being labeled a “bad kid”. Another student responded that “some I like as a teacher and as a person.

They treat you in a personal way. Respect-yeah!- you've got to earn that". Another interviewee stated that "it depends" when asked whether or not she felt to be part of the school community or treated as an individual. The four remaining students simply stated that they felt that they saw themselves as having an "average" personal relationship within the school community and with teacher themselves.

Teachers in this school were believed by the low achieving students to be willing to help students become successful. Ten of the eleven students responded positively to this question and one responded that teachers in the "business and computer classes" were willing to help him become successful. These senior students each expressed a belief that "success" was dependant upon the individual. They stated a strong streak of independence when four of the interviewees stated that success depends upon "your self." Another four stated that teachers played a support role in the attainment of success through keeping students "on track", playing the role of the "encourager" and "staying on you by making you do things". Senior students are developmentally young adults and their ability to view the world as a result of their actions was telling.

The issue of trust brought forth the most negative comments of the entire interview. Only one of the eleven interviewees responded positively to the question about "feeling trusted by the teachers and administrators in your high school". One person felt that, "if you got straight A's then you are trusted", but he did not know if trust was given to those with lesser grades. Two students stated that "they don't trust us. Trust is not automatic. They don't fool with you.".

Another students simply stated, definitely not” while another student stated that “certain teachers only pick on certain students”.

Two students adamantly opposed the recently enacted attendance policy that restricts the number of absent days allowable for a student in order to be able to graduate or progress towards graduation. The district chose a twenty day limitation with discretion for emergencies as a method of improving student attendance and achievement. This policy was seen by at least two students as being coercive and “unfair” as well as a transgression into the “trust” the school maintained for students. One of the dissident students stated that they “suspect you and don’t believe you” while also maintaining that before the school “trusted us too much and too many people abused that trust”. Several of the senior students characterized the ninth grade class as “being out of control” and in need of more discipline. A final comment from one student mentioned that the school “trusts athletes” more than they trust “us”.

The identification of teachers and classes as those defined as “challenging your ability to solve problems”. The responses were as varied as were the students. The senior course on economics/law (course number 263) was mentioned by four of the eleven students. Two students mentioned English while one mentioned video production and another student identified “foods” as a challenging course. “Gym” was specified by two students as being challenging and a problem solving course”.

The next question relating to courses that allow for independent work and the completion of assignments that test your knowledge and skills while being interesting to the student elicited a

series of varied responses once again with courses such as the “discovery lab, gym, social studies courses, computer art, CADD and mathematics being among those course mentioned as challenging and interesting to the students.

Responses to question seven concerning the choices students are permitted to make concerning classes and activities elicited the least varied set of responses. Students responded simply with the statement that the major choice they made at the high school was the selection of classes in their yearly schedule. There was little discussion beyond this “talking point” except when one student stated that a choice that he made was to “choose to annoy some teachers”. The question did not garner much response and the researcher moved on to the next question concerning the atmosphere or climate of the school.

The climate of school #2 was described by ten of the eleven students interviewed as “good not great”. When asked to elaborate on that statement, the students’ responses were more robust. A female student insightfully stated that “I was bad and then I just grew up.” High school was described by this student as a place where students grow from immaturity to maturity and that the climate of the school reflected that change. Her statements are in alignment with the previous statements concerning the freshmen class being “out of control”.

A second student spoke of the gossip and talking about other people that was part of the climate of the high school. She stated that this happens in this school because all of the students from the area are physically in one place for the entire year and that this created such an

atmosphere. Two other students mentioned the “cliques” that exist at the high school as a way of describing the atmosphere.

One very verbal student stated that he “just gets through the day. Some stuff is ridiculous. Going to lunch, everyone is running and a teacher picks me out and I get suspended. I told the lunch lady that I wanted to fight her and they suspended me. Suspension only makes me mad. I don’t pay attention to the suspension anyway”. For this student, the high school is a place and time to be endured and a rite of passage to be completed.

In general, students viewed the climate of school #2 as good not great”. They made statements that the school climate was “good, better than others, nothing wrong here, good for me, OK, and I like to go here”.

The final question concerned the student definition of success in high school. When asked to describe “success” in the high school, Students described success in terms of “getting out, graduating, doing good and getting out, being happy, knowing what I am doing, not failing and achieving a diploma. Three of the eleven students interviewed stated that Passing the Pennsylvania State School Assessment and meeting the guidelines of the newly developed attendance policy were measures of a successful student. Only one student of this group of low achieving students mentioned post secondary careers or further education. This person stated that he had committed to armed services and was prepared to

fight in Iraq. He stated boisterously that he just wanted to “kill some towel heads”. The researcher mentioned that his career choice was fine, but that the opposition tended to shoot back and that he hoped that the young man would return home safely. The researcher noted a change in the tone of the voice of the student as he appeared to recognize the seriousness of his career choice and the bravado of his remark.

The researcher pondered the responses to his questions and was struck by the fact that this group of low achieving students maintained a overall positive attitude about the high school. These students did see the high school as a positive place, but seemed to not connect high school with their adult life. Students did refer to the transition from a young person to an adult, but there was little thought of what came after high school and what was necessary to prepare for their adult life.

The Teacher Interviews and Observation of Teacher Practice

The researcher spent considerable time (two weeks) at school #2. During the two weeks, the researcher was able to observe each teacher in their classroom and to interview each teacher in the mathematics department. The use of block scheduling also provided the researcher with an extended period of time for the interview phase of the project. Mathematics teachers at school #2 were very cooperative and seemed eager to speak of their school and its mathematics program.

A total of nine teacher participated in the interview. The majority of the teachers in the mathematics department were experienced teachers well beyond tenure, yet not within sight of

retirement. Two members of the mathematics department are “more mature” in terms of their career and are within five years of retirement. The mathematics department is housed in a wing of the school that includes the science department. The rooms are large, clean and well equipped for instruction. Teachers have access to a department planning center and a teacher’s lounge in the math/science wing of the building.

High achievement in mathematics and consistency of curricular approach are hallmarks of this high school. The school has successfully employed the Chicago Mathematics approach to instruction and has done so for over ten years. In addition, the 4 by 4 block scheduling design allows students to complete as many as eight mathematics courses in their four years at the high school. Eight courses would be a rarity and some would say an impossibility, but the opportunity does exist for vastly increasing the topical coverage of mathematics should a student demonstrate the desire and the aptitude for such a rich curriculum. Teachers and the principal noted that students tend to take more math under the block scheduling approach than would be apparent in a more traditional eight or seven period day. Mathematics scores on the both on the Pennsylvania State School Assessment (PSSA) and the Scholastic Aptitude Test (SAT) exceed the state average in both mathematics and reading/verbal. The largest positive difference occurs in mathematics on both assessments.

The researcher found an expression of a consistent educational philosophy throughout the discussions with faculty, building level administration and the Superintendent of Schools. The Superintendent of Schools had first expressed the simple mission statement of providing for student achievement and the acceptance and legitimacy of individuality. His statements led to

further elaboration on the point that the schools in the district must find a way to educate the individual through his/her unique talents rather than trying to fit the individual into a “one size fits all” mold. This emphasis on achievement and the uniqueness of the individual was apparent in informal discussions and interviews with members of the faculty. There was a consistent message being expressed by the professional staff.

The initial question in the interview process targeted the teachers’ method of eliciting student opinion and their willingness to provide time for “student voice”. The teachers responded with a range of answers that could be characterized as either 1) student voice is expressed through the language of mathematics 2) student voice is provided for by teachers who listen carefully to student formal and informal discussions. Five teachers expressed the concept of student voice through their ability to listen to student concerns and their willingness to allow for informal discussions before or after the major academic work of the day. Four of the teachers expressed student voice in terms of the expression of understanding of mathematics problems using the language of mathematics. Perhaps, the important factor discovered was the fact that students are encouraged to communicate both about academic subjects and about personal concerns in the classes and teachers were aware of the importance of such communication. One teacher employed a formal “feedback process” of reflection on the work of the class while others employed less formal structures. The allowance for student communication was, most certainly, a feature of the school.

Teacher responses to question two that centered on positive personal relationships with students were often related to and part of their responses to question one concerning student

voice. Teachers separated their subject related discussions from their more person- centered relationships with students. All teachers expressed a belief in the importance of communication with students and only one teacher expressed difficulties with a specific group of low achieving students. Again, only one teacher employed a formal process of information gathering about students. This teacher developed a questionnaire of student interests that was employed at the beginning of the school year. The remainder of the teachers relied upon less formal methods of getting to know their students. Teachers expressed the necessity of developing good listening skills and that they came to learn their students through listening to their conversations rather than through any other means. Teachers understood the fine line between being too personal and being an adult mentor.

Responses to the question concerning student academic success in the classroom were rich in detail. The researcher believes that this is a question that borders on the area of classroom management through effective instructional design. Teacher responses often combined statements about student responsibility (question #4) with explanations about the structuring of classes to provide for a high level of student success. Teachers are most definitely in control of these segments (level of student responsibility expected and the creation of a climate of success) of the classroom experience. What set the discussion apart from other discussions the researcher had participated in was the richness of strategies apparent in the design of lessons that led to student achievement. The length of the each class (90 minutes) is most certainly a factor in the quality and quantity of instructional approaches as well as the apparent impact of staff development on the mathematics teacher of the high school. A teacher described a typical instructional scenario as:

1. Opening with a relevant story about the relevancy of the problem being presented
2. A guided practice session
3. An independent practice session
4. A group review of the problems being presented
5. A dialogue with the students about the problem
6. work that could be done to enhance learning

Another instructor stated that her approach was “anything hands on”. It was her impression that students “loved doing those kinds of things”. She also noted that she used the Cognitive Tutor series from Carnegie Learning Corporation to great effect and that technology was a powerful tool. Yet another teacher stated that she employed “discovery learning” concepts where students are presented with a problem and are led to discover the answer. She also expressed a desire to employ an interdisciplinary approach to learning “especially related to the history of mathematics”.

A teacher spoke of the use of problems of increasing complexity and “lots of guided practice. Another spoke of how the students must “show me” the processes involved to solve problems and how important it is to “break down the problem”. Teachers mentioned the “effort over time is the key to success”. The teacher mentioned that she provided “silly”, yet effective incentives such as stickers on tests and the use of candy as an incentive for students during class.

Several of the teachers spoke of student responsibility for their learning and the necessity of student effort over time. Teachers spoke of the students' role of defining their own level of success. There was high expectation of quality student work apparent after speaking to teachers in school #2. Teachers often stated that they offer an "expert plan" for students to solve problems and then expected them to do their best after the expert explanation. They express the belief that learning "is your (The students) responsibility". Students are expected to "do your part and then come to me should you need help". An emphasis on group work and the practice of pairing students with similarly skilled students was mentioned as a strategy to improve mathematics skill levels. Teachers spoke of switching seats and placing the struggling students in the middle of the room. Teachers noted that block scheduling provided the time for a variety of classroom structures. Teachers stated that group work was a consistent practice in the block-scheduled classroom. Independent practice during class time and the use of modeling of problem solving were also common practices mentioned by mathematics teachers at School #2. One teacher noted that she kept "independent work to a minimum. Students are more productive with partners". Teachers noted that homework was not a major portion of the work that students completed because much work could be completed during the ninety-minute classes. Homework was employed for additional practice and for the completion of work that was not completed in class.

Creative problem solving situations were apparent in the classrooms of school #2. Three of the nine teachers stated that creative problem solving was a major component of the Chicago Mathematics Series as adopted by the district ten years previous to my visit. All teachers spoke of the creation of a problem-solving scenario that is an integral component of the series.

Interestingly, teachers mentioned that their students were not well versed in “basic mathematics facts” and that they could not do these basic functions well. Teachers noted that students were successful in problem solving of unique and interesting problems while not being able to perform simple arithmetic functions without a calculator. They decried this lack of skill in basic computational function and spoke of the need to emphasize these skills at the middle school level.

Teachers spoke of the fact that they allowed students to “think of the many ways (to solve problems).” A teacher mentioned that she used the strategy of providing the students with an example of how to solve a problem while stating that, “I did it this way. Does this make sense? How do you think that you could solve the same problem?” Teachers spoke of “understanding real life problems” and the fact the students “like to be challenged”. The teacher stated that the curriculum was a major portion of this positive attitude. Another teacher stated that Chicago Math lent itself to the “higher end of problem solving”, but students no longer state that “I can’t do it”. The teacher stated that the curriculum was a trade off between higher end problem solving and an emphasis on basic computational skills. The curriculum employed emphasized higher order thinking skills over basic computational skills. Despite the success of the school in mathematics achievement, teachers still questioned the seeing imbalance between proficiency in higher order skills and the apparent lack of arithmetic skills.

The setting in the mathematics department at School #2 favored group work over independent student work. The teachers emphasized the necessity of having a discussion about problem solving strategies and that independent work was kept to a minimum.

Teachers spoke of creating a scenario of interest to students and then developing information that helped in solving the problem. Once again, this approach was seen as a major component of the Chicago Mathematics approach.

Pairing of students was mentioned frequently during the interviews. In fact, a variety of groupings were apparent from the discussions with the teachers. These groupings seemed similar in practice to the “pair, square, large group” concept frequently employed in elementary classrooms when teachers ask students to develop solutions independently, share the solutions with a partner, explain the solution to a group of four (square) and finally lead a class discussion on the problem. It was quite clear to the researcher that the curriculum and instructional techniques employed emphasized high interest creative problem solving in a group and discussion oriented setting.

The researcher moved away from instructional technique and curricular matters into a discussion about the climate or atmosphere of the building. The researcher was searching for the relationship between the atmosphere of building and student achievement and ultimate success. Six of the nine mathematics teachers interviewed made positive statements about the climate of the school. One teacher described block scheduling as “an administrator’s dream” with less confusion in the hallways due to fewer class changes. This majority of the teachers felt that discipline within the school was handled well and that “the guys (administrators) do a good job”. A teacher who stated that the atmosphere was “very positive”, elaborated further in saying that “they (the students) know that we are serious about what we do and we expect them to be also.

We set expectations and we want it to be a certain way”. Another teacher provided the researcher with a point by point elaboration to the inquiry. She stated that in her opinion:

1. Student felt that teachers cared about them
2. Teachers are supportive of the students
3. Teachers held high expectations for their students
4. The operation of the building was supportive of the educational process
5. There is a concern about “bullying” that takes place “under the surface” of the atmosphere of the building.

Three of the nine mathematics teachers expressed concern about some negative aspects of the climate of the school. A younger teacher noted that there may be “too much freedom” and a “level of disrespect between students and teachers”. He pondered, “Are we too lax in this school?” A second instructor noted that there was a need to be more consistent in the enforcement of the rules. She stated that the “dress code was too loose” and that the newly adopted attendance policy limiting the number of student absent days was “already not being enforced”. A comment from a third teacher expressed the belief that the “climate seems to be anything goes-that it is getting worse. This trickles into the classroom because students know that “they can screw around.”

Clearly, there was a significant, yet a minority level of dissent within the department about the climate of the high school. Earlier students had mentioned that the freshman class was less respectful and “more wild” than the remainder of the school. This seems to indicate a certain noticeable level of concern about appropriate behavior and the level of respect apparent at the

high school. The researcher noted that he saw little if any graffiti and that he observed little disrespectful behavior during his time in the building. The researcher did personally observe student fashion that would not be acceptable in his school setting, but he did not conclude that the dress was a deterrent to learning. He noted that students seemed unconcerned about the dress of other students.

Success at school #2 was described in many ways, but there was a strong vein of consistency apparent in the statements made by teachers. Success was described in two facets as being related to success in one's later life and success in terms of improvement over time during school. Success was seen by one teacher as success on the state tests and the success of the school in general on measures of student achievement. Others stressed the necessity of students becoming "attentive, organized, active and participative". Several stated that success was the ability or willingness to "give 100% effort and to struggle to overcome difficulties". These teachers stated that the successful student was not necessarily the one with the "highest grade, but rather the ones that learn the most and come along the farthest way". Others stressed that success was "not only the ability to learn math, but also the ability to prepare for the next four years and to learn relationships, socialize and to react to changing situations" (Teacher, School #2, personal communications, May 18, 2004).

Data Analysis:

The researcher employed the identical instrument measuring Learner Centered Practices as defined by the American Psychological Association as was employed in the investigation, data

collection and data assessment of high school #1. The researcher repeated the process used to relate the five significant learner centered variables to high student achievement and motivation. The researcher used the identical approach to the analysis of available data as employed with school #1. Tables were created that demonstrated the results of the data comparison for the five major learner centered practices that result in high student achievement and high student motivation.

Table 11.

Profile of students who participated in the ALCP survey at high school #2.

N = 31

Total Number of students	N=31	Low Achieving = 10	High Achieving = 21
Grade Level	Grade =12		
Gender	Female = 15	Low Achieving = 3	High Achieving = 12
	Male = 13	Low Achieving = 4	High Achieving = 9
	Unidentified	Low Achieving = 3	High Achieving = 0
Ethnicity	White = 25 Asian = 0	Black = 2 Unidentified = 2	Hispanic = 1

The number of high achieving students surveyed exceeded the number of low achieving students. The principal noted the fact that attendance was a problem with low achieving students and that the researcher could not count on the attendance of the 15 low achieving students identified for the survey and interview. The prediction held true for this phase of the case study. The group surveyed self identified as White. This reflected the high percentage of white students enrolled in

the high school. Three students chose not to self identify by gender and two students chose to not self identify by ethnicity.

Table 12.

Profile of teachers who participated in the ALCP survey at high school #2

N = 60

Number of Teachers	N=60		
Gender	Male = 22	Female = 36	Unidentified = 2
Ethnicity	Black =2 Asian = 1	White = 55 Unidentified =1	Hispanic = 1
Years of Experience	1 to 2 = 4 11 or more= 42	3 to 5 = 4 Unidentified = 1	6 to 10 = 9

The faculty was comprised of a majority of female members. The vast majority of faculty members self identified as White and possesses 11 or more years of teaching experience. Obviously, this was a “veteran” teaching staff that may have reflected an earlier trend towards females in the profession. The superintendent had stated that the district was a place of “traditional values” and perhaps this tendency towards female teachers was reflective of a more traditional time in education. The staff of School #2 has much experience and, as such, was seen as a valid source of information, opinion and data by the researcher.

Table 13. All Students, High School #2-ALCP Survey

N=31

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	3.20	.89	.86	3.09	.70	.88
Student Voice	3.05	.84	.75	2.97	.61	.79
Higher Order Think	3.13	.80	.76	2.90	.70	.84
Individual Differences	2.54	.98	.81	2.50	.71	.73
Self-Efficacy	2.91	.95	.57	3.05	.68	.81
Epistemic Curiosity	2.57	1.00	.38	2.75	.63	.75
Active Learning Strategies	2.73	.81	.77	2.79	.61	.80
Effort Avoidance Strategies	2.15	.95	.76	2.13	.62	.77
Task Mastery Goals	2.81	.95	.86	2.86	.72	.84
Performance Oriented Goals	2.37	1.08	.60	2.37	.72	.76
Work Avoidance Goals	2.20	1.07	.48	2.31	.68	.75

The scores of all students surveyed from school #2 showed positive differences in four of the twelve variables. The variables of “Effort Avoidance” and “Work Avoidance” are considered by the researcher to be indicators of negative educational efforts by students and are interpreted separately. Students scored above the national mean in effort avoidance, but below the national mean on the variable of work avoidance. The difference between the national mean and the local score in effort avoidance was .02 and was not considered significant.

Four other variables were scored lower than the national mean and one was equal to the national mean. The largest positive difference between the national mean and the local score of

school #2 was +.23 in the variable of higher order thinking skills. The results of the survey of all students were considered to be non-conclusive. This lack of clear interpretation of the results may indicate that learner-centered practices were not a significant contributor to student achievement at High School #2.

Table 14. Low Achieving Students, High School #2-ALCP Survey

N=10

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	2.76	1.00	.83	3.09	.70	.88
Student Voice	2.76	.89	.78	2.97	.61	.79
Higher Order Think	2.87	.98	.68	2.90	.70	.84
Individual Differences	2.26	.98	.80	2.50	.71	.73
Self-Efficacy	2.98	.96	.57	3.05	.68	.81
Epistemic Curiosity	2.63	1.09	.35	2.75	.63	.75
Active Learning Strategies	2.54	.97	.35	2.79	.61	.80
Effort Avoidance Strategies	2.32	.99	.71	2.13	.62	.77
Task Mastery Goals	2.57	1.03	.78	2.86	.72	.84
Performance Oriented Goals	2.23	1.14	.48	2.37	.72	.76
Work Avoidance Goals	2.22	.93	.80	2.31	.68	.75

Low achieving students scored lower than the national mean on nine of eleven variables. The mean score of low achieving students was above the national mean in the variable of effort avoidance (2.32 vs. 2.13) while below the national mean in the area of work avoidance (2.22vs.2.31). This finding is similar to the findings for all students. The statistical difference is

greater than the differences between identical variables for all students, but not considered significant. This finding may indicate that low achieving students are willing to do academic work while not placing much effort to the task as was found with the survey results for all students.

Table 15. High Achieving Students, High School #2, ALCP Survey

N=21

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	3.43	.72	.84	3.09	.70	.88
Student Voice	3.18	.77	.69	2.97	.61	.79
Higher Order Think	3.26	.68	.77	2.90	.70	.84
Individual Differences	2.68	.95	.80	2.50	.71	.73
Self-Efficacy	2.75	.88	.57	3.05	.68	.81
Epistemic Curiosity	2.52	.93	.43	2.75	.63	.75
Active Learning Strategies	2.80	.87	.75	2.79	.61	.80
Effort Avoidance Strategies	2.08	.98	.77	2.13	.62	.77
Task Mastery Goals	2.92	.88	.90	2.86	.72	.84
Performance Oriented Goals	2.44	1.07	.64	2.37	.72	.76
Work Avoidance Goals	2.10	.85	.63	2.31	.68	.75

High achieving students scored higher than the national mean on seven of the eleven variables. The largest positive difference was +.36 in the variable of positive relationships. In order to maintain consistency, the researcher again focused on the two student variables of effort avoidance and work avoidance. High achieving students scored below the national mean on both

variables (2.08 vs. 2.13 and 2.10 vs. 2.31 respectively). The researcher interpreted this finding to be significant and indicative of a willingness to work hard and to exert the necessary effort for academic success.

Table 16. All Teachers, High School #1- ALCP Survey

N=60

Learner-Centered Beliefs	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	3.05	.73	.70	3.02	.44	.85
Student Voice	3.53	.61	.79	3.20	.44	.76
Higher Order Think	3.39	.66	.86	3.08	.49	.76
Individual Differences	3.13	.76	.78	2.92	.52	.68
Teacher Self-Efficacy	2.90	.74	.40	2.99	.50	.73
Non-LCP Beliefs @Learner	2.67	.86	.71	2.40	.50	.72
Non-LCP Beliefs@Teach	2.63	1.10	.48	2.53	.43	.76
Can Influence Learning	3.28	.61	.17	3.75	.31	.46
Adolescence Diff. Stage	3.05	.69	.76	2.74	.41	.66
Reflective Self-Awareness	2.80	.88	.91	2.96	.48	.85
Moderately Controlling	2.87	.83	.21	2.93	.38	.40
Highly Controlling	3.01	.74	.23	3.07	.43	.47
Moderate Autonomy	2.71	1.62	.09	2.51	.46	.56
High Autonomy	2.78	.80	.31	2.85	.46	.51

Teacher scores were above the national mean in seven of the fourteen areas in the ALCP survey.

The largest positive difference was in the area of student voice (+.33). The largest negative

difference was in the area of teachers' belief that they can influence learning (-.46). This is an interesting finding in a school that is known for high achievement by students.

The researcher continued to focus on the variables that were closely related to classroom practices that allowed for a positive student response to learning. Tables were again developed that allowed for the comparison of data collected from four groups:

- 5) All students
- 6) Low Achieving students
- 7) High Achieving students
- 8) All teachers
- 9)

Table 17. All Students – Achievement Related Variables School #2

N=31

Student Variable	Local Mean	National Mean
Positive Relationship	3.20	3.09
Student Voice	3.05	2.97
Individual Differences	2.54	2.50
Active Learning	2.73	2.79
Higher Order Thinking	3.15	2.90

Scores on four of the five variables did exceed the national mean calculated through the scores of all students surveyed for this project. Students, in general, expressed the belief that their teachers

developed positive relationships with their students, paid attention to individual differences, provided an active learning environment and provided for higher order thinking skills in their classrooms. The variable of providing for student voice was viewed as lesser characteristics of the teaching staff and school environment. This is in contrast with the findings previously reported from teacher data indicating a teacher belief that student voice is a strong factor in student achievement.

Table 18. Low Achieving Students – Achievement Related Variables, School #2

N=10

Student Variable	Local Mean	National Mean
Positive Relationship	2.76	3.09
Student Voice	2.76	2.97
Individual Differences	2.26	2.50
Active Learning	2.54	2.79
Higher Order Thinking	2.87	2.90

Low achieving students in school #2 ranked their teachers and instructional environment below the national mean on all five focus variables. Learner-centered practices seem to have less impact on low achieving students in High School #2 and may not positively influence academic achievement.

Table 19. High Achieving Students – Achievement Related Variables, School #2

N=21

Student Variable	Local Mean	National Mean
Positive Relationship	3.43	3.09
Student Voice	3.18	2.97
Individual Differences	2.68	2.50
Active Learning	2.80	2.79
Higher Order Thinking	3.26	2.90

High achieving students ranked their teachers and instructional environment higher than the national mean in all of the five focus areas. The greatest difference between the local mean score and the national mean score was +.34 for the variable, “Positive Relationships” and +.36 in the area of “Higher Order Thinking Skills”.

Table 20. All Teachers – Comparative Achievement Related Variables School #2

N=60

Student Variable	Local Mean	National Mean
Positive Relationship	3.05	3.02
Student Voice	3.53	3.20
Individual Differences	3.13	2.92
Moderate Control	2.87	2.93
Higher Order Thinking	3.39	3.08

Teachers of school#2 ranked themselves higher than the national mean in four of the five focus variables. They ranked themselves lower than the national mean in the area of “moderate classroom control”. The researcher believed that this finding was a reflection of the teacher held belief that moderate classroom control is not viewed by teachers as a positive instructional trait.

Conclusions

The researcher ended his interviews with the teaching staff with an overall positive view of the building operation. The curriculum was in place and consistently applied over many years. The teachers expressed the belief that effective staff development had permitted the program to grow and be successful over the long haul. The mathematics curriculum was firmly entrenched and well implemented. Recent scores on the PSSA test had demonstrated the effectiveness of the program as the high school consistently outscored other similar schools in Pennsylvania.

Students were able to accelerate their learning dependent upon their aptitude and attitude. Block scheduling and a four course requirement per semester were important factors in allowing competent students to take a number of advanced courses and to accelerate their learning when viewed in comparison with a traditionally scheduled high school. The data indicated that students in the high achieving group found their instructional environment and the quality of instruction to foster high achievement. The low scores on effort avoidance and work avoidance may be interpreted as indicators that high achieving students at school #2 put forth strong effort and actual work towards high achievement. Work avoidance is also not a strong characteristic of high achieving students at school #2.

Low achieving students at school #2 also score below the national mean on work avoidance while scoring higher than the national mean of effort avoidance. Such scores

may indicate the presence of a strong work ethic among all students, but a lesser willingness to put forth effort among low achieving students at school #2.

The low achieving students surveyed scored their teachers and their instructional environment much lower than both the scores presented by the high achieving group and the national mean score. The instructional setting was identical for both groups, yet the scores on the five significant variables were much lower. The researcher purports that this similar environment does not lead to high achievement among low achieving students at school #2 and that there is reason to believe that only a completely different environment could lead to significant gains in achievement.

The impact of long term consistent staff development was apparent as teachers employed and expressed belief that the methods employed had resulted in high student achievement. Indeed, teacher scores on the ALCP survey indicated high self scoring for the variables that influence student achievement. Moderate classroom control was the only variable to receive a score lower than the national mean. Moderate control may not necessarily be seen as an attribute of good instruction at school #2. The superintendent of schools stated in an interview that this school was located in a conservative area with strong feelings about good schools. The low score in the moderate classroom control variable may be indicative of the value of strong classroom control in this district and high school.

The majority of the mathematics department was pleased with the overall climate of the building while there was an expression of concern about a deteriorating behavioral climate.

Finally, the definition of success was broad but consistent. There existed an attitude that success was a result of increased effort over time and that there was more to success than academic success. The teachers stated consistently the importance of socialization into society as being a hallmark of success for their students. In general, the researcher perceived a commitment to student success in his discussions with the mathematics department. A commitment that was apparent in the time spent observing classroom activities that reflected those positive attitudes about students and their ability to become successful over time through increased effort. Teachers of lower achieving students expressed reservations about the ability and behavior of their students. The researcher noted a negative attitude towards lesser achieving students that was most pronounced in the lowest level of mathematics instruction. The researcher noted that for this group the setting and teacher attitude did not lead to higher achievement as defined by grades not a positive relationship with the teacher assigned to the classes.

The researcher noted that there appeared to be a consistent message of the importance of achievement in all school related activities (academic and extra-curricular). The superintendent, the principal and staff members all stated that achievement is obtained by increased effort over increased time and that the overall guiding principle of the school and district was high achievement. High school #2 was noted as a place where consistency in curriculum, programs and staff development had delivered high achievement for a wide range of students. The researcher noted that low achieving students were not as positive about their school and its instructional environment. It might be stated that the school must still address the needs of the low achieving students while maintaining the strong work ethic and effort of the high achieving students.

CHAPTER V

Case Study #3- An Urban Fringe High School near a Medium Size City

The Supporting Community

The community that supports the high school explored as Case Study #3 is an urban fringe school located 6.4 miles from a medium size city of approximately 334,500 residents. The community is compact. The total land area is 1.0 square miles. The population according to the Year 2000 Census was estimated to be 8, 595 persons. This number represents a 2.0% decrease in population from the initial census roles of the year 2000.

The median age of the population in the community is 36.6 years. The median household income is \$31, 481 with dollar values computed to the year 2000. The median house value is \$70,000. The community's demographic profile specifies that:

- 92.9% of the population is white
- 4.4% of the population is Black
- 1.3% of the population is of mixed origin
- 0.8% of the population is of Hispanic origin
- 0.5% of the population is American Indian.

The profile of the community indicates that the percentage of black race population and other racial groups is significantly below the state average. 88% of the population has completed a high school education. 23.4% have earned a bachelor's degree with 7.2% holding a graduate or professional degree. The unemployment rate is 5.5%. The divorce rate in the community is 13.2% (<http://city.dat.com>).

The community is comprised of the descendants of the many immigrant groups that came to the Western Pennsylvania in the late 1800's and early 1900's. Significant percentages of residents are of German, Irish and Italian backgrounds. The community retains its ethnic identity despite its close proximity to its larger urban entity. The crime rate is below the average of the United States.

The researcher was familiar with the district previous to the intensive study undertaken as Case Study #3. The community is small in geographic area. This one square mile area is comprised of a business district located on a main street with residential areas flanking the business district. The business district appears to have undergone a revival with new shops and restored storefronts. The housing stock is of the "mature" variety with most residential construction taking place between 1920 and 1950. A small hospital serves the area and the educational, health and social services industries provide 21% of the employment in the community. The junior/senior high school was constructed on the northern side of the community and is within walking distance of all residences. The district does not provide bus transportation due to the close proximity of the school.

The High School Setting

All students of junior/senior high school age are housed in one large, well maintained building. The building has undergone a recent renovation with air conditioned classrooms and carpeted hallways. The district offices of the superintendent and curriculum director are found in the lower level of the building. The main office is located adjacent to the main entrance and provided a “stop point” for all visitors to the school. A “senior lounge” area was also located in the main foyer. This “lounge” allowed seniors to relax and to meet with fellow seniors during study halls or lunch without much supervision with the exception of the visual observation provided by the glass walls that encompassed the main office. The principal noted that he was forced to close the “senior lounge” only one time due to a small amount of vandalism. He reported that the student who damaged the furniture by writing his name on the wood also repaired the damage. Seniors were seen talking and sitting in the lounge area without disruptive behavior for the duration of the researcher’s visit. A “Hall of Fame” for graduates was located in the main entrance way near the auditorium. A school store operated through the special education department sold snacks during the day opposite the lunch periods. The auditorium and gymnasium are also accessed through the main hallway.

The main office housed the two male principals and two administrative assistants. The assistants were pleasant and efficient while providing services to the students, staff and administrators. The principal relied upon his two administrative assistants greatly and there appeared to be a strong positive working relationship between the administrative assistants

and the administrators. An attendance office was immediately adjacent to the main office and a third administrative assistant played the role of the attendance officer. The two principals were supported by a three person counseling staff and a school resource officer.

The hallways are pleasant and carpeted. The carpet tended to act as an additional acoustic treatment for the building. Students left and entered the classrooms in the normal, ebullient manner, but the carpet dulled the effect of many voices. The classroom environment is pleasant with adequate space for teacher materials and student desks. Students and teachers welcomed the researcher and expressed interest in the dissertation topic.

The Administrative Team

The principal and vice-principal are middle aged men in their forties. At the time of the visit, the vice-principal had been appointed the principal of the district's single elementary building and he was anxious to begin his new assignment. Staff members mentioned during the interview process how well the principal and vice-principal had worked together. They praised the vice-principal for his relationship with the students of the school and for his positive attitude towards the staff.

The Principal

The principal was the "educational leader" of the building. He was the driving force behind the many programs and instructional innovations that were apparent to the researcher. The

principal put theory into practice and garnered the support of a strong cadre of teachers. The programs supported by the principal did not receive universal acclaim, but did receive the support of a large majority of staff members. The principal was an affable man who was a serious and motivated educator able to place the job in perspective and to maintain a balance between job and life in general. The principal had recently completed his dissertation and had received his doctoral degree during the time of the researcher's visit to the school. The principal was the driving force behind the reforms enacted at the school and had the support of several key staff members.

Since the principal was the change agent for the high school, the researcher spent a large amount of time interviewing him in order to develop an accurate portrayal of the programs he initiated. The principal described the approach to improve student achievement at his school as a "constructivist approach based upon teacher teams centered upon the standards and based upon teacher developed exemplary lessons". He further described a program that was seen from two perspectives: the student perspective and the teacher perspective.

The student perspective is supported by a program that required the development of a formal Individualized Learning Plan (ILP) for each student 9-11. The teacher perspective was represented by the inclusion of a "Grade Level Culminating Project". In each instance one could state that the emphasis was on a "student-centered approach" to successful acquisition of the knowledge and skills required by the state standards.

The Grade Level Culminating Project booklet distributed to staff and students described the project as a “Student Portfolio” required of “All students enrolled in the (High School Case Study#3) in grades 9, 10, and 11. These students “will be required to maintain portfolios of student work as evidence that they are making strides toward the proficient level according to the PA Academic Standards”.

Further requirements describe student obligations as:

- a. “Students will be asked to familiarize themselves with the academic standards in Reading/English and Mathematics.
- b. Students are required to take an active role in determining what student works (i.e. teacher developed tests, standardized tests, class work, homework, research papers, written pieces) meet or exceed the specific bench mark.
- c. Once an article of student work of proficiency has been selected to be in the Student Portfolio, the student will describe the student work beneath the specific benchmark and attach this work to the student portfolio.
- d. Students must continually refer to the Student Portfolio and assess whether or not their student work of proficiency meets or exceeds the specific level of the standard.
- e. Students may continually assess their works and determine if ‘new or more updated student works of proficiency’ is a better representative of their ability; thus, the three student works (found in the Student Portfolio) of their ability may change from day to day, week to week and semester to semester according to student self

assessment”.

The unique aspect of the student portfolio, in the opinion of the researcher, was the emphasis on student involvement in knowledge of the standards, student selection of representative works and student directed re-assessment of portfolio contents. Each of these represent a unique twist to the program at School #3 that places the obligation for representative standards based works squarely on the shoulders of the student population of the school. This emphasis placed the responsibility for the production of artifacts included in the portfolio in the hands of the students and the responsibility for the assessment of the portfolio as a professional responsibility of the teaching staff.

The second student centered element of the program was the creation of an Individualized Learning Plan for each student in the high school. The ILP called for the review of a list of indicators of student achievement on a yearly level, a plan for remediation (if necessary) in mathematics and reading, a checkbox of proficiencies for each subject and a listing of differentiated instructional strategies that could be employed to improve student achievement of the state standards. The principal indicated that the review process was an important component of the Individualized Learning Plan. He stated that the review was conducted by a team of teachers and counselors. He also noted that the size of the school made the implementation of the ILP easier to manage.

A review of the documentation provided by the principal concerning the development of the ILP described a 13 step process of implementation. The document is found in Appendix (). This

document demonstrated a comprehensive approach to program development represented by eight implementation steps. These steps are outlined as:

1. The recognition of state and federal mandates concerning the implementation phase of the No Child Left Behind Act by teachers, administrators, school board, parents and students.
2. The development of a joint administrator/teacher vision that “meets or exceeds mandates”.
3. Approval Phase from Superintendent of Schools and School Board. This phase includes the training of staff, the actual implementation of the program (after formal approval) and an evaluation phase.
4. The change phase indicating that professional staff members become involved in the process themselves and assume ownership of the project.
5. The creation of a nine member Individualized Learning Plan Council comprised of the principal, the vice-principal, the counselors, the librarian, two math teachers and two English teachers.
6. In-service phase for the Individualized Learning Plan Council providing the council with the time and knowledge to successfully implement the program.
7. The Establishment of the Individualized Learning Plan for each student. Each student understood the process, the need, his/her personal academic strengths and weaknesses and the opportunities for improvement under the ILP plan.
8. The quarterly meeting phase for review of progress.

The principal emphasized that the use of state standards to drive an individualized learning plan provided his students with a “level playing field”. The learning environment was, in his opinion, now more transparent and less dependent upon teacher preference and subject area strength. He stated that the school was more of a team and less of a group of individual professionals all working within their own personalized classroom and lesson plans. He further stated that “my kids know these standards and what is expected of them”. This indicated to the researcher that the principal believed in the concept of sharing the responsibility for learning with the students in the school and that the standards provided staff and students with a common set of shared academic goals.

He further stated that teams of math and English teachers developed exemplary lessons for each standard thus providing direct teacher ownership of the instructional process. Finally, he stated that the inclusion of the grade level culminating project was a concession to the teacher perspective that an series of artifacts needed to be created by students to demonstrate proficiency according to the standards. He stated that the Individualized Plan approach provided for the student centered perspective and allowed for the voice of students to be heard on a regular basis through the process.

The principal responded to the second question concerning the provision for “student voice” by stating that the grade level culminating project allowed for a focused forum about a topic of interest and importance to the student. The principal stated that by scheduling monthly meetings between faculty advisors and students student voice was not only heard but listened to in a unique fashion. Students discussed topics that were vital to their yearly academic progress and

stayed focused on the topic. The principal also stated that the Individualized Learning Plan allowed for a similarly focused expression of student voice. Finally, the principal cited the necessity of “being around” for students and that students took advantage of the opportunity to speak with the principal about subjects of importance to them.

The researcher noted that the interview with the principal continued to be centered on the same themes and structural ideas. It was clear that student knowledge of the standards, student centered culminating projects and individualized student learning plans comprised the major initiatives within the school. This was, most certainly, a school with a focus on student achievement, student responsibility and student self-awareness.

The principal continued the interview by addressing the concept of student responsibility and trust. He stated that the creation of the “senior corner” was a visible symbol of the school’s sense of trust of its students. He stated that it was the seniors’ responsibility to maintain, protect and “police” the corner. He stated that he had to close the corner only once since its two year old inception and those senior students enjoyed the lack of supervision apparent in the operation of the “senior corner”. The principal also referred to the fact that student responsibility was entailed within the grade level culminating project due to the fact that the responsibility for the completion of the project was included in school board policy.

The principal described the atmosphere of the school to be “more wide open than the stereotypical traditional high school. He stated that each grade level was provided with the opportunity to acquire greater responsibility within the structure of the school. He stated that his

preference was a more wide open environment and that the students responded well to this approach. He stated that the school retained a strong belief in the importance of academic achievement while providing for greater and greater levels of student responsibility.

The principal described his school as standards driven. He stated that all instructional objectives are referenced to the standards and that teachers consciously teach towards those standards based objectives. His main achievement strategy was described as “assessment of each step of the lesson” with an emphasis on the practice of monitor and adjustment of lessons to match the learning of the students. He stated that the purpose of the assessment strategy was to make certain that teachers could tell “how they learned what you (the teacher) wanted them to learn”.

Finally, the principal described a successful student in his school as “someone who gives effort and attempts to fulfill their potential. A student who successfully connects with the adults in the school. Students who stated that they really miss being here when they are absent.” He stated that this description did not apply to simply the “straight A student”, but rather to all that realized their potential while students in the school.

The interview with the principal provided the researcher with an overview of the philosophical and structural components of the school. The researcher then interviewed faculty and students to investigate the connections between the descriptions provided by the principal and the actual perceptions of the student and staff groups.

The Student Interviews

Students of school #3 were interviewed in groups. A total of fifteen students were interviewed in a single day's session. Each group consisted of no more than five students and each interview was approximately one hour in duration. Students in school #3 were a mixture of low achieving students and higher achieving students. As in other schools, the responses to interview questions ranged from rather simplistic one word responses to more fully developed thoughts. At times, the opinion of one person in the group seemed to be acceptable as a response for all group members. The researcher believed that the group of individuals chosen for the interview did influence individual responses.

The first question of the interview was an inquiry into "student voice". Students were asked to describe programs instituted to "listen to students" or to allow for student opinions to be heard. Responses could be divided into three categories:

1. Suggestions on how to set the climate to listen to student voice
2. Frustrations and consequences of student opinion not being heard
3. Student voice and opinion being heard through activities or through choices concerning course selection.

Two students suggested that teachers and principals "should just talk with the students" while another like minded student stated that "teachers should go out of their way to take student opinions into consideration and should always give a reason why for a decision". A

third student stated that student voice is not always heard and that is because “we are still teenagers”.

Three other students formed a dissenting opinion concerning the value of student voice within the school. One student surmised that “student voice can be heard through activities, but no one wants to listen or has to listen to students who do not participate (in activities). A second student in this group said that “you have to be a top person- no one listens to me. A third student opined that “they don’t give us a choice, therefore we act out”.

Five other students could be grouped as those involved in school activities. They stated that the “student council is where student opinions and voice are heard. If you want it to happen, the student council works. We (in this school) are very personable, personally know the teachers well and it is hard to keep a secret in this school”. A member of this participatory group stated that “it is a lot easier (to be heard) if you are involved in lots of activities”.

The second question concerning the sense of involvement in the school community felt by students in school #3. The question also asked the students to gauge the level of care for students expressed by the teachers in the building. Twelve of the fifteen student interviewed responded positively to the expression of “caring” by teachers and to the feeling of inclusion in the overall school community. Once again, there were three dissenters in the group of fifteen students who expressed negative thoughts about the school and its teachers. Three students mentioned the importance of humor in developing a positive relationship with teachers, while the other nine

stated simply that their relationship was “cool” and that they could talk to their teachers “about anything”.

Once again, the three dissenters had quite opposite opinions. They stated that they “can have no decent conversation with teachers or they “don’t get along with them and call them names” or that they simply “cannot get through to them” (the teachers). One of the dissenters again mentioned the importance of “joking around” with students as a way to achieve a positive relationship.

The willingness of teachers to provide assistance to students was the focus of the next interview inquiry. fourteen of the fifteen of the students responded positively to the question. It was interesting to the researcher that two students stated that older teachers were more willing to help them than the younger teachers. In general, the responses indicated that students felt that “teachers make us learn; teachers made a me a better person; school taught me responsibility being on time; teachers are drawn to sports and I developed a wide range of friends in each area, teachers made me work; teachers teach you a lot of things, things that you like and don’t like and you can choose; teachers set up the fundamentals.”

Trust and respect of students was the focus of the next question in the interview. Trust seemed to be a value earned throughout your time at school #3. Five of the fifteen interviewees mentioned that seniors are trusted more and that the school has demonstrated its trust through the establishment of a senior area in the school and the fact that seniors are expected to work through their problems in the school.

Trust was also viewed as a continuum of earning the trust of the teachers and administration. A student stated that “they trust you as much as you trust them”, another stated that “if they show you respect, you show it back”. Reputation provided another basis for trust. A student said “if you are not one of the (bad) students, then you earn trust”. Another stated that “reputation is the way they know who you are”. One student stated that teachers and administrators “shouldn’t trust us. Students are shifty”.

The researcher then asked the students to identify specific classes that challenged the students ability to solve problems. The following is a listing of the responses. The responses were wide ranging in the courses that were identified, but several courses did stand out from the rest. Surprisingly English 12 and history 12 recorded the greatest number of student affirmations of a course with challenging content. Interestingly, mathematics courses were not mentioned by any students as being challenging in nature.

The following is a listing of courses identified by students as being challenging in their problem solving content and delivery. The number to the right of the course name signifies the number of students specifying a course as being challenging in the problem solving arena.

1. Psychology
2. Computer Classes- 2
3. Gym 3
4. Physics
5. Biology

6. Art
7. Music
8. Wood Shop
9. Foods
10. History 5
11. Chemistry 2
12. Personal Advancement
13. English 12

The next query asked students to identify classes or subjects that allowed for independent work and use personal knowledge and skills of interest to students. The courses identified as challenging and incorporating student skills and interests were:

1. Wood Shop – 2
2. English 12 – 3
3. AP History
4. AP Chemistry
5. Chorus – 2
6. AP Chemistry – 2
7. All senior classes – 3

The concept of “choices” provided for students as part of their normal school experience did not elicit a wide range of responses. This concept seemed quite foreign to the students of school #3. Nine of the fifteen respondents responded that the main choice that they made in their high

school was the choice of classes to take in the coming school year. A variant on the class choice subject was an additional student who spoke about choosing the local technical school. One student cited that he chose the way he wished to behave in school while a second student spoke of the choice to do homework. One student spoke about the choice to participate in activities and another spoke of choosing to speak to the administration about a matter that was serious to the student. A final student stated that she chose her friends. The concept of choice was not a very well developed component of high school #3.

Students were then queried about the overall climate of the school and whether or not rules were enforced fairly. Six of the fifteen students responded that the rules of the school were not enforced equitably. These six responded that the rules were unequally applied to the privileged (athlete and those with a good reputation) or that seniors were given more lenient treatment than other students. Nine students responded that, in their opinion, the rules were fair and equitably applied. There was clearly a divide between the students who were interviewed in their opinions about the application of rules in the school. This may be a result of the principal's belief in natural consequences for one's actions and that students earn the treatment they deserve while students in the school.

Finally, students were asked to define "success" in their school. The responses were more sophisticated than the researcher originally believed he would find. Eight of the fifteen respondents spoke of setting goals, graduating from high school, working to the best of their ability, getting the job done-no matter what, not giving up and getting it done my way. Three students spoke of getting good grades while still having fun. Not one single student expressed

success in terms of other avenues. They each expressed viewpoints grounded in a reality of success in adult terms and not in terms of adolescent fantasies of athletic success or success as a rock star.

Teacher Interviews and Observation of Classroom Practices

The researcher spent two weeks in school #3 observing mathematics classes and interviewed mathematics teachers. It was interesting to note that there were a variety of teaching styles apparent within the supposed constricted environment of a curriculum and instructional setting that emphasized model lessons, standards and common assessments. Teaching styles varied according to the personality of the individual instructors and their stated beliefs about the capabilities of their students. The responses to question #1 ranged from specific descriptions of how students solve math problems to a more florid description of the “look and feel” of the classroom.

A teacher described “student voice” in terms of explanation of the previous night’s work using the proper mathematics terminology while another teacher described student voice as the communication that appears because students “feel comfortable and ask questions”. Six mathematics teachers were interviewed and four described student voice in instructional terms. One teacher described “student voice” as a “check for understanding” and an opportunity for students “to experience speaking in mathematical terminology, to learn by explaining and to gradually improve their ability as they move from novices at the beginning to the end of the year”. A second teacher noted that student responses allowed them to move from “low level

questioning to get them engaged to higher level questions. A third teacher spoke of student reluctance to speak. She stated that “kids are quiet and reserved.....I will ask in class-they won’t talk- they have a fear of failure”.

The other teacher responses centered upon a more affective classroom approach. This teacher spoke of a creating a physical arrangement of classroom furniture that allowed for classroom instruction. This teacher accepted the concept that “every student has a different view of things and that I am as accepting as possible of all student responses. He said “ I let them know that the lines of communication are open. I am polite to all students; I respect them as individuals and as human beings”.

Positive personal relationships with students were important to the teachers in high school #3. All teachers interviewed believed that a positive personal relationship was an important component of a successful classroom environment. One teacher mentioned that small class size allowed for such an environment to exist. Another spoke of the importance of speaking to students individually before and after school. He stated that “He cannot imagine not doing that- it is a part of teaching especially in classes that I have where the ability level is diverse”. A third teacher described “each kid as special-each kid can learn- I am not their buddy. They know that I care. If they need help before or after school. They know that I care about the subject and that I want them to succeed on test so as not to let me down”(Teacher, School #3, Personal Communication, May 4,2004). A final teacher stated that, “I am honest with kids. I tell them where they are at-the total truth. My former students come back to talk and ask how my family is doing” (Teacher, School #3, personal communication, May 5, 2004).

Classroom structures that led to student success were the third point of discussion in the teacher interviews. The responses were divided along two instructional fronts. Assessment was a major factor in the structuring for student success and increased time on focused tasks was the second predominant response. One teacher did mention the inclusion of the Carnegie Cognitive Tutor mathematics software as a vital component of his instruction, but the remainder of the staff remained focused on both constant assessment and re-assessment as a major strategy or the opportunity for increased practice time for problem solving. The pre-designed pacing of the ideal lessons was mentioned as a factor in effective classroom structures. A teacher mentioned that “if I know that a large portion of the class are succeeding then there is no problem flexing time”.

Student responsibility and the development of a trusting relationship between student and teacher was the focus of the next interview question. Only two of the six teachers interviewed actually directly addressed this question. The remainder stated that trust and responsibility are either earned or demonstrated by a student’s willingness to do the work independently. Two teachers did answer the question in more detail. One teacher re-stated the question in terms of his clear expectation for his students. He stated that his students know his expectations and know “what they are responsible for”. Students are responsible for classroom assignments and also know the “results of their actions”. He stated that he dealt with students on a “case by case” basis and that he “stuck to the results of a student’s actions”. He stated that students were responsible for their behavior and that he did not permit “disrespectful actions or words”. A second teacher stated that “kids are capable of doing well and that the atmosphere here (school #3) is to reward the kid for putting forth the effort”. This teacher did not rely upon homework and stated that it

did not get done or was done in collaboration with other students. He stated that students cannot be trusted to work independently since they have access to computers and text messaging. He designed his classes so that kids demonstrate self reliance in the classroom and that he created “a time for practice in the classroom. Students are then on task and practice (the problems). He stated that this practice promoted “doing well” in the class.

The question of a challenging classroom environment that permits a student to solve problems and develop solutions brought forth a more full response to the question. One teacher stated that he “does this a lot of times and uses real numbers instead of a lot of dry statistics”. A second instructor credited the open ended question formats found on the Pennsylvania State School Assessment (PSSA) with helping teachers with the way we teach. He stated that “you have got to show them how to do the open ended questions”. Two teachers stated that the Integrated Math curriculum employed by the district provided for “a lot more application and was “rich in problem-solving”. Yet another teacher described his approach of “teaching to a topic and starting with a simple problem and leading to a more complex problem and solution. I come up with real life situations that incorporate problem solving into a bunch of different fields”.

Teachers were not unanimous in their beliefs about creative problem solving and more open ended formats. They stated that they believed that their current approach to curriculum was “too rigid” and did not allow for the degree of creativity that was possible. Two teachers decried the lack of skills in calculations demonstrated by their students and one teacher stated that “they should get rid of calculators” in order to improve basic computational math skills. This sentiment concerning the impact of calculators on a student’s ability to perform mental arithmetic was

found to be common among mathematics teachers at each school included in this study. Creativity was seen in light of one's ability to think and to problem solve independent of an over-reliance on calculators.

Five of the six teachers interviewed at high school #3 responded positively when queried about the relationship between school atmosphere and school achievement. A teacher described a cooperative atmosphere at the school. He stated that the "administration helps us tremendously. We enjoy the kids and the kids feed off one another to create a positive atmosphere". This same instructor described school spirit as low in the sense that "the kids feel that they are below average".

A second instructor reiterated the sentiment that there was a cooperative atmosphere at the school. He stated that "kids here are very supportive of each other- not back stabbers. They talk to one another – they are not isolated in cliques". He stated that he did not know if that was a tradition at the school, but that it was definitely a characteristic of the current school atmosphere. A third instructor stated that there was a "direct relationship between climate and achievement. The climate is pretty good here. There are few fights. We (the faculty) are visible all the time and involved in the sports. The majority of the kids know". Another faculty member noted that the school possessed a "great climate. All of our kids know we care. Ours (students at school #30 are needy. We all try to fill the gaps. We love to be here. Students can come to us for anything". A fifth teacher stated that the atmosphere was "orderly, thanks to Brian and John (the administrators). This instructor also stated that "The kids are finally getting the idea of the

standards and the passing of the tests. It is a combination of Brian (the vice-principal) and the standards”.

The lone dissenting instructor stated that “the environment outside the school speaks against the school. It is not positive towards the school. There are too many disruptions and not enough emphasis on academics and core courses. There is too much lost time on extra-curricular activities. This sends a message that this (education) is not the biggest priority. Your classes come first. This message must get across”.

The interviewer shifted gears and returned to an instructional question, The interviewer inquired into the strategies teachers believed to be most effective in their classroom. Teachers responded to this question citing a variety of forms of interactivity and engagement. Teachers noted real world problem solving and the importance of teacher modeling of problem solving behavior. Small group work was stressed. Small groups were described as being a format for “students being inquisitive, asking each other, coming up with solution and teacher assessing individual knowledge”. Teachers expressed the importance of prior knowledge and how prior knowledge allowed students to “do enough to get their hands-on problem solving”.

“Board work” was used as a favorite form of effective practice by several teachers. They stated that “board work” allowed students the opportunity to demonstrate their knowledge and to express themselves in mathematical terms.

A lone teacher expressed effective practice in terms of the “Madeline Hunter” model of instructional practice (Teacher, School #3, personal communication, May 5, 2004). He stated that his lessons followed the model with a warm up exercise followed by guided practice, independent practice and a closure activity. Obviously, Madeline Hunter lives!

A final interview question concerned the description of a successful student at school #3. The researcher found that the description of success was varied. A teacher described a successful student in terms of “responsibility. A student who cares about learning and wants to learn. Responsibility is many leveled. A student who desires to seek help when help is needed”.

A second teacher described success in terms of “life-long learning skills”. Students who like learning in general and who find it rewarding and fun. A third teacher spoke about the “well-rounded students who was involved in not only class work, but also activities and leadership roles”.

Three of the six mathematics teachers interviewed expressed success in very clear terms. One stated the necessity of the student realizing that “The main job is school. The student does not have another job. School is up there and the student cares about school. A student who spends time on studies and whose main focus is school, not a job.” A second teacher stated simply that the successful student is one who, “comes to school, is organized, follows directions and does homework. The final teacher in this group stated that success could be measured in terms of a GPA of 3.8 or higher, A Scholastic Aptitude Test (SAT) Score of 1250 or higher, enrollment in AP English and AP social studies and the personal attributes of kindness and honesty”.

The teachers of high school #3 were extremely cooperative and interested in the study being conducted at their school. They gave freely of their planning periods and allowed the researcher to observe classes and gave extensively of the time that was available for them to participate. The students were the next target of the research and the researcher spent two days interviewing groups of low achieving students for their impression of the academic and behavior atmosphere and practices found at high school #3. The following section contains a narrative of their responses to the student interview questions.

Data Analysis:

The researcher employed the identical instrument measuring Learner Centered Practices as defined by the American Psychological Association at school #3. The researcher used the identical processes constructed for the data analysis for case study schools #1 and #2. The clear intent was to present the reader with a similar pattern of investigation and conclusions in this section.

Table21.

Profile of students who participated in the ALCP survey - High School #3

N = 33

Total Number of student	N=33	Low Achieving = 14	High Achieving = 19
Grade Level	Grade = 12		
Gender	Female = 17	Low Achieving = 6	High Achieving = 11
	Male = 14	Low Achieving = 7	High Achieving = 7
	Unidentified	Low Achieving = 2	High Achieving = 1
Ethnicity	White = 25 Asian = 2	Black = 2 Unidentified = 3	Hispanic = 1

The researcher achieved a balance between high and low achieving students and between male and female students. Three students chose not to self identify by race while two students chose not to identify themselves by gender. The researcher did not employ other means to acquire that information. The student sample was predominantly white as was the general population of the high school

Table 22.

Profile of teachers who participated in the ALCP survey at high school #3

N =51

Number of Teachers	N=51		
Gender	Male = 23	Female = 22	Unidentified = 5
Ethnicity	Black =2	White = 43	Hispanic = 3 Unidentified =5
Years of Experience	1 to 2 = 9 11 or more= 19	3 to 5 = 9 Unidentified = 3	6 to 10 = 10

The teaching staff of the high school was almost evenly divided by gender. Most teachers identified their ethnicity as “White”. Five teachers chose not to identify themselves by race. Three members of the staff self-identified as “Hispanic”. The majority of the staff possessed 10 or less years of experience. The staff appeared to be “in transition” from a veteran staff with 11 or more years of experience to a much less experienced staff. This fact may account for the rapid development of the innovative ideas such as the yearly culminating projects, ideal lesson formats and the emphasis on student responsibility that characterized the program.

Table 23. All Students, High School #3-ALCP Survey

N= 33

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	3.04	.89	.85	3.09	.70	.88
Student Voice	2.88	.89	.74	2.97	.61	.79
Higher Order Think	2.94	.81	.69	2.90	.70	.84
Individual Differences	2.33	.94	.50	2.50	.71	.73
Self-Efficacy	2.65	.92	.54	3.05	.68	.81
Epistemic Curiosity	2.46	.96	-.215	2.75	.63	.75
Active Learning Strategies	2.80	.87	.86	2.79	.61	.80
Effort Avoidance Strategies	2.04	.96	.69	2.13	.62	.77
Task Mastery Goals	2.80	.87	.86	2.86	.72	.84
Performance Oriented Goals	2.16	.98	.79	2.37	.72	.76
Work Avoidance Goals	2.24	1.02	.79	2.31	.68	.75

The scores of all students surveyed in School #3 were not above the national mean in seven of the nine positive areas of student variables. Scores for the variables, “Higher Order Thinking Skills” (2.94 vs. 2.90) and “Active Learning Strategies” (2.80 vs. 2.79) were higher than the national mean, but not significantly. Students of School #3 did score lower than the national mean on “Effort Avoidance” (2.04 vs. 2.13) and “Work Avoidance” (2.24 vs. 2.31). Such findings can be interpreted as a positive reflection on the effort and work habits of all students at School #3.

The researcher noted that the scores of all students in this school were lower than the national mean (-.40) in the area of “Self-Efficacy”. The researcher was surprised by this finding due to the fact that he believed that the school emphasis on student responsibility and knowledge of state standards would lead to a higher than the national mean score in this variable.

The researcher was baffled by the negative test of reliability for (-.215) on the Crombach’s Alpha for the variable, “Epistemic Curiosity”. The researcher chose to disregard the results of this variable due to this negative score.

The patterns and responses of all students at School #3 did not indicate an above average tendency to be “Student-Centered”. Despite the efforts of the administration and teachers the scores did not indicate that School #3 “broke the mold” when compared with the national mean scores for the ALCP.

Table 24 Low Achieving Students, High School #3-ALCP Survey

N=14

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	2.77	.98	.85	3.09	.70	.88
Student Voice	2.50	.85	.59	2.97	.61	.79
Higher Order Think	2.78	.83	.69	2.90	.70	.84
Individual Differences	2.24	1.05	.41	2.50	.71	.73
Self-Efficacy	2.93	.91	.39	3.05	.68	.81
Epistemic Curiosity	2.46	1.01	.17	2.75	.63	.75

Active Learning Strategies	2.70	.82	.65	2.79	.61	.80
Effort Avoidance Strategies	2.23	.91	.82	2.13	.62	.77
Task Mastery Goals	2.44	.82	.87	2.86	.72	.84
Performance Oriented Goals	2.27	1.06	.85	2.37	.72	.76
Work Avoidance Goals	2.50	1.16	.88	2.31	.68	.75

Low achieving students at School #3 scored lower than the national mean on all nine of the positive student variables. A significant difference was noted for the variable, “Student Voice” (2.50 vs. 2.97). Low achieving student scores in this variable indicated that these students believed that their opinions and expressions are not being heard by teachers or the school in general. Higher mean scores in the variables of “Effort Avoidance” and “Work Avoidance” indicated that low achieving students place less effort and work into their studies than their national counterparts.

Table 25 High Achieving Students, High School #3, ALCP Survey

N=19

Student Variable	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive Relationship	3.26	.72	.82	3.09	.70	.88
Student Voice	3.20	.76	.58	2.97	.61	.79
Higher Order Think	3.08	.76	.64	2.90	.70	.84
Individual Differences	2.41	.75	.63	2.50	.71	.73
Self-Efficacy	2.91	.88	.57	3.05	.68	.81
Epistemic Curiosity	2.52	.91	.66	2.75	.63	.75
Active Learning Strategies	2.94	.73	.77	2.79	.61	.80

Effort Avoidance Strategies	1.88	.91	.49	2.13	.62	.77
Task Mastery Goals	3.10	.75	.79	2.86	.72	.84
Performance Oriented Goals	2.06	.90	.72	2.37	.72	.76
Work Avoidance Goals	2.02	.80	.32	2.31	.68	.75

High achieving students in School #3 scored higher than the national mean on five of the nine positive variables. This is in contrast to the lower than the mean scores established for low achieving students in School #3. The scores for the variables of “Student Voice” (3.20 vs. 2.97) and “Positive Relationships’ (3.26 vs. 3.09) indicated that high achieving students in School #3 viewed their relationships with teachers in the school in a positive manner.

The researcher noted that the lower than the national mean score in the variable of “Self-Efficacy” (2.91 vs. 3.05) indicated that students did not have confidence in their ability to self advocate despite the apparent emphasis on this area by the school administration. The difference between the national and school mean was -.14 and may indicate that the school is not much different than other surveyed schools in this area of emphasis.

High achieving students scored lower than the national mean in the variables of “Effort Avoidance” (1.88 vs. 2.33) and ”Work Avoidance” (2.02 vs. 2.31). These scores indicated that high achieving students do believe in a strong work ethic and do value effort as a means to success in their academic achievement.

Table 26 All Faculty High School #3- ALCP Survey**N=51**

Learner-Centered Beliefs	Mean	SD	Alpha	Nat. Mean	Nat. SD	Nat. Alpha
Positive relationship	2.83	.91	.90	3.02	.44	.85
Student Voice	3.25	.79	.84	3.20	.44	.76
Higher Order Think	3.23	.77	.84	3.08	.49	.76
Individual Differences	3.15	1.25	.29	2.92	.52	.68
Teacher Self-Efficacy	2.99	.85	.40	2.99	.50	.73
Non-LCP Beliefs @Learner	2.46	.91	.79	2.40	.50	.72
Non-LCP Beliefs@Teach	2.52	.91	.75	2.53	.43	.76
Can Influence Learning	3.28	1.04	.41	3.75	.31	.46
Adolescence Diff. Stage	3.03	.98	.77	2.74	.41	.66
Reflective Self-Awareness	2.84	.92	.85	2.96	.48	.85
Moderately Controlling	3.02	.99	.17	2.93	.38	.40
Highly Controlling	3.00	.84	.65	3.07	.43	.47
Moderate Autonomy	2.75	1.35	.05	2.51	.46	.56
High Autonomy	2.82	.74	.47	2.85	.46	.51

Teachers in School #3 scored above the national mean in seven of the fourteen variables. Teachers at this school scored at the national mean in the variable of “Teacher Self-Efficacy” and below the national mean in the remaining six variables. This presented the researcher with a mixed message concerning the influence of Learner-Centered Principles over achievement at School #3.

The scores in three variables are worth noting at this point. The researcher noted the negative difference between the national mean and the local mean of $-.47$ in the area of “Can Influence Learning” (3.28 vs. 3.75). The researcher believed this to be a significant finding that indicated teachers’ lack of confidence that they (alone) can influence learning. This may indicate the belief that other mitigating factors (family, socio-economic level, student attitude) are believed by teachers to be significant influences over achievement.

Other variable scores of interest were the $-.19$ difference between local and national mean scores in the area of positive relationships (2.83 vs. 3.02) and a higher than the national mean score in the area of “Moderately Controlling”. The difference between the local and national mean was small ($+.09$), but when viewed in combination with a lower than national mean score for Highly Controlling ($-.07$) may indicate a belief that moderate classroom control is viewed positively by the staff as an effective instructional tactic.

The researcher continued his strategy of focusing on the five variables that McCombs identified as the variable most closely associated with high student achievement. As with the other two case study sites, the researcher analyzed the data in his search for significant findings.

Table 27 All Students – Achievement Related Variables, School #3

N=33

Student Variable	Local Mean	National Mean
Positive Relationship	3.04	3.09
Student Voice	2.88	2.97
Individual Differences	2.33	2.50
Active Learning	2.80	2.79
Higher Order Thinking	3.94	2.90

Scores on four of the five focus variables identified as leading to high achievement were less than the national mean when calculated through the scores of all students surveyed for this project. Students, in general, were less positive in the belief that their teachers developed positive relationships with their students, paid attention to individual differences, provided an active learning environment when compared to the national mean scores. Students surveyed did score school #3 higher than the national mean score in the area of “higher order thinking skills” in their classrooms

Table 28 Low Achieving Students – Achievement Related Variables, School #3

N=14

Student Variable	Local Mean	National Mean
Positive Relationship	2.77	3.09
Student Voice	2.50	2.97
Individual Differences	2.24	2.50
Active Learning	2.70	2.79

Higher Order Thinking	2.78	2.90
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Low achieving students in school #2 ranked their teachers and instructional environment below the national mean on all five focus variables. The most significant negative difference between the national mean and the local mean was in the area of “student voice” (-.47). This score indicated that low achieving students believe that there is less than desirable attention placed on their opinions in the school. The variables of “Active Learning” and “Higher Order Thinking Skills” were scored by students closer to the national mean than the other three focus variables.

Table 29 High Achieving Students – Achievement Related Variables, School #3

N= 19

Student Variable	Local Mean	National Mean
Positive Relationship	3.26	3.09
Student Voice	3.20	2.97
Individual Differences	2.41	2.50
Active Learning	2.94	2.79
Higher Order Thinking	3.08	2.90

High achieving students ranked their teachers and instructional environment higher than the national mean in four of the five focus areas. The variable receiving the lowest score below the national mean was the variable of “individual differences”. The highest positive differences were found in the variables of “Student Voice” (+.23) and “Higher Order Thinking Skills” (+.18).

Table 30 All Teachers – Comparative Achievement Related Variables, School #3

N=51

Student Variable	Local Mean	National Mean
Positive Relationship	2.83	3.02
Student Voice	3.25	3.20
Individual Differences	3.15	2.92
Moderate Control	3.02	2.93
Higher Order Thinking	3.23	3.08

Teachers of school#3 ranked themselves higher than the national mean in four of the five focus areas. Once again, McCombs has discovered a tendency for teachers to self-score in the high range on the ALCP survey and to score themselves higher than student scores on similar variables. The teachers of School #3 ranked themselves lower than the national mean in the area of “Positive Relationships”. This lower score was mirrored in the low score afforded the school in this variable by all students of school #3 in the student ALCP. The researcher pondered the low teacher score in the area of “Positive Relationships” and believed that this variable deserves greater scrutiny and further study.

Conclusions

School #3 has developed a unique program based upon, state standards, the development of ideal lessons, student culminating projects reflected in an emphasis on student responsibility and ownership of their achievement.

Students in school #3 were found to be aware of the state standards. In addition, students at school #3 were required to complete projects that demonstrated student proficiency in each required standard. Students understood the process and worked in tandem with their teachers to complete their work and demonstrate their proficiency. The researcher was surprised by the low scores afforded school #3 in the areas of student self-efficacy (mean score of 2.65 for all students surveyed versus a national mean score of 3.05) combined with the school's current emphasis on student responsibility and knowledge of standards. The researcher believed that the effect of the emphasis on student responsibility and subsequent acceptance of such responsibility require a long term, sustained commitment to such programs. The current program has not been in place more than four years and may therefore have only influenced one graduating class.

Another area in question was the score for "student voice". The school appeared to present the students with many opportunities for the voicing of opinions and for student activism. The mean score for all students surveyed was .47 points less than the national mean. Interviews with staff members and administration led the researcher to believe that the ability to be heard was an earned privilege and that students earn such a "right" through their achievement and their behavior. Obviously, there existed a disparity between the scores of low achieving and high

achieving students in this variable. This disparity may be reflective of the “earned” nature of student voice in School #3.

A disparity existed between the scores of low and high achieving students in the five focus variables. High achieving students rated their teachers above the national mean in four of the five areas with the exception of “individual differences”. Low achieving students scored their teachers lower than the national mean in all five focus variables. The principal had expressed a concern about the differentiation of instruction and, perhaps, these scores indicate the recent emphasis on “exemplary lessons” and raising achievement on the PSSA rather than attention to differing learning styles and ways to address individual learning preferences. The principal noted that there was to be an emphasis on differentiated instruction in the staff development program for the 2004-2005 school year. He acknowledged the necessity of such a differentiated approach and his desire to emphasize the differentiation of instruction with his staff.

Teachers of school #3 developed exemplary lessons and common assessments for each required segment of the Pennsylvania School State Assessment. Teachers developed pre and post test formats that measured and documented student achievement on a regular basis throughout the school year. Teachers were expected to teach to the standards and to work within the common framework of the exemplary lesson format. Teachers were held accountable for achievement and seemed eager to demonstrate the success of their students. Teacher mean scores indicated self-scores above the national mean in every focus variable area with the exception of “positive relationships”. This is in contrast to many statements made by teachers during interviews about the closeness of student/faculty relationships, the small size of the school, the

uniqueness of the fostering community and the generally positive relationships within the school. The researcher pondered the possible meaning of this low score and believes that the current emphasis on standards, achievement measured by the PSSA, the delivery of “ideal lessons” and the pacing of the curriculum has led teachers to believe that positive relationships may not be a point of professional emphasis. That conclusion is in opposition to the belief fostered by Professor McCombs that “positive relationship” is one of the five focus variables leading to greater academic effort and achievement.

The leadership of the building communicated a consistent message of student and staff responsibility for achievement and was the driving force behind the development of grade level projects, exemplary lessons; assessment formats (pre and post testing) and staff development. This message of achievement and student accountability was reinforced through school district policies on the year end project required for each grade level and the proficiency levels demanded on the PSSA for graduation. Students who failed to achieve proficiency on the PSSA were required to attend remedial sessions and required to document their proficiency in each of the standards tested on the PSSA.

High school #3 was re-built upon a solid foundation that emphasized student and staff responsibility. The researcher questioned whether or not this level of achievement could be maintained without the dedication and innovative work of the building principal. He questioned whether or not the innovations developed over the past four years would diminish in importance if the principal pursued another position beyond the school district. The researcher believed that it was too early in the process to state that the changes to instruction, assessment and student

responsibility would become a significant part of the school culture. The future will hold the answer to this question.

CHAPTER VI

Purpose and Scope of the Study Re-defined

The study originally proposed by the author contained the following purpose and set of elements. The researcher found his study to be ever evolving. The concept of “Practical Research” was introduced. Such research allowed for the development of research patterns and directions as the project developed from the research phase through the actual school site visits. The researcher changed his emphasis as indicated by the experiences and knowledge acquired through the entire process. The core concept of the impact of Learner-Centered Practices remained throughout the study, but the finished product reflected the ever developing thoughts and knowledge of the researcher.

The elements of the study remained unchanged throughout the entire study; however there were changes to the methodology employed in the study. A major change was the elimination of the author created student and teacher centered surveys that focused on individualized learning and school climate. The researcher chose to use the nationally validated survey, “The Assessment of Learner-Centered Practices” provided by Professor Barbara McCombs of Denver University. The use of the ALCP provided the author with a statistically valid survey that had been employed nation-wide to gauge the depth of Learner-Centered Practice in many high schools. In addition, the use of this survey provided the author with comparative data for use in this work.

The author recognized the timely advice of his dissertation committee. Committee members questioned the employ of a school climate survey as part of the original design. This advice encouraged the author to look beyond his own resources and to seek further knowledge in the survey vehicles employed to gauge the impact of Learner-Centered Practices. The committee also recommended that the researcher change his focus from “school climate” to areas more strongly related to school achievement. This advice was timely and encouraged the researcher to investigate more validated methods of gauging the impact of Learner-Centered Practices.

Purpose of the Study Restated

The purpose of the case study was to describe the structural, instructional and student learning practices that combine to create a school environment where a large percentage of students achieve at a high level. Three high schools have been selected for the study. The investigator will focus on the actual use (or non-usage) of specific learner centered practices in the mathematics classes at those schools to develop the relationships (if any) between specific learner centered practices and student achievement.

Summary of Findings

The researcher set his sights on the discovery of relationships between Learner-Centered Practices and high student motivation and achievement. In the process, the researcher experienced firsthand the organic nature of the American high school as described by Lemke

(Lemke, 2002; Wheatley, 1999a, 1999b). Lemke portrayed change and learning through the lens of a complex living system. The researcher was led through a series of experiences that led him to understand that no one single factor can be identified as the major contributor to student achievement or motivation, but rather it was the combination of factors that led to such achievement.

Professor McCombs in her personal communication with the author in July of 2004 cautioned that Learner-Centered Practices must be seen as part of a complex interaction between the school, the teacher and the learner and that investigations into Learner-Centered Practices must be employed for reflective purposes and as part of a metacognitive approach to the complex subject of human learning. Therefore, the findings of the study reflect the complexity of human learning and human relationships between the institutions we call “school”, the teachers and the students. The researcher recognized that the relationships of schooling extend beyond the school and its administrators, teachers and students, but these extended relationships (parents, community, state and nation) are beyond the scope of the study.

Each case study high school possessed its own unique approach to the development and maintenance of high student motivation and achievement. Despite these unique characteristics each school was “standards driven” in that each institution was directly influenced by the development of state standards. These standards became the focus of classroom instruction as well as a final gauge of success according to state mandated testing.

The Ohio site school placed great emphasis on achievement according to the ever evolving testing prescribed by the State of Ohio. The newly created Ohio Graduation Test was viewed with some consternation due to its recent development and the fact that teachers believed that the new test was less valid than the previous Ohio Tests of Basic Skills. The existence of the position of “Standards Coordinator” at each level of the school district (elementary, middle and high school) whose job description included matching instruction to standards and the development of pre and post test assessments belied the importance of a standards driven approach to instruction.

The site school located near a small city east of Pittsburgh had experienced high test scores in mathematics over several years and attributed this achievement to an emphasis on the standards as well as to consistency in instruction through a long term commitment to staff development focused on standards and “best practices”. This district committed to long term, consistent staff development through the position of a “Director of Staff Development” who coordinated curricular and instructional approaches closely tied to state standards.

The urban fringe site school near Pittsburgh had modeled its instruction according to “ideal lesson formats” that emphasized the standards and had encouraged students to claim ownership of the standards through the development of year long culminating projects. The driving force behind these standards driven approaches was the high school principal. The task of maintaining these programs has become more difficult due to the recent re-assignment of the previous vice-principal to the elementary building and the replacement of the vice-principal with a “Dean of Students”. The Dean of Students does not have instructional responsibilities and focuses solely

on student behavior issues and cannot assist the principal in the maintenance of these standards based programs.

Discussion of the Elements of the Study

What are the unique structural and operational characteristics of the schools identified as having made changes that positively impact student achievement?

The site school located in Ohio brought to fruition the concept that “one program does not suit every student”. The principal stated during the interview phase of the research that their approach was to personalize the educational experiences of 9th and 10th grade students and to develop programs that suit the educational and job related aspirations of 11th and 12th grade students. The school is divided into two “academies”, the Preparatory Academy for incoming and sophomore students and the Graduation Academy for junior and senior students. The Graduation Academy is itself divided into four component parts:

- 1) Community College Preparatory – for students aspiring to associate degrees
- 2) Career Center – for vocationally oriented students
- 3) Trailblazer – an alternative school program
- 4) University Prep – for students wishing to enter the four year university

In addition, each section of the Graduation Academy operates on its own time schedule. Students can choose from a traditional eight period day or a four by four block schedule or a combination of block and traditional in the University Prep section. Students in the Community College Prep classes are allotted a three hour portion of the day for flexible scheduling according to the instructional needs of students. This schedule is controlled by the teachers assigned to the

Community College Preparatory program. Students can then schedule the remainder of the day in block of traditionally scheduled electives.

Trailblazer students attend either morning, afternoon, full day or evening sessions depending upon their unique situations. Students in the Trailblazer program can schedule classes in the larger school and students flow from one main school building to the alternative program located on school grounds. Students enrolled in the Career Center program attend ½ day on site and ½ day off site at a shared (other districts) vocational school setting.

All students are held accountable to the same standards and are assessed according to the common assessments (pre and post tests) developed for each course. All students must pass the Ohio Graduation Test (OGT) or prove competency through an alternative formats described previously in this text.

Case Study School #2 is characterized by three elements in its instructional program. The first element is the long-term implementation and refinement of four by four block scheduling. This form of scheduling allows students to accelerate their learning according to their particular talents and personal motivation. Students can complete as many as eight mathematics courses in their four years at the high school. The schedule also permits the remediation of students who experience difficulty at a particular level of instruction. Uniquely, a student can continue his/her studies onto a more advanced level once the course is repeated for remedial purposes.

The second element is a long term commitment to the Chicago Mathematics approach to curriculum and instruction. This series allows for the introduction of multiple mathematics topics in each course and the building of increasing levels of skill in each topical area. Students address each topical area in every course on an increasingly sophisticated level and, at minimum, attain an introductory skill level previous to the administration of the Pennsylvania State School Assessment (PSSA) during the junior year of high school. Students matriculating through a more traditional approach to mathematics may never be exposed to the basic tenets of trigonometry or statistics and may never have been exposed to any math topics beyond basic geometry by their junior year.

The Chicago Mathematics approach guarantees that each student is exposed to the major math topics by the time of the junior year PSSA test. This exposure is not only guaranteed by the employment of the Chicago Mathematics series but also through the use of block scheduling that permits the exposure to major math topics by the junior year. A student could complete five full mathematics courses and be participating in a sixth course by the spring of the junior year.

A long term commitment to staff development is the third component of the successful program found at Case Study School #2. There has been no change in the position of school superintendent, high school principal, vice-principal and Director of Staff Development. This consistency of leadership combined with a consistent message of achievement coupled with practical and effective program implementation in the area of mathematics allowed School #2 to boast of high achievement.

School #2 was not as unique and innovative as Case Study School #1, yet accomplished the goal of high achievement through a different approach. Consistency of message, consistency of leadership, and consistency of program seemed to be the hallmarks of achievement for School #2.

Case Study School #3 was unique in its approach to student accountability. Students in School #3 were held accountable to know and develop competency in the standards as defined by the State of Pennsylvania. Students were provided the mentorship to develop their competency and knowledge by an administration/faculty committee. Students were required to create a yearly culminating project that consisted of an Individualized Learning Plan (ILP) and proof of grade level competency based upon state standards. The plan is constantly being revised by the school principal based upon faculty suggestions and the feedback provided by students as they matriculate through the high school program. Uniquely, students at School #3 were able to verbally express their understanding of the standards in mathematics and understood their responsibilities in the achievement of the standards.

Teachers in mathematics committed to the development of a series of standards based “ideal lessons”. The lessons formed the backbone of the Chicago Mathematics curriculum and every teacher was expected to teach the “ideal lesson” format when applicable. The use of the Chicago Mathematics Curriculum, while not unique to this school, did provide students the opportunity for exposure to a variety of mathematics topics previous to the junior year administration of the PSSA test. The school operated under a traditional eight period day, yet students achieved at an ever higher level in mathematics.

Teachers at School #3 also developed a series of standards based pre and post assessments for each grade level in mathematics. The involvement and excitement of the teaching staff in the development of these lessons and assessments was a unique feature. The department head and another teacher became instrumental in the development of the assessments and ideal lessons. The unique feature at School #3 was that the teachers did not “fear” being identified as teachers involved in the instructional improvement process. The researcher concluded that the academic culture developed by the principal at the school allowed such teachers to come forth and take an active role in their professional lives with the encouragement of their fellow teachers. Teachers stated their commitment to student success and their personal excitement for the process.

What learner centered practices are identifiable in the instructional practices of teacher of mathematics at the three high schools?

The researcher in his original description of Learner-Centered Practice stated that he would search for the following characteristics:

- 1) A school and classroom environment that allows for the development of positive personal relationships, a caring school and classroom environment.
- 2) A school and classroom environment that allows for and respects “student voice”.
- 3) The presence of metacognitive, problem solving and student self regulating instructional practices.
- 4) The presence of specific adaptations to the learning styles, cultures, social backgrounds and developmental differences of students.

The researcher believed that high achieving high schools would be identified by the four characteristics states above. The researcher was able to locate instances of each of the four characteristics in every case study school, but he believed that only in Case Study School #1 could he find planned, deliberate implementations of the four characteristics. Case Study School #1 planned for and implemented a caring school and classroom environment through its development of the “Preparatory Academy” for 9th and 10th grade students as well as with its “Graduation Academy” customized to meet the needs of a variety of students. These academies allowed for a smooth transition from middle school to high school and for an ever-increasing range of future oriented choices for juniors and seniors. Flexible scheduling permitted the creation of different academic environments within the school while holding students accountable through state standards, common assessments and state mandated assessments of competency previous to graduation. The academy approach not only allowed for a caring atmosphere to develop, but also led to specific adaptations to suit a student’s background, learning style and social background.

Student voice was fostered through a monthly meeting of the Student Advisory Committee. This committee meets on a monthly basis with the principal to discuss problems. The principal remarked to the researcher that this past year has been “so smooth” that the committee no longer meets because there are no items on the agenda for discussion. It is worthy to note that there exists a monthly meeting with the superintendent attended by randomly selected students to discuss the operation and climate of the district. This meeting is yet another avenue for student voice. Finally, surveys are sent to all parents, community members and students to gauge their

satisfaction with the schools. Results of the surveys as well as reviews of student achievement are reviewed during the yearly administrative retreat. Finally, students find their voice as members of one of the four Graduation Academies. These smaller entities that exist within the larger school unit allow for the development of student voice and the dissolution of student anonymity.

Achievement at School #1 is definitely an expectation. Faculty members spoke often of a “tradition of academic excellence” and that “failure is not an option”. Programs exist at all levels that allow students to achieve at a high level. A unique assessment was the administration of the Nelson-Denny Test of Reading Skills. This test was given to all students in grades 1-11 with the expectation that all students must demonstrate a year’s improvement in reading skills for a year of schooling. Expectations for ever-improved achievement were apparent in the expectations, attitudes and operation of the Case Study School #1.

Case Study Schools #2 and #3 each possessed elements of Learner-Centered Practices, but not to the degree apparent in Case Study School #1. Case Study School #2 allowed for metacognitive and higher order thinking processes through its use of block scheduling and the ability of students to enroll in ever increasingly sophisticated levels of courses. Block scheduling also permitted longer class sessions (90 minutes).

Teachers noted that there was time in their instructional day to develop a better relationship with their students and that teachers deliberately designed lessons that took advantage of the opportunity for cooperative work and subject related socialization. Differentiated instructional

techniques accommodated for different learning styles, but formal structures to address cultural differences, social backgrounds or developmental differences were not apparent to the researcher. It was obvious that the emphasis on work groups, “study buddies”, and cooperative learning techniques were the result of intensive and long term staff development conducted by the district.

Students of Case Study School #2 were asked specifically about formal structures that allowed for the student voice. Students did not express an awareness of formal channels that allowed for student voice at School #2. Students did note that certain teachers did allow them to express their opinions especially in social studies, but such expressions were limited to specific teachers.

Case Study School #3 demonstrated awareness and program development in two of the four focus areas of Learner-Centered Practice. Student self-regulating practices were most identifiable at School #3. Students were expected to not only know and understand the standards but also to produce evidence of accomplishment of each standard. Socially, senior students were provided areas of privilege and responsibility. The most visible area being the “senior Courtyard” found in the main lobby of the building. Seniors were responsible for the area and took responsibility for the care, maintenance and upkeep of the senior court.

A caring school environment was possible given the relatively small size of the high school student body (600+students) and the creation of the Individualized Learning Plan Council that

provided students with guidance towards their academic and career goals. This is in keeping with Glasser's belief (1990) that schools should be built upon positive social relationships.

Students did mention in the interview process that student voice could be heard through the student council. Students also expressed the belief that a student's reputation and behavior prevented their voices from being heard. Teachers and the principal expressed the belief that student voice can be heard and legitimized only if the student behaves properly and lived up to his/her responsibility as a student. The researcher noted that this attitude reflected a belief that student voice is dependant upon the natural consequences of a student's actions. A student who takes responsibility for his/her actions will be heard while those less responsible will not be allowed a forum for their opinions.

The use of formal learning style inventories were not apparent to the researcher either through observation or interviews conducted with teachers or administrators. Pre and post test formats were frequently employed to assess student progress. Higher order thinking skills were stressed in the upper levels of mathematics class while the less skilled students worked with a teacher who expressed the belief that his students needed "the basics" and "consistency in instruction". There was little student interaction or involvement in less advanced math classes observed by the researcher.

The school was not organized along developmental lines. Students from the junior and senior high school mingled in the hallways and there was no formal effort to separate the junior high school students from the senior high students. Junior high students did not enroll in senior high

school courses not were senior high students enrolled in junior high courses. The researcher did not observe any negative interactions between the two developmental groupings.

What data are used to define and monitor achievement at the three selected schools?

The “gold standard” for achievement at Case Study School #1 was the previously administered Ohio Test of Basic Skills and the current adaptation, the Ohio Graduation Test. The principal noted that the variety of programs in existence in Case Study School #1 allowed everyone the chance for success and that this plethora of programs was the reason for the success of the school and its subsequent identification by the State of Ohio as an Ohio School of Excellence and Achievement.

Case Study School #1 has been rated by the Ohio Department of Education as an “Excellent” school that has met all seven of the indicators of school performance. The excellent rating dated to 2000-2001 school year. The school exceeded all areas of ninth grade proficiency. The high school scored a minimum of 7.7% above the state requirement for ninth grade proficiency in the areas of citizenship, mathematics, readings, writing and science. Attendance for the high school during the 2003-2004 school year was 96.2% compared to a state requirement of 93%. Student scores for the high school indicated a math proficiency rate of 84% with a state goal of 52%. Scores in reading were at the 92% proficiency rating with a state goal of 66.2%. The graduation rate was 94.4% compared to a state goal target of 73.6%.

The common student achievement data system required by the state allowed the school instant access to additional achievement data for each student. The Vice-Principal demonstrated the power of the system by generating an achievement report for every student in the senior class. This “student profile” contained information concerning student grades for all courses taken, attendance and all standardized test scores by grade level when administered. All information was readily available in preformatted reports through Schoolnet.Com™.

Case Study Schools #2 and #3 were less sophisticated in their approach. Neither school possessed a comprehensive data system. Case Study School #2 commented that they were hampered by the cooperative relationship that existed between the school district and the local intermediate unit. All data and subsequent request for reports are sent through the intermediate unit and the quality of data services was mentioned by teachers as a concern. Case Study School #2 does emphasize the results of the PSSA as a gauge of student success. Student test scores in mathematics on the PSSA have been beyond the band for similar schools consistently over the past several years. Student achievement in general was broadly defined as anything that students successfully participate in. There was an emphasis on the education of the whole student in Case Study School #2 that included academic and as well personal interest achievements.

Case Study School #3 clearly noted its improvement on the PSSA as a major measure of success. PSSA test scores have risen in the past consistently over the past two years. The principal maintains a very visible chart in his office that illustrates the path towards 100% proficiency on the state exam. Classroom assessments are standards based and pre and post test gauge student achievement towards achievement of the standards. The principal embraced the

concept of state standards and the PSSA testing when he claimed that the standards and the test provide his students with a “level playing field” for comparing their achievement with the other high schools in the state.

The school operates a sophisticated information system (SASI XP™) that allows for customized reports according queries developed for all existing data fields. Information on student achievement is available on demand according to the “need to know” permissions permitted by the information system.

What are the patterns and responses of low achieving students at the three high schools to the:

- a. structural and operational practices**
- b. instructional practices**
- c. learner-centered practices**

The researcher interviewed low achieving students at each high school in order to discover the impact of the practices believed to foster high achievement. In addition, low achieving students completed the student version of the Assessment of Learner Centered Practices (ALCP).

There existed a great divide between the low opinions and scores of the low achieving students enrolled in Case Study Schools #2 and #3 and those enrolled in Case Study School #1. Students in school #1 spoke highly of all aspects of their school experience. They were positive about the program and its teachers and had well developed post secondary school plans. These

students were able to describe their academic and personal deficiencies and how the program and its teachers had assisted them in overcoming their difficulties. They spoke with confidence of their future.

Scores of low achieving students of School #1 exceeded the national mean in every achievement related category. Scores in the variables of personal relationships and attention to individual differences were significantly above the national mean for the ALCP.

The scores of low achieving students of Case Study Schools #2 and #3 were below the national mean in all five of the achievement related variables. Student Ratings concerning personal relationships and attention to individual differences were mixed as were the opinions about the school programs and teachers. Students from these two schools did not express well developed post secondary plans. These students believed their schools to be “good not great”.

Clearly, low achieving students at school #1 had been positively impacted by the program and teachers of the alternative school program housed within the high school. The scores recorded for these students indicated that their high school experience had led them to become more successful students with a vision of a successful adult life. Low achieving students of school#2 and #3 had less positive viewpoints about the programs and teachers of their respective schools and expressed less well developed and positive views of their future adult lives.

What are the patterns and responses of mathematics teachers at the three high schools to:

a. structural and operational practices

b. instructional practices

c. learner-centered practices

The researcher spent considerable time in the interview process with classroom teachers of the mathematics department of each school. In addition, the researcher observed classes conducted by mathematics teachers at all levels. The concept was to attempt to match the responses to interview questions with actual classroom practices. The researcher realized early in the process that it would be difficult to obtain a realistic and accurate appraisal of opinion with practice during the limited time at the schools, but the observation did allow the interviewer to attach a name and a face to an opinion.

The researcher believed that mathematics teachers would be more concrete, more results driven and less ebullient in their description of the schools programs and climate. The researcher acknowledged that he may have succumbed to a stereotypical image of the mathematics teacher, but the researcher did believe that teachers of mathematics would be able to provide the researcher with a clear, concise snapshot of school operation and climate. In addition, the researcher acknowledged the relationships between Learner-Centered Practices and the work of Romberg that emphasized the importance of personal relationships and the ability to express oneself in the language of mathematics (Mathematizing). This concept is related to the Learner-Centered Principle of student voice. The researcher conjectured that if he could find Learner-Centered Practices in mathematics, then he would find Learner-Centered Practices throughout the school building.

Teachers, in general with a few exceptions, in each of the three school settings were positive about the structures and operational practices found in their buildings. Teachers in Case Study School #1 noted that the diversity of programs provided “something for everyone”. They praised the administration for their visibility and for their overall handling of behavioral issues. They liked the employment of the “tardy table” and its impact on student behavior and class attendance.

Teachers in Case Study School #2 attributed the orderly school climate to the less frequent disruptions found in block scheduling. They noted that block scheduling was an “administrator’s dream”. They also gave the administration credit for handling behavioral issues well. “The guys do a good job”.

Teachers of School #1 and #2 expressed concern about a decline in the overall behavior of students. Both groups stated that there was a need to tighten up the instructional environment. Teachers in School #2 expressed dismay about the behavior of younger students at the high school. This dismay was also noted by students during the interview process when students were asked a question similar to that asked of teachers.

Teachers in School #3 were positive about the structures and operational practices found at the school. They stated that the two principals did a good job and that students were finally accepting responsibility for their work and achievement. The standards movement was viewed in a positive light especially when faculty members addressed the concept of student responsibility.

Overall, teachers at all three schools had a positive view of the structures and operational practices found in their institutions. A minority did express grave concerns about student behavior especially among the 9th and 10th grade students. Teachers believed that the climate of their building contributed to the high achievement apparent at the school. There were notes of caution, but in general, the overall evaluation was positive.

Instructional practices were as varied as were the teachers despite similarities in curriculum (all employed the Chicago Mathematics Approach). Teachers at all three schools praised the curriculum for its creative problem solving approaches and its emphasis on many solutions to each problem. Teachers of mathematics were universal in their condemnation of the use of calculators. Math teachers expressed the viewpoint that calculators had diminished the computational skills of their students. Furthermore, teachers stated that the curriculum was filled with higher order thinking skills, but lacked an emphasis on basic math facts. “Real world” problems were emphasized and students were motivated by such an approach. They wished a more balanced approach in order to remediate what they believed were basic skill deficiencies.

Teachers in all three schools practiced a variety of forms of Learner-Centered Practices, but not necessarily on a deliberate level. They responded positively to inquiries about specific learner-centered practices such as the creation of positive relationships, allowances for “student voice” within the social setting of the classroom and within the subject matter (mathematizing), but were unaware of the body of research that defined Learner-Centered Practices. The researcher found instances of learner-centered practice throughout every school and in math classes, but not because there was a confirmed (with teachers) relationship between such

practices and achievement, but rather because teacher believed that such practices were simply the hallmark of “good teaching”. Positive personal relationships and the development of a “caring environment” were seen as positive characteristics of each of the three schools. Teachers posted pictures, developed personal interest surveys, structured their classrooms for improved communication, took time to speak with students about their interests and strongly believed that they acted in such a way so as to foster strong personal ties with their students. The principal of Case Study School #1 addressed the issue by stating that it was very important that teachers show a strong interest in the lives and activities of their students and that a visible presence in the lives of students was a positive attribute of his school.

Student voice actually took two forms in all three schools. One form was what Romberg would call “mathematizing”, that is, speaking and explaining using the terminology and vocabulary specific to mathematics to solve problems or explain problem solving strategies. Teachers noted that there were many solutions to an individual problem and that the real test of understanding was to explain the problem and the solution using the language of mathematics. Classrooms were purposely structured so that group work could be fostered and students were seen working in pairs, in groups of four and sharing their knowledge with the wider class. Two teachers in two separate schools believed in the traditional format of stating the problem, solve the problem and finally solve another problem. This traditional strategy certainly was not the norm at the three case study schools.

Interestingly, teachers in all three schools were unanimous in their belief that the traditional concept of homework was no longer an effective measure of student understanding. Cell phones,

e-mail and text messaging had transformed individual homework into a collaborative effort with unlimited numbers of contributors. This electronic communication has become a unique form of “student voice” that has had a great impact on a traditional teacher practice. Teachers have sought new methods of gauging student understanding. Teachers have employed individual portfolios, centered all instructional activities within the classroom and even have gone so far as to develop a series of oral exams to grade student understanding. Homework, in the traditional sense, has been generally abandoned as an effective means of independent practice and individualized learning.

Student voice was heard in classrooms that allowed for socialization. Teachers saw themselves as “listeners” as well as “speakers”. They expressed the opinion that they could learn as much from listening to student conversation as they could from being the locus of all verbal communication. There was little formality to this form of student voice. The researcher observed little formal, pre-designed forms of communication between teacher and student, but did experience many, many instances of informal communication. Several teachers noted the importance of a sense of humor when working with teenagers and believed that teachers could grab the attention of their students by being outrageous at times or by being “hugely sarcastic”. Students also expressed a preference for the humorous teacher and noted that teachers could be humorous with students as long as the humor did not become demeaning to students.

The Chicago Math curriculum employed at all three schools emphasized the metacognitive aspects of mathematics and placed a great emphasis on the development and expression of problem solving skills. Classrooms were still largely teacher controlled in all three schools.

There were exceptions to this control, but the researcher observed little opportunity for student self-regulating instructional practices. Portfolios in one classroom were a form of self-regulation, but in general the teacher was in control and the center of attention in most classes observed.

The researcher did not observe teacher use of formal learning style inventories, but did observe adaptations to classroom practice to suit a variety of learning styles. Classroom teachers in Case Study School #2 employed a variety of instructional techniques throughout the 90 minute classroom period. The researcher observed limited adaptations to the culture, social backgrounds and developmental differences of students in each of the three schools. Case Study School #1 seemed most involved in the creation of learning environments to suit the learner and did indeed boast that the program was to tailor instruction to the learner not force the learner to accept a specific instructional style. Differentiation of instruction was a topic of discussion with all school administrators and the focus of staff development efforts.

A review of the achievement related variables gleaned from the teacher ALCP surveys (Tables #9, #21, #31) indicated that teachers of all three schools scored themselves above the national mean on every variable with the exception of “Moderate Classroom Control” and “Positive Personal Relationships”.

Scores for the variable, Moderate Classroom Control, were low for teachers in Case Study Schools #1 and #2. This may indicate the preference by teachers in these schools to be seen as exhibiting a high degree of classroom control. This high degree of classroom control was observed by the researcher during his time at these schools. Scores for the variable, “Positive

Personal Relationships” were lower than the national mean for teachers in Case Study School #3. The researcher did not observe any lack of positive relationships with students at this school, nor did relationships seem to be a concern expressed by the faculty during the interview period.

What are the relationships between the patterns and responses of both teachers and students at the three high schools to the:

- a. structural and operational practices**
- b. instructional practices**
- c. learner-centered practices**

The researcher observed a wide range of structural and operational practices (flexible scheduling, groupings, common assessments etc.) in each school. Most certainly, each school possessed a unique approach to student achievement and the development of an instructional environment that fostered high achievement. The Researcher has previously reviewed these approaches and will comment further on this area in his conclusion. The researcher believed that the high achievement results of these schools indicated that these practices were contributing factors towards success in these target schools.

Instructional practices observed in each school did not appear to be unique to the schools, but rather found in schools throughout the nation. Instruction was, for the majority of classes observed, teacher centered and directed. Curricular materials allowed for the introduction of higher order thinking skills and creative problem solving activities. Students in all three schools were engaged with the exception of a small minority of classes that were structured along

traditional lines. In these classes, the teacher stated the problem, demonstrated a solution and directed the students to solve a similar problem. The students in these classes seemed “bored” and disengaged. The observer believed that a significant number of students in these classes did not appear to be involved in the subject, nor well versed in expressing solutions.

Instructional approaches to the less talented math students ranged from the very creative as observed in Case Study School #1 to classrooms where the instructional emphasis seemed to be control of student behavior as found in Case Study School #2. The disengaged, traditionally managed classroom did not appear to present behavioral issues in Case Study School #3, but the researcher observed less evidence of learning in this class.

Case Study School #1 had developed a variety of approaches to address the needs of a diverse student body. The students, in turn, seemed to appreciate the efforts on their behalf and responded positively as evidenced by the extremely high achievement rates of the school. Case Study School #1 did pay specific attention to the differing developmental needs of younger and older high school students. The effectiveness of these programs was questioned by faculty members in the mathematics department as they expressed concern about the behavior of younger students in the building. This concern was echoed by senior year students (low achieving) during the student interview phase of the research.

Case Study School #3 has less well developed programs that illustrated concern for developmental differences and social backgrounds. Case Study School #3 was the only junior/senior high school included in the study. In addition, the student body did not contain as

diverse a range of social and cultural backgrounds. The students of Case Study School #3 were derived from a rather small geographic area with a lower middle class to working class tradition and income range.

Despite differences in program, all three schools perceived themselves as achieving their goals and moving positively towards the future.

Conclusions

The researcher has reviewed the research concerning school reform, personalized instruction, Learner-Centered Practices, student engagement, effective practices in the teaching of mathematics concepts and the impact of teachers and teaching styles on student achievement. The researcher has visited urban fringe three high schools, interviewed, observed and surveyed teachers, administrators and low achieving students and analyzed data from a variety of sources. The researcher has compared his findings with his own personal experiences and has developed a set of conclusions based upon almost two years of research, visitations and contemplation. The researcher will attempt to state clearly and in a concise manner the findings of this experiential and academic journey.

There is evidence that Case Study School #1 has developed a series of programs that address the needs of a wide spectrum of students and that students in all programs achieve at a high level. Achievement data collected from the mandated “report cards” indicate that a high percentage of students at Case Study School #1 achieve proficiency in math, reading and writing. The recognition of this achievement by the Ohio Department of Education is but one indicator of the success of the school and its students.

The alternative school program developed by the district has led to a high graduation and proficiency rate amongst non-traditional students who, in a more traditional setting, would be characterized as “disengaged, inattentive, exert little effort, fail to complete tasks and claim to be bored” (Marks, 2000). Interviews with alternative school students, observation of actual

classroom instruction and results of the Student Assessment of Learner-Centered Practices (ALCP) all indicate that the alternative school students achieve at a high rate, are engaged in learning, expressive of future educational and vocational plans and proud of their accomplishments. These students rated achievement related variables above the national mean on all factors, most notably on the variables of “Positive Personal Relationships” and attention to “Individual Differences”.

This specialized program comprised of standards based assessments common to all high school students at Case Study School #1, smaller more personalized instructional settings, flexible scheduling, personal coaching and advisement, combined with a personalized educational plan can be seen as an example of an effective educational program that truly impact large numbers of students.

The “Academy” structure of the school allowed for the successful transition of students from the middle school to the high school program and permitted junior and senior students to choose settings appropriate to their future educational and career goals. Case Study School #1 most closely resembled Fullan’s belief that educators should create the kinds of caring learning communities that support all learners (Fullan, 1997, 2000).

The total school program is bolstered by a “tradition of excellence” that pervades the faculty and student body. It is evident that this successful program built upon the principle that “one program does not fill the needs all students” contained many elements that should be considered in the creation of a high performance school.

All three schools deliberately developed programs that contained several or all of the elements of personalized instruction as described by Jenkins and Keefe (2000). Case Study School #3 created personalized learning plans and year-end culminating projects at each grade level. This program was similar to the program found at Thomas Haney Education Center in Canada mentioned in the research phase of this project (Jenkins & Keefe, 2000).

Differing degrees of flexible scheduling and pacing were found to exist in Case Study Schools #1 and #2. Case Study School #1 development of hybrid forms of block scheduling created an educational environment where the needs of the students are reflected in the flexible scheduling patterns of the school. Interestingly, the variety of scheduling patterns does not appear to exclude students from participation across programs within certain limitations. Alternative school students can and do enroll in the main school program as do members of the other academies. Despite the ability to cross-register from program to program, students of the alternative school still believed themselves to be stereotyped as members of the “stupid school” and as different from the other more traditional students.

Case Study School #2 employed a 4 by 4 block schedule that allowed for and required students to enroll in an increased number of courses when compared to the traditional high school. This form of scheduling also permitted the acceleration of learning as students were able to enroll in an increased number of advanced subject specific courses.

The schedules of both schools allowed teachers ample time for collegial planning as well as time for advisement, academic and behavioral coaching and the administration of a variety of authentic assessment formats. Davidson and Phelen (1999) identified two styles of teacher behavior that are effective and important to students. They were:

- 1) Learning about student's life after school
- 2) Speaking to students on a regular basis about their academic achievement

Both of these characteristics were accommodated for and fostered at Case Study Schools #1 and #2.

All three schools were strongly "standards based" and had developed either "ideal Lessons" or common assessments to monitor continual student improvement according to the established standards. Clearly, standards and assessment guided instruction in each of the case study schools. Fullan (1999) stated that "assessment is the coherence maker". This coherence was observable and tangible in each of the three schools.

The researcher also uncovered disturbing evidence of effort avoidance and work avoidance after the analysis of the survey data elicited from high achieving students at Case Study School #1. The tendency for these high achieving students to avoid effort and avoid work was a confirmation of the complaints heard from advanced placement teachers about the motivation and drive of their students. Equally troubling was the evidence that indicated that low achieving students of Case Study School #2 and #3 rated their teachers lower than the national mean for achievement related variables. It could be said that the most negative opinions about students were spoken by the teachers of the low achievers in Case Study Schools #2 and #3. In addition,

observations of those two classrooms indicated that instruction was divided into three parts: a review, a presentation of new material and a period of individualized study or student/teacher collaboration on problem solving. Weller (1991) characterized this pattern as the “rhythm of instruction”. Romberg (1997) stated that coverage of material rather than learning formed the criterion for American schools in the past and reminded a powerful force in today’s classroom. There was a tendency towards this “rhythm of instruction” in the low achieving mathematics classrooms found in Case Study Schools #2 and #3.

Each case study school attempted in its own unique way to foster higher student achievement. Case Study School #1 was most certainly the most innovative, most student centered and most high performing of all of the school studied. The school created programs to meet the needs of students and not to meet the content coverage needs of the curriculum. The creation of such a need fulfilling environment allowed the teachers and students to perform and achieve at a high level. This was most apparent in the achievement and graduation rates of low achieving students. Obviously, the school had made a difference in their lives. The author believed that the success of the building can be found six elements of personalized instruction described by Jenkins and Keefe (2000). Case Study School #1 has developed a program of personalized education that fosters a climate of high achievement and a “tradition of excellence”.

Case Study School #2 could be characterized as a high achieving school that fosters acceleration and intensification of learning through structural components such as the employment of 4 by 4 block scheduling and long term staff development. School #2 possessed the luxury of consistent, long term leadership at the level of superintendent and high school

principal. This resulted in yet another example of a pervasive philosophy that the mission of the school was to foster higher achievement in every possible way for its students. Teachers and administrators spoke of achievement through effort over time and the results of this commitment to achievement were obvious. Case Study School #2 did not appear to be as successful with raising the expectations and confidence of low achieving students as with Case Study School #1, but it was apparent that high achievement was an expectation and a possibility for the general school population. Effective structural implementations, targeted staff development, consistent philosophy and long term committed leadership were the highlights of Case Study School #2.

The building level leadership of Case Study School #3 had fostered the development of programs based upon a strong commitment to standards and assessment as well as the creation of a philosophy of accountability. Students were held accountable for knowing and understanding the academic standards. Students were not only accountable for the understanding and knowledge of the standards but were also accountable for the production and organization of the evidence of competence and proficiency. Year end culminating projects were the stepping stones towards graduation and proficiency on the state assessments.

Teachers were held accountable for the achievement of students. Teachers developed common assessment in pre and post test formats and created ideal lessons that became the basis of assessment and proficiency. Teachers, counselors and administrators served as mentors for students in the development of individualized learning plans. Student input and suggestions from the professional staff have enabled the school to revise and improve the individualized learning plans for the students of the school. Strong administrative leadership, staff participation, an

emphasis on student accountability and the existence of a strong mentorship (for students) program were characteristics of this high performing school.

The title of this project contained the question, “Are Learner-Centered Practices the Difference?” My answer to that question is a qualified “NO”. Learner-centered practices did not appear to be the crucial difference between these high achieving urban fringe schools and less high achieving schools on the urban fringe. Learner-centered practices did appear to be a significant factor in the achievement of students who do not respond positively to the traditional school environment. In a world where no child should be left behind it seems very important that we, as educators, seek methods and attitudes that reach every child and unlock their personal potential. Knowledge of and reflection on Learner-Centered Practices can lead to a better understanding of what it will take to leave no child behind.

The researcher often found instances and occurrences of learner-centered practices in existence in each school. The existence of such learner-centered practice was often due to personal teaching style and not because the instructor designed learner-centered practices into their lessons. Teachers professed a lack of knowledge when questioned about learner-centered practices, but were able to provide examples of specific strategies or personal approaches that illustrated specific learner-centered principles. Therefore it is not possible to state that Learner-Centered Practices were the defining difference between these high performing schools and their lesser performing peers. Structural components, more closely related to the concept of personalized instruction as described by Jenkins and Keefe (2000), appeared to the researcher to be the actual major contributors to improved student achievement. Learner-Centered Practices

are fostered in the types of educational environments that were researched in this work. The researcher has now come to believe that Professor McCombs was correct when she stated that Learner-Centered Practice is a means of reflection for teachers. Teachers must see their practice as a series of relationships that must be understood and pondered in order to improve student achievement. An understanding of and reflection upon Learner-Centered Practices can assist teachers in their quest to understand the complexities of the relationships that we call “school”.

Recommendations for Further Research

The researcher has reviewed the entire process that he pursued in order to develop his thesis. This review has been rich in detail and in content. The researcher believes that his studies have implications for further research.

A major focus of further research and study would be in area of teacher reflection on Learner-Centered Practices. What changes occur in classroom practice when the classroom teacher engages in a process of reflection based upon Learner-Centeredness? What changes occur in the classroom practice when the teacher reflects upon the results of the student version of the Assessment of Learner-Centered Practices Survey? What changes result in classroom practices when entire departments or faculties choose to participate in the teacher and student versions of the ALCP survey and share the results of the survey? What is the impact of a reflective atmosphere in a school when the ALCP surveys are imbedded in staff development efforts? A fertile area would be the development of an instrument that would measure the emotional and motivational responses of teachers in such a reflective atmosphere? Do teachers respond

positively to such an approach or would they view such activities as impractical and unrelated to the day to day operation of the classroom? The author believes strongly that there is a rich source of research and further study in the study of Learner-Centeredness.

The author initially believed that Learner-Centered Practices would be a crucial factor found in high performance high schools. The author's research leads him to believe that Learner-Centeredness is not as powerful a factor in the development of a high achieving high school program. The author believes that his research opens the door into further studies on innovative programs based upon the six principles of personalized instruction as developed by Jenkins and Keefe (2000). Further study into how these six principles are implemented and embedded in high school programs would be informative to an educator interested in such an approach to school program design.

The author centered a portion of his research into effective practices in the secondary mathematics classroom. His premise was that if Learner-Centered Practices could be found in the mathematics classroom, then they would be found in other academic disciplines within the high school curriculum. This match of practice to theory could be greatly expanded by a future student of this subject. The author would recommend the development of a new instrument or the use of an existing instrument that would effectively gather data about actual classroom practice. The results of a more intensive and scientific classroom observation approach than was employed in this project would assist the researcher in his/her quest for an accurate picture of classroom practice. The observation mode employed in this project provided the researcher with a "snapshot" of classroom practice, not a more sophisticated analysis of teacher practice and

student responses. A further question would be, “What positive changes to teacher practice appear after an intensive period of observation and reflection based upon the results of the ALCP student and teacher surveys?”

The issue of the impact of “homework” on student achievement could be considered as a topic of future research. There were strong indicators at each school studied that homework was no longer an effective tool. The ability to collaborate electronically seemed to diminish the importance of homework as a gauge of individual proficiency. What are new formats for independent work and skill practice? What are new methods to judge individual competency? Does “homework” contribute to high achievement for all students or does it serve as a negative aspect for low achieving students?

The author recommends that further study be initiated into how schools are meeting the challenges of achievement goals as set by the No Child Left Behind legislation. What data is being gathered and “mined” in order to verify student achievement? How is data on disaggregated groups being organized and results disseminated to classroom teachers? What impact on classroom practice does the increased use of achievement data have on actual classroom practices?

The author believes that further research could be conducted to measure the impact of structural changes made to adjust the school program to the achievement needs of disaggregated groups? If no child is to be left behind, then programs must be developed to meet the needs of students who do not achieve in the traditional school setting. Do these programs exist and in

what form? Are such programs academically rigorous and are students and teachers held accountable to rigorous standards and assessments? What achievement results are being used to verify program success? What implications do these practices have in the development of high school programs in the future?

Change will not happen without leadership. Two of the three case study schools have experienced consistent leadership and leadership philosophies over a ten year period of time. What are the positive effects of long term leadership in an era when superintendents are known to possess short tenures in school districts? What are the relationships between consistency of leadership and the improvement of student achievement? What leadership characteristics must superintendents and principals possess in order to facilitate high achievement?

Attention to “Student Voice” is an area of interest and further study. What do students think about the programs, processes and instructional relationships that exist within their school? What impact do positive or negative interactions have on student achievement? What are effective measurements of the viewpoints of students? Should student play a role in the governance of the building? If so, what is the relationship between their role in this process and the role of staff and administration? What impact does a student role in the governance of the building have on student achievement? Are there examples of public high schools that allow for student governance?

The American high school has been described by Edward Humes (2003) as “like an organism, living, breathing, complex, impossible to know in its entirety. A thousand dramas unfold daily,

endless storylines, alliances, jockeying, heartbreaks, victories, and secrets—oh so many secrets—small and large”. Further research can be pursued in this rather incredible organism. There are still so many secrets to be revealed, so many lives to be changed, so little time to make a difference.

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APPENDIX A

(original – not administered)

STUDENT SURVEY

LCP High School Survey (Will be customized to meet each school program)

Circle one

Gender – Male or Female

Check one

I have been a student of the LCP S.D. for my middle and high school years. _____

I transferred to LCP School District sometime during middle or high school. _____

Circle One

My middle school grades were on average A B C D E

Please rate the Individualized Learning Process by circling the appropriate response

1 = Strongly Agree

2 = Somewhat Agree

3 = Neither Agree or Disagree

4 = Somewhat Disagree

5 = Disagree

-
- 1) The (tutors) I had cared about me 1 2 3 4 5
 - 2) I found the (LCP Conference) helpful 1 2 3 4 5
 - 3) My regular teachers helped me learn 1 2 3 4 5
 - 4) The (learning packets) helped me learn 1 2 3 4 5
 - 5) The school cares about my achievement 1 2 3 4 5
 - 6) I learned to write well at (LCP) High 1 2 3 4 5
 - 7) My parents liked the (LCP process) 1 2 3 4 5
 - 8) My opinions were taken seriously in 1 2 3 4 5

the (LCP conference)

9) I liked the (LCP process) 1 2 3 4 5

Open Ended Response: Any comments you wish to make concerning the climate of the LCP High School.

Part 2 – School Climate

Please rate your school’s climate by circling the appropriate response

- 1 = Strongly Agree
 - 2 = Somewhat Agree
 - 3 = Neither Agree or Disagree
 - 4 = Somewhat Disagree
 - 5 = Disagree
-

- 1) Students are enthusiastic about learning in this school. 1 2 3 4 5
- 2) The high school has good attendance. 1 2 3 4 5
- 3) Teachers are willing to help those students in need of assistance. 1 2 3 4 5
- 4) This school has high expectations for all students. 1 2 3 4 5
- 5) Teachers know their subject matter. 1 2 3 4 5
- 6) Teachers pay attention to students of all ability levels. 1 2 3 4 5
- 7) Teachers treat students fairly. 1 2 3 4 5
- 8) School discipline is handled well. 1 2 3 4 5
- 9) Students get along well. 1 2 3 4 5
- 10) Students feel safe in the school. 1 2 3 4 5
- 11) Students are proud of the school. 1 2 3 4 5
- 12) The various social and ethnic groups get along with one another. 1 2 3 4 5

13) There is good school spirit. 1 2 3 4 5

14) The principal cares about the students
of the high school. 1 2 3 4 5

15) The community is supportive of the school's
programs. 1 2 3 4 5

Open Ended Response: Any comments you wish to make concerning the climate of the LCP High School.

APPENDIX B

(Original- not administered)

LCP High School Climate Survey-Faculty

Circle one

I have been a faculty member of the LCP high school for (Circle correct response)

- a) 1 to 5 years
- b) 6 to 10 years
- c) 10 to 15 years
- d) Over 15 years

I have worked as a teacher in a different school district previous to my employment at LCP high school

- a) Yes
- b) No

Please rate your school's climate by circling the appropriate response

- 1 = Strongly Agree
- 2 = Somewhat Agree
- 3 = Neither Agree or Disagree
- 4 = Somewhat Disagree
- 5 = Disagree

-
- 1) Students are enthusiastic about learning in this school. 1 2 3 4 5
 - 2) The high school has good attendance. 1 2 3 4 5
 - 3) Teachers are willing to help those students in need of assistance. 1 2 3 4 5
 - 4) This school has high expectations for all students. 1 2 3 4 5
 - 5) Teachers know their subject matter. 1 2 3 4 5
 - 6) Teachers pay attention to students of all ability levels. 1 2 3 4 5
 - 7) Teachers treat students fairly. 1 2 3 4 5

- 8) School discipline is handled well. 1 2 3 4 5
- 9) Students get along well. 1 2 3 4 5
- 10) Students feel safe in the school. 1 2 3 4 5
- 11) Students are proud of the school. 1 2 3 4 5
- 12) The various social and ethnic groups
get along with one another. 1 2 3 4 5
- 13) There is good school spirit. 1 2 3 4 5
- 14) The principal cares about the students
of the high school. 1 2 3 4 5
- 15) The community is supportive of the school's
programs. 1 2 3 4 5

Open Ended Response: Any comments you wish to make concerning the climate of the LCP High School.

APPENIDX C

Interview Protocol and Questions

The purpose of the interview component of the research project is to allow for the inclusion of “student voice” in this study of student motivation and sustained achievement. Students will be interviewed individually and the interview participants will include the interviewer, an observer/compiler, the interviewee and, possibly, the parent or guardian.

A maximum total of 45 participants will be interviewed. Ideally, 15 students from each school will consent to participate in the study.

Mathematics teachers will be the target population for the teacher interviews. These interviews will focus on effective instructional practices, teacher attitudes concerning school climate and structural implementations.

Building level administrators will be interviews focusing on structural implementations that are viewed as having a positive impact on student achievement at the high schools.

Student Interview Questions:

- 1) Are there activities, programs or classroom teachers that you feel “listen to students and respect their opinions? How are the opinions and beliefs of students “heard” in your high school?
- 2) Do you feel to be part of the school community? Do you have a positive personal relationship with your teachers? Do you feel as if your teachers care for you as an individual?
- 3) Do you believe that the teachers in your school are willing to help you become successful?
- 4) Do you feel trusted and respected by the teachers and administrators in your high school? What is your responsibility in the development of trust and respect?
- 5) Are there specific classes or subjects or teachers that really challenge your ability to solve problems?
- 6) Are there classes, teachers or programs that allow you to work independently and use your knowledge and skills on assignments that really interest you?
- 7) What choices has your school allowed you to make concerning classes, course work or participation in activities?
- 8) How would you describe the atmosphere or climate of your high school? Are you allowed to “get away” with too much in terms of school rules and regulations? Are school rules enforced fairly and consistently?

9) How would you describe “success” in high school?

10) Any other comments?

Mathematics Teacher Interview Questions:

1) How do you as a classroom teacher “listen to students and respect their opinions? How are the opinions and beliefs of students “heard” in your classroom and/or high school?

2) Do you have a positive personal relationship with your students? How do you let students understand that you care for them as an individual?

3) How do you as a teacher structure your class so that students can be successful?

4) How are your classes structured to permit the development of trust and student responsibility?

5) How do you conduct your class in order to challenge a student’s ability to solve problems and develop creative solutions?

6) How do you plan your classes in order to permit students to work independently on assignments or to develop solutions to problems that are of interest to students?

7) How would you describe the atmosphere or climate of your high school? Are students allowed to “get away” with too much in terms of school rules and regulations? Are school rules enforced fairly and consistently?

8) What are the most effective strategies in your mathematics classroom that allow for achievement for all/most students?

9) How would you describe success in high school?

10) Any further comments?

Principal Interview Questions:

1) What program or structural components are in place that you believe positively impact student achievement?

- 2) How do you as principal allow for “student voice” and a student role in the operation or governance of the school? How are student opinions heard?
- 3) What structures exist within your school that allow for the development of positive personal relationships between students and staff members?
- 4) What structures are in place to ensure a high level of student success?
- 5) How are student responsibility and a trust of students developed in your high school?
- 6) How would you describe the atmosphere or climate of your high school? Are students allowed to “get away” with too much in terms of school rules and regulations? Are school rules enforced fairly and consistently?
- 7) What strategies that allow for the success of all students do you observe in the classrooms in your school? Specifically, strategies observed in mathematics classrooms.
- 8) How would you describe success in high school?
- 9) Any further comments?

APPENDIX D

Institutional Review Board Letter

04-13-04

University of Pittsburgh Institutional Review Board
Hieber Building
3500 Fifth Avenue, Suite 105
Pittsburgh, PA 15213

Dear Sirs,

Mr. Terence M. Doran has the permission of the Northgate School District to conduct research during the months of April and May of 2004. Mr. Doran can have access to information concerning student QPA, course enrollment, attendance and PSSA results. Mr. Doran has agreed that all information provided to him will be held as strictly confidential and that no attempt will be made to identify the students beyond the purposes of the study.

Mr. Doran has permission to interview staff members and to conduct a brief school climate survey with the staff of the senior high school. Mr. Doran also has permission to observe mathematics teachers in the classroom solely for the purposes of the study.

Mr. Doran may interview selected students under the guidelines established by the policies of the Northgate School District.

Mr. Doran will operate within the daily schedule and routines of the school and will hold the educational mission of the district as his guideline for performance of his research.

Mr. Doran is granted permission to conduct research at the Northgate High School for the months of April and May of 2004.

Sincerely,

APPENDIX E

Parental Permission Letter

THIS IS A DRAFT VERSION OF THE PARENTAL PERMISSION LETTER

Mr. and Mrs. Joseph Joseph
2222 Greensburg Pike
Greensburg, PA 15555

Dear Mr. and Mrs. Joseph,

The purpose of this letter is to request your permission to interview your son/daughter as an important section of my doctoral research concerning high school students, academic achievement and personal academic motivation. The interview will focus upon your son or daughters opinions about the role of the programs found at Greensburg Salem high school in their personal academic development. Additional questions will focus on the academic motivation exhibited by your son or daughter. The interview will allow my research to include the voices of students in the report. All responses will be kept strictly confidential. Your son or daughters responses will be identified by solely the date of the interview and no records will be kept that would allow for identification of the student with actual names and addresses.

It is my sincere hope that you will allow your son or daughter to participate in my research. I have served as a high school principal for the past fourteen years and realize the importance of student opinion in any study of high schools. I am willing to meet your son or daughter at your convenience either before or after school hours. The interview will last about 30 minutes. You are invited to observe the interview and to add your own opinions after the student interview.

It is very important that student voice be heard about such matters as motivation and achievement. I hope to receive permission to interview 15 members of the senior class for my study. Your son or daughter's participation in this process will contribute greatly to my research and to my life as a high school principal. Please return the permission slip in the envelope included with this letter. You may contact me at 412-344-3280 or my e-mail address, doran7@Earthlink.net should you have any concerns or questions. I will contact you to confirm a specific time and date within the months of April and May.

Sincerely,

Terence M. Doran,

Date _____,

I grant my son, _____, permission to participate in the interview portion of the research study conducted by Mr. Terence Doran for the purposes of including student opinion in his research project on American high schools.

Author's Note

The researcher is indebted to many professors, colleagues, students and teachers as each contributed in their own way to the accomplishment of this task. My affiliation with the University of Pittsburgh, Graduate School of Education, Department of Administration and Policy Studies has been rewarding and personally fulfilling

Dr. Charles Gorman provided many hours of advice, encouragement and counsel. Dr. John Wilkinson, served as a valued colleague, friend and inspiration to the author. His secretarial staff made the author welcome in their school and provided invaluable technical assistance. Mr. Thomas Shipley, Mr. Robert Stamps and Ms. Kelly Wittman provided the author with vivid program descriptions and allowed the author access to school buildings and students. Professor Barbara McCombs of Denver University provided invaluable insight and feedback to the concept of learner-centered practices and allowed the author use of the Learner-Centered Practices Survey (ALCP) employed in the study.

The researcher is indebted to his committee and thanks them for their willingness to assist in this process and to contribute to the endeavor. It has been a long journey.

Most importantly, the author acknowledges the love and support of his wife of 36 years, Bonnie Hill Doran. She supported the author during a very challenging illness and allowed him the opportunity to complete his studies at the University of Pittsburgh. She is my love, my life, a wonderful care giver and the reason for my continued existence.

This work would not have been remotely possible without the encouragement of the many persons mentioned above nor would it have been possible without the expert instruction provided by the many fine professors at the University of Pittsburgh.

Thank You. I hope that you find this work to be worthy of your faith in me as an educator and a life-long learner.