UTILIZING A RESPONSE TO INTERVENTION FRAMEWORK TO SUPPORT STUDENT ACHIEVEMENT IN MATHEMATICS AT CAPE HENLOPEN HIGH SCHOOL

by

Michael Scott Young

An executive position paper submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Leadership.

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IN MATHEMATICS

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ABSTRACT

This paper examines the critical components required to establish a Response to Intervention (RTI) program at the secondary level in mathematics. The difficulty accomplishing this is that the majority of existing RTI programs focus on reading at the elementary level. My attempt is to create a framework I can utilize in a high school setting that will allow the facilitation of RTI. The development of a secondary RTI framework is critical in order for a successful mathematics intervention program to be developed. Without a functional framework, the RTI program will not succeed. In order to maintain focus throughout the project, I utilized several guiding questions when attempting to identify various RTI framework components:

1. Is the identified RTI framework component specific to the secondary level or can a school modify it for the secondary level?
2. Is the RTI framework component specific to a mathematics program or can a school utilize it in a mathematics program?
3. Has the identified RTI component been used in an RTI program that has experienced success?
4. How can a school modify its schedule to accommodate an RTI program?

I developed the framework by considering the answers to these questions.

Chapter 1

INTRODUCTION

When I began my doctoral work, I did not initially choose to focus on RTI. I had decided originally to investigate the issue of bullying in schools. Within the first few months of this investigation, I discovered that much of the information on the topic of bullying had a recurring connection to Positive Behavioral Interventions and Supports (PBIS) programs. The literature closely connects PBIS to RTI because of the similar framework and delivery structure of both programs. The primary difference between PBIS and RTI is that PBIS focuses on improving student behavior through structured interventions while RTI focuses on improving student academic achievement in a similar structured intervention format. I should point out that although PBIS and academic RTI have different focuses, they could be included as part of the same RTI program. As I researched PBIS I decided that instead of focusing my efforts toward bullying, I would refocus my attention and doctoral project toward academic RTI. I ultimately made the choice to focus on RTI based on my experience as a special education mathematics teacher.

As a special education mathematics teacher, I already felt passionately about working with students who were struggling in mathematics. In my teaching position, I continually sought out interventions and strategies to implement in my own classroom

that would have a positive effect on my students' achievement levels. I finalized my decision about my project after I attended a statewide RTI workshop. During this workshop, I learned that the State of Delaware was planning to require all high schools to develop and implement academic RTI programs by the fall of 2013. Based upon the sense of urgency created by this deadline combined with my practical experience, I decided to focus my energy and efforts on investigating what is necessary to create an RTI program at the high school level. This was not simply a decision based on my area of professional interest but also a decision of practicality. Although my professional goal was to become a high school administrator, at the time I started my doctoral studies I was still a teacher. I decided that investigating, evaluating and synthesizing information about RTI components and programs during my doctoral studies would allow me at least to implement some sort of intervention program based on RTI in my classroom even if I did not become an administrator. If I were to achieve my goal of becoming a high school administrator, I would be able to use what I learned during my doctoral studies to implement a formal RTI program on a school-wide basis. I would also be able to take the project further by providing input for any future programs that might be needed to serve the RTI needs of the district.

Problem Area

The Cape Henlopen School District's mission statement is, "The Cape Henlopen School District prepares each student for a healthy, creative and rewarding life in a diverse and global society by creating an educational environment which

enables each student to achieve personal excellence and lifelong learning skills to become a productive and responsible citizen." Despite the good intentions of this mission statement, the falling DSTP mathematics scores for 9th grade and the stagnating DSTP mathematics scores for 10th grade mathematics indicated that the district was not meeting its own mission of enabling each student to achieve personal excellence and acquire lifelong learning skills.

Because of the low proficiency levels on the DSTP, Cape Henlopen High School had not met the adequate yearly progress (AYP) requirement as defined by No Child Left Behind (NCLB) for the school years 2007-2008, 2008-2009 and 2009-2010. This resulted in a one-star out of five-star ranking and a rating of "Academic Watch" for each of those three school years. Academic watch means the school was below the minimum score needed to avoid intervention by state officials. In response to this poor performance, the high school was put under corrective action. One of the outcomes of the corrective action was the appointment of a new principal at Cape Henlopen High School for the 2009-2010 school year.

The continuing problem is that Cape Henlopen High School does not have a coherent, systematic and data-driven mathematics support program that can be used to identify specific areas of need, provided targeted interventions and document successes through data. A Response to Intervention (RTI) program could provide the common vision, formal structures and data collection methods required to assist all students obtain higher levels of achievement in mathematics. The state of Delaware is moving toward mandating RTI programs at the secondary level (middle and high

school). This mandate would require Cape Henlopen High School to create a framework to implement a more formalized way of meeting student needs. This type of program may provide the structure that Cape Henlopen High School needs to be able to address the overall deficiencies and subgroup discrepancies in mathematics proficiency levels. In the article *Response to Intervention in Secondary Schools*, Feuerborn, Sarin and Tyre (2011) stated:

> The promise of RTI is that it will enable schools to better and more efficiently meet the learning needs of a large continuum of students by providing evidence-based, school-wide instruction, supplemental supports, and intensive individualized interventions. (p. 50)

Schools can use RTI to improve student achievement among low performing students. According to the 2011 RTI Implementation Report in Technological Learning Magazine (2011), elementary schools are leading the way in the area of RTI implementation. The report states that 80% of elementary school respondents indicated that they have completed a full implementation of an RTI program with fidelity in one or more domain areas (reading, math or behavior). Seven in ten districts reported that they had enough data to evaluate the affect that their RTI program had on Annual Yearly Progress (AYP). Of these districts, a higher percentage reported an increase in AYP compared to those that reported no improvement in AYP. Feuerborn, Sarin and Tyre go on to say, "Although the promises are alluring, the literature gives little guidance on how to implement RTI at the secondary level" (p. 50).

General Approach

Since a high school is a much different environment from an elementary school, the general approach I chose was to focus first on developing a workable framework at the high school level. The high school would then integrate the components into an RTI program. I decided it was important to first ascertain if Cape Henlopen high school could implement a secondary RTI framework at all and if I could develop one that would function within the constraints presented by a high school setting. I decided to first focus on the refinement of the interventions and then perfect them once the framework proved workable.

Within this Executive Leadership Portfolio, it is my intention to provide some guidance for implementing an RTI framework at Cape Henlopen High School. I organized the portfolio into this introduction and five subsequent chapters. Chapter 2 will set the context and define the problem facing Cape Henlopen High School. Chapters 3 and 4 will present the improvement strategies and explore their results. Chapter 5 will contain my reflection on my improvement effort results. Chapter 6 is a reflection on my development as a leader throughout and as a result of the doctoral process. Following these chapters is a comprehensive list of references. The portfolio's supporting artifacts are included as ten separate appendices at the end of the document. Although final decisions, actions, and strategies of the improvement project and their resulting outcomes will be explained within the five main chapters of the portfolio the artifacts contain further details regarding development of implementation ideas, historical context, and logistics of the project.

Chapter 2

SETTING THE CONTEXT AND THE PROBLEM

The purpose of this Executive Leadership Portfolio is to present my improvement efforts related to increasing student achievement in mathematics at Cape Henlopen High School as it applies to the student population as a whole, the various subgroups and to the achievement gap. In this chapter, I contextualize the problem through a discussion of my roles and responsibilities, the context of Cape Henlopen High School including demographics about students and staff and a discussion of student achievement data. I then lay out the problem of establishing a framework for a Response to Intervention (RTI) program as it relates to my work at CHHS.

Roles and Responsibilities of the Candidate

When I began my doctoral studies in September 2009 the Appoquinimink School District (ASD) was my employer. At that time, I was a special education mathematics teacher responsible for both self-contained and co-taught algebra and geometry classes at Appoquinimink High School. While working at ASD, I began to understand how an RTI program might benefit those students who were performing below proficiency. This understanding began when I had the opportunity to attend a statewide, two-day professional development workshop for administrators and teacher leaders on the implementation of RTI programs at the secondary level. After the

training, I felt that my career experience of working exclusively with students who struggle in mathematics made me an excellent candidate for creating an RTI program for both Appoquinimink High School and the second high school in the district, Middletown High School. While my administration was receptive to my ideas for establishing an RTI program at our school, they believed I would not be able to accomplish this task in my role as a teacher. My principal asserted that to properly institute and execute an RTI program the high schools, the district would need to orchestrate each phase of its development. This RTI program development would require participation from many of both high schools' staff members. The rest of the Appoquinimink High School administrative team also believed that someone at the district level would need to be responsible for the organizing and execution of such a program. At that time, ASD had just eliminated the secondary math specialist position, which required the district's elementary math specialist to focus on her expanded responsibilities of district-wide math specialist. These added responsibilities and the demands of the newly reconfigured position precluded her from being able to establish an RTI program at the high school level during that school year. Although I was interested in assuming the responsibility of creating a district RTI program, my position as a teacher made it impossible for me to act as a day-to-day coordinator or specialist for a district-wide program. In addition, the district was not willing to create a new position for me nor was my school willing to lose the teacher unit that I represented. Even though I was unable to initiate an RTI program at that time or even participate in something that the district might create, I kept the belief that to increase

student achievement levels, a program with defined structure and fidelity of implementation was required to raise overall proficiency levels. It also became my belief that addressing all students' needs would directly benefit each subgroup and have a positive effect on the narrowing any achievement gaps that existed. It was at this time that I began to focus my doctoral work on how I could use RTI raise student achievement levels, specifically in the area of maximizing student proficiency in mathematics.

In August 2010, Cape Henlopen School District hired me as the high school's math specialist. As the mathematics specialist at Cape Henlopen High School my task was to establish and implement a secondary mathematics support program at the high school. The district assigned me to teach all mathematics support classes that the district had titled "math enrichment" classes. Math enrichment is an additional period of mathematics for low-achieving students. Schools often call these types of classes "double math." The district structured the classes as general support by previewing and reviewing topics that will be or have been taught in the students' primary mathematics classes. Because of this structure, the enrichment program is not truly RTI. However, teaching enrichment classes gave me the insights I needed to convince my principal to begin the process of moving the school in the direction of establishing an RTI program.

I remained the math specialist until July 2012 when the district promoted me to assistant principal. As assistant principal, I have begun the process of creating a school-wide RTI program. My initial phase in this process is to use my new role as an

evaluator to look at how mathematics teachers address student needs within the mathematics classroom. I have worked with 9th and 10th grade teachers specifically to identify curricular, instructional, and environmental conditions or practices that either enable or hinder learning. This has led to conversations within the mathematics department Professional Learning Community (PLC) about best practices. I have done this to minimize any "contextual variables" such as poor or inconsistent instructional practices so that they can be removed as the explanation of learning difficulties before beginning the hard work of looking at individual learners to identify why they are struggling. My second phase is to identify the core components necessary to create a workable RTI framework at Cape Henlopen High School. This will be discussed later in this portfolio. The last phase will be to implement the RTI framework and begin the process of creating interventions to address the specific student needs.

Setting the Context: Cape Henlopen High School

The Cape Henlopen School District is located in the town of Lewes in Sussex County, Delaware. It primarily serves the communities of Lewes, Milton, Dewey Beach, Rehoboth Beach and several smaller areas of eastern Sussex County. The district opened the new Cape Henlopen High School in 2010. This new facility is a 216,000 square foot school that houses grades nine through twelve. Cape Henlopen High School is a comprehensive, public high school and is the only high school in the district.

Students and Staff

During 2011-2012, Cape Henlopen High School had a total enrollment of 1,302 students. The distribution of students was heavier in the lower grades than the upper grades with 382 students in Grade 9, 364 students in Grade 10, 313 students in Grade 11 and 243 students in Grade 12. The ethnic breakdown of the student population was as follows: 71.5% were white, 17.2% were African-American, 7.8% were Hispanic/Latino, 2.3% were Asian, 0.7% were American Indian, 0.4% were Multi-racial and 0.1% were Hawaiian. Students from low-income homes comprise 42.7% of the population; students receiving special education services make up 14.2% of the population and 1.3% of students are English Language Learners (ELL).

Cape Henlopen High School is improving graduation rates for most of its subgroups with the exception of Hispanic, ELL and low income. Table 1 depicts the 2011year end ESEA four year adjusted graduation rates and changes from the prior year.

Table 1 Cape Henlopen 2010-2011 Graduation Rates and Prior Year Change

	2010	**2011**	**Change**
All	76.8	79.1	+2.3
American Indian	33.3	66.7	+33.3
African American	68.1	73.0	+4.9
Asian	60.0	83.3	+23.3
Hispanic	92.3	68.8	-23.5
White	79.4	82.0	+2.6
ELL	88.9	77.8	-11.1
Special Education	63.3	67.3	+4.0
Low Income	71.5	69.6	-1.9

Cape Henlopen High School recorded 449 suspensions and six expulsions during 2011-2012. The count of students who were either suspended or expelled was 229. As stated above, the total enrollment count for the school was 1302. This means that 17.6% of the student population was either suspended or expelled at some point during the school year. This is higher than both the district's percentage of 10% and the state's percentage of 15%.

During 2011-2012, there were eighty-five teachers, one media specialist/librarian, eleven paraprofessionals, two special education coordinators, four guidance counselors, two college and career counselors, two nurses, four secretaries and four administrators employed at Cape Henlopen High School. Of the eighty-five teachers working at the high school, 88.7% were white, 9.3% were African American, 1.0% was Hispanic, 1.0% was Asian and 0.0% was American Indian. More than half of the teaching staff, 57.1%, obtained a master's degree or higher and 3.3% held a National Board for Professional Teaching Standards certificate. More than three-quarters (82.4%) of the teachers at Cape Henlopen High School had five or more years of teaching experience and highly qualified teachers taught 95.8% of all classes.

Student Achievement

At the end of the 2009-2010 school year, Cape Henlopen High School administered the Delaware Student Testing Program (DSTP) mathematics assessment; the results indicated low levels of proficiency for both 9th and 10th grade students. The

percentage of 9th grade students who met or exceeded the benchmark score for mathematics proficiency was 54%. This represented a five-percentage point decrease from the previous year's proficiency percentage of 59%. The percentage of 10th grade students who met or exceeded the benchmark score for mathematics proficiency was 57%, which represented a mere one-percentage point increase from the previous year's proficiency percentage of 56%. Even though the Cape Henlopen School District implemented the Learning-Focused Strategies (LFS) program two years prior with the intent of boosting student achievement, the lack of progress warranted the development or adoption and implementation of other strategies that would more specifically address mathematics achievement. During the 2010-2011 school year, the district implemented one such strategy, the adoption of a new mathematics curriculum. The new curriculum is called Interactive Mathematics Program (IMP) which is a problem-based, integrated mathematics program developed to specifically focus on improving students' mathematics competencies and problem-solving abilities thereby improving student achievement. By the end of 2010-2011, Cape Henlopen High School was utilizing LFS for all grade levels and had completed the initial rollout of IMP to all 9th grade students.

During the summer of 2010, the administrative teams of the Cape Henlopen district office and Cape Henlopen High School created a mathematics intervention program. Cape Henlopen High School titled the program "mathematics enrichment" with the intent of providing additional mathematics support and instruction in the form of an additional instructional period of mathematics for all students in 9th and 10th

grade students who were performing below proficiency. The creation of the mathematics enrichment classes helped Cape Henlopen High School meet a 2010-2011 Race to the Top (RTTT) goal. The state required that all districts meet the goal, "accelerating achievement and improving student outcomes by turning around low achieving schools" as a provision of Delaware's adoption of RTTT and acceptance of RTTT funding. The selection criteria for enrichment classes were loosely defined. Scheduling conflicts made it difficult to include all students who had not obtained proficiency on their 8th grade spring 2010 DSTP into an enrichment class. Because of this, many students who may have benefitted from additional mathematics instruction and support did not receive it. In spite of the problems with enrichment classes, it was a step in the right direction since the district had no unified vision and few formal structures at the secondary level to help students who struggled in mathematics before the introduction of the enrichment program. In the years before enrichment, teachers at the high school implemented their own strategies to assist these struggling students. Some of these strategies may have been more successful than others were, but teachers gathered little if any data about them or which of the strategies had a positive effect on student achievement.

In the school year 2010-2011, the Delaware Comprehensive Assessment System (DCAS) replaced DSTP. Schools administered DCAS assessments three times (autumn, winter and spring) during that school year. The results of the first DCAS mathematics test in autumn 2010 indicated that only 45% of the students in 9th grade had met proficiency. When I disaggregated this 9th grade group by ethnicity,

53% of white students, 24% of Hispanic students and 20% of African-American students reached proficiency. Additionally, 13% of students receiving special education services had reached proficiency.

The spring 2011 DCAS results did show improvement with 73% of the 9th grade population achieving proficiency (28% increase). The subgroup breakdown revealed an improved picture as well; 82% of white students met proficiency (29% increase), 54% of Hispanics met proficiency (30% increase) and 43% of African-American students met proficiency (23% increase). Additionally, 40% of students receiving special education services met proficiency (27% increase). However, while these scores show significant gains it is unclear if Cape Henlopen High School should attribute these gains to teachers' utilization of LFS strategies, the IMP mathematics curriculum, the support received in enrichment classes or some combination of these programs. Inconsistencies in performance remain between the Caucasian/African American, Caucasian/Hispanic, and special education/general education subgroups. Significant segments of the student population at Cape Henlopen High School are not obtaining proficiency on the Delaware Comprehensive Assessment System (DCAS) standardized test. Because significant gaps persist between the Hispanic and African-American student subgroups when compared to the Caucasian subgroup and the special education subgroup when compared to the general population, this situation requires further attention.

The Problem

A significant portion of the student population at Cape Henlopen High School is not obtaining proficiency on the Delaware Comprehensive Assessment System (DCAS) standardized test. Additionally, significant gaps persist between the Hispanic and African-American student subgroups as well as the special education subgroup when compared to the Caucasian subgroup. While several positive, research-based programs exist within the district, the district only recently introduced these programs. Moreover, only one program, the Interactive Mathematics Program, specifically addresses increasing mathematics achievement. Cape Henlopen High School first began using this program for the freshman class during the 2010-2011 school year. At the same time, the school began to enroll students who were not meeting proficiency on the mathematics portion of the DCAS in specific mathematics enrichment classes. Before these programs, the district had no unified vision and few formal structures at the secondary level to help students who struggled in mathematics. Teachers at the high school implemented their own strategies to assist these struggling students. Some of these strategies may have been more successful than others were, but no data were gathered to ascertain which of these strategies had a positive effect on student achievement. In light of the college- and career-readiness movement in the United States, this situation was in need of attention. Therefore, the problem is that Cape Henlopen High School does not have a coherent, systematic and data-driven mathematics support program to meet the needs of struggling students.

Although steps toward improving student achievement have been taken, Cape Henlopen High School still does not have a coherent, systematic and data-driven mathematics support program to identify specific areas of need, provide tiers of targeted interventions and document effective practices through data. Cape Henlopen High School could begin to address the issue of improving student achievement more directly if the school developed a clear strategy that would allow the development of a formal RTI program. Cape Henlopen High School must develop an RTI implementation strategy for two reasons. First, the State of Delaware will require all high schools in the state to have an operational RTI program by 2014-2015. Second, and perhaps more importantly, RTI would provide the common vision, formal structures and data collection methods required to assist all students obtain higher levels of achievement in mathematics at Cape Henlopen High School.

Chapter 3

IMPROVEMENT STRATEGIES

In October 2011, I proposed the steps I would take to support the organizational improvement goal of establishing a Secondary Response to Intervention (RTI) for mathematics at Cape Henlopen High School (Artifact 1 or Appendix A). Looking back at the initial development of addressing my problem, I can categorize my improvement strategies into four phases: discovery, research, testing and verification, and implementation. I began my doctoral journey with the discovery phase. I began the development of my overall improvement strategy in this phase. During the discovery phase, I found myself constantly learning and deepening my understanding of the issues that surround student achievement and how I could support efforts to increase student achievement through the RTI process. I include three artifacts in my portfolio to document the discovery phase. All three artifacts touch upon the topic of College- and Career-readiness. I completed the first artifact at the end of my first year of doctoral study. I titled this artifact *The Reauthorization of the Elementary and Secondary Education Act: College- and Career-Ready Students* (Artifact 2 or Appendix B). This artifact provided me the opportunity to analyze the topic of college and career readiness in the United States including the history of the legislation that led to this area of concentration.

The next discovery phase artifact is my *Public Engagement Strategy Reflection* (Artifact 3 or Appendix C), which I wrote at the beginning of my second year of doctoral coursework. This document gave me the opportunity to identify the connections between the College- and Career-readiness initiative to both the Race to the Top (RTTT) and the National Common Core State Standards (CCSS) initiatives. Through these artifacts I was able to investigate and increase my understanding of the major environmental forces that guide RTI. I was able to use this understanding to find a rationale for using RTI as an improvement strategy at the secondary level. I developed the belief that RTI is an appropriate improvement strategy at the secondary level because its primary function is to help students develop skills they will need to be college and/or career ready by the time they leave high school.

The last artifact that I include in the discovery phase I titled *Addressing Student Achievement at Appoquinimink High School* (Artifact 4 or Appendix D). I wrote this artifact concurrent to Artifact 3 during my second year of coursework. I took a critical look at the components of the instructional core itself, students, teachers and content. This artifact is the bridge between the discovery phase and the research phase and contains elements of both phases. Together these three artifacts of discovery informed my thinking regarding the rationale for improving student achievement. They allowed me to develop a deeper understanding regarding the importance of student achievement in high school as it applies to preparing students fully for their education and/or careers after high school. These artifacts were instrumental in bringing my chosen problem area of RTI into focus.

The next phase of my improvement strategy development was the research phase. This was the most arduous of the phases and the most time consuming. The artifacts that define this phase also include my *Addressing Student Achievement at Appoquinimink High School* (Artifact 4 or Appendix D), as well as *Exercise of Leadership* (Artifact 5 or Appendix E), and *Literature Review of Secondary Response to Intervention* (Artifact 6 or Appendix F).

The next phase is what I call the testing and verification phase. During this phase I conducted an *Evaluation of Mathematical Misconceptions Intervention Program* (Artifact 7 or Appendix G), created and reported a *DCAS/STAR Correlation Memo* (Artifact 8 or Appendix H) and *Analysis of Student Performance Data* (Artifact 9 or Appendix I). These artifacts helped to clarify the current state of student performance by analyzing student performance data and the extent of effectiveness of a STAR Math, performance tool used to measure performance and targeted interventions intended to improve student achievement. This was the beginning of understanding how students were performing and what elements I might need to draw upon when creating the RTI framework for Cape Henlopen High School.

The last phase is my implementation phase and includes the *Collaborative Teaming and Professional Development Modules* (Artifact 10 or Appendix J) and my document *Creating and Supporting a Response to Intervention Program: Cape Henlopen High School RTI Schedule* (Artifact 11 or Appendix K). These artifacts focus specifically on changing both the culture and the existing structures at Cape Henlopen High School so that they will function more effectively when implementing

the RTI framework. I will discuss the outcomes of these implementation artifacts in Chapter 4, Improvement Strategies Results.

Phase 1: Discovery - Developing an Understanding of Environmental Forces

Before developing, and certainly prior to my attempt at implementing an RTI program at Cape Henlopen High School, I deemed it necessary to develop an understanding of the forces at work that set the stage for the current focus on RTI in education. My analysis of the reauthorization of the Elementary and Secondary Education Act (ESEA) titled, *The Reauthorization of the Elementary and Secondary Education Act: College- and Career Ready Students* (Artifact 2 or Appendix B) helped me understand one of the greatest forces driving the RTI movement, the development of ideas surrounding College- and Career-readiness in the United States' political realm. I was able to identify how these developments from the greater environment, over which the district has no control, had a direct effect on the instructional core by increasing required levels of student performance. I realized that a weakness in any of the components of the instructional core (students, teachers, content) in a high school could result in students graduating and entering college or the workforce with limited skills in mathematics. If weaknesses exist in the instructional core, students will need to enroll in remediation classes or receive additional on the job training after high school.

Two key ideas from this investigation stand out. The primary idea is that schools must ensure College- and Career-readiness. To do this schools must provide students with rigorous and fair accountability and support at every level. Educational organizations must foster comparability and equity. The outcome must be to eliminate the need for post-secondary remediation for any subgroup of students by minimizing or eliminating persistent achievement gaps thus developing the skills all students need before they leave high school. Since the RTI process focuses on developing and strengthen skills students need to be college or career ready, a formal RTI program could be the tool to ensure this outcome.

The secondary idea is the Common Core State Standards (CCSS) could be used to create a national definition of proficiency so that achievement levels are comparable across the states. The current system of different standards in every state lulls many educators and students into a false belief that students are being sufficiently readied for the challenges they will face after high school. However, students may eventually find that they were not prepared as rigorously as their counterparts from other states, putting them at a competitive disadvantage when applying to colleges or jobs. School districts do not have the capacity to properly address or eliminate this disparity. We could eliminate this disparity if the United States implements a seamless, unified system of proficiency standards, like the CCSS. Utilization of the CCSS makes it easier to measure how well the instructional core is performing by making the performance of the instructional core components easily comparable to those of other educational organizations across the United States.

I included *Addressing Student Achievement at Appoquinimink High School* (Artifact 4 or Appendix D) in this portfolio despite the fact I no longer work at the Appoquinimink School District. I believe this artifact is important because it allowed me to develop my understanding of the importance of a guiding strategic plan in addressing environmental forces. If all schools in a district are to make measurable gains toward improving the instructional core, i.e. decreasing achievement gaps in mathematics, a thoroughly developed and coherent strategic plan must be in place. The details about decreasing achievement gaps within the Appoquinimink School District's Strategic Plan document were vague. However, this vagueness allowed me to create my own parameters regarding the target population and the methods that the district could use to specifically address these gaps. This was my first attempt at creating a strategy to support the instructional core (students, teachers and content). Within the artifact I suggest that the target population for interventions should freshman at Appoquinimink High School who are considered low achieving in mathematics. I explain that teachers should be a second target population. Appoquinimink School District should provide professional development in conjunction with requiring teachers to use the adopted problem-based mathematics program known as Core Plus. The teachers were not implementing Core Plus with fidelity at that time. The strategy includes the creation of a Professional Learning Community (PLC) so that the teachers could increase their competence with Core Plus and develop a plan that would allow them to work as a unified team. As a team, they could focus on increasing student engagement and obtain a high level of fidelity in the

implementation and delivery of Core Plus. The teachers could use this improved delivery of content to increase student achievement and narrow the achievement gap. Although I had designed a strategy to address the achievement gap through a coherent RTI program, I was not able to implement the strategy. The importance of the artifact is that within it I investigated the many of the variables required to create a framework for mathematics intervention in a tiered RTI format. I could easily modify these ideas to meet the specific needs of Cape Henlopen High School.

My *Public Engagement Strategy Reflection* (Artifact 3 or Appendix C) connects to the Appoquinimink artifact through its investigation of Cape Henlopen School District's need to redevelop its own Strategic Plan, as it existed in the fall of 2010. The reasons for redevelopment include the need to address environmental changes such as the state's secondary RTI requirement as well as internal changes within the district itself, a new Superintendent. These and other changes required the strategic plan to be updated immediately. This artifact gave me an opportunity to reflect on the new district I had just joined and to compare it to the district I had just left. It allowed me to describe what I saw as the district's current state of affairs as they related to the world of education's "bigger picture". When I wrote this reflection, I developed a personal plan of action framework in which I included my assertion that RTI would be beneficial to the district's only high school. This plan of action framework gave me insight into how to handle the greater community that I had just joined in September of that year. In this reflection, I argue that the Cape Henlopen School District needs to modify its Strategic Plan to include provisions regarding

College-and-Career readiness guidelines and a teacher quality framework if overall student proficiency is to be increased. I suggested that other stakeholder groups (teachers, parents, and community organizations) should also be included in the discussion. I made this suggestion because the greater community can contribute to positive outcomes students experience at school. The synopsis is that the district needs to pursue all avenues to find solutions when students are not obtaining academic proficiency during their high school years. The work that I did on these artifacts during my discovery phase clarified the importance of implementing RTI at the secondary level for students who are struggling.

Phase 2: Research – Identifying Components of the Strategy

When I left the Appoquinimink School District and began working as the math specialist at Cape Henlopen High School in the fall of 2010, I took with me many of the ideas I had developed at Appoquinimink High School regarding the need to establish a secondary RTI program to address issues surrounding college and career readiness. I developed these ideas further and investigated my leadership style in *The Exercise of Leadership* (Artifact 5 or Appendix E). This artifact was written in May 2011 at the end of my first year at Cape Henlopen High School. The intended audiences for this artifact include the district secondary mathematics curriculum director, the high school principal, mathematics department supervisor and the 9th and 10th grade mathematics teachers. This artifact developed an outline identifying how to begin the implementation of an RTI program and the best practices that should be

included in the RTI framework. I based the strategy on John Kotter's (2013) *Eight Stage Process for Leading Change*. Although this outline was my first attempt at addressing the process of enacting an implementation strategy, these basic ideas are still the foundation of my improvement initiative. Kotter's process continues to inform my decision making as the RTI framework and program implementation are further developed. Of particular importance is the third stage of the process. This stage requires the practitioner to develop a vision and strategy. My original vision for this component was to brand the mathematics department's improvement efforts with the acronym iCAPE. The acronym iCAPE plays off of the recent trend to place a lower case i at the beginning of any word to mean that the item is Internet ready and therefore somehow cutting edge. The acronym defines the strategy because iCAPE stands for **i**nnovative, **c**ollaborative, **a**ccountable, **p**roactive and **e**quitable. Over the past two years, this acronym has given the mathematics department focus regarding increasing student achievement.

By September 2013, the Cape Henlopen High School mathematics department will have fully rolled out a four-year problem-based mathematics curriculum known as the Interactive Mathematics Program (IMP) with the implementation of the final year of the program, IMP 4. The IMP program represents the innovative component in that IMP shifts the mathematics authority from the teacher to the math itself. Over the past three years, the teachers have taken on the role of facilitator and taught students that to understand mathematics, they must investigate mathematics themselves. Teachers have been instrumental in creating this transition and have participated in extensive

professional development to acquire pedagogical practices that support students in a problem-based classroom and a deeper understanding of the content. This professional development has made the traditional "stand and deliver" or "skill and drill" methods preferred by many veteran mathematics teachers no longer sufficient. The teacher can no longer be the only person in the room who is required to understand the mathematics.

The intent is that students will now engage in the formation of mathematical understanding, and this should lead to a more collaborative culture within the classroom. If this student collaboration truly occurs, it will be a form of collaboration that I had not originally anticipated when I envisioned this project. When I developed my vision and strategy to include collaboration I thought of it simply as teacher-to-teacher collaboration such as a Professional Learning Communities (PLCs). However, with the implementation of IMP and its problem-based methods for math instruction, the mathematics teachers are able to extend the collaborative culture to include students. Sciarra and Seirup (2008) stated that there is evidence in the research for a positive relationship between student behavioral engagement and achievement. Therefore, although I did not anticipate this, it could lead to desirable outcomes in student achievement that will strengthen Tier I mathematics instruction at Cape Henlopen High School.

The creation of a collaborative student culture with the intent of increasing student engagement may transfer the accountability for learning mathematics to the students. However, the predominant form of accountability is the use of high stakes

test results to evaluate both teacher and student performance. Component 5 of the Delaware Performance Appraisal System II (DPAS II) holds teachers accountable by quantifying individual teacher performance in the area of student achievement as measured, in part, by the DCAS. Component 5 now provides a rating for that performance categorized as Exceeds Expectation, Satisfactory or Unsatisfactory. The teachers of the Cape Henlopen High School Mathematics department are working to meet the challenge of the high level of accountability required of them. The work they have done includes using PLC time to develop their understanding of the DPAS process. With the help of a data coach during PLC meetings, teachers have focused on topics such as writing effective goals and reviewing data. Ninth and tenth grade teachers have set a specific time within the weekly PLC to meet with the math specialist to define specific difficulties their students are having within the general mathematics classroom and to develop plans that will allow the math specialist to identify interventions that address these issues.

The anticipated structure of the RTI process should also contribute to raising student accountability. Students who are identified as having difficulties and performing below proficiency or not meeting growth targets will be required to participate in RTI. I expect that the RTI process itself will raise student accountability by giving students the opportunity to address their own areas of deficiency and improve their own level of achievement.

Teachers are becoming more communicative because of PLC. An example of this improved communication is a teacher suggestion to make changes to the structure

of the DCAS testing. The teachers requested changes that focus on how to better manage the delivery process for DCAS testing at Cape Henlopen High School. Teachers asked to find ways to minimize the impact testing has on instructional time. Another example of improved communication that also exemplifies increased accountability is when teachers require extended leave for situations such as maternity, they have become much more proactive at suggesting how to maintain integrity of instruction during their absence. The teachers now suggest which substitute teacher would be the best replacement. In many cases, teachers have planned lessons not only for but also with the substitute before their departure. In each of the four extended absences during 2012-2013, all teachers made themselves available for support during their absence. This teacher willingness to remain accountable even when on leave has been instrumental in maintaining the integrity of the mathematics program.

The mathematics department is also becoming a leader at Cape Henlopen High School in the area of equity. The department spoke against tracking at several faculty meetings and produced research supporting their position. The math teachers frequently promote the idea of heterogeneous grouping for students at all levels. However, the teachers have not yet fully implemented heterogeneous grouping at Cape Henlopen High School.

Over the last two years, the mathematics department, in conjunction with district office personnel, the guidance counselors the school's administration has eliminated the three track system (remedial, college preparatory and honors) and

replaced it with a two level system (college preparatory and honors). This may seem an insignificant change, however, eliminating the remedial track has required teachers to engage with the ideas of differentiation, rigor and equity not only in the mathematics department but also across the school. Several teachers in the mathematics department are now advocating for all students to be scheduled into one level of mathematics that offers an honors option. Honors option is a form of differentiation within those classes for any student who excels. The broader acceptance of this idea will require specific details, on-going communication between the school and all stakeholders and educational outreach to the school board, parents and students.

The artifact entitled *Literature Review of Secondary Response to Intervention* (Artifact 6 or Appendix F) is the artifact in this portfolio where I gained the most information about RTI. In this artifact I identify the components that are essential for establishing an RTI framework within the high school's mathematics department. Since the development of a secondary RTI framework is the essence of my project, I felt it necessary to scour the available literature to identify as many research-based practices as possible. I then synthesized what I had discovered into a composite framework. I began writing my literature review in early 2012 but did not finish until May 2013. The reason for the extended process was that I kept encountering two problems. The first problem I encountered was that much of the research that supports the effectiveness of RTI programs has been done in the area of elementary reading intervention. There has been little research in the area of RTI for high school

mathematics. I was eventually able to work through this problem by focusing on the RTI framework itself instead of the instructional intervention practices. This more specific focus allowed me to glean from the literature those practices that I could use universally. The second problem was that many authors proposed best practices that they had not supported by research. These best practices were suggested methods, strategies or frameworks that the authors only stipulated to be effective without providing sufficient supporting evidence of their effectiveness. The authors of many of these best practices presented them as though they were supported by research but further investigation often proved they were not. In some cases these best practices were simply a favorite idea of the author that they hoped would draw the attention of researchers and researcher would eventually conduct research that supported them. Because of this, I excluded many popular ideas accepted as best practices from my synthesis.

In the end, I presented components from five sources. By disaggregating the literature into core components, I was able to identify four key components to include in my proposed RTI framework for Cape Henlopen High School. The first three components are: evidence or research based interventions, a multi-tiered structure and, screening and progress monitoring. These three components are supported by more than one source. To these three components, I add school-level and grade-level teams to oversee and manage the functioning of the RTI framework. Although only one researcher, Nellis (2010), directly investigated school-level and grade-level teams, researchers indirectly support his convincing evidence. Because of this, I included the

team approach when developing and implementing the Cape Henlopen RTI framework. I believe this is a practical matter. A large high school requires teams because an individual would be unable to handle all of the on-going demands of an RTI program. The teams will be instrumental in managing all of the initial and long-term logistical considerations of the Cape Henlopen RTI program.

Phase 3: Testing and Verification

Since I suggest evidence or research-based interventions as one of the components of my RTI framework for Cape Henlopen High School, I included the artifact, *Evaluation of Mathematical Misconceptions Intervention Program* (Artifact 7 or Appendix G) in my portfolio. The paper documents the evaluation of an in-class direct instruction intervention unit I created to address several common mathematical misconceptions that students in the enrichment classes were experiencing. I developed the interventions and created materials based on information and ideas developed by the National Strategies division of the British Department of Education. I used what I created to address specific misconceptions held by students in my mathematics enrichment classes.

The program consisted of a three-part diagnostic pre-assessment, direct instruction intervention, and post-assessment. I evaluated the effectiveness of the program by reviewing the data I collected during the intervention process.

Each intervention included four steps:

1. Identify through pre-assessment if the student is working with a mathematical misconception
2. Implement direct instruction teaching strategies to counter the misconception
3. Confirm that the misconception has been corrected through a post-assessment
4. Repeat the process for each misconception identified

The delivery of the direct instruction interventions took place in three 30-minute sessions over three days. When completed, the program evaluation verified that direct instruction was effective for correcting mathematical misconceptions, however, the contribution this evaluation made to my overall project was not simply that direct instruction is an effective intervention strategy. The true contribution was that a mathematics intervention could be delivered in a concise period of roughly thirty minutes and still be effective.

I had hoped that a brief intervention session would be effective since there are considerable time constraints present in the high school setting. These time constraints limit the amount of time available for RTI interventions. Based on the overall confirmation that students who received the interventions showed statistically significant levels of improvement over a control group that took the pre- and post-tests but did not receive the intervention, I decided that the amount of time needed for an RTI period at Cape Henlopen High School should be no more than thirty minutes. This led to the idea that if I could incorporate a shorter period of no more than thirty

minutes into the daily schedule, I could establish an RTI program at Cape Henlopen High School. I will discuss the creation of the RTI schedule later in this chapter.

I also included a memo titled, *DCAS/STAR Correlation* (Artifact 8 or Appendix H) in Phase 3. I used this artifact as a way to verify if the screening and progress-monitoring tools we would use in the framework had any correlation to DCAS. This was important because the State of Delaware uses DCAS to measure student achievement, which it reports as AYP. I was naturally interested in finding out if achievement gains documented by the progress-monitoring tool would translate into increased levels of performance on DCAS.

I had originally proposed to use Scholastic Math Inventory (SMI) as the screening and progress-monitoring tool. I planned to conduct the correlation between DCAS and SMI. However, due to various issues, my technology department was unable to install SMI on the server. My intention is to find ways to resolve the issues the technology department is having installing SMI. Since SMI identifies specific areas of weakness, provides specific interventions specific to these weaknesses, and produces reports detailing student progress, it could prove to be useful as the sole tool for screening and progress monitoring. In addition, the areas identified by SMI can be cross-referenced with the appropriate Common Core State Standards. I could use this data to provide an indicator of how a student might potentially perform on a high-stakes test like the DCAS.

Fortunately, the district had a different tool, STAR math, readily available at no cost. Although STAR math can be used as a screening tool to identify a student's

baseline level of performance in mathematics, is designed to monitor-progress and generates reports regarding student performance, it does not identify areas of need nor can it provide interventions. Despite its shortcomings, I eventually had to use STAR math as a means to screen and monitor at-risk students. No matter what the screening/progress-monitoring tool ended up being, my intention always was to identify if it could predict at-risk students future performance on the DCAS. This is important because if the assessment tool does not closely correlate to the DCAS, it may monitor progress inaccurately or insufficiently when compared to the DCAS. This could lead to teachers and/or the team to make incorrect decisions about whether a student should be included in interventions. It may also cause problems once a student starts receiving interventions, causing a teacher to inaccurately surmise that a student has made sufficient progress to be moved up from a lower tier to a higher tier. Although I think it is important to understand the correlation the screening/progress monitoring tool has to DCAS, I also think that the purpose of RTI is to increase student achievement in general and not just to obtain higher scores on the DCAS. Because of this, any progress-monitoring tool that monitors growth should suffice for the purposes of RTI.

My DCAS/STAR correlation analysis provided mixed results (Table 2). There is a weak correlation between DCAS and STAR when I ran the analysis for tenth grade students (n=26) but a moderately strong correlation between the two assessments when it was run for ninth grade students (n=24). A correlation analysis of the two groups combined (n=50) resulted in a moderate correlation between the two

assessments. Although the results did not indicate a strong correlation between DCAS scores and STAR scores, STAR may still be useful to monitor progress in the form of general growth. My final recommendation in the artifact was to run a new correlation analysis using a larger population. This may be a moot point, however, since STAR math is the only tool available for the foreseeable future that Cape Henlopen High School can use as a screening and/or progress-monitoring tool.

Table 2 Correlation of DCAS Scores to STAR Math Scores

Group	N	Correlation Coefficient
Grade 10 Fall 2012	26	0.309 = Weak
Grade 9 Fall 2012	24	0.665 = Moderately Strong
Grade 9 and 10 Fall 2012	50	0.528 = Moderate

The artifact *Analysis of Student Performance Data* (Artifact 9 or Appendix I) includes an analysis of two years of DCAS data for those students who participated in the enrichment class support. The enrichment program came into existence at the end of the 2009-2010 school year. Cape Henlopen High School had not meet Adequate Yearly Progress (AYP) and received the No Child Left Behind categorization of "Academic Watch". Compounding this problem, Cape Henlopen High School had not met the AYP target for the three prior years. As a result, the Cape Henlopen School District administration took action and decided to address the problem by utilizing

recently awarded federal Race to the Top (RTTT) funds. The district tasked the high school to include an additional intervention class for mathematics in the master schedule for the school year 2010-2011. The high school administration and guidance counselors reviewed student test data as a method of identifying students for the intervention program, which they titled mathematics enrichment. The original criterion for placement of students into mathematics enrichment was simply receiving a lower than proficient score on the DSTP (still the state's high stakes test at that time) in the prior school year. Over the summer, guidance counselors scheduled eighth and ninth grade students who met this criterion at the end of school year 2009-2010 into ninth and tenth-grade, mathematics enrichment classes for the 2010-2011 school year.

An analysis of the first two years of the enrichment program seems to support that the enrichment program had a positive effect on increasing students' overall achievement on the DCAS as evidenced by scale score mean increases. The evidence points toward the first year being the most effective at increasing students' growth levels. A major finding from this artifact is that if a student has success (achieves proficiency) at the end of one year of enrichment, the student should be able to maintain a higher level of growth even if we discontinue enrichment in the second year.

For students who did not achieve proficiency during their first year of enrichment, there are several other potential outcomes, none of which suggested that time spent in enrichment beyond the first year results in statistically significant increases in student achievement. In the end, the data seems to indicate that a short

period of intervention in the first year of high school is actually the most beneficial to the average student. One could interpret this further to mean that the shorter intervention periods of RTI might be even more effective than longer periods of participation in the current enrichment program.

Phase 4: Development and Implementation

The artifact describes the initial RTI professional development efforts at Cape Henlopen High School. The original intent of this artifact was to simply focus on collaborative teaming or co-teaching strategies for special education and general education teaching teams. However, the professional development efforts presented in *Creating and Supporting a Response to Intervention Program: Professional Development* (Artifact 10 or Appendix J) are more than just that. The administration at Cape Henlopen High School originally envisioned providing RTI-like interventions and supports to students who have Individualized Education Plans (IEPs) even though schools usually exclude students receiving special education services from RTI programs as soon as they begin receiving those special education services. The administration wanted to do this in order to address the disproportionately low achievement levels for students in this subgroup. The administration wanted to first strengthen teaching practices and strategies used to deliver content to students within the inclusion classrooms by special education teachers. The intention was that the inclusion classroom would provide as high a level of Tier 1 instruction as any non-inclusion classroom. Because effective delivery of curriculum and improved teaching

strategy methodologies would require the participation of special education teachers, my administration asked me to create several training modules regarding collaborative teaming. The intent of these training modules was to ensure that a universal model was being used across the school for interventions and that collaboration was occurring to ensure consistency of interventions. This professional development was delivered in the two parts. The first, in August 2011, was titled, "Inclusion and Resource Classes 2011-2012: Collaborative Teaming, Co-Teaching, Co-Planning." The second, in August 2012, I titled, "Team Approach to Mastery (TAM) Co-teaching Methods and Instructional Strategies for the Inclusion Classroom."

The scope of the professional development required for the implementation of an RTI framework quickly went beyond this original plan. The administration realized that the total general population of teachers had to be educated on the topic of RTI and its impact on their individual teaching practices. If a multi-tiered RTI framework was to be put in place at Cape Henlopen High School, the idea of RTI and the importance of effective Tier 1 instruction had to be universally understood. The first step my principal and I took was to establish a School-wide Response to Intervention team. This team consists of the principal, the school's three assistant principals, the school psychologist, the ninth grade counselor, the reading specialist, a special education coordinator and a teacher. The team met at Cape Henlopen High School to discuss ideas and potential improvements for upgrading the existing enrichment program and to begin the discussion about the establishment of a Response to Intervention (RTI) program at Cape. At the time of the team's first meeting, Cape Henlopen School

District had not yet developed an RTI program at the high school level. The team needed to learn about the essential components and practices of an RTI program and what their role as the guiding team would be during the development of an RTI program at the school.

As my first duty as assistant principal, I created an RTI presentation module used as professional development to guide this discussion. This module is titled, "Creating and Supporting a Response to Intervention Program: The RTI Problem Solving Team". This module was used to develop the team's understanding of the basics of RTI, including its multi-tiered approach; screening, progress monitoring and data based decision-making. I later slightly restructured this module as an RTI presentation and delivered it to the entire staff at the beginning of the school year 2012-2013. During this workshop, I introduced the staff to the school's new schedule that incorporated the Student Success Academic Period (SSAP).

I had to build time into the master schedule to deliver interventions before an RTI program could be possible. In order to implement a multi-tiered RTI system that incorporates separate intervention cycles required by the state, the Cape Henlopen High School master schedule had to be reevaluated and restructured in order to provide time in the schedule for RTI intervention sessions. Restructuring the schedule also makes the processes of conducting universal screening and ongoing progress monitoring much more manageable by creating a dedicated time to focus on and complete these activities without taking time from core courses. For these reasons, my RTI schedule proposal artifact had to be the first consideration before the

implementation of an RTI framework could begin. Therefore, adjusting the school's schedule is perhaps the most important aspect of this project.

In their investigation titled, "Principals' Perceptions of the Importance and Availability of Response to Intervention Practices Within High School Settings", Sansosti, Noltemeyer & Goss (2010) indicated that their findings verified the findings from previous similar studies (Windram, Scierka, & Silberglitt (2007); Sansosti, Telzrow, & Noltemeyer (2010)) that "scheduling and structural factors are major obstacles to the application of RTI within secondary settings." The Delaware Department of Education published a list of scheduling items that support RTI implementation. The list includes scheduling items like: a Freshman Academy, team teaching, instructional specialists, modification of the master schedule by moving to an A-day, B-day block schedule, scheduling common planning time for teachers, creating split block periods, staggering the school day, adding minutes to the day, incorporating homeroom into the first period of the day, and shortening each period by a few minutes to create a shorter period known as a "skinny". Within the artifact *Creating and Supporting a Response to Intervention Program: Cape Henlopen High School RTI Schedule* (Artifact 11 or Appendix K), I investigated and explained each item as it applies to Cape Henlopen High School. I also explained how the school is utilizing or could utilize each item to create a schedule that would support an RTI framework and allow for the implementation of an RTI framework (Table 3).

The result of my analysis was the creation of a master schedule for school year 2012-2013 that incorporated a separate, year long, 25-minute homeroom period

(skinny) built from time reallocated from the block periods during the day (Table 3). I reallocated 100 minutes of instructional time per week. We use this time for an RTI homeroom that meets Tuesday through Friday. I did not schedule homeroom on Monday. The administrator team met and named the homeroom the Student Success Academic Period (SSAP).

Table 3 Cape Henlopen High School Daily Schedule for RTI Intervention

Strip Day	Class Time	Lunch Time	Minutes
Student Arrival	7:30		
Breakfast	7:30 - 7:50		20
Homeroom	None		
1	7:55 - 8:35		40
2	8:40 - 9:20		40
3	9:25 - 10:05		40
4	10:10 - 10:50		40
5	10:55 - 12:35		100
5 (Lunch A)		10:55 - 11:25	30
5 (Lunch B)		11:30 - 12:00	30
5 (Lunch C)		12:05 - 12:35	30
6	12:40 - 1:20		40
7	1:25 - 2:05		40
8	2:10 - 2:50		40

Odd Period	Even Period	Class Time	Lunch Time	
Student Arrival	Student Arrival	7:30		
Breakfast	Breakfast	7:30 - 7:45		15
SSAP	SSAP	7:50 -8:15		25
1	2	8:20 - 9:50		90
3	4	9:55 - 11:25		90
5	6	11:30 - 1:30		120
5 Lunch A	6 Lunch A		11:30 -12:00	30
5 Class A	6 Class A	12:05 -1:20		75
5 Lunch B	6 Lunch B		12:05 -12:35	30
5 Class B	6 Class B	11:30 - 12:00 and 12:40 - 1:20		80
5 Lunch C	6 Lunch C		12:50 - 1:20	30
Class C	6 Class C	11:30 - 12:50		80
7	8	1:25 - 2:55		90

Cape Henlopen High School uses the SSAP to deliver both Tier II and Tier III RTI interventions to students who require them. We also use the SSAP to deliver several

other academic support programs to the remainder of the school population not involved in RTI. One of these initiatives is Kaplan SAT preparation course that is provided to every student in their junior year. The 100 minutes of homeroom included in the schedule sufficiently meets the Delaware Department of Education's requirement for 90 minutes of RTI time per week for Tier II interventions since Tier II interventions require at least 90 minutes of targeted instruction per week that is outside of the students' regularly scheduled class time.

During the school year 2012-2013 Tier III interventions were more difficult to schedule. The difficulty stems from the Delaware Department of Education mandate that Tier III interventions must provide a minimum of 150 minutes of targeted intervention in the student's area or areas of identified need. We must provide the 150 minutes a minimum of four sessions per week. Utilizing the 100 minutes of homeroom time for Tier III interventions minimizes the amount of additional time that we must find for Tier III to 50 minutes. This difficulty to find time for Tier III interventions could have been a problem for us because the State of Delaware originally required high schools to create a formal RTI program and begin implementation of the program during school year 2013-2014. Fortunately, the state changed the implementation date to 2014-2015. Since I was unable to find sufficient time for Tier III interventions in the schedule and the state mandate for implementation had been moved back a year, the first year of RTI implementation was not actually a pilot year. We named the first attempt at RTI at Cape Henlopen High School during school year 2012-2013 as the "trial year". During the trial year, the

grade-level teams discussed whether we could use one of the thirty-five minutes of class time on strip days (Mondays) creatively to provide not only supplemental instruction to struggling students but also extension instruction to students who are performing at or above proficiency. We did not make a decision at that time. Additionally, the extra 35 minutes does not quite satisfy the State's Tier III requirement of 150 minutes of RTI time per week outside of the students' regular class time. We will need to find alternate solutions to make up the 50 minutes difference. These alternate solutions could include looking for other areas of flexibility within the schedule, utilizing Enrichment classes exclusively for Tier III interventions, or using a "pull out" system where a specialist will take students from their core courses to provide additional intervention support time during the week. I will present the challenge created by Tier III to a school-wide RTI team. I will give them the task of finding a workable solution during our actual pilot year, 2013-2014.

Cape Henlopen High school had to create a more flexible master schedule so that students would be able to receive interventions when they needed them but also discontinue interventions when they have demonstrated the desired progress. I could not use the present structure of the enrichment program to provide RTI interventions because the enrichment structure requires students who we enroll in enrichment classes to remain in them for a full year. While this full year structure may be beneficial to students with the most severe mathematics deficiencies, many students do not need such an intensive, yearlong intervention program. RTI is a more appropriate format to target specific areas of need. Cape Henlopen High School needs

to rethink and restructure its school schedule if we are to keep the RTI program in compliance with the Delaware Department of Education's Guidelines for a Response to Intervention (RTI).

In the end, the two most important factors for establishing an RTI framework at Cape Henlopen High School are the aspect of providing professional development and the creation of a master schedule that will accommodate RTI interventions. The professional development is important for two important reasons. First, professional development is used as a means to educate the staff at Cape Henlopen High School about RTI in general so that the entire school has a common understanding of the purpose, structure and intended outcomes of an RTI program. Secondly, I can use professional development regarding RTI to educate the staff about specific aspects of RTI that may affect them directly. This type of professional development could include training on best practices for teaching in the Tier 1 classroom or data based decision-making practices. I cannot understate the importance of making key changes to the master schedule because without a schedule that allows RTI interventions to take place within the school day, an RTI program will not be able to be implemented at all. The outcomes of the professional development and the process of recreating the master schedule will be the focus of Chapter 4.

Chapter 4

IMPROVEMENT STRATEGIES RESULTS REFLECTION

As I look back at the four years of doctoral work and my project presented in this Executive Leadership Portfolio, I can say that I have had success implementing an RTI framework at Cape Henlopen High School. This success was only made possible when I achieved my goal of becoming an Assistant Principal at Cape Henlopen High School in July 2012. With this promotion, I got my first true opportunity to begin the implementation of an RTI program on a school-wide basis. I immediately went to work on the RTI implementation with my principal to define how this major change could work at our school.

Where we started

The process of implementing the framework truly began at the beginning of school year 2012-2013. When the teachers returned to work, we introduced the entire staff to the concept of, purpose for and means of implementing an RTI program at Cape Henlopen High School. We disseminated RTI information during a morning of the teachers' in-service time to explain and define the plan, how it would benefit the school, how it would change the school's master schedule and, most importantly, how it would affect individual teachers.

We knew that during this training we would have the opportunity to communicate a sense of urgency regarding the need to establish an RTI program at Cape Henlopen High School. We would need the staff to understand and accept this urgency in order for this initiative to be successful. We were able to create the sense of urgency relatively easily since many teachers already understood that the State of Delaware would soon require RTI at all secondary schools within the state. We decided to share detailed historical DCAS data to provide some context for the reasons our school needed to implement an RTI program. We also did this to allow teachers the opportunity to analyze the DCAS data and identify specific areas of need themselves. We believed this would give the teachers a deeper understanding regarding the urgency for implementing RTI and also a chance to develop a sense of ownership in the RTI implementation. During this process, we made sure that we recognized the mathematics and English departments for their contributions in creating the successes that led to improvement in student achievement over the prior two years. We defined successes as increases in overall proficiency scores on the reading and mathematics DCAS for ninth and tenth grade students. Through the analysis of the DCAS data, teachers discovered that despite the successes in our overall achievement, our African-American and special education sub-groups were still performing at significantly lower levels of proficiency than the Caucasian population (Table 4).

Table 4 Three Years Achievement Gap DCAS Data

Grade	Group	Spring 2010-2011 Math DCAS % Proficient	Spring 2011-2012 Math DCAS % Proficient	Spring 2012-2013 Math DCAS % Proficient
9	Caucasian	82%	89%	89%
9	African-American	43%	73%	52%
9	Special Education	39%	69%	41%
10	Caucasian	61%	82%	76%
10	African-American	32%	49%	46%
10	Special Education	20%	41%	37%

The staff's recognition of these lower performance levels led to two questions, "What are we currently doing to address this?" and "What steps do we need to take as a school to change this?" It was at that moment I knew that the teachers were taking ownership of RTI. To begin answering their questions, I referred to the enrichment program. Since I created the program, I provided a detailed explanation to develop the staff's shared understanding of the enrichment program since most of the staff did not have direct experience with it. I explained that the enrichment program was providing a similar type of intervention support found in RTI but as a school; we were unable to schedule all students who needed support into enrichment classes. I further explained that this was a major consideration in coming to the decision to implement the RTI program as an extra period built into the schedule. With this academic time outside of

the regular daily schedule, we would have an increased level of flexibility that would allow us to provide intervention support for all students who required it.

During the second half of the in-service morning, I introduced and explained the upcoming changes in the school schedule. I also explained that with the changes in the schedule, there would be corresponding changes in teacher responsibilities. I thought it was important to point out that the changes to the schedule were not simply an administrator decision but were decided in conjunction with a school-based RTI team that we had assembled over the summer. I wanted the teachers to understand that the team included, not only the principal and all three assistant principals but also the school psychologist, a guidance counselor, a special education coordinator, the math specialist, the reading specialist and a special education and a general education teacher. I thought this information was important so that teachers would not think that the changes to the schedule were coming from the top down without any teacher input.

First, I shared that the creation of an additional twenty-five minute period for RTI by rebuilding the school's daily schedule a team decision chosen and regarded as the best manner for delivery of RTI. I then described that the purpose of the twenty-five minute period was to create a time during which RTI interventions could take place. I explained that the team had identified a problem with the twenty-five minute period. The problem was what to do with students who did not participate in RTI during this "extra" time. The team's solution to the problem was to brand the period "Student Success Academic Period" (SSAP) and use it for more than just the RTI process. The team recommended this period should have an academic focus. We set

the expectation that teachers could not use the period as an advisory period or for club meetings. The team decided that teachers must give grades to students. The team also decided that for each year of SSAP participation, students would earn a quarter credit. The team thought this was necessary to increase student accountability and minimize attendance issues. The benefit of the concept of SSAP is that it offers time in the weekly schedule to include all students in academic focused activities.

At this point that I discussed what the academic focused activities would be. I explained that the creation of these activities would increase teachers' responsibilities and teachers would need to take on one of several new instructional assignments. These assignments vary by grade and include RTI interventionist (grades nine and ten), "Success-ability" program instructor (grade nine), Kaplan SAT Preparation instructor (grade ten and eleven), or College-and Career student advisor (grade twelve).

When the information of the new assignments was shared with the teachers, there were some heated discussions at first regarding the extra responsibilities as well as the professional development teachers would need to participate in to be able to do them. At this point in the day, all administrators became actively involved in order to present a unified front. We provided time for teachers to ask questions and participate in a discussion regarding the changes as they affected them. However, since we gave all teachers in the school a responsibility in order to ensure an equitable division of labor, teacher buy-in occurred rather quickly. Because of this quick buy-in, Cape Henlopen High School was able to move forward with implementing the SSAP right

at the beginning of the year. Surprisingly, there was never any pushback from the teacher's union.

What we accomplished

Once the staff understood and seemed to accept the RTI process and the modified schedule as a new part of the school's culture, I was able to implement all of the key RTI core components I recommended in my Literature Review (Artifact 6 or Appendix F). These key components are: building-level and grade-level teams that guide the program, a system of screening and ongoing progress monitoring, a multi-tiered structure, and evidence or research-based interventions. In the first year, we labeled RTI as a trial program to allow for mistakes and pitfalls. During the trial year each of the key components found a place in the program with varying degrees of success.

We created grade-level teams of teachers to guide the RTI program. These teachers review student DCAS data, recommend students for RTI and provide interventions and monitor progress. We were meeting at least once a week at the beginning of the year. However, finding time for meeting on a regular basis became a challenge that we will need to look at more closely in the new school year.

We were able to implement a system of screening and ongoing progress monitoring. This system utilizes ninth and tenth grade students' DCAS scores from the prior spring to identify if they are at-risk. Currently, not obtaining proficiency on the DCAS at the end of the year qualifies a student as at-risk. After we identify

students as at-risk, we screen them using a screening and progress monitoring software called STAR Math to identify if they are indeed performing below expected levels. We enroll students who are not proficient on DCAS and test below grade level on the STAR test in RTI. We then administer he STAR Math assessment every two weeks to monitor progress.

We were successful at creating a multi-tiered structure that delivered Tier I, Tier II and Tier III interventions as prescribed but we still struggled to find enough time for 150 weekly minutes required for Tier III. Students who required Tier III were provided interventions that were specific to their needs but the time allotted for these intensive interventions was the same 100 minutes provided in Tier II. This is an area that requires further attention.

We also have been able to incorporate research-based interventions. We use Compass Learning for our RTI interventions. The State of Delaware has approved Compass Learning standard protocol intervention software, which it provides it to us free of charge. The data gathered by Compass Learning is readily available to teachers and it adds another layer of information about student performance that can be used in the decision making process.

Another important outcome that moved us toward a true RTI program at Cape Henlopen High School other than my individual work on the project was the creation of the school-wide team. With the help of the school-wide team and the other administration members of Cape Henlopen High School, I was able to realize one of the most important goals: the inclusion of a “skinny” period into the school schedule. I

was able to incorporate time in the schedule to accommodate the implementation of an RTI program. This is one of the most important outcomes of my project and I have documented it in Artifact 11 or Appendix K.

As stated previously, we named the skinny period SSAP. During the school year 2012-2013, the time allocated for SSAP was thirty minutes at the beginning of each block day. Mondays are not block days so we did not hold SSAP on that day. Since school announcements take up five minutes of this period, there were effectively twenty-five minutes of time available for RTI four times a week for a total of 100 minutes. Without this modification to the schedule, implementing an RTI program would have been much more difficult if not logistically impossible.

A secondary but no less important outcome attributed to the inclusion of the SSAP into the weekly schedule is the streamlining of Cape Henlopen High School's overall schedule itself. When I modified the schedule, I had the opportunity to correct an uneven distribution of time between periods across the week. The inconsistencies in the original schedule created instructional challenges for teachers since class periods were not the same length and varied by as much as twenty-two minutes. Additionally, classes began and ended at times that were difficult to remember (e.g. 11:12, 1:37) and pass times between classes varied from four to seven minutes. These factors appeared to contribute to student tardiness. Incorporating the SSAP into the daily schedule helped to recalibrate the weekly schedule so that now, each block class period meets for eighty-five minutes, pass times are all a consistent five minutes and all classes start and end on a zero or a five (e.g. 7:55, 10:00).

Where we are going

Re-evaluating and expanding the RTI program at Cape Henlopen High School will continue to be the focus of my work. This work will be a team effort. The team will be required to ascertain if our screening process is identifying the correct students, verify that the interventions we choose are most effective and under what circumstances and review student performance data to decide if the program is having a positive affect on student achievement. The team may also need to decide if we should expand the RTI program to address student misbehavior. This is something that the school psychologist has recently suggested.

In order to ensure that the RTI program at Cape Henlopen High School develops into an RTI program that satisfies the requirements of the State of Delaware and meets the needs of the students of Cape Henlopen High School, I applied to participate in the State of Delaware's Secondary RTI Pilot Program. In June 2013, the State of Delaware's Secondary RTI Pilot Program accepted Cape Henlopen High into the pilot. We were awarded a grant of $30,000.00 that we could use for professional and program development. Participation in the pilot represents the second phase in the development of the Cape Henlopen secondary RTI program. The first phase was the first or trial year where we put the structures of the program into place. The second phase will encompass the current year (2013-2014). This year will be the pilot year where we will focus more on data-collection and data based decision-making, intervention development and quantifying improvements in student achievement. The third year (2014-2015) will represent the first year of a fully developed RTI program

at Cape Henlopen High School just in time to meet the state's secondary RTI deadline for implementation. I believe that the work I have done in the completion of this ELP has been a major factor in being able to create an RTI program in time to meet the state's deadline.

If I were to consult with anyone who was about to begin implementing an RTI program at his or her school I would recommend this three-year implementation process. I consider the first year of any RTI program as a trial year for developing the program. During this first year, the focus should be on developing the RTI program's structures and processes as well as developing staff capacity within the program. In this first year, program developers should expect mistakes. They should learn from these mistakes and use them as a method to improve upon their original ideas. Developers should consider the second year as the pilot year and should attempt to run the program as close to its final form as possible.

We are utilizing this model at Cape Henlopen High School. I have found that the original framework established in the first year is working well but delivering effective interventions and verifying their efficacy has been more difficult. This second or pilot year has become the year that we are fine-tuning interventions. We are still using Compass Learning as the main provider of RTI interventions but several of the teachers have begun to investigate other options such as Learning Point Navigator, which we have access to through the DCAS system. In addition, we are going to pilot Scholastic Math Inventory (SMI) during second semester. SMI can be used as a secondary screening tool, identify the areas in which students require intervention,

provide interventions and function as a progress monitoring tool. As a team, we will have to critically assess the effectiveness of the interventions. Additionally, the team is developing parameters that define how we should group student for interventions and how to measure the interventions in a manner that results in useable data.

My second recommendation is to maintain the original core group of teachers in the RTI program for at least the first two years. In our trial year, we had chosen a large group of teachers to be RTI interventionists. In the second or pilot year, we decreased the number of teachers utilized as RTI interventionists. The teachers we removed from the RTI program we reassigned to be SAT prep instructors. This was a mistake. The teachers who remain in RTI feel that we had placed an unfair burden on their shoulders. They stated that in the first year there were fewer students in each RTI class. This divided the responsibility of obtaining results in RTI more equitably. The increased responsibility and workload has caused a bit of dissent and "hard feelings" that has proven difficult to counter. Because of this, we have recently begun to use part of the weekly mathematics Professional Learning Community meeting to discuss and create an Action Plan to improve the RTI program at Cape Henlopen High School.

In order to ensure that the Cape Henlopen secondary RTI program continues to grow and strengthen, I recommend the following:

- Use the pilot year to investigate effective interventions

  Rationale: We conduct the current RTI process more as mathematics support and not true intervention. We give students opportunities to work on general mathematics topics that may or may not address their area(s) of need. There

appears to be a lack of fully developed, research-based interventions or intervention programs in mathematics. Because of this, we currently are not providing interventions tailored to meet each student's specific area(s) of need.

- Continue Professional Development for Tier I Instructional Best Practices

  Rationale: Providing students quality instruction and delivering the core curriculum with fidelity is the best method to ensure that students reach high levels of achievement. Differentiation of instruction within the general education classroom is supported by research as a major contributor to student success.

- Ensure implementation Common Core State Standards with fidelity in all schools at Cape Henlopen School District

  Rationale: The Smarter Balanced assessment will replace the DCAS test during school year 2014-2015. If we are to continue to use the state's chosen standardized test as an indicator of students at risk, we must be sure that the students who take the test will be able to perform at the highest levels possible or we will misidentify a large number of students as at-risk in the spring of 2015. We can counter this student misidentification during the secondary screening, but the process may become logistically much more difficult.

Chapter 5

LEADERSHIP DEVELOPMENT REFLECTION

The growth I have made as a scholar, problem solver and partner has been something that surprised me in ways that I did not expect. While I did expect to grow academically and acquire skills that I would be able to apply to my career and professional life, I did not expect the amount of personal and emotional growth I have experienced through the process of working on my doctoral degree. Learning about, reflecting on and making efforts to become part of the bigger picture within my district and community has caused me to think deeply about my place in the greater scheme of things and how my decisions and actions can either help or harm the educational community in which I function. I have become much more reflective and much more likely to listen to those around me, taking their ideas and suggestions into account before coming to a decision of my own. I do not believe that I have become less decisive; I simply view this as a form of professional maturity. I attribute this professional maturing to the cohort structure of the University of Delaware's educational leadership doctoral program (Ed.D.). Throughout the process, I had to learn how to effectively work with others. I came to realize that no one makes a difference in education without learning the skills that are required to collaborate well, communicate effectively and implement ideas fully and efficiently.

My growth as a Scholar

I am very fortunate that I have a brain that works well. The fact that I am able to process information easily, learn and retain facts and reason well has been, at times, a detriment to developing other skills that are also necessary for truly high levels of academic achievement. These attributes include organization, using time efficiently and developing perseverance when faced with challenging problems that may be beyond one's current cognitive ability or academic skill set. Within the first semester of the doctoral program I quickly realized that I would need to develop in these areas if I wanted any chance at completing my studies because "being smart" was not enough.

I remember sitting in Dr. Frank Murray's class as he discussed some of the finer points of test reliability and validity. Dr. Murray was explaining what he considered the obvious differences between these two ideas; however, the concepts are very nuanced and despite his explanation I realized that I was having an extreme amount of difficulty comprehending the nuances that he was presenting. I realized for the first time what it felt like to be pushed to the edge of my cognitive ability. I also realized that this is where I needed to be if I wanted to get to the point of being worthy of receiving a doctoral degree. I could have easily given up out of frustration but instead I looked inward. I found that by analyzing new ideas or questioning my previously developed understandings and then reflecting deeply on whatever concept was being presented I could push myself beyond the edge of my understanding. I

learned that to be truly scholarly I needed to go through this process and develop my deeper, fact-based understanding of topics that I did not understand intuitively. This has translated into my work and given me the ability to process different perspectives more effectively.

My growth as a Problem Solver

My strength has always been being able to look at a challenge, assess all of the variables, make sense of what needs to be done and then do it. My career started in the private sector and I spent many years assessing novel situations and finding unique and workable solutions. What I think I have learned through my doctoral studies has to do more with being able to use research to find a solution that supported by empirical evidence. I now look for proof that an idea or proposed solution has some evidence that supports it will work instead of just following fads or gut feelings. Two tools that have had an appreciable impact on my problem solving abilities are the PELP Framework and Kotter's Eight Steps of Change. These tools include ideas that have become ingrained in me as "go-to" processes for approaching problems or introducing change into my organization. Both of these frameworks provide a structure that allows me to ensure that I approaching a problem in a logical manner, account for the major variables and check for successes along the way. Although these process tools may not be outwardly apparent in this project, both were constantly running in the background. They were instrumental in any success I had addressing the problem of implementing an RTI program at the secondary level.

My Growth as a Partner

My years as a classroom teacher caused me to become a sort of sole-proprietor. As the only special education math teacher or math specialist in the schools I worked in, I did not have many opportunities for collaboration. Most of my interactions with other teachers were consultative instead of collaborative. Most of the time, I worked as an entrepreneur who created a unique product and service. Now as an administrator, I spend most of my time collaborating with other administrators regarding strategies to improve the instructional core, discipline issues, logistics and simple day-to-day problems that arise. I collaborate with the teachers regarding instruction, students and evaluations. I collaborate with the guidance department, the district office, parents, students, and the support staff in the building all in an effort to find ways to make the educational process and experience better for the students at Cape Henlopen High School. I no longer have the autonomy to be the sole decision maker about every detail as I did as a classroom teacher. Because of this I have had to develop partnerships that promote professionalism, cooperation, effectiveness and respect. These partnerships have become invaluable to me as I work to foster an inclusive climate of excellence at Cape Henlopen High School. I remember the words of University of Delaware professor Dennis Loftus when he explained that each of us in the cohort would forever be a "no cost consultant" to everyone else. His words were very prophetic as I have contacted or been contacted for a professional reason by every person in my cohort. I have found these professional partnerships to be the most valuable outcome of my years of doctoral study.

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Appendix A

EPP PROPOSAL: UTILIZING A RESPONSE TO INTERVENTION FRAMEWORK TO SUPPORT STUDENT ACHIEVEMENT IN MATHEMATICS AT CAPE HENLOEPN HIGH SCHOOL

Introduction

This Executive Position Proposal will describe the steps I will take to support the organizational improvement goal of establishing a Secondary Response to Intervention (RTI) for mathematics at Cape Henlopen High School. Its secondary intents are to present data that documents the Response to Intervention program's effectiveness at improving students' math competencies and to make recommendations regarding the future structure of the program.

Organizational Context

The Cape Henlopen School District is located in the town of Lewes in Sussex County, Delaware. The town of Lewes is a community that values history and tradition. The atmosphere of the town and the preservation of history and traditions extend into the school district itself. The district opened the new Cape Henlopen High School in 2010. This new facility is a 216,000 square foot school that houses grades nine through twelve. It is the only high school in the district. In school year 2010 – 2011, Cape Henlopen High School had a total enrollment of 1,319 students. The ethnic breakdown of the student population was as follows: 18.5% were African-

American, 71.3% were white, 7.3% were Hispanic/Latino, 1.8% were Asian, 1.0% were American Indian and 0.1% were Hawaiian.

The district defines its Mission Statement as, "The Cape Henlopen School District prepares each student for a healthy, creative and rewarding life in a diverse and global society by creating an educational environment which enables each student to achieve personal excellence and lifelong learning skills to become a productive and responsible citizen." In spite of this statement, standardized test scores for both 9th and 10th grade mathematics at the high school had been falling over the previous few years. This was an indication that the district was not meeting its own mission of enabling students to achieve personal excellence and acquire lifelong learning skills. Additionally, despite the 2010 – 2011 Race to the Top goal of "accelerating achievement and improve student outcomes by turning around low achieving schools", DCAS scores remained low. The results of the September 2010 DCAS testing in mathematics indicated that only 45% of the students in 9th grade had met proficiency. However, when the 9th grade target group is broken down by ethnicity, 53% of white students reached proficiency, but only 24% of Hispanic students and 20% of African-American students reached proficiency. Additionally, only 13% of students receiving special education services had reached proficiency.

During the 2010 - 2011 school year, the high school was under corrective action to address its low level of student performance. In the summer of 2010, a mathematics intervention program was created. This program created additional sections of mathematics known as Enrichment classes. Ninth and tenth grade students

who were performing below proficiency were candidates for these enrichment classes. However, the screening of the students was not formalized and actual scheduling of students for enrichment classes was difficult. Because of this, many students who may have benefitted from additional mathematics instruction did not receive it. Regardless of this fact, the spring 2011 DCAS results did show improvement with 73% of the 9th grade population achieving proficiency (28% increase). The subgroup breakdown revealed an improved picture as well; 82% of white students met proficiency (29% increase), 54% of Hispanics met proficiency (30% increase) and 43% of African-American students met proficiency (23% increase). Additionally, 40% of students receiving special education services met proficiency (27% increase). However, while these scores show significant gains, there are inconsistencies in performance between the subgroups that require further attention.

The 2010 – 2011 school year also introduced a new principal to Cape Henlopen High School by the name of Brian Donahue. In his first year at the school, he made a concerted effort to address the inconsistent levels of performance that exist between various groups of students at the school. As he entered the second year of his tenure as principal, Mr. Donahue remained committed to instituting practices and programs that would lead students toward academic success. His goal is for Cape Henlopen High School to obtain a Superior rating.

Prior to school year 2010 – 2011, the Cape Henlopen School District decided to appoint a math specialist at Cape Henlopen High School as part of Delaware's Race to the Top initiative. The intent of appointing a math specialist at the high school was

two-fold; first, to establish a data-driven program that could define which students require support in the area of mathematics and second, to develop a program that regularly utilizes research-based interventions in a systematic and purposeful way to those underperforming students.

Organizational Role

In September 2009 when I began my doctoral studies, the Appoquinimink School District (ASD) was my employer. While working at ASD, I began to realize that a Response to Intervention program would benefit those students who were performing below proficiency. This understanding began when I had the opportunity to attend a statewide, two-day professional development for administrators on the implementation of Response to Intervention programs at the secondary level. After the training, I felt that my career experience of working exclusively with students who struggle in mathematics made me an excellent candidate for creating an RTI program for the two high schools in ASD. While my administration was receptive to my ideas for establishing an RTI program at our school, they felt I would not be able to accomplish this in my role as a teacher. My principal believed to properly institute and execute an RTI program, the district would need to orchestrate each phase of its development. This would require the participation of both of the district's high schools. The administrative team believed that someone at the district level would need to be responsible for the organizing and execution of such a program. At that time, ASD had just eliminated the secondary math specialist position. At the same time, the district expanded the responsibilities of the elementary math specialist to

those of district-wide math specialist. Although I was willing to take the responsibility of creating a district RTI program, my position as a teacher made it impossible for me to act as a day-to-day coordinator or specialist for a district-wide program. In addition, the district was not willing to create a new position for me nor was my school was willing to lose the teacher unit that I represented. Even though I was unable to initiate an RTI program at that time, I did not let go of the idea that in order to address the needs of all struggling students, a program with defined structure and fidelity of implementation was required to raise overall proficiency levels. It also became my belief that addressing all students' needs would directly benefit each subgroup and have a positive effect on the narrowing any achievement gaps that existed. It was at this time that I began to focus my doctoral work on raising student achievement, specifically in the area of increasing student proficiency in mathematics.

In August 2010, Cape Henlopen School District hired me as the high school's math specialist. My task, as Cape Henlopen High School's math specialist, is to establish and implement a secondary mathematics support program at the high school. In addition, the district assigned me to be the sole teacher for all mathematics enrichment (support) classes.

Problem Statement

A significant portion of the student population at Cape Henlopen High School is not obtaining proficiency on the Delaware Comprehensive Assessment System (DCAS) standardized test. Additionally, significant gaps persist between the Hispanic and African-American student subgroups as well as the special education subgroup

when compared to the Caucasian subgroup, Table 5. While several positive, research-based programs exist within the district, the district only recently introduced these programs.

Table 5 Cape Henlopen High School Spring 2011 9th Grade DCAS Performance Results

Group	Percentage Proficient
Overall	73%
White	82%
Hispanic	54%
African American	43%
Special Education	40%

Only one program, the Interactive Mathematics Program, specifically focuses on increasing mathematics achievement. Cape Henlopen High School first began using this program for the freshman class during the 2010-2011 school year. At the same time, the school began to enroll students who were not meeting proficiency on the mathematics portion of the DCAS in specific mathematics enrichment classes.

Before these programs, the district had no unified vision and few formal structures at the secondary level to help students who struggled in mathematics. Teachers at the high school implemented their own strategies to assist these struggling students. Some of these strategies may have been more successful than others, but no data were gathered to ascertain which of these strategies had a positive effect on student achievement. In light of the college- and career-readiness movement in the

United States, this situation was in need of attention. Therefore, the problem is that Cape Henlopen High School does not have a coherent, systematic and data-driven mathematics support program to meet the needs of struggling students.

The state of Delaware has been moving toward implementing Response to Intervention Programs at the secondary level. In the context of Cape Henlopen High School, the RTI mandate creates a framework in which a more formalized way of meeting student needs could be implemented. This type of program may provide the structure that Cape Henlopen High School needs to be able to address the deficiencies and discrepancies in mathematics proficiency levels. In the article *Response to Intervention in Secondary Schools*, Feuerborn, Sarin and Tyre (2011) stated:

> The promise of RTI is that it will enable schools to better and more efficiently meet the learning needs of a large continuum of students by providing evidence-based, school-wide instruction, supplemental supports, and intensive individualized interventions. (p. 50)

Research has shown that RTI can be used to improve student achievement in among low performing students. According to the 2011 RTI Implementation Report in Technological Learning Magazine (2011), elementary schools are leading the way in the area of RTI implementation. The report states that 80% of elementary school respondents indicated that they have completed a full implementation of an RTI program with fidelity in one or more domain areas (reading, math or behavior). Seven in ten districts reported that they had enough data to evaluate the affect that their RTI program had on Annual Yearly Progress (AYP). Of these districts, a higher

percentage reported an increase in AYP compared to those that reported no improvement in AYP.

> "Although the promises are alluring, the literature gives little guidance on how to implement RTI at the secondary level." (p. 50)

However, Matthew Burns (2008) described guidelines for an effective secondary RTI program as three "Core Components". These components might be able to be used as guidelines for creating an RTI framework at Cape Henlopen High School. He described these components as:

1. **Data-based decision making with multiple sources of data**: The multiple sources of data that could be utilized to represent this component are: the Scholastic Math Inventory, Cape Henlopen's students' results on the DCAS and student performance on common formative and summative assessments created collaboratively by the mathematics teachers
2. **Flexible, small-group instruction in both skill strategies and content**: The current framework of Enrichment classes at Cape Henlopen High School would represent the focus of this component.
3. **Collaborative problem analysis**: The Mathematics Department's Professional Learning Community and the Special Education Department personnel who work with mathematics students would be representative of this component.

Burns further stated that success of an RTI program is more likely to be ensured if these core components are followed closely. Establishing, implementing and

maintaining a framework that includes these core-components will provide students with additional time to develop their mathematical skills and gain greater understanding of the mathematical content. The intention is to improve their overall math performance, allowing them greater success in their mathematics classes and higher levels of proficiency on the DCAS.

Overall Improvement Goal

There are several significant differences in the levels of proficiency in mathematics between Caucasian students and students of other subgroups at Cape Henlopen High School. The district recognizes this problem and it is taking steps to rectify it. Even though the district has adopted two programs, Learning-Focused Strategies (LFS) and Interactive Mathematics Program (IMP), with the intention of improving student proficiency levels, only the Interactive Mathematics Program specifically focuses on improving mathematics proficiency. During 2010 - 2011, Cape Henlopen High School utilized LFS for all grade levels but implemented the Interactive Mathematics Program only for 9th grade students. The spring 2011 DCAS data reflected an increase in proficiency but also suggested that these programs alone would not be enough to raise the proficiency level for all subgroups (Table 5).

Based on this data and its representation of the student needs at Cape Henlopen High School, my organizational improvement goal is to establish a formal RTI support program for those students who have not yet reached proficiency in mathematics as indicated by their DCAS scores, mathematics performance and teacher referrals. Since any progress or positive effects the program might have on student achievement

will need to be monitored, I will use the DCAS data from the two-year period of 2010 – 2012 as evidence that the program is having the intended effect. The results will be included in my Executive Leadership Portfolio.

Improvement Efforts to Date

In an effort to create a systematic and coherent mathematics support program at Cape Henlopen High School, there are several variables that the district required me to include. The first is Cape Henlopen School District's requirement that any program developed focuses on raising student proficiency percentages on the DCAS in order to ensure AYP. Second, the district requested that the program provide students additional time and support outside of their primary mathematics course. Cape Henlopen High School provided this additional time and support during school year 2010 – 2011 through supplementary mathematics support classes known as Enrichment classes. During school year 2011 - 2012, CHHS restructured these Enrichment classes to resemble more closely the tiered structure of a Response to Intervention program. This restructuring provided a more specific focus on screening students for service as well as providing levels of intervention that better addressed each student's needs. My future artifacts will investigate if this structure of providing additional time in an RTI framework results in the district's overall improvement goal of increasing student proficiency in mathematics at Cape Henlopen High School.

Table 6 Elaboration on Problem and Improvement Efforts to Date

Artifact	Audience	Description	Action Steps
1. Analysis of the Development of Educational Law	Educational Leaders	Analysis of College- and Career-Readiness in the US	
2. Addressing Student Achievement at Appoquinimink High School	District Personnel/ School Admin/ Teachers	This artifact goes beyond overall student achievement and examines what can be done to address achievement gaps that exist between subgroups.	
3. Public Engagement Strategy	District Office Personnel	Discussion of the CHSD Strategic Plan regarding College- and Career Readiness, Teacher Quality and increasing student proficiency.	The Cape Henlopen School District has addressed these issues in its RTT LEA Plan Goals
4. Exercise of Leadership	Self/ Colleagues/ Admin/ District Personnel	An outline of the plan for RTI at the high school and best practices that should be included.	This artifact is an outline of the development of the RTI program and stakeholder involvement
5. Evaluation of Mathematical Misconceptions	School Leaders	Verification of Effectiveness of Direct Instruction	Direct Instruction will be used in enrichment
6. Collaborative Teaming PD Module	RTI Team	Developing Best Practices for teaching in interventions	Develop modules and deliver during PD
7. Literature	Self/ Math	Documentation of	Analyze the

Review of Secondary Response to Intervention	Department/ Parents	latest best practices in Secondary RTI	body of Research on Secondary RTI and formally organize findings
8. Universal Screener Correlation to DCAS Performance Levels	Admin/ Guidance/ RTI Team	Ascertaining if there is a correlation between chosen Universal Screener and DCAS Performance Levels	Assess students with SMI at a time close to DCAS administration and analyze the results
9. Analysis of Student Performance Data	District Admin/ School Administration/ Teachers/ Parents	Analysis of two years of DCAS data for the same cohort of students	Gather and analyze 2010 – 2012 DCAS data to ascertain what if any growth has been made by students
10. RTI Schedule Proposal and Implementation Document	Admin/ Guidance/ Students	The master schedule document of the enrichment classes by Tier. It includes information regarding sections, number of students, times and co-teachers	Revise current implemented schedule to better meet the needs of students

Artifact 1: Analysis of the Development of Educational Law

I am the primary audience for this artifact. However, it is useful for providing information to administrators at both the district and school levels who may want more information about College- and Career-readiness. This artifact was the document that helped me understand the importance of College- and Career-readiness developments in the United States political realm. To allow students to graduate and go to college so unskilled in mathematics that they must enroll in remediation classes is unacceptable and must be addressed during the high school years. In light of these developments, the importance of implementing RTI at the secondary level for students who are struggling became clear to me.

Artifact 2: Addressing Student Achievement at Appoquinimink High School

The audience for this paper is district personnel and school administration. This artifact investigated the Appoquinimink School District Strategic Plan requiring that all schools in the district make measurable improvements toward decreasing the achievement gap in mathematics, especially between black and white students. The details about this requirement were vague within the document but this vagueness allowed me to create my own parameters regarding the target population and the methods that the district could use to specifically address these gaps. The artifact identifies the target population as freshman at AHS who are considered low achieving in mathematics. It explains that any student who was identified as needing intervention will receive it as part of their individual mathematics program, for as long

as required with the goal of maximizing their overall achievement. This artifact is the first paper that allowed me to investigate the creation of a framework for intervention that was in the Tier I, Tier II and Tier III model of Response to Intervention (RTI).

Artifact 3: Public Engagement Strategy Reflection

This artifact's intended audience is all stakeholders of the Cape Henlopen School District. The focus of this artifact is a description of the reasons that the District needs to redevelop its Strategic Plan. These reasons include changes in the national political scene of education that affect the District as well as changes within the District itself that require the District's immediate attention. I want to include this artifact in my proposal because it gave me an opportunity to reflect on the new district I had just joined. It allowed me to describe what I saw as the district's current state of affairs as they related to the world of education's "bigger picture". This helped me to develop a framework for a personal plan of action, which included my belief that RTI would be beneficial to this district. This plan gave me some direction as to how to handle the greater community that I had just joined in September of that year. In this reflection, I argue that the Cape Henlopen School District needs to modify its Strategic Plan to include provisions regarding College-and-Career readiness guidelines and a teacher quality framework if overall student proficiency is to be increased. Other stakeholder groups are also included in the discussion because the greater community can also contribute to positive outcomes students experience at school. The synopsis is

that the district needs to pursue all avenues to find solutions when students are not obtaining academic proficiency during their high school years.

Artifact 4: Exercise of Leadership

The intended audience for this artifact is the district secondary mathematics curriculum director, the high school principal, mathematics department supervisor and the 9th and 10th grade mathematics teachers. This artifact includes an outline of the plan to improve the structure of the mathematics department including the plan to begin the implementation of a Response to Intervention program and the best practices that should be included in the RTI program.

Artifact 5: Evaluation of Mathematical Misconceptions Intervention Program

This paper has an intended audience of school administrators in particular the principal. It documents the evaluation of an in-class direct instruction unit that addressed several common mathematical misconceptions that students in the enrichment classes were experiencing. This evaluation verified that direct instruction was indeed an appropriate strategy to use with students who are below grade level in mathematics.

Critical Next Steps

Now that one year of enrichment services has been completed and a preliminary framework for an RTI program has been established at Cape Henlopen High School, I need to systematize the successes that we experienced last year in the area of student growth. It is of the utmost importance to create a formalized RTI program that utilizes best practices in order to effectively support all students in

obtaining proficiency. Identifying these best practices from the literature and to some extent my own experience will provide structure for the program and allow for future successes and development. By formalizing the program's framework, it is my intention that the RTI program will be perpetuated even when I am no longer the math specialist at the school. The following five proposed artifacts will help me to formalize the secondary RTI program at Cape Henlopen High School and maximize positive outcomes for all students require additional support.

Proposed Artifact 6: Collaborative Teaming Professional Development Module

The administration at Cape Henlopen High School wanted to include intervention strategies and support to students who have Individualized Education Plans to ensure that all students' performance levels are increased as much as possible. They wanted these interventions to be similar in structure to the RTI program. Because delivery of these interventions will require the participation of Special Education teachers, my administration asked me to create several training modules regarding collaborative teaming. The intent of this professional development is to ensure that a universal model is being used across the school for these interventions and that collaboration is occurring to ensure consistency in the delivery of these interventions to the students.

Proposed Artifact 7: Literature Review of Secondary Response to Intervention

I have familiarized myself with some of the research regarding the implementation of Response to Intervention programs, although I have not yet completed a full analysis of the existing literature. Much of the literature I have read

focuses on the implementation of RTI programs at the elementary level. From this, I have extrapolated what might work best at the secondary level. At this point, I need to complete a literature review that identifies the best practices at the secondary level. Since the implementation is truly in its infancy, a literature review will inform the processes and procedures that we are establishing at the high school. In addition, the information gathered during this process would allow me to reflect on successes and failures and make recommendations for improvement to the mathematics department staff, guidance counselors and administration at both the school and district levels. It would also provide me with information I would need to have a common dialogue the Math Specialists at the middle schools.

Proposed Artifact 8: Universal Screener correlation to DCAS performance levels

Justifying to my administration and to parents which students should receive RTI services is less challenging when the decision is based on data. My district has adopted the Scholastic Mathematics Inventory as a tool to be used for the universal screening of all students during their first year of high school. I am to use this tool as a means to identify those students who are performing below grade level so that they can be included in the RTI program. Since one of my focus components is "Data Based Decision Making" I need to ascertain how reliable the SMI is as a tool for providing reliable information about student need in the area of mathematics. I do not know if this screener correlates with the DCAS. I want to run an analysis to ascertain if SMI is a reliable indicator of how students will perform on the DCAS. I will

compare the data from the SMI administration to the student performance data with the winter DCAS data.

Proposed Artifact 9: Analysis of Student Performance Data

This artifact will include an analysis of two years of DCAS data for those students who have participated in the Enrichment class support program. I am the primary audience for this artifact because I believe this is a critical artifact of reflection. However, I would also like to share the results with my administration. My being able to analyze the data and quantify where growth is occurring – which parts of the population are responding and which are not – is absolutely necessary in order to make adjustments that will strengthen the program and tailor it to the unique needs of our student population.

Proposed Artifact 10: RTI Schedule Proposal and Implementation Document

The intended audience for this artifact includes the school administration, guidance counselors, students and math and reading specialists. The RTI master schedule document is required to be able to appropriately build the school's master schedule. Developing the RTI schedule is necessary so that each student who requires enrichment will be placed in the correct tier of enrichment class. This document will include information regarding the rationale behind the assignment of each tier of students, the number of sections available in each tier and grade level, the total number of students who need to be scheduled, the times each class will be offered - including the total number of minutes of enrichment each tier level will receive each

week - and the co-teachers (if any) who will need to be scheduled. Additionally, many students require both math and reading enrichment. Because of this, reading enrichment sections will also be included in this document.

Summary

This project has become an integral part of what I do to ensure that the Cape Henlopen School District's mission is being carried out in practice. It is my hope that my ELP will be a documentation of the passion I have developed regarding this initiative and that it will become a true and significant contribution to the educational community. I hope that my work in this area will help to expand the secondary RTI knowledge base and lead to success for more students both within and outside the Cape Henlopen Community.

I do not foresee any circumstances that will prevent me from completing my proposed artifacts. Therefore, the culminating portfolio that I will submit will include the following components:

- An Analysis of the Development of Educational Law
- An Document Addressing Student Achievement at Appoquinimink High School
- A Public Engagement Strategy Argument
- An Exercise of Leadership Analysis that includes specific components for a Response to Intervention program at Cape Henlopen High School
- An Evaluation of a Mathematical Misconceptions Intervention Program

- A Professional Development Module for Collaborative Teaming, Co-Teaching and Co-Planning
- A Literature Review of best practices for Secondary Response to Intervention Programs
- A Correlation Analysis between DCAS scores and the universal screening tool
- An Analysis of DCAS data documenting student growth
- An RTI Schedule Proposal and Implementation Document

Timeline

I will utilize the remainder of the winter of 2011/2012 and Spring 2012 to complete my remaining artifacts. The January 2012 DCAS administration will provide me with the data that I need to ascertain the amount of growth students receiving RTI support make as compared to the general population.

My current plan is to be prepared to defend my ELP this spring and graduate in May 2012.

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Appendix B

THE REAUTHORIZATION OF THE ELEMENTARY AND SECONDARY EDUCATION ACT: COLLEGE- AND CAREER-READY STUDENTS

Proposed Changes to ESEA

The United States Department of Education's "A Blueprint for Reform" document (The Blueprint), states that a major function of the American educational system is to create "College- and Career- Ready Students." This Elementary and Secondary Education Act (ESEA) reauthorization proposal has been included as a key goal for the nation. The College- and Career-Readiness policy in The Blueprint (2010) requires that states:

- Set rigorous college- and career- ready standards,
- Provide rigorous and fair accountability and support at every level,
- Measure and support schools,
- Build capacity for support at every level and,
- Foster comparability and equity

The basis of this goal stems from the 1994 ESEA reauthorization requirement that each state must set education standards describing what students should know and be able to do in several key subjects. The 1994 requirement established the need for each state to develop state education standards and state assessments quantifying whether or not students were meeting the standards as evidenced by a level of proficiency as

defined by each state. The desire to create college- and career-ready students developed because it was found that the current standards do not sufficiently ensure that students will obtain the knowledge required to be successful in college or their post high school career. The current thought is that with federally mandated, state instituted college- and career-readiness standards, in the form of a universal set of standards used by all states, the states would more effectively and equitably prepare students for their post high school experience.

Rationale for Policy Study

According to a 2005 report, an increasing number of students (63% at two year institutions and 40% at four-year colleges) need to take remedial classes in order to be able to perform at the college level. In spite of this intervention effort by colleges and universities, the number of students who drop out of college during their first year is rising. The dropout rate has been reported to be as many as half of all community college freshmen and up to twenty-five percent of freshmen at four-year colleges and universities[1]. Over the past thirty years, the earnings gap between those workers who have earned a bachelor's degree and those workers who have a high school diploma has grown to over 60 percent[2]. In 2002, the U.S. Census Bureau projected that a person with a bachelor's degree will earn almost twice as much over his or her lifetime than a person who has a high school diploma[3].

With these facts and stakeholder and student needs in mind, any educational leader must become well versed in the topic of college- and career-readiness.

Educational leaders should consider not only supporting this policy but also becoming advocates for college- and career- readiness; stakeholders will support this initiative. It is in any educational leader's best interest to prepare all students for their futures by helping them develop the skills and abilities needed to be successful at the post secondary level. It is no longer enough to simply teach students what they need to be educated. It must now be ensured that they receive an education that gives them the practical tools of success beyond the high school experience.

Policy Content, Values and Intended Outcomes

The driving belief behind the need to create college- and career- ready students is that every student should graduate from high school completely ready for college or for a career and that every student should have true opportunities from which to choose when they graduate. As it is written, the policy is attempting to unify a very disparate system of educational standards. Currently, each state has developed and implemented educational standards as required by the ESEA. Each state has also developed and implemented assessments that measure student progress toward those standards. The current standards, however, do not take into account the skills and knowledge that students will need after they leave high school. As stated, the intended outcomes of the policy have been developed around the belief that every student should graduate college- and career-ready. The following parameters are a summary of the proposed college- and career-readiness policy framework:

- Realigning standards and assessments to direct students toward college or career

- Re-structuring standards and assessments in such a way that that they provide educators with meaningful and usable student data
- Developing these college- and career-readiness standards at the state level
- Rewarding schools that are making significant progress or maintaining high levels of achievement
- Changing lowest performing schools
- Addressing persistent achievement gaps and low graduation rates

By focusing on these areas, the authors of the ESEA hope to better prepare students for careers and college and to ensure that state standards are based on evidence regarding what students need to be successful beyond high school. Therefore, the College- and Career-Ready Students policy strives to create a common longitudinal goal that students will work toward during their entire Pre-K – 12 educational careers.

Additionally, the authors hope that a successful College- and Career-Readiness program will reduce or eliminate:

1. The heavy cost of post-secondary remediation which in some cases is estimated to be about $1.4 billion per year and,

2. The estimated $2.3 billion in lost income that is attributed to students who drop out of college.

Further, the authors of the policy hope to create a national definition for and understanding of proficiency so that achievement levels are comparable from state to state. The current method used to make a proficiency comparison is the National Assessment of Educational Progress (NAEP). This assessment has clearly revealed

that states have very different definitions of proficiency. This evidence can be found in the NAEP scores themselves. Many states that report high levels of student achievement as measured against their own state standards have actually performed worse on the NAEP than states that are report lower levels of student proficiency as gauged by their own state standards. This is a clear indicator that states are functioning at different expectation and performance levels. One intended outcome of the policy is to eliminate this disparity and eventually create a seamless, unified system of proficiency standards. These new standards of achievement and proficiency, when used by all states, will ensure that a student who moves from one state to another will not find that the state he previously lived in did not prepare him for what he is expected to be able to do in his new state.

Policy Strategies and Instruments

The states have invested considerable amounts of money and man hours in creating their current standards and assessments. Requiring them to realign themselves toward the goal of college- and career-readiness and its requisite set of new standards and assessments will not be without resistance. An apparent strategy to encourage compliance can be found in The American Recovery and Reinvestment Act of 2009 (ARRA). In response to the current economic climate, the federal government has made funds available to the states as a much needed injection of capital into infrastructure improvements and other civil projects. The intent of making these funds available is to provide a means to create or retain jobs that might otherwise not

exist, resulting in an increase of those who are unemployed. However, states accepting ARRA funds must demonstrate that they are working to improve standards and assessments. This is a direct tie in to the College- and Career-Ready Students Policy of The Blueprint. The administration has set aside $350 million of ARRA competitive grant funds to support collaborative efforts to develop improved assessments aligned to the new common standards. However, certain sections of the proposed ESEA reauthorization are mandates that must be followed by the states. Because of these mandates, states must prove that they are in compliance in order to apply for the ARRA competitive grants. If states are in compliance and are instituting the policy, there are further inducements in place which allow states to apply for more money to support their efforts at meeting the mandate. However, if states are not in compliance, they are ineligible for these grants.

A major instrument that has been created to encourage compliance is the Common Core State Standards document itself. This document sets the stage for all states to institute The Blueprint's College- and Career-Ready Students policy with little resistance. Since the guiding standards document for English and Mathematics has already been developed, the states do not have to invest in creating their own. They have a road map of what is expected when the government talks about College- and Career-Readiness at every grade level. If each state were to adopt these standards, the entire country would be working toward the same end. In the high school section of the mathematics section of the document, the document itself explains that these

"standards specify the mathematics that all students should learn in order to be college and career ready" (Common Core Standards, High School, Mathematics pg. 47).

Value and Instrument Mismatches and Implications for Policy Effectiveness

Many states may not have the financial resources available to institute the initial mandates that are required for them to be able to apply for a federal funds grant. Since this will make states ineligible for grants if they are not in compliance, it is a direct block of a national roll out of the College- and Career-Ready Students policy. Additionally, making the grants competitive may prove to be a barrier to getting all states to comply with the ESEA reauthorization.

The Common Core Standards will meet some resistance. This may not have been the best path for the government to take because unlike many other countries, the United States does not have a central education ministry. The federal government traditionally has not been able to mandate what children should learn and what schools should be teaching. In many cases, this means that federal efforts to unify education across the country have not been very successful because of the various education programs and initiatives at the state level and in local school districts. Expecting all states to accept and implement federally created common core standards may be something that will take quite a bit of effort.

Recommendations to Policy to Match Outcomes

The government should be willing to be more of a consultant and put its efforts and resources into educational research. In this role, the government could work toward identifying effective educational practices and developing useable

interventions. The federal government has an advantage over state and local agencies in the scope of its reach and influence in this area. State and local agencies may be more aware of their individual needs than the federal government would be but that does not mean that the local teacher, administrator or district officials know which interventions or practices will work best to address their students' needs. Much like in the field of medicine where doctors rely on medical research to keep abreast of proven approaches to address patient diseases (Manna, 2009), the field of education could benefit from widely available research methods distributed directly through teacher training colleges, state and local agencies and private educational firms. This would have a much larger influence on the national education agenda than mandates that could be complicated, redundant and cumbersome to institute in all 50 states.

E**NDNOTES**

[1] The Governance Divide: A Report on a Four-State Study on Improving College Readiness and Success, a report conducted and issued by: the Institute for Education Leadership, the National Center for Public Policy and Higher Education, and the Stanford Institute for Higher Education Research, 2005.

[2]Speech by US Treasury Secretary Hank Paulson at Columbia Business School, August 1, 2006.

[3]Day, Jennifer C. and Eric C. Newburger, *The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings,* Washington, DC: U.S. Census Bureau, 2002.

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Appendix C

PUBLIC ENGAGEMENT STRATEGY REFLECTION

The world of education is changing. Nationally, the pathways required for movement toward much needed changes are not simply being discussed but are actually being developed by various agencies and organizations. These groups have developed several programs and documents that include the Race to the Top initiative and the National Common Core Standards initiative. The Cape Henlopen School District is also changing. The district's student achievement is declining, our schools are underperforming, and specifically our Strategic Plan is too broad and seems to lack the focus on key areas that would be required to address and correct the challenges we are facing today. The Strategic Plan and its supporting programs must be re-evaluated. Key areas of weakness must be identified so that the Cape Henlopen School District can focus its attention and energy on those areas that will have the highest impact on improving student achievement. To do this, the district must utilize its administration, teachers, and staff as agents of change to ensure the support of our community, school board, parents, students and other key stakeholders in the implementation of these changes.

The changes that should be the focus for the redevelopment of the District's Strategic Plan are:

1. Ensuring that all students are college- and career-ready by the end of high school (this, by default, requires the district to eliminate the achievement gap), and
2. Ensuring teacher quality in all content areas.

Why does this need to be done? Since 2006, the district's achievement data have indicated a marked widening of the achievement gap between white and African-American students in the area of mathematics and reading. The decrease in the level of success that our African-American students are experiencing is certainly having an impact on their ability to be college- or career-ready upon the completion of high school. Additionally, Caucasian students have been experiencing a drop in their level of performance, which has been reflected in their achievement data. This is unfortunate because no community wants to be associated with low-performing schools. Since teacher quality and student achievement have been determined by a variety of sources to go hand in hand, it would be in our best interest to focus on proficiency of all students as part of the redevelopment of the strategic plan.

Internally, all district personnel are essential to ensure that our plans will be implemented with fidelity. However, the support of the teachers is of highest priority, because the teachers will be most affected by the upcoming changes. We must ensure that our current teaching staff is the most qualified and capable to do what needs to be done. This fact requires that certain changes will be made that the teachers must be willing to accept. For example, teachers must be willing to recognize their own weaknesses in their teaching practice and must be willing to accept training and

supports to increase their competence. If certain teachers are unwilling or unable to make these changes, the teachers who are highly competent must be willing to accept that those teachers should be replaced with the most qualified, dedicated and motivated educators that we can recruit.

Teachers might not be willing to make these changes unless they feel they have a large role in defining them. They must embrace the changes and become advocates within the greater community. To do this, teachers need to be brought into the effort as the experts on all things regarding students' educational needs and the delivery of the curriculum. The assertion is that teachers are working tirelessly to advance the education of their students. This assertion needs to be advertised and maintained. The "however" that needs to be pointed out is that although teachers are exerting large amount of effort, student achievement is still not where it could and should be. The teachers are the ones who can identify those factors that are need to be strengthened in order to improve student achievement. By engaging the teachers in an open discussion of what can be done to improve our student achievement, they will become part of the solution and not viewed as the problem. Too many times, teachers feel as though they are being attacked when students are not showing measurable gains in their achievement. All of the blame tends to rest on their shoulders. This creates an attitude of resignation that becomes counter-productive to any changes that are introduced. If we as a district recognize and publically state that we have many capable and hard-working teachers in our district, we will have a greater likelihood of engaging teachers positively in the change effort. We need to reassure all teachers that

we believe that most of them have the qualifications, tools and attitude necessary to challenge and motivate our students and reach the district goal. We must also make it clear that if teachers find that they need help in developing their teaching skills, we will provide the professional development and support they require. We can engage teachers if we affirm that we as a district believe that all educators are here for benefit of the students, and teachers are already working toward giving every child a world-class education, including the development of the tools they need to be successful after high school. The task put before teachers should be that we must unify our efforts now. We must encourage teachers provide input and ideas regarding the best practices we as a district should be using to achieve our goals.

The important stakeholders outside the organization are all parents, but with specific regard to the achievement gap, we should focus on the parents of our African-American students and the organizations that support that community. The method of engaging the parents should involve using the organizations that make a difference in their community: organizations that they are already familiar with and most likely support or believe in. Garnering the support of organizations such as the NAACP and religious institutions can send a message to the community that the school district is reaching out to them and needs them to be a unified voice and partner for change and improvement. The NAACP itself has much data and information regarding the difficulties African-American students encounter in the American public school system. Using their knowledge base and member network could be a very useful and mutually beneficial relationship. Much like teachers, we need to get the parents to

assume a feeling of involvement in this effort by asking for their input. In an open forum discussion we can ask parents what they think we are doing well and where we are missing the mark. Part of the discussion should also include what parents do to help their children be successful so that we can share that with parents who may be having a more difficult time with their children. In this way, both stakeholder groups can be handled similarly. However, unlike teachers, parents will have to be recruited to take part in these discussions. Teachers can be brought together in many ways within the confines of job responsibilities (ex. faculty meetings.) If parents feel that school is a place where their input is valued, school and its efforts might become an everyday part of parents' lives. Information could be shared between the two groups by recruiting a parent liaison committee that would attend all teacher input sessions and school board meetings. The parents on the committee would discuss parental needs and suggestions in these forums and bring back information to the greater community through parent meetings, and through relationships built with the community organizations previously listed. The district could also create a newsletter dedicated to the effort and publish it for distribution on a timeline that could be decided by all stakeholders.

Based on the results on the recently administered DCAS test, the situation has not improved during this school year. The time cycle for this initiative needs to begin as soon as possible. We need to build awareness of the problem, increase understanding of why it is a problem and what needs to be done, and garner stakeholder support

almost simultaneously. We need to do this because the situation will not resolve itself on its own.

Timeline:

Awareness: We must immediately make all stakeholders aware that the situation needs immediate attention. With the collection and immediate availability of the data from the administration of the fall DCAS examination to all 9th and 10th grade students, the district could organize several information sessions for parents to come and learn about what the data looks like, what it means, and what the district has to do as a result of it. Minutes from these information sessions should be distributed to the local media for publication to reach stakeholders who may not have been able to make the meetings.

Understanding: Stakeholders need to be brought to the understanding that we need to do this because student proficiency levels are dropping, while at the same time, proficiency standards are becoming more and more demanding. At the end of the awareness meetings, the input process should begin. Stakeholders in attendance should be invited to participate in district brainstorming sessions that have the purpose of creating best practices toward the achievement of the district's streamlined strategic plan goals. A schedule of these sessions should be available for the parents at the end of the awareness meetings. The district should encourage everyone to attend who might be willing to help search for ideas that could be beneficial for the district plan. The topic of college- and career-readiness should be introduced at this time. The district should schedule these meetings so that they will be completed no later than

one month after the last awareness meeting. The sense of urgency and the commitment of the District to address it at this time should be made a priority in this message to the public.

Concern: At this point, during the first month, teachers and experts should be present at the brainstorming sessions to develop the sense of concern about this situation. Teachers can discuss what has been done in class to address the achievement problem. Experts can suggest what the district and community might want to think about doing that would move the effort further. By having these professionals give their input and express their concerns, community stakeholders can develop a sense of concern within themselves.

Action: A clear understanding of the dire situation that exists in the district regarding student achievement and the achievement gap should be the call to action that the community needs to become engaged in the development of a workable strategic plan initiative. It is at this point that the call for highly qualified teachers should become the mantra of the community.

Acceptance: The process should bring about a tipping point in the community that complacency on any level is not acceptable. Stakeholders should come to expect that every child will receive a high quality, focused education free from inequality every time he or she sets foot in a classroom anywhere in the district. By being part of the process, they should also now understand how this is possible and what needs to be in place to make it happen. If they see that something is lacking, they can recognize it and demand that it be corrected within the support network that has been

created within the district. Full support should be in place by the end of the school year.

Appendix D

ADDRESSING STUDENT ACHIEVEMENT AT APPOQUINIMINK HIGH SCHOOL

Appoquinimink High School (AHS) is located in the Appoquinimink School District and is the newer of the district's two high schools. The district itself is located in southern New Castle County and services the towns of Middletown, Odessa, Townsend, and parts of Bear, Delaware. Opened in 2008, AHS is a modern, well-appointed facility that features several computer labs, spacious classrooms, state-of-the-art science rooms, a fully equipped commercial kitchen, a greenhouse and a large campus that includes a sports stadium, track and field facilities, tennis courts and practice fields. It currently services students in grades 9, 10 and 11. The class of 2011 will be the school's first graduating class. The total enrollment at AHS is 1,003. The majority of students at AHS are white (68.4%) with the second largest ethnic group being African-American (24.4%). The demographic profile of the student population can be seen in the following table (Table 7):

Table 7 Appoquinimink High School Demographic Information

Fall 2009-2010	Grade 9	Grade 10	Grade 11	Grade 12	Total	Percent Total
Enrollment	408	341	253	1	1003	100%
American Indian	0	0	2	0	2	0.2%
African American	108	77	60	0	245	24.4%
Asian American	16	9	7	0	32	3.2%
Hispanic	14	8	16	0	38	3.8%
White	270	247	168	1	686	68.4%
ELL	8	4	5	0	17	1.7%
Low Income	73	46	36	1	156	15.6%
Special Education	43	22	12	1	78	7.8%

During the two years that AHS has been in operation, the school has needed to hire many new teachers to fill positions that become necessary as new grade levels are added. Currently, the school has sixty-two teachers. Thirty-nine are female and twenty-three are male. The teachers are representative of three ethnic groups. There are eight African-American teachers, one Hispanic teacher and fifty-three white teachers. The group as a whole is quite inexperienced. Roughly fifty-three percent of the teachers have fewer than four years of teaching experience.

Teacher Qualifications – Education Statistics

At AHS, 67.8% of teachers possess a Bachelor's Degree Plus 30 or below. 32.2% of teachers have a Master's Degree or above. No teachers at AHS have a degree lower than a Bachelor's Degree. The following table (Table 8) summarizes the educational qualifications of all teachers at AHS.

Table 8 AHS Teacher Qualifications – Certification Statistics

Teacher Education Level 2009 – 2010	**Number of Teachers**	**Percentage of Total**
Below Bachelor	0	0.0%
Bachelor	34	54.8%
Bachelor Plus 15	4	6.5%
Bachelor Plus 30	4	6.5%
Master	15	24.2%
Master Plus 15	0	0.0%
Master Plus 30	1	1.6%
Master Plus 45	3	4.8%
Doctorate	1	1.6%
Master's Degree and Above	**20**	**32.2%**
Totals	62	100.0%

The percentage of classes taught by highly qualified teachers varied by department during the 2008 – 2009 school year. The social studies, art and mathematics departments had the highest percentage of teachers who were highly qualified with 100%. Foreign languages followed with 79.20% of the teachers having highly qualified status. English followed with 69.4% of the teachers having highly

qualified status and the science department had the lowest percentage of highly qualified teachers in the classroom with 66.7%.

A Specific Focus on Mathematics Achievement

The current instructional practices in the mathematics department are still in a phase of development. In the 2008 - 2009 school year, all algebra teachers participated in a yearlong series of professional development sessions run by an outside educational consulting group. These sessions focused on developing a curriculum map for algebra. Each teacher was given the opportunity to provide information about the scope and sequence from their individual classroom. This information was compiled into a master list that was then edited by the Algebra team into a comprehensive plan or curriculum map. This curriculum map was adopted as a framework for future instructional planning. While this document has been helpful in providing a road map that has allowed for consistency among the classroom delivery of content, it is far from perfect and requires much revision at the end of the current school year.

At AHS, all 9th grade students receive a full year of block instruction in the subject of algebra. The block is ninety minutes in length. There is currently no formalized mathematics intervention program in place. However, the ninety-minute block would allow sufficient time to run an intervention program within the block without requiring additional scheduling of interventions outside of the math period.

The instructional materials used for the subject of Algebra are two separate mathematics programs. The first program is Holt – Algebra I. This program is more

traditional in its approach and is the main program used to deliver algebra instruction. The second program is the Core Plus program. This is an integrated math program and would be considered a progressive mathematics program. There are no supplemental mathematics materials used for intervention at this time.

Within the subject of algebra students are grouped by ability. Algebra is offered as an honors class, as a College Preparatory (CP) class and also in a small group format. Within the CP level, there are two inclusion classes made up of students with and without Individualized Education Plans (IEP) and three CP classes that are not inclusion classes. There is one section of honors algebra and one section of small group algebra that includes only students with IEPs, mostly due to learning disabilities.

Because of the short history of the school, there is very little useful achievement data for AHS. Regarding the school's Adequate Yearly Progress status, new schools are not rated until after the second year of assessment. That information will, therefore, be available after the completion of this (2009 – 2010) year. The school has not yet been given a school rating. In 2008 – 2009, 70% of 9th graders and 71% of 10th graders met the state standard in mathematics as tested by the DSTP. This exceeded the state's 2009 goal of 58% of all students meeting or exceeding the mathematics standards.

Professional Support System for Teachers

At AHS the usual practice is to provide professional development at a departmental level to address the needs of each specific department. There are usually

one or two school-wide professional development opportunities during the year as well. However, all professional development was limited this school year due to budget cuts.

The district does have a Secondary Math Specialist who is available for in-class support and coaching. However, she only provides these services if requested. To date, she has been underutilized at AHS.

General Concern:

The Appoquinimink School District Strategic Plan requires that all schools in the district make measurable improvements toward decreasing the achievement gap in mathematics, especially between black and white students. While admirable in intent, the requirement is vague because the district's suggestions for decreasing the achievement gap are not specifically outlined nor are they based in research. Therefore, the district's approach ultimately may have very little, if any, impact in narrowing the achievement gap. This will have ramifications for teachers, who are being held accountable for the closing of the gap, and more importantly, for students who may find themselves with weak mathematics skills as they start college or enter the workforce. They may find themselves making decisions about colleges and careers that take into account their weak math skills. In turn, this could lead to their being unable to obtain higher paying careers with a mathematics focus such as engineering, computer science and medicine.

Specific Concern:

The Appoquinimink School District Strategic Plan 2009- 2010 states: "The achievement gap separating African-American and Caucasian students will be reduced to 26% or less on the state's math assessment." On the spring 2009 10th grade Mathematics DSTP, the difference in percentage for African-American students when compared to white students was -32.77 points. The district recommends the following strategies to address the problem:

- Increase student/teacher expectations with regular walk-through visits and review of the data
- Improve teacher effectiveness through targeted recruitment and professional development
- Align teacher resources with student needs

Although research seems to indicate that student behavioral and cognitive engagement has the biggest impact upon improving student achievement, the district has not outlined any strategies that would include any focus to increase student engagement. Implementing a mathematics intervention program that will increase student time on task should address both issues of behavioral and cognitive engagement. When students are participating and engaged in the classroom, behavioral issues are minimized. Additionally, implementing a program that provides individualized attention and differentiation will address the way that each student learns best. This differentiation should increase the cognitive engagement of the students because the instruction will be more in tune with their learning needs.

The target population will be freshman at AHS who are considered low-achieving in mathematics. Any student, African-American or not, who are has scored a 2 or below on the DSTP, will be screened to find what, if any, intervention is required for that student. Any student who is identified as needing intervention will receive it as part of their individual mathematics program, for as long as required with the goal of maximizing their overall achievement. The model for this intervention will be the Tier I, Tier II and Tier III model of Response to Intervention (RTI). Students who do not make progress despite these interventions will be referred for special education services (Tier IV).

Target Population (Teachers):

The target population will include all four Algebra I teachers who teach in the 9th Grade Academy. The district and AHS administration will have to support the creation and scheduling of a PLC at the school so that teachers will have time to plan and collaborate together. This PLC would be used to deliver professional development on the methods that work best with Core Plus (Tier I) so that student cognitive and behavioral engagement in the mathematics curriculum could be increased. Developing teacher competency in the delivery of the unit lessons and investigation activities with the focus of increasing student engagement should be the purpose of this PLC. Working as a team, there would be a unified effort to maintain a high level of fidelity in the delivery and implementation of Core Plus as the first line of attack to measurably narrow the Achievement Gap.

Current Practice:

At AHS the current instructional style is based in traditional mathematics teaching methodologies with several individuals making attempts at "progressive" teaching techniques. The Holt mathematics series, Algebra 1, is the text currently in use. Algorithms are stressed and the presentation of mathematical concepts is not always connected to real-world problems that are challenging, interesting, and engaging to students. The Appoquinimink Strategic Plan does require that "instruction will include problem-based learning in mathematics" but it does not specifically require that this problem-based learning be engaging or related to real-world situations, which may be of greater interest to the students. The math department at Middletown High School chose the current text. It was piloted there for one year and then accepted by the district as the primary mathematics program for all secondary mathematics in the district. It includes textbooks and ancillary materials for three separate courses: Algebra 1 (9^{th} grade), Geometry (10^{th} grade) and Algebra II (11^{th} grade). This program is not an integrated program. Because of this, it is difficult to align the Holt materials with the State of Delaware Grade Level Expectation (GLEs). The GLEs are written to be used with an integrated mathematics program. The GLEs include algebraic reasoning, geometric reasoning and quantitative reasoning components as a continuum across every grade level. The Holt program, for the most part, treats these strands discreetly. This makes it difficult for the classroom teacher to deliver grade-level appropriate lessons in a strand other than the one addressed in the specific text he or she uses for his or her course. For example, the

Holt Algebra I text does not provide a sufficient unit in geometric reasoning for an Algebra teacher to effectively address the required 9th grade GLE in geometric reasoning.

In August 2007, three days before the beginning of the new school year, all of the algebra teachers in the district were required to attend a professional development session at the district office. The purpose of this professional development was described as "Improving Instruction in the Algebra Classroom." The new curriculum director informed the teachers that the district had purchased the Core Plus Integrated math series and was expecting immediate implementation in that school year. It was explained that the day's professional development session was to familiarize the teachers with the program, its features and its recommended delivery. The teachers refused to implement Core Plus without full professional development and support. The result was a compromise between the district office and the teachers to use Holt and Core Plus in tandem as a "blended" program. This approach has proven to be cumbersome and difficult to implement. Gathering data on the effectiveness of the overall math program has been difficult as well because the level of use of both programs varies from classroom to classroom; therefore, the student experience in algebra is not uniform across the district.

Beginning in August 2010, the 8th grade Advanced Math classes will be implementing Core Plus with fidelity. It will be the sole program in those classes. The teachers will be receiving several days of professional development over the summer, with several other professional development days throughout the year.

However, this is being regarded as a pilot of the newest Core Plus program. Because of this, the 9th grade Algebra classes will still function as they have, blending Holt and Core Plus, until the 2011 – 2012 school year. During that school year, Core Plus will become the sole secondary mathematics program for the district. All students will participate in the program and the course titles will be changed from Algebra I, Geometry and Algebra II to Integrated Math I, Integrated Math II and Integrated Math III. The decision of what do to with Probability and Statistics and Pre-Calculus courses has not yet been made.

The mathematics coach for the district is presently unable to provide support at the high school level in instruction, content or methods for engaging our students in challenging concepts because of her lack of experience at the secondary level. Currently, the only teachers who collaborate are the two teachers who are assigned to the two Algebra inclusion classes; however, they are not given common planning time. All other teachers work in isolation, there is little sharing of best practices, and a PLC is viewed as a future potential extra responsibility instead of a desirable collaborative tool.

Despite the specific requirement for professional development in the strategic plan, professional development specific to mathematics has not taken place this year due to budget cuts. The AHS mathematics department is a young department with teachers who could use additional professional development targeted toward student engagement in the classroom. There are currently ten teachers in the department. Two of the teachers are in their first year of teaching (one is ARTC), three have two

years or less of experience, one has three years of teaching experience, one has four years of experience and the remaining three have seven or more years.

The teachers created curriculum maps for each subject during the 2008 – 2009 school year. They are followed and do provide some consistency of subject matter being taught. Consistency was the goal in mind when the department created common assessments; however, teachers tailor the tests to their needs without consulting the rest of the department. Due to this reworking to meet the needs of individual teachers, common assessments do not exist in practice.

Description of Goal for Change:

The goal at AHS should be to utilize all talent and resources as stated in the strategic plan to narrow or eliminate the achievement gap between black and white students. The most important resource to utilize should be the current Core Plus program (as opposed to the pilot of the newest version). This should be implemented immediately in the 9^{th} grade academy and not supplemented with the Holt program. This would have the immediate impact of maximizing student engagement since the Core Plus program is an investigational and real-world problem based program. Moving away from traditional mathematics practices should have an impact on student achievement. These improved practices need to be implemented at the start of the next school year and to continue consistently in each individual teacher's classroom throughout the year if any impact is to be made in this area.

Research Basis for Selecting Change:

Slavin (2002) stated that "with a robust research and development enterprise and government policies demanding solid evidence of effectiveness behind practices in our schools, we could see genuine, generational progress instead of the usual pendulum swings of opinion and fashion" (p. 20).

This quote addresses the discomfort I feel when I read the Appoquinimink School District's Strategic Plan document and its lack of research-based strategies for improvement. The strategies outlined in the document are rather vague and do not have any real potential to impact teacher practices or student engagement.

Sciarra and Seirup (2008) stated that there is evidence in the research for a positive relationship between student behavioral engagement and achievement. Their own research indicated that the three types of engagement that students experienced with their learning environments (behavioral, emotional and cognitive) have a significant relationship to mathematics achievement. They concluded specifically that positive behavioral and cognitive engagement at school was a significant factor for improving overall achievement for African American students with cognitive engagement having the most impact. The district's document should include strategies for monitoring levels of student cognitive engagement if true progress in narrowing the Achievement Gap is to be obtained. While an integrated mathematics program with investigations of real world problems can be an effective program for engaging those student who are experiencing sufficient progress in the general

education classroom, students who are not experiencing sufficient achievement may benefit more from an intervention program that utilizes a direct instruction model.

Effective Instruction:

Current teaching practices and the lack of intervention practices at the Appoquinimink School District must be adjusted. They should also incorporate proven research-based methods. With this in mind, the immediate goals should be to improve mathematical fluency and overall achievement for struggling or at-risk students and to narrow the Achievement Gap in mathematics between African-American and Caucasian students. The characteristics that the district should employ in all mathematics instruction to meet these goals will require district-wide reform and should be made up of the following components:

1. Provide teachers and students with regular, specific information (data) regarding the performance of each student.
2. Use in-class peer tutors specifically for the enhancement of computational skills and problem solving abilities of students who are underperforming.
3. Provide on-going, clear and specific feedback to parents of low-achieving students regarding their children's performance in mathematics. This feedback should be:
    a. Objective, specific and truthful
    b. Track student successes instead of failures
4. Utilize engaging intervention strategies including direct instruction methods.

Research Evidence:

There are two main articles that I have used to research for this project. The first article provided information used to compile the research-based components that the Appoquinimink School District should employ to reduce the achievement gap. In this report, Baker, Gersten & Lee (2002) reviewed fifteen studies about improving student performance of low-achieving students. They created a synthesis of the data and results from these studies. They found that there were four components that were consistent enough to be offered as best practices for improving student performance. These best practices make up the bulk of ideas that are included in the Effective Instruction section of this paper. In summary, the authors' components of best practice are:

1. Mathematics achievement seems to improve when both teachers and students are given specific information that can be used to inform them of current performance and therefore quickly address any needs that are present.
2. Peer tutors who provide feedback and support improve the computational abilities of low-achieving students and can increase achievement. Peer tutors also seem to assist in improving problem solving skills.
3. Specific, positive feedback given to parents about their child's mathematics performance seems to slightly boost achievement. At the minimum, it is a benefit to have on-going, long-term open lines of communication between the school and home.

4. Classic direct instruction approaches have an effect on improving students' successes when learning mathematical concepts and procedures.

This report led me to the last study by Kozioff, LaNunziata, Cowardin & Bessellieu (2001) titled "Direct Instruction: Its Contributions to High School Achievement." This study provided information necessary to understand the major ideas behind direct instruction and how the concepts could be applied in the Appoquinimink School District to meet the goal of eliminating the achievement gap. This article described that direct instruction should be used as a tool within the school day and is not to be used as a complete mathematics program. The suggestion is that roughly 30 minutes of a block could be used for direct instruction for those students who would benefit from it. This targeted time is meant to improve students' understanding of underlying concepts or to strengthen weak prerequisite skills needed for higher level mathematics and problem-solving. Direct instruction should be used as a method to review previously learned concepts and give instruction that builds on previous learning. Direct instruction is reminiscent of Response to Intervention methods; therefore, it seems to be an appropriate model for Tier III Instruction at all educational levels.

Programs or Strategies:

For Tier III, SRA/McGraw Hill has excellent direct instruction materials that can be used in the proscribed manner of an intervention that is not more than 30 minutes of a daily block. Their offerings include materials that are appropriate for students from first grade up to those who require algebra intervention. The

programs are scripted, targeted, brief and brisk in pace as recommended by much of the research on direct instruction.

A second vendor, Carnegie Learning, offers proactive intervention software called Cognitive Tutor that can be used within the classroom for students who are struggling. This would be appropriate as a Tier II intervention. Its key features include differentiation of instruction as a built-in component of the program. It has been designed to be used as a freestanding program (text and Cognitive Tutor together), or as a supplement to the existing Tier I program (in this case, Core Plus supplemented with Cognitive Tutor). Implemented in this manner, students targeted for Tier II intervention would spend just under 40% of the week using the program's interactive computer software pre-teaching those concepts coming up in class in a "just-in-time" format. Students who are in Tier I would also use the software but as an extension of concepts already learned in class. Using the software as technology component for the course has several advantages:

1. Student successes are tracked weekly throughout the year, providing both the teacher and the student on-going, specific information about individual performance.
2. Students become familiar with using the computer to complete mathematics work which will be useful in becoming comfortable with DCAS.
3. Student accountability for learning increases. This increase occurs as the students work through the problems presented by the software. If a

mistake is made, instant feedback is provided that guides the student in his or her effort. If the student continues to struggle, the program launches a guided tutorial that the student must complete before moving forward.

4. Student data is tracked and is reported to the teacher. With this information, teachers will be able to keep parents apprised of student successes easily.

Implementation Description:

Using MAP, DSTP, or any available DCAS data, students who are performing below average proficiency will be included in the district-wide effort to attack the achievement gap. These students will take the "Essentials for Algebra" placement exam that is part of the SRA/McGraw Hill program. Using the data gathered from these placement examinations, students will be grouped into ability levels for the first phase of intervention at the beginning of the year. For example, McGraw Hill's Algebra Readiness program divides students into three groups: Not Ready for the Algebra Readiness program (these student would need to take a second placement examination for the program at the level below); Level 1 (these students begin at the beginning of the program); and Level 2 (these students begin at a place further in the program). During the pre-service days at the beginning of the school year, or at the end of the current year, mathematics teachers would participate in a short professional development to learn how to properly administer this placement exam to their students. Teachers, the department chairperson, and the mathematics department supervisor would receive professional development for the Cognitive Tutor program

that they will be using in the algebra classroom. Carnegie Learning also offers support to teachers throughout the year. A PLC could be used as the forum to address effective peer tutoring and which design or peer-tutoring model could be used across the department.

Teachers will report progress on a weekly basis to both students and parents in the form of a printed report. Administrators will be apprised of these communications weekly and conduct a random sampling of calls to parents to discuss/verify that the progress report was received. Administrators could also offer additional support to parents as needed.

Assessments of Student Learning

The target population for this intervention effort includes any freshman student who performed below a proficient level for the previous grade tested (DSTP 2 or less). Parents who would like to "opt in" their child could request screening. Race would not be a screening criterion, although one of the main goals of these interventions is to close the achievement gap at Appoquinimink School District. These students, in general, may find themselves experiencing frustration in mathematics class due to gaps in their previous knowledge or lack of prerequisite skills for the course they are currently taking. The likelihood is that they may be lacking in one or more of the five strands of mathematics proficiency: adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition. In order to perform better in the area of mathematics, these students would benefit from

intervention that offers to develop their area(s) of need. The specific needs can be obtained from the MAP or DCAS instructional needs report.

Screening:

In order not to miss any student who may require intervention but do not appear to be in the target population**,** a broad screening of all 9th grade students would be given. This would be a basic grade level performance assessment such as Brigance. Students who perform below grade level on this assessment and the students in the target population would then take the Essentials for Algebra placement exam. The Essentials for Algebra placement exam acts as a diagnostic tool as well.

Teachers would be responsible for grading these exams for their roster of students, compiling a list of students and the type of intervention they should receive based on their test results. This should not require much effort on the part of the teachers, since the students are leveled by their scores on the test. This allows for immediate ability grouping without the need for another separate testing of the students in need of intervention. Students who perform poorly on this placement exam would be placed in the Tier III intervention using the Essentials for Algebra curriculum. Students who did well on the Essentials for Algebra placement exam but were initially found to be low-achieving students or performing below grade level would be placed in Tier II intervention.

The Tier II Curriculum will be the Carnegie Learning Cognitive Tutor program. Since the Tier III intervention will take place outside of the general classroom, the list of students requiring this intervention will be forwarded to guidance

so that these students' schedules can be amended accordingly. The names of all students requiring intervention will also be sent to the mathematics department supervisor and the principal.

Diagnostic:

As stated, students who had been screened as intervention candidates would be given the Essentials for Algebra Placement Exam provided with the SRA/McGraw Hill direct instruction program. The results of the placement test would clarify the specific needs of the student and would provide information about grouping and instructional needs. The actual placement exam can be found at: https://www.sraonline.com/download/EssentialsForAlgebra/PlacementTest/Essentials_PlacementTest.pdf

The rationale for providing Tier III intervention outside of the general classroom is that it would allow delivery of direct instruction without involving students who did not require this level of intervention. This format will better meet the needs of all students. By having an intervention teacher who has been trained in providing direct instruction effectively, the students' specific needs will be directly addressed instead of having the classroom teacher simply providing general interventions that may or may not work.

This "shuffling of students" could present logistical and scheduling difficulties. Fortunately, all freshmen have a full year of algebra. The guidance department and administrators responsible for scheduling would have to build an intervention schedule that addressed the major areas of need, for example, Tier III: 8 am to 8:30 am, M-F,

Mr. Young, four weeks. Students receiving Tier II and those requiring no intervention would remain in the classroom and use Carnegie Learning Cognitive Tutor during that same time period. This would allow for all students to receive instruction differentiated for their individual need and still retain the integrity of the block. All students would receive Tier I instruction (Core Plus) for the remaining hour of the block.

Progress Monitoring:

At the beginning of each Tier III intervention course, the students will be given a pre-assessment specific to the topic for which they are receiving intervention. This assessment is a version of the end of course exam that they take at the end of the intervention to assess mastery. This initial pre-assessment will provide the data that the final test will be compared to for progress reporting. It is part of the SRA/McGraw Hill program. Different versions of the test can be administered at various times throughout the intervention to verify that progress is being made. At the end of the intervention, each student must obtain a grade that indicates mastery of the topic if they are to be considered to have made sufficient progress. If they do not, further intervention might be warranted or Tier IV may need to be considered. Teachers would be responsible for collecting and reporting this data to students, parents and administration. At this level, the teacher would also compile reports of sufficient or insufficient progress.

Tier II progress is monitored as part of the Carnegie Learning Cognitive Tutor Program. The software constantly assesses each student's skills. It is adaptive and

adjusts in accordance to student responses. As students work with the program, their attainment of mastery is tracked at the top of the screen in the form of green and gold bars. As they move toward mastery of a specific topic, the bar is green and lengthens as they improve. When mastery is obtained, the bar changes color and becomes gold. The teacher can compile all student progress in a report so that mastery and the addressing of additional needs can be identified. These reports are easily shared with students, parents and administrators.

Outcome:

During the 2010 – 2011 school year, DCAS will be the assessment that the Appoquinimink High School should use to evaluate the overall effectiveness of the intervention program. Fortunately, it is given several times throughout the year and is designed to track progress. The fall intervention schedule could be coordinated to end right before the winter DCAS. The spring intervention schedule would then start shortly after that winter DCAS administration. A school-wide committee that includes teachers of all subjects could be formed to help organize the data by student and interventions received so that both student and teacher successes could be recorded. The progress charted for the students in these reports would be used to verify effectiveness of the program. If at least half of the target population does not show statistically significant progress, the program will be reevaluated.

Professional Support Plan

The mathematics interventions at AHS will be commercial programs (Essentials for Algebra, McGraw Hill/SRA and Carnegie Learning Cognitive Tutor)

that can be implemented immediately at the beginning of the school year. The short timeframe for the rollout would require teachers to become familiar with the program over the summer. Both vendors require professional development to ensure that their programs are being implemented with fidelity. All four of the Algebra teachers will need to receive professional development for Cognitive Tutor, since they will be using it in their classrooms.

Because the Tier III interventions will be in a direct instruction format, the length of the student intervention sessions should not exceed one half hour each day. This would be built into the students' schedules as part of their overall ninety minutes of math. Students will be "pulled out" for the intervention session that will allow for the interventions to be provided by one teacher in a separate classroom and a small group setting. Only this teacher (and perhaps an alternate) would need to become intimately familiar with the program. On-going professional development could be accomplished during the teacher's planning and preparation period using the packaged professional development materials provided by SRA/McGraw Hill. Additionally, this teacher would need to become familiar in the methodology of direct instruction. This could be accomplished through reading of articles about Direct Instruction as developed by Siegfried Engelmann. A very informative article that will be required reading is "Direct Instruction: What the Heck is it?" by Rory Donaldson. It can be found at the following link www.brainsarefun.com/di2.html. This article is a clear, factual description of direct instruction and independently recommends the SRA/McGraw Hill programs. In addition, the intervention teacher will be responsible

for developing professional goals regarding the intervention program. The math department supervisor will oversee these goals. The reason for this is to ensure that specific learning goals that have been set are being met.

On-going professional development would be delivered via a CD-ROM that comes with the Essentials for Algebra program. This CD-ROM includes demonstrations of best practice that can be viewed by the teacher and implemented in the classroom. These lessons should provide the teacher with the fundamental knowledge necessary for the appropriate delivery of the lessons. However, since this would be a new intervention program and has never been used at AHS or any other school in the Appoquinimink School District before, there will be no experienced teachers to observe or model. The Subject-Specific Coaching Model (McKenna & Walpole, 2008) should be established to monitor the teacher's progress and that proscribed methods for the implementation of Essentials for Algebra are followed. The district math specialist or someone else in a non-supervisory role will monitor this coaching model. This individual will monitor the teacher's adherence to the program, assist in quantifying student progress, and provide constructive criticism to the teacher to improve instructional practices until mastery is obtained. Since this model includes focused observations to provide the teacher an opportunity to reflect on his or her own instructional quality, it would benefit skill development of the teacher as well as an opportunity to record fidelity of the delivery of the program as designed in order to maximize student outcomes. The role of the math specialist will, therefore, be that of coach but also a program evaluator. The coach's documentation regarding how

effectively the teacher managed the intervention program will be instrumental in deciding if the program experienced success. If the coach finds that the teacher mastered the techniques of the intervention program and delivered the program as intended then any improvement or decline in student performance can be attributed to the program with a higher degree of certainty than if this aspect of the intervention program was not monitored. The decision to continue or discontinue the intervention program will then be based on quantifiable evidence. Without this feedback from the coach, the variables that may have caused the success or failure of the intervention will be much harder to quantify and the effectiveness of the program will be impossible to ascertain.

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Appendix E

THE EXERCISE OF LEADERSHIP

Section I: Context for the Problem

The Work Environment and My Leadership Style

The Cape Henlopen School District opened the new Cape Henlopen High School building in 2010. This new facility is a 216,000 square foot school located in the town of Lewes in Sussex County, Delaware. The school houses grades nine through twelve. It is the only high school in the district. The town of Lewes is a beach community with a laid-back, friendly atmosphere. History and tradition are valued and the community does its best to preserve them. The atmosphere of the town and the preservation of history and traditions extend into the school itself. The attitude of teachers and students alike can be surprisingly relaxed; the staff sometimes acts as though they consider some rules as merely suggestions. Additionally, it can sometimes appear as though the sports traditions at the school are valued much more highly than the academic programs. Standardized test scores for grade 9 and grade 10 have been falling over the past few years. Currently, the high school is under corrective action to address its low level of student performance.

There is a new principal at Cape Henlopen High School, Brian Donahue. In his first year at the school, he has made a concerted effort to re-establish many of the rules and has set expectations for both staff and students as they had become quite

loose under the prior administrator. An example of the lack of expectations is the inconsistent manner in which DPASII was utilized under the prior to Mr. Donahue's arrival. Many teachers were not observed for several years at a time. There was no expectation that an observation would ever occur for many teachers on staff. Mr. Donahue has reintroduced quite fully the prior evaluation system into the school. He displays what Hoy and Hoy (2009) describe as "supportive behavior" (p. 331). He makes an effort to listen to teachers' input and suggestions and treats the staff professionally even when he has to deliver constructive criticism. Although Mr. Donahue is new to this position as the high school's principal, he is not new to the district. Previously he was the principal of one of the district's two middle schools. He also was an assistant principal and former football coach at the old Cape Henlopen High School.

Under the prior administrator, a significant portion of the staff developed what Hoy and Hoy (2009) describe as "intimate behavior" (p. 331). The teachers had formed very close relationships at work that were more informal and personal than they were formal and professional. With the introduction of the new principal, a disengaged climate has developed. This type of climate is described by Hoy and Hoy (2009) as one where "the principal's behavior is open, concerned and supportive…nonetheless, the faculty is unwilling to accept the principal…the faculty is divisive, intolerant and uncommitted" (p. 335). This applies to much of the staff, although there is a contingent that is supportive of the principal.

Problem Statement

There are several significant achievement gaps in mathematics between Caucasian students and students of other subgroups at Cape Henlopen High School. Even though the district has adopted two programs, Learning-Focused Strategies (LFS) and Interactive Mathematics Program (IMP), with the intention of improving how students perform in mathematics, the spring DCAS data suggests that these programs alone will not be enough to minimize or eliminate the achievement gaps (See Table 1). Cape Henlopen High School implemented these programs only for 9th grade students during this school year.

Table 9 Spring DCAS Proficiency Percentages by Subgroup

Spring DCAS Subgroup	Percentage Proficient as of 5/20/2011
All 9th Grade	74%
Non-Special Education	79%
Special Education	40%
Caucasian	83%
African-American	40%
Hispanic	54%

Context and Features of the Problem and Supporting Literature

I am focusing my attention only on 9th grade students at this point, because they are the students who I will be working with next year as 10th graders. Although the Spring DCAS data (Table 9) reports that 74% of the 9th grade students have met or exceeded the proficiency standard for the year, not every subgroup had similar results. Overall, Cape Henlopen High School's 9th grade performed better than the state average of 62% meeting or exceeding the proficiency standard. When broken down by subgroup within the school, 83% of Caucasian students have attained proficiency. However, only 54% of Hispanic students are proficient and an even lower 40% of African-American students obtained proficiency. This means that there is a gap of 29 percentage points between Hispanic and Caucasian students and a gap of 43 percentage points between African-American and Caucasian students. The gap that exists between students receiving special education services and those who do not stands at 39 percentage points (79% proficient and 40% proficient respectively). These gaps are well outside of the district's goal to narrow the achievement gaps to less than 20 percentage points.

I have used two studies as guides to a solution. The first provided information that I used to create a list of five research-based components that Cape Henlopen High School should employ to reduce achievement gaps. In this report, Baker, Gersten & Lee (2002) reviewed fifteen studies about improving student performance of low-achieving students. They created a synthesis of the data and results from these studies.

They found four components that were consistent enough that one could consider them as best practices for improving student performance. The authors' components of best practice that I considering to include in the strategy for Cape Henlopen High School are:

5. **Give both teachers and students specific information about current performance.** This information seems to assist in improving achievement by quickly addressing needs that exist.
6. **Provide struggling students peer tutors who provide feedback and support.** Peer tutors also seem to assist in improving problem solving skills and improve the computational abilities of low-achieving students.
7. **Implement a system for giving specific, positive feedback to parents about their child's mathematics performance.** This seems to boost achievement slightly. At the minimum, it is a benefit to have on-going, long-term open lines of communication between the school and home.
8. **Implement interventions of classic direct instruction approaches.** Research has shown that direct instruction has an effect on improving students' successes when learning mathematical concepts and procedures. This works best when it is a supplemental intervention.

Wanting to know more about direct instruction, I found a study by Kozioff, LaNunziata, Cowardin & Bessellieu (2001) titled "Direct Instruction: Its Contributions to High School Achievement." This study provided information necessary to

understand the major ideas behind direct instruction. Cape Henlopen High School might be able to apply the concepts to meet the goal of eliminating achievement gaps. This article described that direct instruction should be used as a tool within the school day, but is not to be used as a complete mathematics program. The suggestion is that between 30-45 minutes of a block could be used for direct instruction. This targeted time is meant to improve students' understanding of underlying concepts or to strengthen weak pre-requisite skills needed for higher-level mathematics and problem solving. Direct instruction should be used as a method to review previously learned concepts and to give instruction that builds on previous learning. Direct instruction could be delivered best in a Response to Intervention model (RTI); therefore, it seems to be appropriate as supplemental mathematics instruction for struggling learners at all educational levels.

As an example, McGraw Hill SRA has excellent direct instruction materials that can be used in the prescribed manner during an intervention that is not more than 30 – 45 minutes. The programs are scripted, targeted, brief and brisk in pace as recommended by much of the research on direct instruction.

Section II: Recommendations to Address the Problem

I propose that the mathematics department work together to ascertain which courses and or levels experience the most significant achievement gaps. When that is complete, teachers of those students should work together to seek out and incorporate positive research-based actions into their teaching practices. This will set the stage for effective instruction in the general education classroom. Focusing on those students

who have the greatest need will more directly affect the narrowing of the achievement gaps in mathematics between African-American and Caucasian students, Hispanic and Caucasian students, and students who receive special education services and those who do not. The characteristics that the district should employ in all mathematics instruction to support the goal of eliminating all achievement gaps would require district-wide support and would be made up of the four components described by Baker, Gersten and Lee:

1. Provide teachers and students with regular, specific information regarding the performance of each student.
2. Use in-class peer tutors specifically for the enhancement of computational skills and problem solving abilities of students who are underperforming.
3. Provide on-going, clear and specific feedback to parents of low achieving students regarding their children's performance in mathematics. This feedback should be:
    a. Objective, specific and truthful
    b. A description of successes instead of failures
    c. Standards-based
4. Primarily utilize direct instruction methods (students are taught a specific method for solving a problem and are then provided time to practice and strengthen their understanding of underlying mathematical concepts) in a supplemental enrichment or resource class.

To these components, I would add one additional component:

5. Create a Professional Learning Community (PLC) that meets regularly to discuss the students and to build a database of effective strategies and best practices. Also, the PLC would be instrumental in researching how to effectively implementing peer tutoring in the classroom. I am including this component in my strategy because it is a component that the district would like all departments to employ as a strategy next year.

Section III: Strategy for Implementing the Proposed Solution

Under the directive of my principal, Mr. Brian Donahue, I am to create a Response to Intervention (RTI) framework within the 9th and 10th grades. Utilizing the five components outlined in the previous section of this paper, this structure will allow me to implement research-based methods within the required RTI framework. The spring 2011 DCAS data will be used as a screening tool to identify students who are performing below average proficiency. These students will be included in the school's RTI effort with the specific focus of improving individual performance in mathematics and minimizing achievement gaps for each subgroup. During the pre-service days at the beginning of the school year, or at the end of the current year, mathematics teachers would participate in professional development regarding RTI in the classroom. Next year's schedule includes a 225 minutes a week of common planning time for all mathematics teachers. It is the intent that this planning time will be used as a professional learning community (PLC). The department will utilize the PLC to develop strategies and/or activities to incorporate into lesson plans that would

address a wide variety of learning styles, to discuss student performance and progress with the math specialist, to train peer tutors and design a model for implementation throughout the department, and to develop a system of regularly communicating with parents or guardians.

I have proposed an RTI structure that can work within our high school's schedule that has been approved by Mr. Donahue. It is a three-tiered system that is intended to supplement the core mathematics instruction.

Tier I candidates are those students who have demonstrated proficiency. They will receive all instruction in their mathematics class and will receive no supplemental mathematics instruction.

Tier II candidates are those students who are below proficiency on the state test. As the mathematics specialist will provide them with support in their mathematics classes. I will visit students in these classes to provide enrichment services for those students who are slightly behind.

Tier III candidates are those students who are 20 points or more below proficiency. These students will be enrolled in a separate enrichment class to receive direct instruction. This tier represents component four of the plan. In this tier, students will be closely monitored. If they obtain proficiency on the winter DCAS, they will move up to receiving Tier II services. If they do not obtain proficiency during the first semester, they will stay in Tier III for a second semester. If they continue to not show progress, they will be evaluated for special education or other support services.

Tier III Resource candidates are those students who receive special education services. All special education students are enrolled in a resource class that has traditionally been used as a study hall. The administration decided that these students will be best serviced in their resource classes with the math specialist co-teaching with a special education teacher. I will be the co-teacher in the resource class and will provide direct instruction in mathematics all year to the students in these classes.

This decision to use the resource classes was made to address two concerns:

1. Eliminating the underutilization of the time in resource classes.
2. Providing an appropriate setting and accommodations to the students who require special education services.

I believe I will be more able to manage the data I need to collect about the individual student's progress in this setting. I will use this data to report progress to parents. The special education teacher will be able to use the data to create and support student goals on the IEP while providing targeted support in the setting the suits the students' needs best.

Strategy Description Outline

I have based the following strategy implementation on John Kotter's "Eight Stage Process for Creating Major Change." Each of the eight stages is in bold print. I have considered several focus questions as well as actions I will take to accomplish each stage. These items follow the stage headings in outline form.

1) Establishing a sense of urgency

a) In the 9th grade we are letting our "customers" down and excluding them from higher levels of mathematics education by not ensuring they meet proficiency in the 9th grade.
   i) 60% of the African-American 9th grade students are not proficient
   ii) 46% of the Hispanic 9th grade students are not proficient
   iii) 60% of the 9th grade students who receive special education services are not proficient

b) What are the true rewards for responding to the need for change?
   i) Increasing the percentages of students who are proficient increases the number of qualified students in mathematics courses beyond 9th grade, making the jobs of those teachers more focused on the core content and less on remediation
   ii) Proficient students have more opportunities available to them in high school and beyond

c) What are the major opportunities that will assist in addressing the problem?
   i) A principal who is on board with the need for change
   ii) The possibility for a true RTI system at the school
   iii) The continuation of Interactive Mathematics Program (IMP) in the 9th grade that has had a positive effect on the schools overall proficiency score
   iv) The department choosing me to be department chairperson which gives me an opportunity to be an influence on the direction of the department

d) Crises
   i) No formalized RTI program established in school as yet
   ii) Not all non-proficient students were identified this year for extra services
   iii) Non-highly qualified teachers "teach" resource classes for special education students
   iv) Teachers who have voiced an opinion of not wanting to change the status quo

v) 60% of African-American 9th grade students not proficient in mathematics

2) Creating a guiding coalition

a) Principal and assistant principals

b) Members of the RTI committee (PD completed May 6, 2011)

c) Reading specialist

d) Special education teachers

e) 9th and 10th grade mathematics teachers (all on board with RTI)

f) Guidance counselors

g) Community members of underserved subgroups

3) Developing a vision and strategy

i) Strategy: Become Mathematics Department Chairperson (Accomplished)

ii) Vision: Mission Statement for the Mathematics Department - iCAPE

(1) Implement **i**NNOVATIVE research-based educational practices and technology

(2) Develop, implement and foster a **C**OLLABORATIVE culture within the department

(3) Be **A**CCOUNTABLE to all stakeholders

(4) Be **P**ROACTIVE in our anticipation and adaptation to the changing needs of our students

(5) Provide **E**QUITABLE education opportunities for all students

4) Communicate the message

a) The mathematics department "elevator speech" is:

i) iCAPE, we have an APP (Alternate Path to Proficiency) for that!

ii) Innovative, collaborative, accountable, proactive and equitable

b) How the message will be communicated and party responsible

i) Faculty meetings - administrators

ii) Department and teacher web pages - teachers

iii) Ongoing emails regarding success and progress – department chairperson

iv) Monthly parent meetings – guiding coalition

5) Empowering broad-based action

a) Removing obstacles
   i) Utilize already scheduled resource classes for special education students so that additional time does not need to be "found"
   ii) Push into class for students in Tier II so that electives and pathway courses are not affected
   iii) Schedule students into enrichment services before year end (based on DCAS scores and teacher recommendations) so that schedules do not need to be changed in the fall
   iv) Communicate with parents about how their child with be serviced
b) The structure of the master schedule has been reconfigured to accommodate all tiers of service
c) Supplemental services should be created such as Saturday sessions, cross-curricular collaboration and technology suggestions

6) Generating short-term wins

a) Planning for visible improvements
   i) Report year-end results of current 10^{th} grade students (not receiving full services) to administration and school board.
b) Creating those wins
   i) Follow up at end of first semester on results of new 10^{th} grade students' progress (after services have been provided)
c) Recognizing and rewarding people who made the wins possible
   i) Reward students in the top 25% of highest increase in performance in a school assembly
   ii) Recognize all mathematics teachers at faculty meeting when targets are met (decreasing gaps by any percentage, increasing proficiency to 85% of students)

7) ***Consolidating gains and producing more change***
   a) At this point, the future consolidation to change the structure of enrichment is to vertically align the lower grades with the secondary grades
   b) Working with individuals at MSERC (Mathematics and Science Educational Resource Center) at the University of Delaware should help to move the program forward and keep it developing
8) ***Anchoring new approaches in the culture***
   a) Integrating support activities and lessons into the general curriculum plans
   b) Creating a team of special educators who work exclusively with students who require enrichment in mathematics
   c) Creating a handbook of outlining the structure, best practices, methods, pacing, sequence and goals

In the first paper of the semester, I described my leadership style as consisting of four main characteristics. I believe I have innate leadership abilities. I am results-oriented. I have a desire to develop an effective team management leadership style. I follow a moral code and maintain a high level of integrity. For what I am trying to accomplish, I do not think that I would want to change any aspect of these characteristics at the present time. I am striving to become the type of leader who can create trust and respect in my organization that leads to a high level of commitment. I have recently obtained my short-term goal becoming the mathematics department chairperson. This will allow me to step into a leadership position at Cape Henlopen High School. This is important for me because the department is divided on the topic of traditional versus problem-based delivery of mathematics and the ideas of common planning, common assessments and vertical alignment. My goal is to unify the

department under the departmental goal of achieving the highest proficiency rate for all students in all subgroups of any mathematics department in the state.

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Appendix F

LITERATURE REVIEW: RESPONSE TO INTERVENTION KEY COMPONENTS

Introduction

The purpose of this paper is to analyze the available research and current best practices to identify essential core components and implementation strategies for a Response to Intervention (RTI) framework at the secondary (high school) level. I will seek to synthesize RTI components and elements that are supported by empirical evidence. If necessary, I will also include information about the most commonly utilized examples of research-based, best practices that support successful RTI programs. Since my overall goal is to create a framework that will support an RTI program for mathematics, I will use this information to formulate an RTI framework that will meet the needs of students who require intervention in mathematics. At the end of my analysis, I will recommend an RTI framework and initial implementation strategy for Cape Henlopen High School.

Defining Response to Intervention

The National Dissemination Center for Children with Disabilities defines Response to Intervention (RTI) simply as "a process that schools can use to help children who are struggling academically or behaviorally" retrieved from www.nichcy.org/schols-administration/rti. Burns & Gibbons (2008) define RTI as

"the systematic use of assessment data to most efficiently allocate resources in order to improve learning for all students" (p. 1). Batsche et al. (2005) more completely define RTI as "the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals, and applying child response data to important educational decisions" (p. 3). All three of these definitions are useful for creating a basic understanding of RTI.

Examining the history of RTI allows for a more complete understanding of RTI. RTI itself can trace its roots to the field of literacy. RTI developed, in part, from a report titled "A Nation at Risk" (1983) and from later work done on a literacy program known as Reading First, which was one of the major components of No Child Left Behind (2002). Fuchs and Fuchs (2006) point out that Reading First focused on providing reading intervention at the earliest signs of difficulty. They explained that two aspects of the Reading First program have developed into major components of today's RTI programs. First, the Reading First program required that scientific knowledge be used when selecting curricula. Second, Reading First required the use of screening measures and progress monitoring to identify students in need of more intensive instruction.

Additionally, some of the earliest ideas that led to RTI can be traced back to work done by S. L. Deno and P.K. Mirkin in 1977 and to the report "A Nation at Risk" published by the United States Department of Education in 1983. Deno and Mirkin's (1977) work was titled, "Data-based Program Modification: A Manual" and

was published by the Council for Exceptional Children (CEC). The fact that the CEC published this work should be noted. The CEC's involvement was a clear indication that the first steps made toward the development of RTI began in the area of special education. "A Nation at Risk" (1983) included in its findings that:

- "Some 23 million American adults are functionally illiterate by the simplest tests of everyday reading, writing and comprehension" (p. 11).
- "About 13 percent of all 17-year-olds in the United States can be considered functionally illiterate. Functional illiteracy among minority youth may run as high as 40 percent" (p. 11).

In the late 1990's, RTI came into the spotlight as an alternate method for identifying children with specific learning disabilities. RTI programs made the assumption that early intervention programs and supports were already being provided. These programs and supports were to include a specific component that would evaluate students in order to identify learning disabilities. The Center for Comprehensive School Reform and Improvement (2008) stated that at the time, the assumption was that every student would be provided with "evidence-based instruction and progress monitoring in general education classrooms".

At the end of 2004, President Bush signed the Individuals with Disabilities Education Improvement Act (IDEA, 2004) into law. The time between the early 1980's and the president's signing of this document, known as the reauthorization of IDEA, saw many changes in the field of education. These changes included the federal government's role in funding special education, a growing dissatisfaction by

the public with special education in general, increases in knowledge regarding how children learn & the academic interventions that assist in that learning, and a movement toward more accountability in education. These developments as a whole created a shift that led to the placement of RTI in the realm of general education (Burns & Gibbons, 2008) where it remains today.

The revision of IDEA in 2004 also had at least one difference from the previous version that is worthy of note. The previous version had encouraged the use of "IQ–achievement discrepancy" to identify children with learning disabilities (LD). IQ-achievement discrepancy is a diagnostic procedure that was approved in the Education of All Handicapped Children Act of 1977 (Public Law 94-142). This diagnostic model identified children as learning disabled (LD) only if their was significant underachievement when compared to what would be expected based on a child's intelligence quotient (IQ). The IQ-achievement discrepancy model was a political compromise. There was little research that supported IQ-achievement discrepancy as effective when the law was enacted. Vellutino, Scanlon and Lyon (2000) point out in their study that as far back as 1960, Malmquist had analyzed the results of a large number of studies that investigated the relationship between intelligence and reading **achievement**. The correlations between intelligence and reading achievement did not have a very strong or strong correlation but rather a correlation was in the moderate range from .40 to .60. They reported that Malmquist had also found "correlations of comparable magnitudes" in a review of "a large, multivariate study of first-grade poor and normal readers." Similar results disputing

the validity of the IQ-achievement discrepancy model were reported by Bond and Dykstra,1967; Allen, 1944; Bond & Fay, 1950; Durrell, 1933; Ladd, 1933; Lennon, 1950. Today the general practice is moving away from the IQ-achievement discrepancy model.

The 2004 revision of IDEA included a provision that made it possible to use RTI as an alternative diagnostic method to the IQ-achievement discrepancy model. The reauthorization caused an expansion in service methods that allowed practitioners to provide early intervention to all children at risk for failure, learning disabled or not. Schools began to implement RTI models and the identification of struggling students grew beyond the realm of special education. IDEA 2004 allowed school districts to use up to 15% of their special education budgets to pay for early intervention programs. This has created changes in the area of educational interventions. These changes include how many students are identified to receive intervention services, which students receive these services, what kind of services they receive and who provides these services. As a result, the identification of any struggling student became a more data based, comprehensive model with the intention of helping any student who needed to improve his or her levels of achievement. In elementary schools, where the majority of RTI models have been employed, RTI is beginning to have an effect on the very nature of early intervention and instruction itself. As high school educators begin utilizing RTI, the possibility of improving student achievement is also strong despite the challenges that exist when implementing RTI on the secondary level.

A Review of the Literature

RTI framework models for secondary schools are a challenge to locate, particularly in the area of mathematics. Marino & Beecher (2010) state that the majority of RTI research to date has focused on remedial reading instruction for students in elementary schools, leaving researchers and practitioners with minimal information about how to implement RTI at the secondary level (Vaughn et al., 2010). Duffy (2007) states that because RTI has been implemented most commonly at the elementary level, it is still unclear what form RTI might take at the high school level. However, this does not mean that RTI does not have "important implications" for high schools.

Mastropieri & Scruggs (2005) point out that in middle and high schools, adolescents face unique challenges and demands that are different from those faced by students in elementary schools. Examples of these challenges and demands include an increase in the pace and amount of material that is presented to students on a daily basis, the ability for students to process and understand increasingly abstract concepts, and the need for students to acquire information that is often broad, shallow and intended to be learned for the high-stakes test with "minimal class review or additional practice" (p. 527). These demands result in increased pressure placed on high school students with regard to their performance on high stakes tests. These elements create a unique set of requirements for RTI programs created for adolescent students. One requirement is to ensure that the curriculum is delivered with fidelity and instructional practices are practiced with integrity in order to support the acquisition of skills and

knowledge before educators consider additional intervention.

Many authors (e.g., Cersten & Dimino, 2006, Mastropieri & Scruggs, 2005; Werts, Lambert, & Carpenter, 2009) have noted that there is a lack of consensus across the research community regarding the expectations and structure to be used in an RTI model. This is compounded at the secondary level due to a lack of empirical research that systematically examines the efficacy of RTI with adolescent learners (Brozo, 2010; Fuchs, Fuchs & Compton, 2010; Vaughn et al., 2008). In spite of the lack of a proven model, some secondary schools have begun a full implementation of an RTI program. Therefore, practitioners in the field are doing the majority of the development of secondary RTI models. However, there are several studies that propose empirically driven implementation frameworks that include core components that can serve as the foundation for a secondary RTI model. It is on these studies that I will focus.

Frameworks for RTI

Glover and DiPerna (2007)

Glover and DiPerna (2007) state in their article "Service Delivery for Response to Intervention: Core Components and Directions for Future Research" that the identification of at-risk students through RTI programs is only an "intermediate objective in achieving a greater end goal" (p. 527). They state that the true key aspect of RTI is service delivery. Service delivery is the method or methods by which RTI interventions are provided. Glover & DiPerna's (2007) paper analyzes those components that are necessary for the "actual application of response-to-intervention

service delivery within schools" (p. 526). The article identifies five components that support successful service delivery, presents research that supports these components and suggests what future research is necessary.

The authors explain that service delivery for RTI is made up of both functional and structural components. An example of a functional component would include the various educator roles in an RTI program. An example of a structural component would be the organizational framework itself. The authors focus specifically on the structural components that are necessary to implement an RTI program. The structural components of service deliver are of particular interest within this literature review. Glover & DiPerna (2007) surveyed the research and identifed five, core components for RTI service delivery. These components are:

1. Multitier implementation
2. Student assessment and data based decision-making
3. Evidence-based intervention component
4. Maintenance of procedural integrity
5. Development and sustaining of systems-level capacity

The authors explain that they focus their synopsis of these components to the evidence that supports the direct application in an RTI framework. They also state that much of the research in this area is still in its "infancy" so further research is necessary.

Glover and DiPerna (2007) explain the first component of service delivery, multitier implementation, should take the form of multiple levels of assessments and interventions. They explain the reason for this is that RTI practices include all

students and, therefore, occur on a continuum where every student participates and receives some sort of intervention. These interventions are simply at different levels of intensity. The different levels of intensity take the form of a three-tier model. Tier one is labeled "primary prevention." Primary prevention is a school-wide level of instructional delivery and behavioral services & supports that are provided to all students. Tier two is labeled "secondary prevention." Secondary prevention is a level of supplementary instructional and/or behavioral supports for students who are indentified to be "at-risk" of underperforming at the primary prevention level. The third level of support is labeled "tertiary prevention." Tertiary prevention is much like tier two except the interventions are of greater intensity and target "at-risk" students who have not responded at the secondary prevention level. Glover and DiPerna (2007) state that the work of VanDerHeyden (2006) provides evidence that multitier interventions result in improved performance for students receiving interventions in mathematics.

Student assessment and data based decision-making is the second core component of RTI service delivery identified by Glover and DiPerna (2007). The authors state that school-wide student screening is a necessity. School-wide screening requires the "application of data-based decision criteria" (p. 528) and the on-going progress monitoring of at-risk students. On-going progress monitoring is necessary to make sure that students identified as "at-risk" are receiving services that meet their individual needs identified during the screening process. Glover and DiPerna (2007) refer to what they call the extensive research that has been conducted over the past 30

years in the area of curriculum-based measurement or CBM. CBM is an approach of frequently assessing students in basic skills or content to monitor growth. When growth can be documented, the instruction or interventions are said to be having the desired effect. The authors cite Deno's (1985) work when the state that there is strong evidence for the use of CBM to assess students' initial level of risk, to differentiate student interventions, to monitor student progress and to evaluate the overall effectiveness of the interventions and intervention program. They state that there is a need for a higher level of precision when initially identifying those students who are "at-risk".

Evidence-based intervention is the third core RTI component presented in the article. The authors explain that to ensure a high level of benefit to students involved in an RTI program, all instructional practices and interventions must be supported with strong empirical evidence. The authors describe two approaches that are supported by research as being effective. The first approach is called the standard protocol approach. In the standard protocol approach, a predetermined plan is used to deliver interventions to a small group of students. The second approach is the individualized approach. This approach is often also referred to as the problem solving approach or method throughout the literature. In the individualized approach, the interventions are created specifically for each individual student based on his or her need and are essentially customized interventions. The authors state that their analysis of the literature confirms that most of the evidence for the effectiveness of both of these approaches is in the area of reading. However, they point out that there is a growing

body of evidence supporting the effectiveness of the individualized approach in other content areas. The authors conclude that additional research on intervention methods for academic areas outside the area of reading are necessary in order to better inform practitioners to the efficacy of both the standard protocol approach and individualized approach for interventions in mathematics for increasing student achievement.

Maintenance of procedural integrity is the fourth core component of service delivery for RTI. After appropriate assessments and evidence-based interventions are identified and implemented at each level of an RTI program, the authors state that both the integrity and fidelity of the program need to be attended to. Integrity can be defined as implementing evidence-based interventions at each tier of service as intended. Fidelity can be defined as "adherence to an established protocol" (p. 532) when delivering services. The authors' synopsis of the research evidence led them to the conclusion that there are three important factors that influence the integrity of an RTI program, acceptability, training and support. Acceptability is defined as to what extent an intervention is considered to be "appropriate, fair and reasonable" (p. 533). The authors state that the literature reports that intervention integrity is more closely connected to, and dependent upon, the training – specifically the type of training - practitioners receive related to the interventions. The authors present three training methods investigated by Sterling-Turner, Watson, Wildmon, and Watkins in 2001. These training methods are direct training procedures, didactic training procedures and feedback training. Direct training includes modeling and rehearsing. Modeling and rehearsing is a training method in which the intervention is demonstrated for the

practitioner prior to utilizing said intervention in an actual intervention setting. Didactic training is defined as a verbal explanation of the intervention. Feedback training is a training method in which the practitioner is critiqued after they deliver the intervention. Of these three methods, direct training procedures resulted in the highest rates of intervention integrity.

Development and sustaining of systems-level capacity is the fifth and final core component of service delivery described by the authors. The authors refer to the work of Adelman & Taylor (1997) and Ervin, Shaughency, Goodman, McGlichey & Matthews (2006) when they simply describe this component as a "scaling up" of an RTI program. This component becomes relevant not only as an RTI framework is being initiated but also after the program has been implemented and established. A newly established RTI program must build capacity so that it can maintain effective service delivery. The building of capacity is explained by Glover and DiPerna (2007) through Adelman and Taylor's (1997) description of a four-phase process model that "facilitates sustainable systemic change" (p. 534). This model's phases are:

(1) Creating Readiness: motivating stakeholders to create a climate that can receive change

(2) Initial Implementation: implementing changes in a sequential manner that includes supporting stakeholders during the implementation

(3) Institutionalizing New Approaches: changing policies and practices of the system so that the newly implemented changes can be perpetuated

(4) On-going Evolution and Renewal: ensuring that stakeholders' capacity in the area of problem-solving is developed so that on-going change and adaptations can be developed and refined as needed

Lembke, Hampton, and Beyers (2012)

In the article, "Response to Intervention in Mathematics: Critical Elements", Lembke, Hampton and Beyers (2012) investigate the key components of RTI programs that address the unique instructional and intervention needs in the mathematical content area. The authors acknowledge "the majority of evidence supporting the use of RTI models has been conducted in the area of reading" (pg. 257) but they continue and state that more and more attention is being given to RTI practices that address mathematics. The authors refer specifically to six core components identified by Riccomini & Witzel (2010) in the area of reading RTI that can be utilized in the area of mathematics. They are:

1) A belief that all students can learn when provided with effective instructional practices and monitored for progress. An aspect of Lembke, Hampton and Beyers' (2012) article that is unique to the subject of mathematics is their identification and discussion of a challenge that that does not occur in the area of reading. Unlike reading, difficulties that students experience in

mathematics are often attributed to the culturally accepted notion that not everyone has the ability to do well in mathematics; that some people are just not wired for math and therefore may never achieve proficiency in mathematics no matter what they do. Parents are often willing to admit that they have poor mathematics skills and because of this are much more willing to excuse their children's difficulties in math "by rationalizing that they were not good in math at that age either" (Riccomini & Witzel, 2010, p. 7). The authors state that this belief is contrary to the a statement made by the National Mathematics Advisory Panel in 2008 which asserted, "All students can and should be mathematically proficient…" (p. 10)

2) A system of screening to identify struggling students. The authors explain that the screening process has two components in practice. The first component is a universal screening where all students are given an assessment that is administered at the beginning, the middle and the end of the school year. This assessment will identify those students who fall below a predetermined level of proficiency. The second component is a secondary screening with an additional assessment. This additional assessment will help identify more specific information related to each student's areas of difficulty. The authors state that at the high-school level in mathematics, this secondary screening should include tasks that focus on computation, working with equations, data and measurement. This secondary assessment also acts as a diagnostic tool that provides interventionists with information about each student's

mathematical strengths and weaknesses. This information is critical when utilizing the problem solving method (individualized approach).

3) The implementation of a progress monitoring system that measures the instructional effectiveness of teachers and is used to help make instructional decisions. The authors refer to a National Council of Teachers of Mathematics (NCTM) report in 2000, which explains that assessments in mathematics should not just be limited to a test at the end of the unit of study but should be an ongoing and imbedded part of instruction. This type of ongoing assessment is known as formative assessment. Formative assessment is used to inform teaching and planning with the end purpose of enhancing student learning. This formative assessment of student progress allows educators to collect student data more frequently, allows educators to monitor student progress more closely and helps educators develop an understanding of student progress over time. An integral part of this progress monitoring and the data that it generates is to measure the effectiveness of both instructional practices and intervention strategies based on student growth.
4) Instructional and intervention practices that are based in research. The authors present the two main interventions types, the standard treatment protocol described by Lembke et al. (2010) and the problem-solving method described by Tilly (2002). This article explains that the main differences between these two methods is that the standard treatment method is designed to provide interventions to a group of students who have similar instructional needs

whereas the problem-solving method can be used to design specialized interventions to meet the needs of individual students.

5) Multiple tiers of instructional support are utilized in the program. The authors describe the use of a three-tiered model focused on the delivery of mathematics instruction that is described as a universal level (Tier 1), a strategic level (Tier 2) and an intensive level (Tier 3). Tier 1 is described as universal because it is where all students receive the core curriculum instruction in mathematics. The authors clarify that the core curriculum must be research-based. They point out that with the coming of the Common Core State Standards, a greater consistency about what is taught in the various states across the country will develop. Teachers must be careful to implement the core curriculum with fidelity. The authors suggest that teachers employ a system of checking for fidelity either by self-checking, checking by colleagues or checking by administration. This fidelity checking is an important aspect of delivering the curriculum. If the mathematics curriculum is being delivered with fidelity but students are not progressing as expected the district may wish to re-evaluate the curriculum and either replace it or supplement it to ensure that it meets the needs of the students.
6) A system of ongoing program evaluation is implemented to ensure that the implementation and perpetuation of the RTI program is as effective as possible.

Fuchs, Fuchs, and Compton (2010)

In "Rethinking Response to Intervention at Middle and High School", Fuchs, Fuchs and Compton (2010) provide commentary on the differences between elementary RTI program components and RTI program components at the middle and high school levels. The authors describe three assumptions made about implementing an RTI framework at the elementary level that they state may not apply to the high school level. The first assumption is that "screening is required to identify risk before academic deficits materialize" (p. 24). The authors explain that by high school, students have already demonstrated their academic deficits and using limited resources to screen all students does not make sense. They point to Vaughn et al. (2010) (as cited in Fuchs, Fuchs & Compton, 2010) who focused on examining the data produced by high-stakes assessments to ascertain which students were having academic difficulties. These students were identified to require additional intervention beyond what they would receive in a Tier 1 setting. Once these students are identified, the second assumption of "determining responsiveness to less intensive levels of the prevention system is required to identify students who need more intensive services" (p. 24) comes into play. The authors state that additional assessments may be administered to gather information about the exact nature of the academic deficits, the instructional needs and which students require immediate Tier 3 intervention as opposed to those who have deficits that are less serious and will most likely succeed at Tier 2. The authors explain that middle and high school students demonstrate "much more serious academic deficits" (p. 25) which may make them less responsive to the

interventions provided at the less intensive secondary level of prevention (Tier 2). Since these students often exhibit low academic motivation and self-confidence, they should be immediately assigned to the more intensive support offered in the tertiary level of prevention (Tier 3). The third assumption that does not apply to the high school level is, "the nature of effective intervention is the same across the grades" (p. 25). Since adolescents who have academic deficits have accumulated substantial deficiencies by the time they reach high school the interventions required to address these academic needs will need to consider many subcomponent skills and address issues of motivation and lowered self-confidence in mathematical skills that would not be present prior to this point in the student's education. Fuchs, Fuchs and Compton (2010) point out the importance of providing effective interventions that take grade level considerations into account when they cite the National Longitudinal Transition Study – 2 (Wagner et al., 2003). This study stated that one-fourth of students with learning disabilities drop out if they are more than three years below grade level in reading and math by the time they reach high school. By 2007, only 46% of this group of students who dropped out had found "regular paid employment" (p. 26) within a two year period after dropping out.

Nellis (2012)

In "Maximizing the Effectiveness of Building Teams in Response to Intervention Implementation", Nellis (2012) investigates the history and development of teams in the field of education. The author states that there are benefits and challenges when creating teams but asserts that creating a team is one of the key

components in the designing and implementing of an RTI program. The author uses Welch, Brownell & Sheridan's (1999) definition of a team as "a group of two or more persons who share responsibility in decision making for the purpose of achieving a particular outcome" (p. 246).

"Building-level teams are often responsible for implementing the logistics of assessment and data analysis at the school, grade, small-group, and individual-student levels" (p. 247). Building teams would be useful to implement, manage and maintain many of the components suggested in both Glover & DiPerna's (2007) and Lembke, Hampton & Beyers' (2012) frameworks and to establish a multitier structure as described by Glover & DiPerna (2007), Lembke, Hampton & Beyers (2012) and Fuchs, Fuchs & Compton (2010).

The importance of Nellis' (2012) article is found in the author's analysis of the empirical evidence that supports utilizing a team approach for establishing, implementing and supporting an RTI program. Nellis (2012) refers to a framework developed by Arthur Ellis in 2001that is used to evaluate educational methods. Ellis' (2001) framework has three levels to evaluate the effectiveness of educational programs,

1. A sound theoretical basis,
2. The ability to demonstrate effectiveness, and
3. The ability to be implemented on a wide-scale.

Nellis (2012) explains that according to Ellis (2001), all three levels must be present for an educational practice to be deemed of value. The building level team would

monitor these three elements. To ensure that the educational program had a sound theoretical basis, it would need to make sure that the program was not founded in educational fads. Ellis (2001) considered educational fads those practices that are implemented widely but with no sound theoretical basis and no evidence of demonstrated effectiveness. However, building level teams should not just be monitoring to make sure that educational fads are avoided. Building level teams should also screen out those practices that have a sound theoretical basis and have been shown to be effective but are not able to be used consistently in practice or do not possess the elements necessary to be implemented on a wide-scale in schools. If an educational practice cannot be recreated and utilized effectively in multiple settings it is unlikely that it will prove useful to an RTI program. The author gives an example of an educational practice that is supported by the empirical evidence presented by Kovaleski & Glew (2006) and can be implemented on a wide-scale, the problem-solving method. The author asserts that building level teams that adhere to problem-solving practices in their delivery of RTI interventions, report benefits to both school systems and student outcomes. These benefits included reduced referrals for special education services and improved student academic performance.

Nellis (2012) also proposes grade level teams. Burns & Gibbons (2008) support Nellis' (2012) ideas regarding the grade level team and explain that grade level teams are necessary for the proper functioning of an RTI program. Grade level teams can be defined as those that are made solely of teacher practitioners who teach the same grade, or in the case of high school teachers, the same course. These teachers take on

the responsibility of assessing students, analyzing the data and placing students in the appropriate intervention tier. Teachers are often responsible for identifying what interventions will be needed by each student, delivering those interventions and monitoring their effectiveness as well as conducting formative & summative assessments and documenting outcomes throughout the process.

Although the teams may appear as two distinct and separate entities, the building level team and the grade level team(s) must collaborate with each other. The teams must coordinate their efforts with regard to how data is collected and interpreted and how decisions are made regarding the type of interventions to utilize for each student or groups of students. Burns and Gibbons (2008) explained that both teams are required not only to analyze data effectively but also to ensure that it is actually used to make instructional decisions. Both building level and grade level teams should be created so that the overall responsibility for student progress is shared instead of being the sole responsibility of individual classroom teachers.

Synthesis: Key Components for RTI in Secondary Mathematics

Feuerborn, Sarin and Tyre (2011) state, "Although the promises are alluring, the literature gives little guidance on how to implement RTI at the secondary level." (p. 50). The research identified and discussed in this paper contradicts this statement. Researchers and school districts themselves have begun to identify the key components required to implement successful RTI programs at the secondary level. The most important aspects of the key components investigated in this paper are summarized in Table 10.

Table 10 Summary of Key Components from the Literature

Glover & DiPerna	• Multiple tiers – primary, secondary and tertiary prevention • Student assessment and data based decision making • Evidence based interventions – standard protocol; individualized • Maintenance of procedural integrity • Sustainability of systems-level capacity and "scaling-up"
Lembke, Hampton & Beyers	• A belief that all students can learn • Screening • Progress monitoring • Research based instructional and intervention practices • Multiple tiers • On-going program evaluation
Nellis	• Direction by teams; school-level and course/grade level • Evidence based intervention practices
Fuchs, Fuchs & Compton	• Screening of identified at-risk students only • Multi-tiered interventions • Interventions targeted for grade level needs

Based on the similarities in the frameworks, it is clear that several components must be included when proposing an RTI framework for Cape Henlopen High School. My proposed framework will focus on the following components: evidence or research based interventions, a multi-tiered structure and, screening and progress monitoring. Additionally, although only Nellis (2010) discussed the research about how school-level and grade-level teams should be used to oversee and manage the functioning of an RTI framework, the evidence is convincing enough to include the

team approach when developing, implementing and maintaining an RTI framework. These teams will be instrumental in managing the all of the initial and long-term logistical considerations at Cape Henlopen High School. In the following sections, I describe four key components to include in the RTI framework in the order and in the manner they will be implemented.

Component 1: Building-level teams and grade-level teams to guide the program

Fuchs, Fuchs & Compton (2010) state RTI programs in high schools should be used to develop an understanding among teachers that their objective is to reduce and eventually eliminate the large academic deficits that their students have developed prior to reaching high school. The authors further state, at the high school level, RTI must be monitored to ascertain when students reach important benchmarks. This monitoring ensures that students are reassigned down the RTI tiers toward less intensive levels of the intervention program as needed. The ultimate goal of an RTI program should be that students are eventually able to function at the standard level or Tier 1 without further intervention. Lembke, Hampton & Beyers (2012) state that progress monitoring should be used to not only inform academic decision-making buy also to gauge the effectiveness of teacher instruction. These aspects of an RTI framework should be managed and monitored by a building-level team. Burns and Gibbons (2008) support Nellis (2010) when they describe a type of building-level team they call a "problem-solving team (PST)". They assert that this team is required

to successfully implement RTI at the school level. The building-level team will be involved in creating the intervention master schedule, deciding which delivery methods to use for supplemental interventions and planning how the school will implement the more intensive interventions of Tier III. The building-level team should meet to review progress of Tier II and Tier III students, discuss the overall effectiveness of the RTI program and decide upon any program changes necessary to increase student success. Effectiveness can be defined as the extent to which students on a particular grade level stay on that grade level and the extent to which students below grade level are able to catch up. This supports Nellis' (2012) assertion that a building level-team is necessary to begin the process of formalizing an RTI program.

One benefit of a building level team at the beginning of the RTI implementation process is the inclusion of staff in the difficult process of organizational change. Both teams would include representation from various areas of the school and ensure multiple perspectives on the creation of the RTI program. This should lead to increased buy-in and support from the rest of the staff.

The initial suggestion for Cape Henlopen High School is that the teams will need to schedule regular meeting times with a structured agenda (Burns & Gibbons, 2008). These meetings should be part of the regular schedule from the first week of school. These meetings will provide the opportunity to continuously evaluate progress, successes and setbacks associated with implementation activities. The building level team can meet during the summer to accomplish the majority of the ground laying work for the RTI framework.

More specifically, grade level teams will need to meet frequently during the school year because the team will be responsible for the review of student data, assigning students to intervention tiers and creating individual interventions in accordance to the problem-solving model. The grade level teams could meet either during a scheduled after school meeting or during the bi-monthly Professional Learning Community (PLC) meetings that each department schedules for teacher collaboration and data review. The benefit of meeting during the PLC time is that a data coach (employed by a third party) is available to assist in analyzing the data. Additionally, teachers would not need to be compensated for the time they meet during the school day as they would for a meeting after school. Cape Henlopen High School also has a schedule of 220 minutes of common planning time per week for each department. This gives every teacher in each instructional area the opportunity to plan and collaborate with other teachers in the same discipline three times per week.

When developing the teams, the school's administration team can utilize the National Center on Response to Intervention's (2010) Guiding Questions:

1. Which staff is involved?
2. How frequently will the team meet?
3. Can existing meeting times be repurposed for the RTI plan?
4. Who will set the agenda and intended goals and objectives for these meetings?
5. How will you know if the meetings are meeting your needs?

Component 2: A system of screening and ongoing progress monitoring

Currently, students' DCAS scores are used as a universal screening tool to identify students who are at-risk in mathematics. Students who were identified as at-risk were candidates for the RTI pilot program established at the beginning of the 2012-2013 school year. The RTI pilot program currently includes only Tier 2 interventions but is supported by the enrichment program as a Tier 3 alternative. The pilot program also includes Tier 2 intervention supports for students who receive special education services. This program is knows as the parallel program. Students who are identified by the universal screener to be at-risk then take the STAR math skills test as a secondary screener to verify their at-risk status. The STAR math results are also used as a diagnostic tool to identify the topics, skills and concepts that need to be included as part of the students intervention plan.

Progress is monitored through a bi-weekly administration of the STAR math assessment. These progress assessments occur four times within a nine-week intervention cycle that coincides with the district's marking periods. The data from these on-going assessments, the DCAS test and other assessments are collected in a data management system called iTracker. iTracker was developed and is maintained by Data Services, Inc. By using iTracker, a longitudinal picture of student progress can be developed and each student's progress or lack of progress can be monitored and evaluated.

During the summer of 2013, the teams can decide if this initial screening and monitoring system used by the RTI pilot program will be maintained or if adjustments

are necessary to meet the needs of the future RTI program. Glover & DiPerna (2008) state that school-wide screening is required. Lembke, Hampton & Beyers (2012) state that two screening tools are required – a universal screener and a secondary screener. The team will need to decide upon the screening process and what resources will be utilized as the universal screening tool and the secondary screening tool. Lembke, Hampton & Beyers (2012) explain that a progress monitoring system must be implemented. The team will need to decide in what manner progress monitoring will be done. The team will be asked to consider the following sources and tools could include:

1. Fall and spring DCAS scores from the previous year
2. Grades from the previous year
3. Teacher referrals
4. Attendance data
5. Behavior Data
6. Data obtained from a secondary screening tool such as STAR math

When developing or deciding upon implementing a screening tool, the building level and grade level teams can utilize the National Center on Response to Intervention's (2010) Guiding Questions:

a. Who will be screened?
b. How many times a year will we collect screening data?
c. On what calendar dates will the screening assessments be administered?
d. Who is responsible for administering and collecting data?

e. When will the RTI team meet to review the results and make instructional decisions?

Component 3: A multi-tiered structure

A broader search of the literature confirms the findings of both Glover and DiPerna (2007) and Lembke, Hampton & Beyers (2012) that RTI is almost universally structured as multi-tiered program of service delivery that attempts to solve students' academic difficulties (National High School Center, 2010; Burns and Gibbons, 2008; Shinn, 2008; National Center on Response to Intervention, 2010; State of Delaware DOE, 2006) by providing increasingly intensive interventions a each successive tier. Additionally, each source considered these tiers to be part of general education. If students do not show evidence of progress after continuing to receive research-based instruction at Tier 1 while completing at least a cycle of interventions at Tier 3, they should be referred for a special education evaluation. Since Cape Henlopen High School operates within the State of Delaware, it makes sense to first ascertain what the State recommends as the preferred number of tiers to be included in an RTI framework. According to information on the Delaware Department of Education's website, Delaware has adopted a three-tiered model. The website states that the three-tiered model is the most effective model to deliver the both high-quality instruction to all students while allowing the efficient collection of data through diagnostic, formative and summative assessments. Using the data to categorize students into one

of several tiers allows instructors to more closely meet the needs of their students based on what the data has indicated.

When implementing the multi-tiered framework, the grade-level and building-level teams can utilize the National Center on Response to Intervention's (2010) Guiding Questions:

a. How will current instructional supports be aligned with tiered interventions?
b. Will other initiatives hinder the implementation of tiered interventions?
c. How will the master schedule be adapted to support tiered interventions?
d. How will student movement between tiers be accommodated?
e. Who will deliver the interventions at each tier?

Component 4: Evidence or research-based interventions

As described by Glover and DiPerna (2007), Lembke, Hampton and Beyers (2012), Nellis (2010) and Fuchs, Fuchs and Compton (2010) interventions can be provided through two types of approaches: the individualized or problem-solving approach and the standard protocol approach. Cape Henlopen High School has a research-supported standard protocol tool that already has been purchased by the district. This tool is called Compass Learning. Compass Learning is a third party, web-based software suite that provides intervention activities that are based in research. The Compass Learning program has been linked to the Delaware Comprehensive Assessment System (DCAS) results and instructional needs of each student in the district. The linking of the instructional needs to Compass Learning generates a file of lessons for each student. These lessons are intended to address each

student's areas of instructional need. The use of Compass Learning provides interventions that one can view as a hybrid of the individualized approach and the standard protocol approach. A benefit of these pre-made interventions could be utilized immediately. Later, as described by Lembke, Hampton and Beyers (2012), to effectively use this as a standard protocol tool, the grade level teams would need to analyze the instructional needs of the at risk students and then group the students in a manner that would allow for interventions to be delivered to groups of students with similar instructional needs. One of the benefits of Compass Learning is that teachers also can create customized interventions to meet the needs of individual students as needed. This would allow the lessons of Compass Learning to be used in a manner very close to the individualized or problem-solving approach. The grade level teams might also want to work with individual intervention providers (teachers) to create customized interventions that may or may not be based in Compass Learning. The team and the teacher would do this in order to better address unique needs of individual students. These interventions could be based directly in the mathematics curriculum and tied to the student's current unit of study. This would be direct, individualized support of what the student is learning in the Tier 1 classroom.

When implementing the evidence and research-based interventions, the grade-level and building-level teams can utilize the National Center on Response to Intervention's (2010) Guiding Questions:

a. What constitutes as a research-based intervention?

b. What research-based interventions best match students' needs as indicated by

assessment and other data?

c. How do we reconcile the need for evidence-based interventions and the freedom to not necessarily use a purchased program?
d. Who should be providing the interventions?

Conclusion

The purpose of this paper was to analyze the available research and current best practices to identify essential core components and implementation strategies for a Response to Intervention (RTI) framework at the high school level. I investigated four frameworks and identified four key components supported by evidence. These components are supported by research and are therefore elements to include when establishing the initial framework of an RTI program at the high school level. Including these four components in an RTI framework are just the beginning steps will set the stage for the creation of a functional RTI program at Cape Henlopen High School.

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Appendix G

AN EVALUATION OF THE CAPE HENLOPEN HIGH SCHOOL TENTH GRADE MATH MISCONCEPTION INTERVENTION PROGRAM

Executive Summary

This evaluation critically reviews the effectiveness of a set of interventions created to address mathematical misconceptions held by 10th grade students participating in the mathematics enrichment class at Cape Henlopen High School, Lewes, DE. It is necessary to evaluate the outcomes of the interventions to ascertain if the program, in its current form, is effectively correcting misconceptions. An additional function of this evaluation is to determine whether a low score on the DCAS can be used as an indicator of a student having mathematical misconceptions. If so, the DCAS score could be used as a screening tool. The program evaluation focuses on two questions:

Process Question: Is there a correlation between Delaware Comprehensive Assessment System (DCAS) pre-test scores and an overall low score on the misconception diagnostic pre-test?

Outcome Question: Are there statistically significant differences between the mean scores of the treatment and comparison groups on the pre-test and the post-tests?

The first question was addressed by comparing student scores DCAS pre-test administered at the beginning of November 2010 and the overall score a student

received on the mathematical misconception pre-test. An analysis of these data indicated that there is no correlation between the two scores.

The second question was addressed by comparing pre-test and post-test scores of a treatment group to those of a comparison group. The average growth of the two groups was also compared. The analysis of these data indicated that the program positively benefitted the students who received instruction. When the average growth of the two groups was compared, it was found that the increase in average score for the treatment group had statistical significance. The evaluator included conclusions and several recommendations in the report.

Introduction

Purpose of the Evaluation

This evaluation critically reviews the effectiveness of a set of interventions created to address mathematical misconceptions held by 10th grade students participating in the mathematics enrichment class at Cape Henlopen High School, Lewes, DE. The intent of the in-class intervention program is to identify and correct any embedded mathematical misconceptions that the students may have developed that hinder them from being more successful in mathematics. The purpose of these interventions is to help students by correcting misunderstandings they may have about common mathematical ideas in order to increase their mathematical confidence, overall mathematical fluency and proficiency scores on the state assessment. Because of this, it is necessary to evaluate the outcomes of the interventions to ascertain if the program is effectively correcting misconceptions in its current form. If it is not effectively correcting misconceptions, I will revise the program to increase its effectiveness, or discard it completely.

Evaluation Questions

The evaluation of the program addresses the following questions:

1. Process Question: Is there a correlation between Delaware Comprehensive Assessment System (DCAS) pre-test scores and an overall low score on the misconception diagnostic pre-test?

2. Outcome Question: Are there statistically significant differences between the mean scores of the treatment and comparison groups on the pre-test and the post-tests?

The process question is intended to investigate if the information provided as a result of students taking the DCAS exam can be used as a diagnostic screening tool so that individual student needs can be more accurately targeted for intervention. If a low score on the DCAS correlates to a low score on the misconception pre-test, the pre-assessment would not have to be given to every student. Instead, only those students who received low scores on the DCAS would be included in a pre-assessment screening to ascertain if a misconception needs to be addressed in the classroom. To answer this process question, I will conduct a review of the performance data from the autumn 2010 administration of the DCAS.

The outcome question is intended to provide evidence of the effectiveness of the treatment. The question must be answered with a statistically significant positive percentage increase for the program to remain in the format it was originally designed. Otherwise, it will need to be decided if changes or refinements need to be made to the interventions to increase the effectiveness of the program.

Description of the Program

Through my experience of working with students who are not reaching proficiency in mathematics at the secondary level, the program designer has observed that they often have significant misconceptions about mathematical concepts that interfere with their success and achievement not only on high-stakes assessments but

also in their general understanding of and ability to use mathematics. The students enrolled in the math enrichment classes in the 10th grade all received either a proficiency level (PL) of 1 or a 2 on the spring Delaware Student Testing Program (DSTP). These scores represent a level that is below proficiency. Additionally, many of the students show evidence of mathematical misconceptions in their class work both in the enrichment class and in their core mathematics class. This data was gathered through a review of items the students completed during the enrichment classes and through informal conversations with each student's mathematics teachers regarding these issues. The interventions were developed from information and ideas gathered from the National Strategies website of the British Department of Education as well as materials specifically created to address specific problems students have in the enrichment class. The program itself consists of a three part diagnostic pre-assessment, direct instruction intervention, and post-assessment.

There are four steps per intervention:

5. Identify through pre-assessment if the student is working with a mathematical misconception
6. Implement teaching strategies to counter misconception
7. Confirm that the misconception has been corrected through a post-assessment
8. Repeat the process separately for different misconceptions

I have created a graphic depiction of the program in a "Logic Model" (see Appendix Ga).

Approximately twenty specific misconceptions have been identified that the program could remediate. For this evaluation, only three common misconception topics will be the focus. The program will address three common misconceptions:

1. Rounding Numbers
2. Addition of Negative and Positive Integers
3. Multiplication's Ability to Increase or Decrease a Number

All three interventions utilize direct instruction lessons. These lessons have been developed for re-teaching of the mathematical concept and its functioning. (Appendix Gb) The instruction lasts approximately 10 minutes. A short, guided practice session of approximately 5 minutes follows the instruction. Approximately 15 minutes of individual targeted practice of the skill is the last step. The students work individually during the targeted practice period but they may ask questions if they need assistance. In the third intervention model (multiplication) the method used for addressing the misconception during the guided practice leads the students to generalize about the concept and then has them test the validity of generalizations directly by asking whether they are always true, sometimes true/sometimes false, or always false. For example, the instructor states, "Multiplying a positive whole number by a negative number creates a number that is less than the original whole number." Then asks, "Is this always true, sometimes true or always false?" In this way, the students must think through the concept with the result of clarifying and broadening their understanding of it. The instruction and reflection generated by this type of activity should contribute to the students' improved understanding as they clarify meanings, exceptions and

interpretations. These questions and the resulting student responses allow me to pinpoint and immediately address incomplete or incorrect understandings of specific number relationships that result from multiplication.

The delivery of the intervention took place over three 90-minute block class periods. During the first block, all students took the pre-test assessment as a warm up activity for that day. The instructor gave them a maximum of 15 minutes to complete the assessment. No students took longer than 15 minutes to complete this assessment. They were instructed not to use calculators and to complete each test question to the best of their ability. They were informed that this was a diagnostic assessment and that would be used to decide the instructional needs for the class. In non-technical language the instructor said, "Please do your best on your quiz because I will use it to figure out what you need to work on in class this week." The lessons, student notes and rubric (Appendix Gc) were created at the same time as the pre-test and post-test prior to this day. The assessments were graded according to the rubric. A spreadsheet was created that listed the name of each student in the first column and had the name of for each misconception as a column heading on the subsequent three columns. If the pre-test results indicated that the student required the intervention, a check was placed in the cell under the heading that represented that idea. If the student did not require the intervention, the cell was left blank. The column headings were multiplication, rounding and integers. The instructor used this spreadsheet to organize the students into groups to receive instruction for three misconceptions, two misconceptions, or one misconception. Those students who had no check marks did

not receive the interventions so that the instructor could focus solely on those students who required the instruction.

During the second block, the students were seated according to the number of interventions in which they needed to participate. Those who needed all three, sat in the front, those who needed two interventions, sat in the middle, those who needed one intervention sat toward the back. Students who required no interventions sat in a separate part of the classroom and completed a computer-based assignment on a program with which they are very familiar. The instructor estimated the assignment to take the full 90 minutes and require a minimum of assistance from me to complete. The desks were arranged into four rows of two-pairs directly in front of the Smart board so that all students had a clear view. No student was more than ten feet from the board. The instructor timed the interventions to take approximately 30 minutes each. They were delivered as described earlier in this section with 10 – 15 minutes of direct instruction that included 5 minutes of guided practice and 10 – 15 minutes of individual targeted practice. At the end of each session, the instructor collected the completed practice sheets, redirected the students who did not need further intervention to the computer-based assignment and began again with the next intervention. The order of the interventions for each class depended on the number of students that required it. The intervention that had the most number of students in need of it was the one that was done first. Conversely, the intervention that the fewest students required was done last. That evening, the instructor reviewed and evaluated the practice assignments according to the rubric.

During the third block, the practice assignments were given back. The instructor allowed the students to review them and offered to re-teach the concepts to those who required it. This re-teaching session took less than 15 minutes. The instructor allowed the students to correct their mistakes. He then reviewed the correct answers with them. At that time, he distributed the post-test. The students were given 15 minutes to complete the post-test. They were not allowed to use calculators, their notes, or their practice assignments to complete the post-test. No students required more than 15 minutes to complete the post-test. The instructor collected the post-tests. That evening the post-tests were graded in accordance to the rubric.

Target Populations

The intervention's target population includes any tenth grader enrolled in the math enrichment class at Cape Henlopen High School.

The evaluation's intended audience includes the curriculum director for the Cape Henlopen School District, the administration of Cape Henlopen High School, and me as the math specialist, program designer and program deliverer. Since the high school is under corrective action, gauging the effectiveness of intervention programs such as this is critical. The district and administration wants assurance that I am using effective methods to assist as many students as possible to achieve or move toward proficiency. Utilizing successful methods to obtain the Adequate Yearly Progress (AYP) required is the goal of the district. The interested parties will make decisions regarding how to achieve this because of this evaluation.

Structure of the Report

Four main sections make up the following report. They are, in order, Introduction and Background, Methodology, Results and Conclusions and Recommendations. This report provides a description of a new program designed to remediate mathematical misconceptions in students who are not achieving proficiency in the subject. It then presents the evaluation questions that will be addressed in this evaluation. The report will detail the process of the evaluation as it pertains to the program. Next, the report will present the results of the evaluation, a summary analysis of the data and the conclusion made about the program based on the evaluation. Lastly, recommendations for future action will be offered.

Methodology

Evaluation Design and Rationale

The design model I am employing for this evaluation is a Before-and-After with Comparison Group. I chose this model because a comparison of the treatment group to the comparison group is important to ascertain if progress by the treatment group has been made. By analyzing the student's scores on the pre-assessment to student's score on the post-assessment, I will be able to ascertain the effectiveness of the treatment. By comparing the average percentage increase of the group receiving the treatment to the comparison group, the level of success (or lack thereof) achieved by the target group can be identified with a reasonable level of confidence.

Sample

The eligible treatment sample for this evaluation included 10th grade students currently enrolled in the mathematics enrichment class at Cape Henlopen High School. The demographics of this group are 31 males, 25 females, 24 Caucasian, 27 African-American, and 5 other. Thirty-eight percent of the students in this group received a Performance Level 1 (PL 1) on the spring 2010 DSTP. Sixty percent of the students in the group received a PL 2 on the spring 2010 DSTP. Two percent did not have a PL score report for the spring 2010 DSTP.

The actual treatment group consisted of fifteen students. Eight of these students are male, seven are female; of these, six are African-American, seven are Caucasian and two are of a different racial makeup. The reason for the smaller treatment sample was due to student absences on various days during the delivery of the program. Students who did not complete all three parts of the program were not included in the data.

The comparison group included 16 students. Seven of these students are male, nine are female; of these, nine are African-American and seven are Caucasian. Both groups matched closely on performance level scores.

Instruments

I have created three instruments for this evaluation. The first is a pre-test (Appendix Gd). I will analyze the answers on the pre-test to identify the areas where the students may have developed a misconception. I will compare the student results

on this pre-test to each student's DCAS accountability score to ascertain if there is a correlation between the students' DCAS scores and the performance on the pre-test.

I have also created a four-point rubric in order to quantify each student's starting level and ending level regarding the misconceptions (Appendix Gc). A score of a four indicated no misconception while a score of a one indicated evidence of a complete misconception. I will use the rubric to track improvement regarding the misconception on the pre-test.

The last instrument is the post-test. (Appendix Ge). The post-test is the evidence that the student corrected the misconception.

Data Collection Procedures

I gave the initial pre-assessment to all 10^{th} grade students in math enrichment who were present ($n = 48$) on Monday, November 8, 2010 (Group "A", $n \approx 24$) and on Tuesday, November 9, 2010 (Group B, $n \approx 24$). The school chose students to participate in mathematics enrichment if they performed below proficiency (Performance Level 1 or 2) on the spring 2010 Delaware Student Testing Program (DSTP). Group A was the treatment group and received individualized instruction to address any misconceptions that the pre-assessment identified. Group B was the comparison group and received no instruction to address any misconceptions that became evident through the pre-assessment. The two groups completed the post-assessment one day apart from each other because of the A/B Block schedule at Cape Henlopen High School. These dates were November 22, 2010 and November 23, 2010.

I collected the data for the treatment group at all stages (pre-assessment, practice and post-assessment) on the 4-point tracking rubric in order to gauge both individual and group progress. I gathered the data for the comparison group from the pre-assessment and post-assessment only. I will gauge progress as simple improvement between the pre-assessment and the post-assessment.

Data Analysis Procedures

By giving the assessments to a comparison group, any improvement these students show can be attributed to something other than the interventions such as their core mathematics class. If the improvement (by percentage) for the target group is similar to the comparison group after the treatment, it will most likely be attributed to the instruction received in the core mathematics class. If the percentage of improvement in the group receiving the treatment is higher than the comparison group, it will need to be analyzed to calculate if the higher percentage is of statistical significance. These data will be used to decide if the interventions had the desired effect and if they should remain a permanent part of the mathematics intervention curriculum. Additionally, based on these data, the decision to develop and deliver the additional seventeen misconception interventions will be made.

Limits of the Evaluation

The data used in this evaluation was limited to a small sample of students in the school who may not accurately represent the greater population. The conclusions made about the program based on this data may be inaccurate for the general population of the school since only students who are not meeting proficiency

participate in the program. Additionally, due to a short time window in which to collect data, there was limited ability to deliver the interventions or post-test to students who were absent. Because of this they were excluded from the data which may have skewed the results and conclusions of the evaluation.

Results

In order to address my outcome question, "Are there statistically significant differences between the mean scores of the treatment and comparison groups on the pre-test and the post-tests?" data for each subtest (multiplication, rounding, and integers) was recorded into Excel spreadsheets and then transferred to the Statistical Package for Social Sciences software (SPSS). Next, Analyses of Co-Variance (ANCOVA) were conducted for each subtest and with the overall test mean using the spring scores as the dependent variables and the fall scores as the covariate. These analyses test whether differences in growth between intervention and control groups are statistically significant, controlling for pre-test scores.

Table 11 presents the mean pre- and posttest scores for the treatment and control groups. Because treatment and control groups differed in their pre-test scores, it is important to control for those differences in determining whether growth is statistically significantly different.

Table 11 Descriptive Statistics

Subtest	Treatment Pretest			Treatment Posttest		
	Mean	SD	n	Mean	SD	n
Multi.	2.27	1.18	15	3.27	1.18	15
Round	3.00	1.41	15	3.60	1.02	15
Integer	1.80	0.65	15	2.60	0.71	15
Overall mean	2.36	0.62	15	3.16	0.56	15

Subtest	Control Pretest			Control Posttest		
	Mean	SD	n	Mean	SD	n
Multi.	2.13	1.33	16	1.88	1.30	16
Round	1.31	0.99	16	1.69	1.30	16
Integer	1.94	0.86	16	1.56	0.83	16
Overall mean	1.90	0.66	16	1.81	0.71	16

Table 12 presents the results of the ANCOVA. After controlling for initial group differences as measured by the pre-tests, there was a significant effect of the treatment on the multiplication, rounding and integer interventions. In these cases, average growth in the treatment group exceeded growth in the control group, indicating that this intervention had a positive effect on mathematics achievement.

Table 12 ANCOVA Results

	Statistics indicating between-group differences	
	F	p
Multiply	11.604	.002
Round	9.082	.005
Integer	15.493	.000
Overall mean	28.155	.000

Lastly, to address my process question, "Is there a correlation between Delaware Comprehensive Assessment System (DCAS) pre-test scores and an overall low-score on the misconception diagnostic pre-test?" I performed a calculation to see if there was a correlation between the students DCAS pre-test scores and the scores they received on the misconception pre-test. The calculation produced a correlation of .23 that indicates a weak positive correlation between these two scores.

Conclusions

An analysis of the results of the data collected during the evaluation of the Cape Henlopen Tenth Grade Math Misconception Program indicates that the intervention effort results in an overall improvement in the ability of students who received instruction to answer questions pertaining to the topics of the intervention. The evidence used to support this is the documented increase in these students' pre-test and post-test mean score. The mean increase equaled .80 on a scale of 1 – 4. The results of the ANCOVA confirm that the increase in the mean scores has statistical significance. Analysis also seems to support that the intervention instruction is important to make any gains in the mean scores between the pre- and post-tests. The support for this is evidenced by the lack of improvement in the pre- and post-tests mean scores of the comparison group. In fact, there was a decrease in this group's mean score of -.08. When looking at improvement on the individual level, a comparison of the means calculated from the differences in score increases or decreases on the pre- and post-tests indicated that the treatment group did better than the comparison group by an average of .88. Unfortunately, the hoped-for correlation

between a student's low score on the DCAS and a score that indicates a mathematical misconception on the pre-test does not exist. The existence of this correlation would have been beneficial so that the DCAS pre-test scores could be used as a screening tool. As a screening tool it would have been easier to ascertain who would be a candidate for the program without having to conduct individual pre-tests.

The program itself seemed to work well for the students. They appreciated the short lessons that were used as reminders of topics that they had learned in the past. Clarifying their thoughts on these topics seemed to produce immediate confidence. Additionally, the teacher was able to immediately see which students required more intensive instruction on each topic and was able to plan further lessons to meet those individual students' needs. The Response to Intervention (RTI) style of the lessons made them quick and manageable for both the instructor and the students. However, delivering all three interventions in one day seemed to be too much for the students as they, in all cases, seemed to lose their motivation and interest after the second intervention.

Recommendations

I recommend the following:

1. **Consider beginning the misconception interventions in ninth grade**
2. **Consider delivering only one intervention per day**
3. **Consider screening all students at Cape Henlopen High School**
4. **Consider expanding the number of interventions to include more misconceptions**
5. **Consider including reinforcing lessons and activities**

1. Consider beginning the misconception interventions in ninth grade.

Since the majority of tenth grade students showed evidence of having at least one mathematical misconception (only one student showed no evidence of misconceptions), it stands to reason that they were working with these misconceptions throughout ninth grade. Screening them at the beginning of high school would allow them to correct these misconceptions early in their high school career. This would be beneficial to them as they begin to work on the more challenging concepts presented in secondary mathematics.

2. Consider delivering only one intervention per day.

   Asking students to absorb information about three disparate topics in one day can prove challenging. Although it can be done, it may be more beneficial if the focus each day is on one misconception so that each topic can be given as much attention as needed. Students who are struggling will also benefit from any extra instruction and practice time that would be possible if only one topic is presented a day.

3. Consider screening all students at Cape Henlopen High School.

   Since the percentage of students screened proved to have at least one mathematical misconception, 97% (30 out of 31), it would stand to reason that the greater population would also have a percentage of students with mathematical misconceptions. Based on the low performance on the DCAS assessment, it may be worthwhile to investigate the need for remediation in the general school population.

4. Consider expanding the number of interventions to include more misconceptions.

   Since the initial results in the data indicate that the interventions have a positive effect on reducing or eliminating mathematical misconceptions, it would be worth the effort to expand the interventions in an attempt to address as many misconceptions as possible. The teacher was interested in expanding the program. Since the data indicates that it is a beneficial program, the expansion would be warranted.

5. Consider including reinforcing lessons and activities.

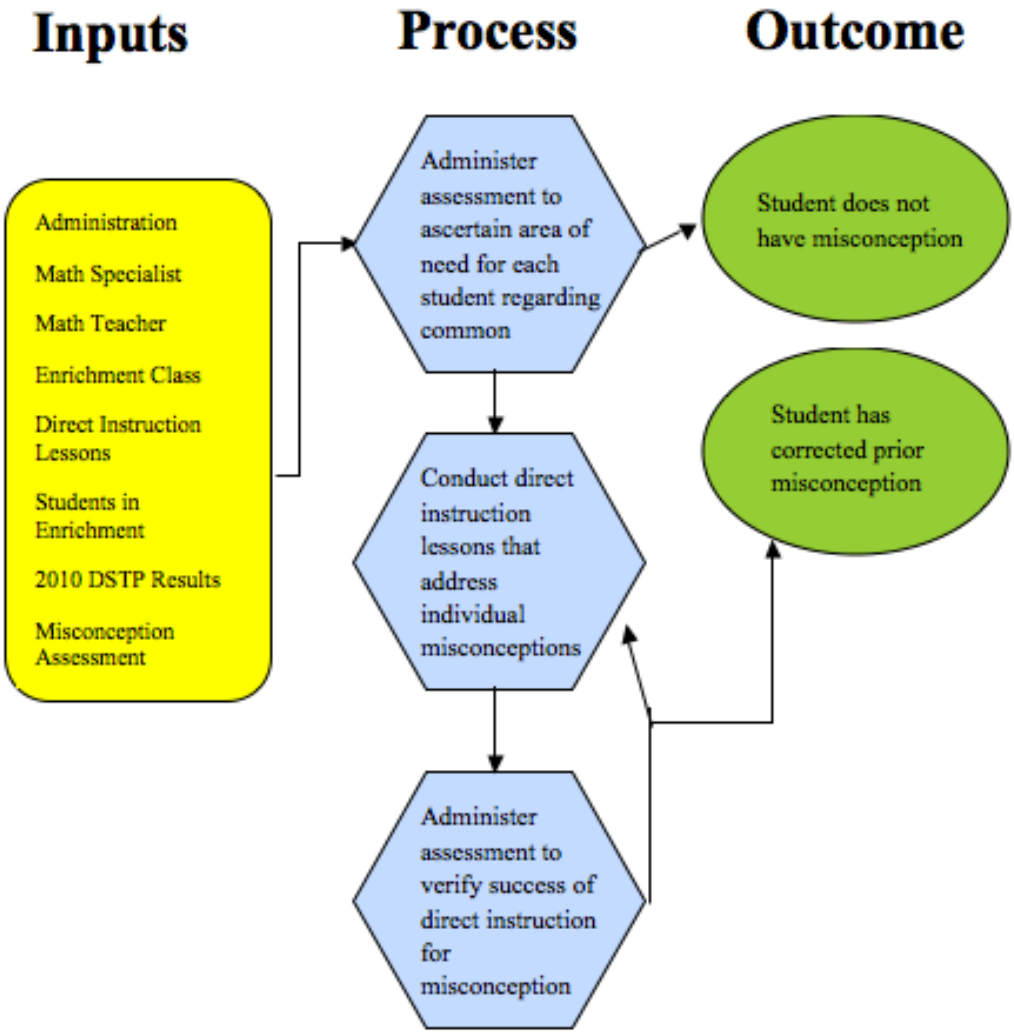
   Although there is clearly a benefit to the interventions, it may be naïve to assume that a fifteen-minute intervention with a short practice interval will completely and permanently correct a long held misconception. It is recommended that the initial intervention be followed by further lessons that reinforce the corrected thinking and provide the students opportunities to use their refined skill. These further lessons could take place in either the enrichment class or the core math class and would be developed by and implemented at the discretion of the teacher.

References

Department for Education. (2010). *Secondary intervention: mathematics module 5: Using misconceptions in teaching mathematics.* Retrieved from http://nationalstrategies.standards.dcsf.gov.uk/

Appendix Ga – Logic Model

Mathematical Misconception Intervention Logic Model



Correcting Mathematical Misconceptions: to help student correct misunderstandings he or she may have about common mathematical ideas in order to increase their mathematical confidence and overall mathematical fluency

Appendix Gb – Direct Instruction Lessons

Name: _____

Date: _____

Period: _____

Multiplication can *increase* a number. It can also *decrease* a number.

Question: Does multiplication always increase a number?

Answer: No, it increases a number only under certain conditions.

Essential Question: How does multiplication DECREASE a number?

While multiplication does INCREASE numbers, that is not all it does.

Take the number 8 for example:

2 X 8 = 16

3 X 8 = 24

4 X 8 = 32

In each case, the number that we get for an answer is larger than 8 so the operation of multiplication clearly increases a number.

RULE: Multiplying any positive number by a whole number greater than 1 will always increase its value.

BUT… what about ½ X 8?

½ X 8 = 4

Let's create a number line together and look at how this works. Make your number line below.

So, multiplying can have a REDUCING effect when multiplying a positive number by a fraction which is less than 1.

Many people understand 4 X 8 as 8 being added over and over again. In this case 8 would be added 4 times. But this doesn't really work with fractions. If we do ½ X 8 and ask how many times are we adding 8 we would have to say, not quite 1 time. If we use the word of instead of times, it will make more sense. So we can read ½ X 8 as ½ of 8. ½ of 8 is 4 as shown on the number line above. This also helps us to understand how multiplying by a fraction works. Finding the answer to ½ X 8 can be found by dividing 8 by 2, which gives us 4.

Mathematically, this can be shown by

Negative Numbers

You can also decrease a number by multiplying by a negative number.
When you bank balance is +4 dollars you HAVE 4 dollars.
When your bank balance is -4 dollars you OWE 4 dollars.
Owing is the opposite of having, so we can associate the concept of "minus" with "the opposite of". This also works in reverse.
SO… (-4) X 8 means "OWING $4, eight times" or "owing $32" which is -$32.
Since -32 is smaller than 8, we have shown another example of when multiplying decreases a number.

Appendix Gb – Direct Instruction Lesson (cont.)
Name: _____
Date: _____
Period: _____

Calculations with Negative Numbers
Question: What is the value that satisfies -4 + ___ = -10?
There are rules to make sure you get the right answer.
Essential Question: What do I need to know to be able to add and subtract negative numbers?
(Draw a number line from -12 to 12 in the space provided)

If we use a number line as above, we have to make sure we remember that positive means we are going to the right on a number line, and negative means going left.
When we add, we do what the signs say.
When we ***subtract*** we ***do the opposite*** of what the sign says.

Example:

6 + (-6) = _____	Start at 6 on the number line and go the direction of the sign on -6 (left). You should end up at 0.
6 – (-6) = _____	Start at 6 on the number line and go the opposite direction of the sign on -6 (right). You should end up at 12.

Appendix Gb – Direct Instruction Lessons (cont.)
Name: _____
Date: _____
Period: _____

Rounding

Question: What is 14,489 rounded to the nearest 1,000?

Essential Question: What method can I use to round a number to any place?

Since you are asked to round 14,489 to the thousands place, only work with the two closest thousands to this number. In this case, those numbers are 14,000 and 15,000. . The answer must be one of these two numbers.

Subtract the lower thousand number from the number you are rounding:

14,489 – 14,000 = 489

Then subtract the number you are rounding from the higher thousand number.

15,000 – 14,489 = 511.

The calculation that gives you the smaller difference indicates the number that 14,489 is closer to. You should round your answer to this number.

In this case, 489 is smaller than 511 so you should round 14,489 to 14,000.

Appendix Gc – Rubric
Mathematical Misconception Tracking Rubric
Mathematical Concept: _____

Student Name: _____

Pre-test Date: _____

Post-test Date: _____

CATEGORY	4	3	2	1
Pre-test Findings	Pre-test shows no mathematical misconception.	Pre-test shows evidence of a mathematical misconception.	Pre-test shows strong evidence of a mathematical misconception.	Pre-test shows complete misunderstanding of the mathematical concept.
Practice Work Progress	90-100% of the work and solutions show evidence of correction of the mathematical misconception.	Almost all (85-89%) of the work and solutions show evidence of correction of the mathematical misconception.	Most (75-84%) of the work and solutions show evidence of correction of the mathematical misconception.	Less than 75% of the work and solutions show evidence of correction of the mathematical misconception.
Post-test Findings	Post-test shows no mathematical misconception.	Post-test shows evidence of a mathematical misconception	Post-test shows strong evidence of a mathematical misconception.	Post-test shows complete misunderstanding of the mathematical concept.

Appendix Gd: Pre-Test

Name: _____ Date: _____

Pre-Test

Please respond to the following statements to the best of your ability.

1. Multiplication can increase or decrease a number.

   Give an explanation and an example of how this is true.

2. Round 14,489 to the nearest 10, 100 and 1000 by completing the following rounding chart:

14,489	Rounded to the 10s place	14,490
14,489	Rounded to the 100s place	14,500
14,489	Rounded to the 1,000s place	

3. Evaluate the following:

-4 + _____ = -10
9 + _____ = -20
-4 - _____ = 6
5 - _____ = -16

Appendix Ge: Post-Test

Name: _____ Date: _____

Post-Test

Please respond to the following statements to the best of your ability.

1. Multiplication can increase or decrease a number.

   Give an explanation and an example of how this is true.

2. Round 14,489 to the nearest 10, 100 and 1000 by completing the following rounding chart:

14,489	Rounded to the 10s place	14,490
14,489	Rounded to the 100s place	14,500
14,489	Rounded to the 1,000s place	

3. Evaluate the following:

   -4 + _____ = -10

   9 + _____ = -20

   -4 - _____ = 6

   5 - _____ = -16

Appendix H

DCAS/STAR CORRELATION MEMO

To: Brian Donahue, Principal

Robin Corrozi, Mathematics Department Chairperson

From: Michael Young

RE: DCAS/STAR Correlation

Date: October 12, 2012

CC: Michael Kelley, Director of Secondary Curriculum

As you know, the Delaware Comprehensive Assessment System (DCAS) is used currently as the universal screening tool for Response to Intervention (RTI) at Cape Henlopen High School. Ninth and tenth grade students who received a 1 or a 2 on the spring DCAS of the previous year are identified as "at-risk" and are considered candidates for the RTI Program at Cape.

For this group of identified students, STAR math (Renaissance Learning) was used as a secondary screening tool to confirm these students' at-risk status as indicated by DCAS. The students' results on the STAR math test will be utilized in three ways:

1. As a screening tool to verify that a student is performing below proficiency and requires Tier II intervention.

2. As a diagnostic tool to identify the areas that the student will require intervention(s) in Tier II.
3. As a progress monitoring tool to verify that the student in making progress as a result of the Tier II intervention(s).

Since STAR math will be used to monitor progress, the assumption that progress on STAR math will mean improvement on DCAS needs to be validated. To find out if STAR math will predict students' future performance on DCAS, I ran a small correlation analysis comparing the identified students' fall DCAS scores to their fall STAR math results. The purpose of this correlation is to see if a relationship exists between the students' performance on STAR math when compared to their performance on DCAS. The results are found in the attached tables.

Graph 1 represents the correlation found for 26 tenth grade students. The correlation coefficient for this group is 0.31 (rounded), which represents a weak correlation between the two assessments. Although the correlation is weak, it is positive.

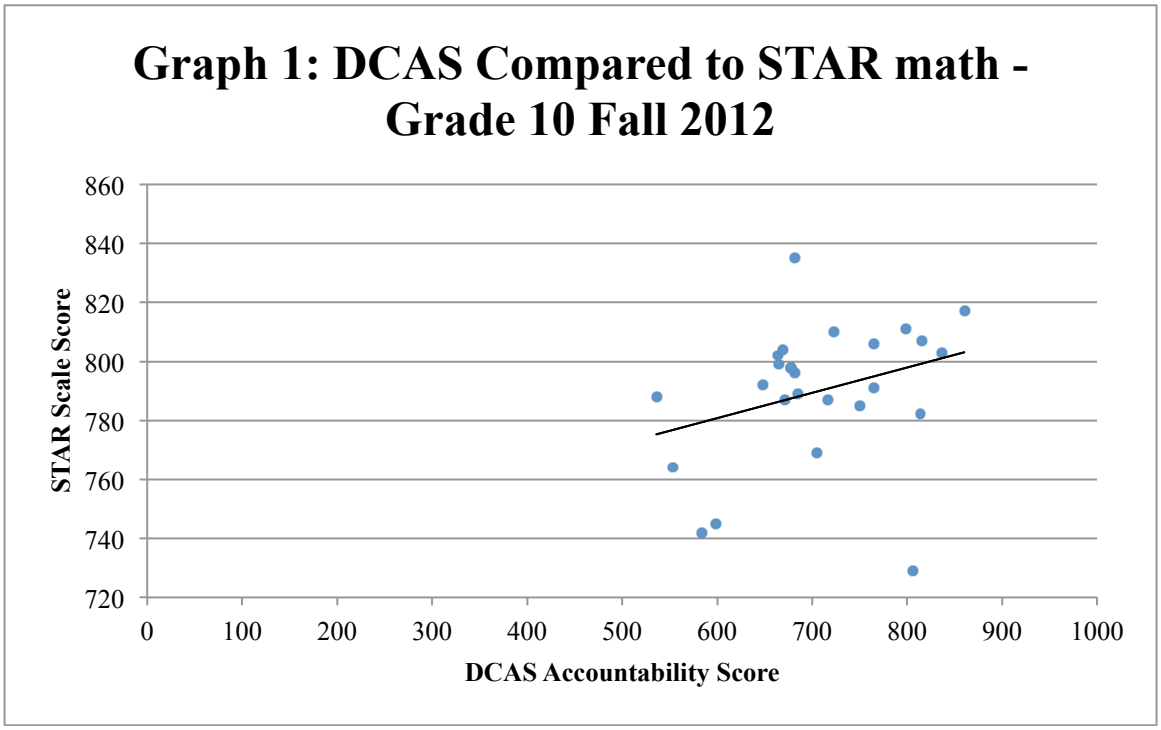
Graph 2 represents the correlation found for 24 ninth grade students. The correlation coefficient for this group is 0.67 (rounded). This is considered a moderately strong positive correlation. For students in this group, documented growth on the STAR math assessment may translate to similar growth on the DCAS.

Graph 3 combines the ninth and tenth grade groups for a total of 50 students. The correlation coefficient for this combined group is 0.53 (rounded). This represents

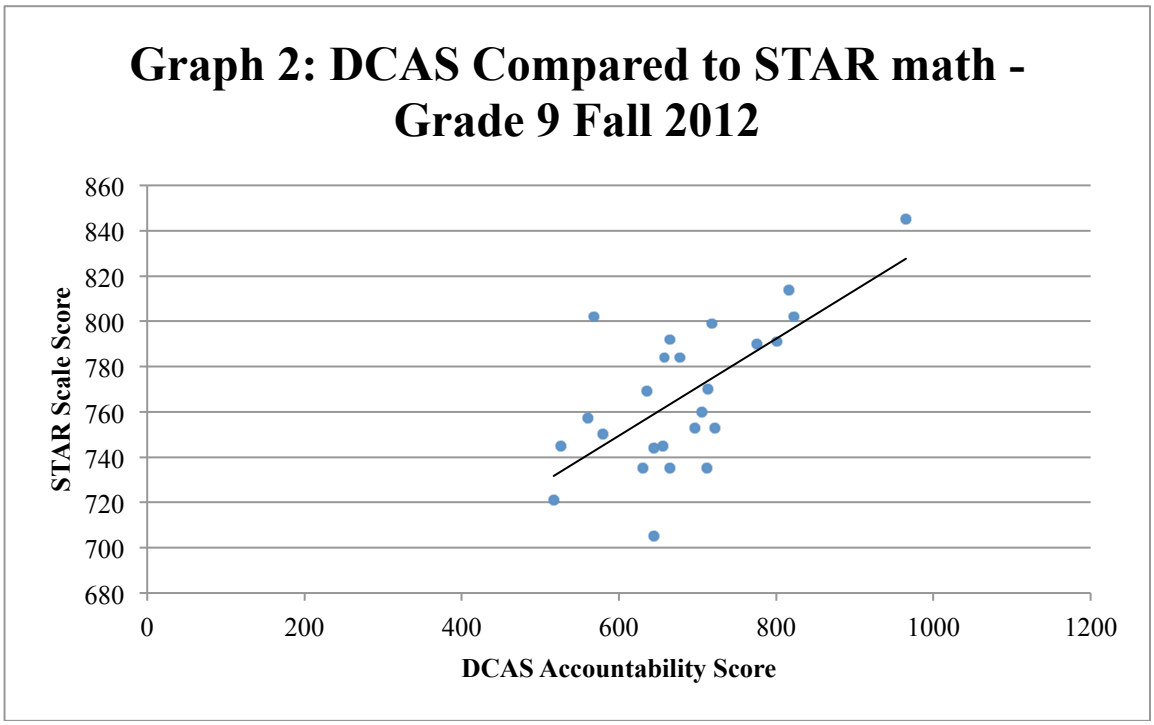
an overall moderate positive correlation. This relationship may indicate that the two tests correlate closely enough for the STAR math to be used as a predictive tool as well.

Conclusions: Since the number of students used in this correlation was small, the validity of the correlations calculated from this group might not be as accurate as necessary to confirm or negate the strength of any correlation that might exist. However, this sample does show promise.

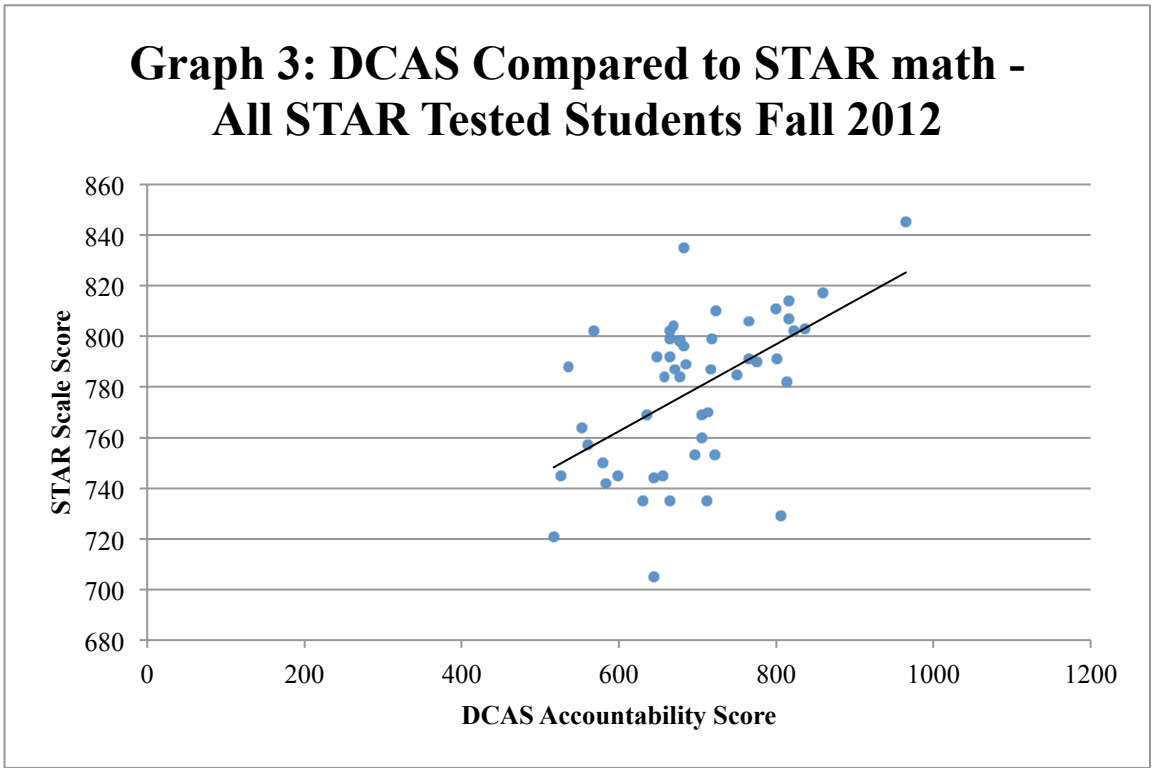
Recommendation: It is recommended that all students take a STAR math assessment close to the spring "Opportunity 3" DCAS administration. At that time, a new, more extensive correlation will be run for each grade to ascertain what if any relationship exists. If it is found that a moderately strong to strong correlation is found, the STAR math assessment should continue to be used. If a weak to no correlation is found, a new secondary screening tool should be investigated.



Correlation Coefficient = 0.309173366: Weak Correlation
n=26



Correlation Coefficient = 0.665461159: Moderately Strong Correlation
n=24



Correlation Coefficient = 0.528415666: Moderate Correlation
n=50

Appendix I

ANALYSIS OF STUDENT PERFORMANCE DATA

At the end of the 2009-2010 school year, Cape Henlopen High School did not meet Adequate Yearly Progress (AYP) and received the No Child Left Behind categorization of "Academic Watch". At that time AYP was based upon meeting or surpassing a set target of the percentage of students who obtained proficiency on the Delaware Student Testing Program (DSTP). Compounding this problem, Cape Henlopen High School had not met the AYP target for the three prior years. As a result, the Cape Henlopen School District administration took action and decided to address the problem by utilizing recently awarded federal Race to the Top (RTTT) funds. The district would use part of the funds to create a new, temporary position for a mathematics specialist to develop an intervention program to address the low achievement levels the school was experiencing. This position would be funded for three years.

The district tasked the high school to include an additional intervention class for mathematics in the master schedule for the school year 2010-2011. The high school administration and guidance counselors reviewed student test data as a method of identifying students for the intervention program, which they titled mathematics enrichment. The original criterion for placement of students into mathematics enrichment was simply receiving a lower than proficient score on the DSTP in the

prior school year. Eighth and ninth grade students who met this criterion at the end of school year 2009-2010 were scheduled over the summer into ninth and tenth grade mathematics enrichment classes for the 2010-2011 school year.

During the summer of 2010, I was hired as Cape Henlopen High School's mathematics specialist. As the mathematics specialist, the district gave me the task of developing, implementing and delivering the content for the enrichment classes. I was to focus on pre-teaching and re-teaching key concepts included in the ninth and tenth grade curriculum. I was told that by the end of the year my efforts should result in measurable increases in achievement for students who were underperforming on the mathematics portion of the DSTP.

At the same time I was hired, the district hired a reading specialist to create an intervention program for students who were underperforming on the reading portion of the DSTP. The district originally envisioned these programs to be independent of each other but because of scheduling issues, the students enrolled in classes simply titled "Enrichment" in which the specialists would deliver both mathematics and reading interventions in the same ninety-minute block period. To accommodate this constraint, the reading specialist and I decided that each section would be divided into two groups. Each group would receive approximately forty minutes of reading or mathematics with a ten-minute transition time to switch subjects halfway through the block. Since our classrooms were adjacent, the switch was easily facilitated.

During the summer, guidance enrolled students who met the enrollment criterion into an enrichment class. Once the guidance department scheduled students

into an enrichment class, there was little flexibility in the school's master schedule to move students out of enrichment if they showed sufficient progress. This scheduling constraint resulted in the requirement that most students would remain enrolled in enrichment for the full school year (two semesters) whether or not they showed progress toward proficiency. The only foreseen exception to this was for sophomores who required a driver's education class. The guidance counselors scheduled these students in enrichment for only the first semester of their sophomore year. In the second semester, the guidance counselors enrolled them in driver's education. One of the final parameters of the enrichment program was that if a ninth grade student had gained proficiency in mathematics or reading by the end of the school year, they would be released from the program and not re-enrolled in enrichment for the following school year. This parameter did not apply to tenth grade students. Since the enrichment program focuses on increasing student achievement on the DCAS, Cape Henlopen High School releases all tenth grade students from enrichment at the end of the school year. The school releases the tenth grade students because the tenth grade DCAS test is the final DCAS examination in which our students participate. This fact eliminates the need for further enrichment in their junior year of high school. The issue with releasing struggling students from enrichment mid-way through their high school career is that these students may still require support to be successful in their subsequent mathematics classes. However, the mission of enrichment specifically focuses on moving students toward proficiency on the DCAS. Because of this, Cape does not offer enrichment beyond the sophomore year.

The Cape Henlopen math enrichment program began in the fall of 2010. The general intent of the enrichment program was to provide additional time working with key mathematical concepts and to provide intensive support in mathematics to students who were struggling to achieve proficiency on Delaware's statewide, standardized mathematics examination. In order to be able to measure effectiveness of the program, the district defined two original goals for enrichment. The primary goal was to provide intervention to decrease the number of non-proficient students at Cape Henlopen High School by increasing the number of students who obtained a proficient score on the spring administration of the state test. This goal's intent was to increase the percentage of proficient students sufficiently so that AYP would be met. The secondary goal was to increase the amount of growth each non-proficient student made toward proficiency between the fall and the spring administrations of the DCAS test. The intent of this goal was to ensure that even if students did not receive a proficient score, there was evidence that the student was making progress toward proficiency. This secondary goal became more important as the calculation for Adequate Yearly Progress (AYP) expanded.

Originally, AYP was based solely upon the percentage of students who met or exceeded the score set for proficiency. The AYP calculation later expanded from the original model to what is known as the growth model. The growth model sets an expected level of growth (scale score increase) for each student based upon each student's fall scale score, which acts as a baseline score. Expected growth for each student is calculated using this baseline score. A student's expected growth goal for

the year is set using a calculation of actual average growth demonstrated by students who received the same baseline score in previous years. The growth model raises these growth goals each year, requiring students to perform at higher levels for a school to continue to meet AYP.

When the district first envisioned the mathematics enrichment program, the State of Delaware's high stakes examination was the DSTP. The examination was changed to the Delaware Comprehensive Assessment Program (DCAS) for the school year 2010-2011. This year was also the first year of implementation of mathematics enrichment. The high school's administration expected that the change in the statewide test would make it difficult to compare the current cohort of students performance to the performance of the corresponding grade level cohort from the previous year. The administration expected this difficulty because the prior year's students had taken the DSTP and the current year's students would be taking DCAS; two completely different tests. Additionally, the state advised school districts around the state that the DCAS was more difficult. This meant that most districts expected a drop in the number of students who showed proficiency.

Although Cape established enrichment classes for both ninth and tenth grade, the data in this paper is an analysis of DCAS data that follows only the original sixty, ninth grade students during their first two years of the mathematics enrichment program. I will not analyze if proficiency levels increased after the first year of enrichment compared to the previous year. This is due to the difficulties in comparing the DSTP to the DCAS. Rather, my intent is to ascertain if participation in enrichment

classes actually had the desired effect of increasing the enrichment students' achievement levels on the DCAS. I will also do an analysis to ascertain if the levels of growth experienced by the enrichment students over the course of a school year were statistically more significant than the growth levels experienced by the population of students who did not participate in enrichment.

Although Cape Henlopen High School enrolled sixty students in the enrichment program at the beginning of the school year 2010-2011, eight of these students withdrew before the end of the first year. As a result, fifty-two students remained in the enrichment program during its second year. No students withdrew during this second year. During the first year, all students were part of the same group. After the first year, the group diverged into several disparate groups. These groups are:

1. **Enrichment for two years (n=9)**. This population did not reach proficiency during their freshman year so were re-enrolled into enrichment for their entire sophomore year of 2011-2012.
2. **Enrichment for one and one half years (n=7).** This population was re-enrolled in enrichment for only half of their sophomore year of 2011-2012 because they needed to be scheduled in the driver's education course for the second semester.
3. **Enrichment for one year – ultimately proficient (n=22).** This population was not re-enrolled in the enrichment course due to receiving proficiency on the DCAS by the end of their freshman year.

4. **Enrichment for one year – ultimately not proficient (n=7).** This population did not reach proficiency in the first year but were not re-enrolled in enrichment due to schedule conflicts.
5. **"Repeaters" (n = 7).** This population remained freshman in their second year of high school and did not take the tenth grade DCAS test during their sophomore year. This happened because they had not earned sufficient credits to be considered sophomores. However, they did take a second year of enrichment.

   These students took the ninth grade DCAS again, so I compared their second year results to their new cohort that consists of first year ninth grade students.
6. **Students who withdrew from Cape Henlopen High School after their freshman year (n=8).** I was not able to include this group in the first year's total population data because they all withdrew within the first year of the enrichment program. This group is not included in the final data or analysis.

In order to ascertain what effect mathematics enrichment has had on improving student performance, I compared the average growth in the DCAS accountability scale score (growth) for each enrichment group to the average student DCAS accountability score increase for the corresponding cohort of students who did not participate in enrichment. The hypothesis is if the average DCAS accountability scale score increase for each group of students who participated in math enrichment is higher than the

average DCAS accountability scale score increase for the general student population of students who did not participate in enrichment, then that group's participation in enrichment has the desired effect of increasing student achievement levels. Evidence of growth will be a comparison of the average overall change in the accountability score for each group of students and an analysis of whether this change is statistically significant. I will discuss specific considerations that pertain to each group to provide context to the data outcomes. I removed students who withdrew from the calculations because I could not track their DCAS scores once they left Cape Henlopen High School. When I removed these students, I was able to analyze two years of growth for fifty-two of the original sixty students who participated in enrichment.

Analysis

When I compared the first year's scale score mean increase for the students who participated in the enrichment program to the mean scale score increase of the students who did not participate in enrichment (Table 13) it appeared that there was evidence the enrichment program did positively affected achievement levels of the students who participated (Table 13).

Table 13 Comparison of Mean Scale Score Increases – Year 1

Population	N	Mean Growth
Enrichment Group – Year 1	N=60	41.633
Non-Enrichment Group – Year 1	N=266	36.876

Although this simple comparison of the mean growth of each group indicates that the students participating in enrichment did, on average, show growth that exceeded the growth of the population of students who did not participate in enrichment, this analysis is too simplistic to prove or disprove that mathematics enrichment had the desired effect and if the effect was of statistical significance. Since the students who participated in mathematics enrichment experienced the program differently depending upon the length of time they spent in mathematics enrichment, I used the subgroups explained above to analyze the effect that enrichment had on each of these groups. I analyzed this data for both Year 1 (Table 14) and Year 2 (Table 15) of the program.

When looking at the outcomes during Year 1 (Table 14) the data indicates that only two groups of students receiving enrichment showed a mean scale score increase that exceeded that of the population not receiving enrichment. These groups are the "Enrichment for one year – ultimately proficient" group and the "Enrichment for one year – ultimately not proficient" group. The ultimately proficient group had a scale score mean increase of 64.09 points (SD = 33.96) compared to the non-enrichment group's scale score mean increase of 36.88 points (SD = 38.15). The ultimately not proficient group had a scale score mean increase of 49.57 points (SD = 44.39) compared again with the non-enrichment group's scale score mean increase of 36.88 points (SD = 38.15).

Table 14 Student Growth by Subgroup: Year 1

Population	Enrichment for Two Years	Enrichment for One and a Half Years	Enrichment for One Year: Ultimately Proficient	Enrichment for One Year: Ultimately Not Proficient	"Repeaters"[1]
N Enrichment	N=9	N=7	N=23	N=7	N=6
N Non-Enrichment	N=266	N=266	N=266	N=266	N=266
Scale Score Mean Increase Enrichment	19.67	35.43	64.09	49.57	18.57
Std. Dev. Enrichment	37.15	26.18	33.96	44.39	33.18
Scale Score Mean Increase Non-Enrichment	36.88	36.88	36.88	36.88	36.88
Std. Dev. Non-Enrichment	38.15	38.15	38.15	38.15	38.15
Difference in Mean Scale Score Increases	-17.21	-1.45	27.21	12.69	-18.31
Enrichment Non-Enrichment t-test	0.205	0.890	0.001	0.482	0.124

Table 15 Student Growth by Subgroup: Year 2

Population	Enrichment for Two Years	Enrichment for One and a Half Years	Enrichment for One Year: Ultimately Proficient	Enrichment for One Year: Ultimately Not Proficient	"Repeaters"[1]
N Enrichment	N=9	N=7	N=23	N=7	N=6
N Non-Enrichment	N=257	N=257	N=257	N=257	N=268
Scale Score Mean Increase Enrichment	8.89	-7.86	28.48	2.14	44.29
Std. Dev. Enrichment	26.48	31.78	36.64	29.87	22.19
Scale Score Mean Increase Non-Enrichment	33.38	33.38	33.38	33.38	34.02
Std. Dev. Non-Enrichment	34.76	34.76	34.76	34.76	38.34
Difference in Mean Scale Score Increases	-24.49	-41.24	-4.90	-31.24	10.27
Enrichment Non-Enrichment t-test	0.036	0.015	0.560	0.035	0.277

[1] Repeaters take the ninth grade DCAS for a second time. The data in this table compares these second year "repeater" students to a new cohort of ninth grade students, not the repeaters' former cohort who are now tenth graders

When I analyzed the data further, only the scale score mean increase of the ultimately proficient group showed a statistically significant effect for participation in enrichment, $t(27) = 3.67$, $p < .001$. No other group demonstrated a statistically significant increase in the mean scale score during the first year.

When looking at the outcomes during Year 2 (Table 15) the data indicates that the continuation of enrichment into tenth grade did not have the desired effect of increasing the mean scale score of the groups of students who participated in the program. There were two groups of tenth graders that continued with enrichment in their sophomore year. These groups are titled the "Enrichment for two years" group and the "Enrichment for one and one half years" group. The "Enrichment for two years" group showed a mean scale score increase that was well below the population of students who did not receive enrichment. This group had a scale score mean increase of 8.89 points ($SD = 26.48$) compared to the non-enrichment group's scale score mean increase of 33.38 points ($SD = 34.76$). The "Enrichment for one and one half years" group had a mean scale score decrease of -7.86 points ($SD = 31.78$).

When I analyzed this data further, these low levels of growth are most likely not due to chance. The "Enrichment for two years" group's t-test yielded $t(8) = -2.52$, $p < .034$ and the "Enrichment for one and one half years" group's t-test yielded $t(6) = -3.38$, $p < 0.015$. This means the disparity between the enrichment groups' scale score mean increase as compared to the scale score mean increase for the non-enrichment students is statistically significant and not due to chance.

The group "One Year Enrichment Released Non-Proficient" a scale score mean increase of 2.14 points (*SD* = 29.87) compared again with the non-enrichment group's scale score mean increase of 33.38 points (*SD* = 34.76). This difference between the means is statistically significant ($t(6) = -2.72, < .035$). This low growth level was expected considering that the students did not obtain proficiency before discontinuing enrichment and then did not receive any additional interventions or support in mathematics in their second year of high school.

Two of the groups' second year DCAS scale score mean increase did not result in a statistically significant difference. This is a potentially positive outcome. The "One Year Enrichment Released Proficient" had an increase of 28.48 points (*SD* = 36.64) compared to the non-enrichment group's increase of 33.38 (*SD* = 34.76). This difference was not statistically significant. This outcome could be interpreted to mean that both groups of students were performing at similar levels. This could be interpreted further to mean that a single year of participation in enrichment may have provided the students enough support to continue to perform at similar levels of growth as their peers even after being released from enrichment. The decision to release these students from enrichment seems to be appropriate because on average, the students maintained a similar level of achievement as their non-enrichment peers on the next year's DCAS. Since the data is based on the average performance of the group, there were certainly students who did not perform as well as their non-enrichment peers but this fact does not invalidate the prior years decision to release the students from enrichment based on their growth during that year. The "Repeaters"

also showed a scale score mean increase. The unique situation for these students is that they remained in enrichment for a second year but because they did not earn enough credits to be categorized as tenth graders, were required to take the ninth grade DCAS for a second time. This is a requirement of the DCAS testing program. The "Repeaters" had a scale score mean increase of 44.29 points (*SD* = 22.19). They were not compared to the tenth grade non-enrichment group. Instead, they were compared to a new group of non-enrichment ninth graders. The scale score mean increase for the non-enrichment ninth graders was 34.02 points (*SD* = 38.34). This scale score mean increase is different than the reported scale score mean increase for the other second year non-enrichment groups in Table 3 because of this new comparison to the new ninth grade group. The difference between these scale score mean increases is not statistically significant ($t(7) = 1.18, < .28$). In these two cases, I interpret the lack of a statistically significant difference between the two groups' scale score mean increase as a potentially positive indicator since these groups appear to be able to obtain similar levels of growth as their peers who did not participate in enrichment. Evidence of similar levels of growth between the two groups is important since the purpose of enrichment is to ensure that students receive interventions that address deficiencies in their mathematical knowledge that will lead toward proficiency on the DCAS or at least growth increases that are similar to their non-enrichment peers. Participation in enrichment does not mean that students are expected to perform at levels that exceed their peers, although there may be instances this occurs, Evidence of this occurring is

not documented in the data analysis in this paper since the data is presented as group mean increases and not an analysis of individual student performance.

Conclusion

The data seems to support that enrichment can have a positive effect on increasing students' overall achievement on the DCAS as evidenced by scale score mean increases. The evidence points toward the first year being the most effective at increasing students' growth levels. It can also be interpreted that if a student experiences success (achieves proficiency) at the end of one year of enrichment, the student may be able to maintain a higher level of growth even if enrichment is discontinued in the second year.

For students who did not achieve proficiency during their first year of enrichment, the data seems to support several potential outcomes. First, students we do not reschedule in enrichment because of scheduling conflicts may not obtain proficiency. They may also show lower levels of growth on the tenth grade DCAS. Second, students who earn enough credits to be promoted to tenth grade but continue enrichment as sophomores due to not having obtained proficiency on DCAS during freshman year may not actually benefit from further enrichment as it is provided now. This is because despite the small sample size of this group of students, the data seems to indicate that the greatest positive effect of enrichment is garnered in first year of enrichment (Table 2). This may also mean that the content and interventions provided during year two of enrichment should be evaluated for effectiveness. Third, students

who do not earn enough credits to be promoted to tenth grade and continue enrichment as ninth grade repeaters may benefit from repeating the ninth grade enrichment program as evidence by higher scale score mean increases on the DCAS. These students repeat the ninth grade enrichment program due to not having obtained proficiency on DCAS during freshman year. The data seems to indicate that these students show a scale score mean increase that is similar to the non-enrichment group. The data does not seem to indicate that repeating ninth grade enrichment intervention results in mean scale score growth that is statistically attributed to enrichment and not just due to chance.

In the end, the data seems to indicate that a short period of intervention in the first year of high school is actually the most beneficial to the average student. This could be interpreted to mean that the shorter intervention time frames of RTI might be more effective than two years of participation in the current enrichment program. This is worth investigation. While these conclusions are speculative, the data does seem to support that longer intervention periods do not result in greater overall scale score mean increases. Because of this, I feel that the goal of increasing student achievement could be accomplished by implementing an RTI program, in spite of the fact that RTI has shorter cycles of scheduled intervention than enrichment.

Appendix J

CREATING AND SUPPORTING A RESPONSE TO INTERVENTION PROGRAM: PROFESSIONAL DEVELOPMENT

Introduction

On July 10, 2012 the Cape Henlopen High School administration established a School-wide Response to Intervention team. This team is made up of the principal, the school's three assistant principals, the school psychologist, the ninth grade counselor, the reading specialist, a special education coordinator and a teacher. These individuals will be referred to from this point as "the team". The team met at Cape Henlopen High School to discuss ideas and potential improvements for upgrading the existing enrichment program and to begin the discussion about the establishment of a Response to Intervention (RTI) program at Cape.

At Cape Henlopen High School, the enrichment program is overseen by the mathematics and reading specialists and provides reading and/or mathematics supports for "at-risk" students. The enrichment program takes the form of targeted interventions delivered in an additional math and/or reading class incorporated into the students' schedule. At the time of this meeting, Cape Henlopen School District has not yet developed an RTI at the high school level. The team needed to learn about the essential components and practices of a RTI program and discuss how such a program could be developed, introduced and implemented at the school. The team would also

need to discuss how to maintain an RTI program over the long term. As my first duty as assistant principal, I created a presentation to guide this discussion. This presentation is attached as Appendix Ja. This presentation was also used again later in the summer as a part of a professional development and discussion for the Building Leadership Team.

The presentation provides a brief overview of the current Enrichment program for those who are unfamiliar with it, a description of the major components of an RTI program including those aspects that are specific to a secondary level program, an explanation of the purpose of an RTI program & its focus of supporting the instructional core (students, teachers and curriculum) and, lastly, a proposal for a major second-order change to the school; a new school schedule that incorporates a 25-minute period at the beginning of the day, four days a week. This "extra" period was proposed primarily to accommodate the levels of intervention that are required in an RTI program. These levels are known as tiers. The State of Delaware suggests that RTI programs within the state provide three tiers of intervention. Tier 1 is delivery of the primary curriculum to all students in a content area within their regularly scheduled class. Tier 1 instruction will be sufficient for the majority of students to master the content in any given area of study. Tier 2 is a more intensive level of instruction or intervention for those students who do not show proficiency or adequate progress after receiving Tier 1 instruction. Tier 2 interventions must be provided outside of the students' regularly scheduled class. Tier 3 is the most intensive level of intervention and is provided to those students who do not show progress even after

receiving Tier 2 interventions. Scheduling a 25-minute period at the beginning of the day will allow students in Tier 2 to receive 100 minutes of RTI time per week outside of their regularly scheduled class without sacrificing a whole block period of 225 minutes each week. The 100 minutes of this "extra" period more than satisfies the minimum number of minutes of direct intervention time for Tier 2 interventions (90 minutes) and a large portion of Tier 3 interventions (150 minutes) required by the State of Delaware RTI model. The presentation explains that Cape Henlopen High School will continued to utilize enrichment services for Tier 3 interventions. The continuation of the enrichment program in combination with the RTI program will allow for smaller group sizes in both tiers and as a result allow the specialists to deliver more individualized interventions to those students in Tier 3. At the end of the presentation, the team provided feedback on the proposed changes and had an opportunity to express their opinions and concerns.

History

The Enrichment Program at Cape Henlopen High School began at the beginning of the 2010 – 2011 school year. During that year, students who had not shown proficiency on the 2010 spring DSTP were identified and became candidates for the new enrichment Program. As many students as possible were enrolled in the enrichment program to receive additional support in mathematics or reading. The primary qualification to be enrolled in the course was a performance that was below proficient on the spring DSTP of the prior year for either mathematics or reading. Students were scheduled into their enrichment classes randomly. Special education

and general education students were enrolled in the same enrichment classes without additional special education support. During the first year of the program, every student who was enrolled in enrichment classes was required to receive both mathematics and reading support. In order to provide the students both interventions, the specialists divided the class roster into two parts. One half of the students would receive reading support for the first half of the 90-minute block and the other half would receive mathematics support. At the mid-way point of each period, the groups would switch.

At the end of the 2010 – 2011 school year, the specialists and guidance counselors proposed several changes to administration to improve the effectiveness of the enrichment program for the 2011 – 2012 school year. The first change concerned providing appropriate enrichment services to each student. The screening of students would still based on the state's standardized test scores, but no longer would a non-proficient score in either mathematics or reading require a student to receive enrichment services for both mathematics and reading. Individual scores in each content area now qualify each student to participate in either mathematics enrichment or reading enrichment or a combination of both mathematics and reading enrichment as warranted. For example, if a student was not proficient in mathematics but proficient in reading she would only be scheduled for a mathematics enrichment class, reading would not be part of her schedule. Therefore, the "all or nothing" format for the math and reading components of enrichment was eliminated.

The second change pertained to students who receive special education services. At the end of the first year of the enrichment program, the specialists suggested that the special education course section titled "Resource" could be combined with Enrichment classes. The Resource class had been used as a type of down time for students receiving special education services. The purpose of the class was to give students the opportunity to organize themselves, complete assignments and prepare for tests and quizzes with the support of a special education teacher. In practice, much of the time was not utilized as intended. Both teachers and students had become disenchanted with Resource classes. In order to give a new purpose to these classes and better utilize the students' time, the school's administration, at the request of the specialists, decided that a new form of Resource would be introduced as "Resource with Enrichment" classes. All students who receive special education services in grades 9 and 10 were considered candidates for Resource with Enrichment but only those who had not shown proficiency in either math and/or reading would be enrolled in Resource with Enrichment. The students' DCAS scores would be the deciding factor for which (if any) enrichment supports they would receive. Resource with Enrichment required that a special education teacher would be scheduled as a co-teacher to work in conjunction with the specialists to provide in-class support. Out of the three class meeting times each week for Resource with Enrichment, one class would be reserved specifically for completing assignments, etc., however, the remainder of the weekly time would be used for reading or mathematics enrichment. The special educator was also responsible to provide structure and specific

expectations within the Resource component of the class to increase student accountability during that time. This would allow the specialist time to analyze student data and work one-on-one with students who require additional support.

The third change was to formalize the Enrichment selection process and to expand the number of Enrichment offerings in the course catalog to mirror the needs of specific groups of students. The Mathematics Enrichment courses are listed in the catalog under the mathematics department as a course that awards an elective credit. Resource with Enrichment is not listed in the course catalog since the Resource component would be included as the students' Individualized Education Plan (IEP) documents and the guidance counselors would arrange for those students to be appropriately placed. The Mathematics Enrichment course listing follows:

Mathematics Enrichment – This course is offered in both 9th and 10th grade for students who require additional mathematics support. This description in the Cape Henlopen high school 2013 – 2014 course catalog states:

> "As preparation for the DCAS, the objectives of this course are to identify and assess each student's performance level in mathematics and mathematical problem solving, to identify and correct mathematical misconceptions, and to prescribe methods, strategies and lessons that offer each student the opportunity to strengthen his or her weaknesses in mathematics. This will be done through previewing upcoming material, building mathematical vocabulary and providing an environment where students have ample time to fully investigate problems assigned in their core mathematics classes. The overall goal is to help each student move toward or achieve grade-level proficiency in all computational skills, algebraic reasoning, geometric reasoning, mathematical problem solving and communication as described in the State of Delaware Grade Level Expectations. Progress will be monitored through web-based and traditional in-class assessments."

Moving Toward RTI

The team was enthusiastic about adjusting the school schedule to accommodate a true RTI program. The team offered suggestions about how to present the new structure to the staff and how to roll out the program at the beginning of the year. The team also had several concerns that were brought forward.

The first suggestion was to create a Professional Development module that was similar to the presentation seen by the school-wide team but in a user-friendly format. It was suggested that the presentation should be created utilizing the structure of Learning-Focused Strategies (LFS) with the intent of communicating the need for an RTI program, the new structure that will be created, how teachers will be affected, and the anticipated benefits of such program. This presentation with supporting documentation can be found in Appendix Jb. The second suggestion was to provide further training to our special education teachers to strengthen Tier 1 instruction for students receiving special education services. This suggestion was made so that all students receiving Tier 1 instruction would be appropriately supported and that the instructional practices utilized in the classroom would lead to improved student achievement. These training modules are not included in the appendices but are described in the next pages.

In the summer of 2011, I had created and delivered a training module focused on moving away from the most commonly used teaching model in Cape Henlopen High School's classes that are a mix of special education and general education students otherwise know as inclusion classes. In this model, the content teacher is the

lead teacher and the special education teacher is the support teacher. The module focused instead on developing co-teaching teams made of a general education teacher and a special education teacher where both had equal responsibility and status. The intention was to begin developing true co-teaching partnerships that utilized co-teaching methods and instructional strategies that would allow both teachers to support all students in the class. A major focus of this training was to get teachers to develop a strong relationship of trust and cooperation so that they could function as equals in the classroom.

One problem that became apparent during the training was that the assumption that both teachers could deliver the content with equal ability was incorrect. This was not actually possible for many of the co-teaching partnerships because several of the special education teachers were teamed with two or more general education teachers throughout the week. This made the prospect of co-planning with each teacher a task that would be difficult to schedule each week. A second and more important reason why co-planning and co-teaching the content might not be possible is not all of the special education teachers are certified in the content area in which they teach. This fact would cause difficulty because several of the co-teaching methods assume that both teachers are equally capable to teach the content. For example, parallel teaching is a method where each teacher provides the same instruction to half of the group on the same lesson in the same amount of time. If this method was used, half of the students would receive instruction from a teacher who is not highly qualified in the content that they are teaching. Because of this, the integrity of the delivery of the

curriculum is in jeopardy. As a result, if students do not show adequate progress or do not obtain proficiency in Tier 1, it may not be due to any difficulty the student is having mastering the content but rather to insufficient or teaching. This could lead to students being referred for Tier 2 interventions who do not actually require them.

As a result of this situation, a new training module was created that focused on what is known as TAM teaching. TAM is an acronym for Team Approach to Mastery and is used to enhance the in-class experience of special education students who participate in inclusion classes. The new training subtly switched focus from teachers being assumed to be equals in the content to each teacher providing either the content component or the special education accommodation support component. For pairs of teachers who both had content certification, the co-teaching strategies were still included. For pairs who did not both have content certification, the focus in the training became defining roles and co-planning to ensure student support and success. Within the training module the roles of both the content teacher and special education teacher were clearly defined. The content teacher's role focused on creating an overview of the content, curriculum and standards to be addressed in the lesson. The expectation was set that content teachers would have their lesson outline complete prior to meeting with the special education teacher for planning. The special education teacher's role is to make sure that they gather any IEP goals, objectives, and accommodations for each special education student in the class and take this with them to the planning meeting with the content teacher. In this way, the content teacher can inform the special education teacher about the overall plan, lesson goal(s),

assignments & activities, and assessments that will be included in the lesson. Conversely, the special education teacher can review this plan and advise the content teacher of any modifications, supports and/or accommodations that must be included in the lesson to support the special education students. The goal of this co-planning activity is for the teachers to jointly address how best to present the content in order to maximize learning and retention for all students. The goal for planning together is not to focus only on what will be taught in the lesson but also on how the lesson will be taught. For the culminating activity of the day, the teaching partners were given a pre-written lesson plan and a spreadsheet listing IEP required accommodations and supports of three fictional students receiving special education services. The teams were required to modify the lesson plan to incorporate a teaching method from the day's training (an example is parallel teaching) and incorporate specific instructions on how to provide required supports and accommodations for the students receiving special education services. The pairs presented their ideas to the group.

In addition to suggestions, the team had several concerns were also presented and discussed. The most frequent concern was what to do with the population of students who did not require RTI time. This seemed to be the most pressing concern since it pertained to the majority of student at Cape Henlopen High School. Over the course of a few weeks after the initial meeting, and with the assistance of the district office, the 9th and 10th grade guidance counselors and the school's career counselor, three programs were proposed that would provide college and career focused content to be used during the RTI Homeroom time. It was also

during this time that the RTI Homeroom was renamed "Student Success Academic Period" or SSAP. The programs extraneous to RTI to be delivered during the SSAP included "Success-ability" for 9th grade students, SAT Prep for 10th and 11th grade student, and College and Career Planning including the completion of Student Success Plans by the 12th grade students.

Appendix Ja

CREATING AND SUPPORTING A RESPONSE TO INTERVENTION PROGRAM:

THE RTI PROBLEM SOLVING TEAM

Cape Henlopen High School

Enrichment Program

- Enrichment Options
  - Math and Reading Enrichment
    - Students have one block of math support and one block of reading support each week
    - Mondays alternate – Reading or math every other week
  - Math Enrichment Only or Reading Enrichment Only
    - Students receive only math or reading support
  - Resource with Enrichment (Special Education)
    - Students receive one block of math support and one block of reading support each week
    - Mondays are reserved for Resource Class

Enrichment Enrollment

- Students have been considered candidates for reading and/or math enrichment based on their spring DCAS performance
  - General education students who did not obtain proficiency in either reading or math were considered candidates for the program
  - All special education students were considered candidates for Resource with Enrichment. Their DCAS scores were reviewed to decide which (if any) enrichment supports they would receive.

Other Enrichment Considerations

- Once students are enrolled they must stay for the full school year
  - Exception: Sophomores who enroll in Driver's Education
- Some students are missed
  - Schedule conflicts
  - Proficient in Spring but actually struggling
- The number of minutes students of support students receive each week is not consistent or based on need
- Class sizes vary but can be up to 20 students

What is Response to Intervention?

- **A multi-tiered, intervention and service process** that supports students who struggle with learning in a specific area
- **A system of regularly scheduled monitoring** of student progress in each tier of intervention
- **A data-based program** that guides decision making and improves instruction, intervention and other support services for every student
- Commonly referred to as "RTI"

The RTI Overview

- RTI is not a specific educational program or curriculum
- RTI is a framework that promotes access to high-quality core instruction
- RTI provides interventions of increasing intensity to students who struggle despite strong core instruction
- RTI systematically measures student progress
- RTI can also be used to support PBIS (Positive Behavior Intervention Program)

The RTI Overview

- RTI yields data that can be used by the RTI team to make educational decisions
- RTI provides a framework for states, districts and schools to allocate instructional services and resource as a response to students' true needs
- RTI functions through a system of primary (least intense), secondary and tertiary levels (most intense) of intervention and support

Delaware Recommends a Three-tiered Model

Tier III: 5% of Students will need this tier

- Students with insufficient progress in Tier I/Tier II
- Sustained intensive interventions
- Possible special education identification

Tier II: 15% of Students will need this tier

- Students who experience insufficient Tier I progress
- Group and individual research-based interventions

Tier I: 80% of Students will never leave this tier

- Every student receives core classroom instruction

The Instructional Core

- RTI and the PST should be developed to support and strengthen the most important focus of any educational program, The Instructional Core
- The Instructional Core consists of:
  - Students
  - Teachers
  - Content
- The Instructional Core itself depends upon "Five Aspects of School" in order to function properly

The Five Aspects of School

- Culture
  - How things work here
- Structures
  - How people are organized
- Systems
  - How vital processes are managed
- Resources
  - How assets are allocated
- Stakeholders
  - Who is interested in the school's performance

Reflection

- **Take a moment to make a list of ways that an RTI program might affect the five aspects of school.**
- How might these changes be utilized to support the Instructional Core: Students, Teachers and Content

Essential Components of RTI

1. **High Quality Core Instruction or Tier 1**
   1. Universal, Research-based, General Education Instructional Program
   2. Usually adopted by the state or district
   3. Delivered with fidelity to the full population of students
   4. An example is the Interactive Mathematics Program (IMP) that has been approved by the State of Delaware and adopted by the Cape Henlopen School District

Essential Components of RTI

2. **Screening**

RTI utilizes a two-stage screening process

A. Universal Screening – an assessment of all students at the beginning of the school year. We are using DCAS as a universal screener.

B. Secondary Screening – used for students who are considered "at-risk" (scored below the proficient level on DCAS) This involves more in-depth testing to confirm a student's "at-risk" status.

Essential Components of RTI

3. **Tiered Interventions**

Tier	% of Population	Description	Assessment Frequency
1	All Students	Universal: Adherence to a research-based core curriculum in General Education	Benchmark Assessment at least three times a year (DCAS)
2	~ 15%	Targeted: Small-Group (three to five students) delivered as part of General Education; 90 minutes minimum	At least monthly progress monitoring. Every two weeks is recommended by Delaware DOE
3	~ 5%	Intensive: Individualized Interventions tailored to each student's needs. Can include Special Education; 150 minutes minimum	At least weekly progress monitoring and frequent informal classroom-based assessments

Essential Components of RTI

4. **Progress Monitoring**
   - Assesses student performance over time
   - Quantifies student responsiveness to interventions
   - Evaluates instructional effectiveness

Essential Components of RTI

5. **Data-based Decision Making**
   - The data gathered during screening and progress monitoring should be used to:
     - Determine whether the core curriculum is effective
     - Formulate effective individualized programs
     - Decide if the student needs a more or less intensive level of intervention
   - If progress monitoring indicates over time that a student is failing to respond, the student may need to be evaluated for a learning disability

An Important Structure to Consider: A Schedule That Supports RTI

Strip Day (Monday)	Time	Daily Minutes
Student Arrival	7:30	
Breakfast	7:30 - 7:50	20
Homeroom	None	0
1	7:55 - 8:35	40
2	8:40 - 9:20	40
3	9:25 - 10:05	40
4	10:10 - 10:50	40
5	10:55 - 12:35	100
5 (Lunch A)	10:55 - 11:25	30
5 (Lunch B)	11:30 - 12:00	30
5 (Lunch C)	12:05 - 12:35	30
6	12:40 - 1:20	40
7	1:25 - 2:05	40
8	2:10 - 2:50	40

An Important Structure to Consider: A Schedule That Supports RTI

Odd/Even Days

Student Arrival	Student Arrival	7:30		
Breakfast		7:30 - 7:45		15
Homeroom	Homeroom	7:50 -8:15		25
1	2	8:20 - 9:50		90
3	4	9:55 - 11:25		90
5	6	11:30 - 1:30		120
5 (Lunch A)	6 (Lunch A)		11:30 - 12:00	30
5 Class A	6 Class A	12:05 -1:20		75
5 (Lunch B)	6 (Lunch B)		12:05 - 12:35	30
		11:30 - 12:00		
5 Class B	6 Class B	& 12:40 - 1:20		80
5 (Lunch C)	6 (Lunch C)		12:50 - 1:20	30
Class C	6 Class C	11:30 - 12:50		80
7	8	1:25 - 2:55		90

A Balanced Distribution of Time

Section	Weekly Minutes	Weeks/Year	Yearly Minutes	Yearly Hours
Homeroom	100	x36	3600	60 hrs
Period 1	220	x36	7920	132 hrs
Period 2	220	x36	7920	132 hrs
Period 3	220	x36	7920	132 hrs
Period 4	220	x36	7920	132 hrs
Period 5A	210	x36	7560	126 hrs*
Period 5B	220	x36	7920	132 hrs
Period 5C	220	x36	7920	132 hrs
Period 6A	210	x36	7560	126 hrs*
Period 6B	220	x36	7920	132 hrs
Period 7	220	x36	7920	132 hrs
Period 8	220	x36	7920	132 hrs

Reflection

- Take a moment to make a list of ways that Homeroom can be utilized to increase overall student achievement at Cape Henlopen High School.
- List one "Pro" and one "Con" for each suggestion.
- Your suggestions should focus on programs that support College- and Career-Readiness.

Other Factors that Support RTI

- Leadership
- Intervention Providers
- Professional Development or Coaching
- Critical Evaluation

Challenges Looking Forward

- Staff Capacity
  - Do we have sufficient manpower to do this?
  - How can staff be utilized most effectively and equitably?
- Scheduling
  - Does the schedule support the instructional core?
  - Is the proposed schedule functional?
- Resources
  - Core Curriculum, Compass Learning, Read 180, etc.
  - Are more resources required and what are they?
- Fidelity
  - Is Tier 1 instruction being delivered with fidelity to all students and as intended?
  - How will the fidelity of prescribed interventions be monitored?

References

- Burns, M.K., & Gibbons, K. A. (2008). *Implementing response-to-intervention in elementary and secondary schools* (pp. 6). New York, NY: Routledge.
- National Center on Response to Intervention (2010). *Essential components of RTI – a closer look at response to intervention*. Washington, DC: US Department of Education, Office of Special Education Programs, National Center on Response to Intervention.

Appendix Jb

The "RTI" Homeroom Presentation Outline

Essential Question:

What is RTI and why is an RTI homeroom necessary for continued student success at Cape Henlopen High School?

K W L Chart

Today's presentation and discussion is about RTI and the RTI Homerooms mentioned in the beginning of the year letter.

Briefly fill in the "K" (Think I Know) and the "W" (Want to Know) columns of your K W L Chart regarding your current understanding of RTI and/or the RTI Homeroom. When you are done, turn to the person next to you and discuss your responses.

We will capture your "Want to Know" questions after the discussion.

5 W's and a How about RTI Homeroom

1. What is RTI?
2. Why are we implementing RTI homerooms?
3. How are the homerooms structured?
4. Who is involved?
5. Where will it take place?
6. When will this happen?

1. What is RTI?

RTI means Response to Intervention

It is a multi-level, intervention and service process that supports students who struggle with learning in a specific area
It is a system of screening and regularly scheduled monitoring of student progress in each level of intervention (called "tiers")
It is a data-based program that guides decision making and improves instruction, intervention and other support services for every student.

Delaware has adopted the definition of Response to Intervention as published by the National Association of State Directors of Special Education (2005):

"RTI is the practice of providing high-quality instruction and intervention matched to student need, monitoring progress frequently to make decisions about change in instruction or goals and applying child response data to important educational decisions. RTI should be applied to decisions in general, remedial and special education, creating a well-integrated system of instruction/ intervention guided by child outcome data.

Delaware Recommends a Three-tiered RTI Model*

Tier III: 5% of Students
Students with insufficient progress in Tier I/Tier II
Sustained Intensive Interventions
Possible Special Education Identification for students with insufficient progress with Tier III interventions

Tier II: 15% of Students
Students who experience insufficient progress in Tier I
Group and individual research-based interventions

Tier I: 80% of Students
All Students
Core Class Instruction

Essential Components of RTI

1. High Quality Core Instruction or Tier I:

Research-based, General Education Instructional Program
Usually adopted by the state or district
Delivered with fidelity to the full population
An example is the Interactive Mathematics Program (IMP) that has been approved by the State of Delaware and adopted by the Cape Henlopen School District.

2. Screening:
RTI utilizes a two-stage screening process:

Universal Screening – an assessment of all students at the beginning of the school year. We are using DCAS as a universal screener.

Secondary Screening – used for students who are considered "at-risk" (scored below the proficient level on DCAS). This involves more in-depth testing to confirm a student's "at-risk" status.

3. Tiered Interventions:

Table 16 Tiered Interventions

Tier	% of Population	Description	Assessment Frequency
1	All Students	Universal: Adherence to a research-based core curriculum in General Education	Benchmark Assessment at least three times a year (DCAS)
2	~ 15%	Targeted: Small-Group (three to five students) classified as General Education 90 minutes minimum per week	At least monthly progress monitoring. Every two weeks is recommended by Delaware DOE
3	~ 5%	Intensive: Individualized Interventions tailored to each student's needs. Can include Special Education; 150 minutes minimum per week	At least weekly progress monitoring and frequent informal classroom- based assessments

4. Progress Monitoring:

Assesses student performance over time
Quantifies student responsiveness to interventions
Evaluates instructional effectiveness

5. Data-based Decision Making:

The data gathered during screening and progress monitoring should be used to:
Determine whether the core curriculum is effective

Formulate effective individualized programs
Decide if the student needs a more or less intensive level of intervention
If progress monitoring indicates over time that a student is failing to respond, the student may need to be evaluated for a learning disability.

2. Why are we implementing RTI Homerooms?

To comply with state requirements:

Originally, districts were required to implement RTI for all elementary school children no later than the beginning of the 2008-2009 school year. For all other students, districts were to implement RTI no later than the beginning of the 2009-2010 school year.
See, 14 DE Admin Code 925.6.11.3.1 through 6.11.3.2.

The timeline has been redefined from the original but some secondary schools have already implemented RTI programs.

To fulfill our school vision:

"We believe that we can create a learning environment where we can systematically, persuasively and significantly improve the achievement of all students."

3. How is it structured?

The amount of time required for Tiered Interventions in RTI must be provided outside of regular instruction. The minimum is 90 minutes a week for Tier 2 and 150 minutes a week for Tier 3. By creating the "Homeroom" period we are building 100 minutes into the weekly schedule. This is enough for Tier 2 and a large portion of Tier 3.

There will be two Parallel Programs:

First Program will support the RTI Program directly

Second Program will support other student success initiatives

- Kaplan SAT Test Preparation
- College and Career Preparation

The combined programs will take place during the "RTI Homeroom" which we will call the Student Success Academic Period.

4. Who is involved?

A Leadership Team of teachers and administrators has been created to oversee the implementation and functioning of the initiative on a school-wide basis

9th and 10th Grade Math and English Teachers and Math and Reading Specialists will deliver the RTI program and monitor student data

All teachers at Cape Henlopen High School will be involved in supporting the Student Success Academic Periods in some way.

5. Where will it take place?

Most teachers will remain in their own classrooms during the Student Success Academic Period.

Some RTI support teachers will relocate to a computer lab during the Student Success Academic Period in order to have access to technology.

Students will report to their assigned location.

6. When will this happen?

We have built a 25-minute period into the school schedule. This will occur at the beginning of the day from 7:55 to 8:20, Tuesday through Friday

Preparation and Professional Development will occur in the first month and a half of the school year. A schedule is forthcoming.

Actual implementation and delivery will begin in October.

Overview of How is the Student Success Academic Period Structured

9th Grade Components
RTI, Student Success Plans, …

10th Grade Components
RTI, Kaplan Test Prep, Student Success Plans

11th Grade Components
Kaplan Test Prep, Student Success Plans

12th Grade Components

College Planning Activities, Student Success Plans

Summary: Discussion

What is RTI and why is an RTI homeroom necessary for continued student success at Cape Henlopen High School?

Appendix K

CREATING AND SUPORTING A RESPONSE TO INTERVENTION PROGRAM: CAPE HENLOPEN HIGH SCHOOL RTI SCHEDULE

Over the past two years, Cape Henlopen High School has implemented a program of reading and math enrichment classes with the intention of supporting struggling students and improving their general skills and overall proficiency in these subject areas. This system has been put in place specifically to address the low level of proficiency on the Delaware Comprehensive Assessment System (DCAS) that certain students have experienced over the past several years. In its current form, the enrichment program has faced some challenges in providing adequate intervention support within the framework of the school's schedule. The program has also been limited in the number of students it can service due to scheduling conflicts that occur between required core courses and enrichment classes when creating students' schedules. There are two recurring challenges the enrichment program has faced:

1. Scheduling students who require supplemental support, and
2. Creating flexibility in the master schedule to allow students to enter or exit the enrichment program as warranted.

Creating a more flexible master schedule is necessary so that students can receive interventions when they need them, and discontinue interventions when they have demonstrated the desired progress and the intervention is no longer needed. The

present structure of the enrichment program requires students who are enrolled in enrichment classes to remain in them for a full year. Because of this, students must often sacrifice an elective course. This has caused problems because many elective courses are required as part of the students' academic pathway (an academic pathway is a series of related courses that act as a vocational focus for the student). Since satisfying the guidelines of a pathway is a requirement of graduation, not being able to participate in a needed course presents serious problems for students. The majority of students must remain in their enrichment class for the entire year; the only exception is for students who are scheduled to take driver's education. These students remain in enrichment for the first semester only and discontinue enrichment to begin driver's education in the second semester. This has caused an additional set of challenges. These students stop receiving enrichment in January of their sophomore year, even if they have not shown sufficient progress toward meeting their goals. This may give them a disadvantage when taking the DCAS in the spring. The cohort of students who experienced the discontinuance of their Enrichment in 2011-2012 showed an average increase of only 1.27 points when comparing their winter DCAS scores to their spring DCAS scores. 26% of these students showed a decrease of more than 25 points. Had there been more flexibility in the schedule, these students could have continued to receive intervention support and perhaps experienced higher point gains on the spring administration of the DCAS.

An additional scheduling issue is Cape Henlopen High School's move to a full credit rather than a half credit system at the high school. This means that most classes

require the students to complete a full school year of the class before a credit will be awarded. Physical education, health, driver's education and civics are the only exceptions to the full credit requirement and are scheduled within the same period so that, in conjunction with each other, they effectively create a one-credit course of study over the full school year. For each course a student successfully completed, the system previously awarded half a credit at the end of the first semester and the second half credit at the end of the second semester. The half credit system provided a few additional opportunities for flexibility in the schedule that now will no longer exist. The challenge of incorporating flexibility into the school's schedule to accommodate the necessity of moving students in and out of enrichment as they make progress therefore becomes more limited.

Add to this the fact that the enrichment program is not yet structured in accordance to the Delaware Department of Education's Guidelines for a Response to Intervention (RTI) program. The State of Delaware requires that all schools create a formal RTI program and begin implementation during the 2013-2014 school year. In order to implement a multi-tiered RTI system that incorporates separate intervention cycles required by the state, the Cape Henlopen High School master schedule has to be reevaluated and restructured in order to provide time in the schedule for RTI intervention sessions. Restructuring the schedule would also make the processes of conducting universal screening and ongoing progress monitoring much more manageable by creating a dedicated time to focus on and complete these activities without taking time from core courses.

The Current "Non-RTI" Schedule

The daily schedule at Cape Henlopen High School is a modified eight-period, 90-minute, alternating A/B block format (Table 17). This schedule was developed before any need to incorporate a school-wide RTI program. A/B block means that there are two alternating schedules each week, and "A" schedule and a "B" schedule. A/B block occurs on Tuesdays, Wednesdays, Thursdays and Fridays. On these days, there are four periods a day. The "A" schedule includes the odd periods (1, 3, 5 and 7) that are held on Tuesday and Thursday. The "A" schedule is referred to as "Odd Days." The "B" schedule includes the even periods (2, 4, 6 and 8) that are held on Wednesday and Friday. The "B" schedule is referred to as "Even Days." "Modified" means that Monday does not follow this format. On Mondays, all periods are held for roughly 40 minutes. Lunches interfere with class length during 5th and 6th period.

Table 17 Cape Henlopen High School's Regular Weekly Schedule

Strip Day	Time	Minutes
Breakfast	7:35 - 7:50	15
1	7:55 - 8:37	42
2	8:42 - 9:23	41
3	9:28 - 10:09	41
4	10:14 - 10:55	41
5	11:01 - 12:44	103
Lunch A Seniors	11:01 - 11:36	35
Lunch A 9 - 11	11:06 - 11:36	30
Lunch B Seniors	11:36 - 12:10	34
Lunch B 9 - 11	11:40 - 12:10	30
Lunch C Seniors	12:10 - 12:44	34
Lunch C 9 - 11	12:14 - 12:44	30
6	12:49 - 1:28	39
7	1:33 - 2:13	40
8	2:18 - 2:55	37

Odd Period	Even Period	Time	Minutes
Breakfast	Breakfast	7:35 - 7:50	15
1	2	7:55 - 9:30	95
3	4	9:35 - 11:13	98
5	6	11:18 - 1:14	116
Lunch A Seniors	Lunch A Seniors	11:21 - 11:56	35
Lunch A 9 - 11	Lunch A 9 - 11	11:26 - 11:56	30
Lunch B Seniors	Lunch B Seniors	12:00 - 12:35	35
Lunch B 9 - 11	Lunch B 9 - 11	12:05 - 12:35	30
Lunch C Seniors	Lunch C Seniors	12:39 - 1:14	35
Lunch C 9 - 11	Lunch C 9 - 11	12:44 - 1:14	30
7	8	1:19 - 2:55	94

The inconsistencies in this schedule create instructional challenges since the annual total hours for each period varies by as much as 15.6 hours (Table 18).

Table 18 Current Weekly Minutes and Annual Hours Allocated by Class Period

Period	Minutes/Wk	School Year	Annual Mins.	Annual Hours
Period 1	232	x 36 weeks	8,352	139.2
Period 2	231	x 36 weeks	8,316	138.6
Period 3	237	x 36 weeks	8,532	142.2
Period 4	237	x 36 weeks	8,532	142.2
Period 5	242	x 36 weeks	8,712	145.2
Period 6	211	x 36 weeks	7,596	126.6
Period 7	228	x 36 weeks	8,208	136.8
Period 8	225	x 36 weeks	8,100	135.0
	1,843 (Total)		**66,348 (Total)**	**138.23 (Avg.)**

RTI Scheduling Alternatives

In their investigation titled, “Principals' Perceptions of the Importance and Availability of Response to Intervention Practices Within High School Settings”, Sansosti, Noltemeyer & Goss (2010) indicated that their findings verified the findings from previous similar studies (Windram et al, 2007; Sansosti et all, 2010) that “scheduling and structural factors are major obstacles to the application of RTI within secondary settings.” They surveyed teacher participants who responded that "time for teachers to attend problem-solving meetings", "time for teachers to conduct interventions", and "block scheduling" were very important to the proper implementation of an RTI program. However, these teachers indicated that these

components were not available to them at their schools, making implementation difficult. These three factors should be taken into consideration when developing a new master schedule that accommodates an RTI program at Cape Henlopen High School. The Delaware Department of Education has created a list of scheduling items that support RTI Implementation. This list can be found at http://www.doe.k12.de.us/infosuites/staff/profdev/scheduling2ndRTI.shtml by accessing the "Scheduling for RTI January 2009 Session Power Point" hyperlink. In the list below, the items the Delaware Department of Education (DDOE) recommends are in bold. The manner in which Cape Henlopen High School is utilizing or implementing this item is included as a description and is italicized. Cape Henlopen High School has incorporated the following items on a school-wide basis:

1. **A Freshman Academy** - *Teachers and classes located in one wing of the school, dedicated solely to 9th grade students and focusing on successful transition from middle school to high school.*
2. **Team teaching** – *A general education and special education teacher team up to deliver instruction in special education inclusion classes, resource classes or enrichment classes.*
3. **Instructional specialists** - *Math Specials and Reading Specialist were hired at the beginning of the 2010 - 2011 school year. They established and refined the enrichment program at the high school.*
    a. *To deliver instruction to students*
    b. *To support classroom teachers*

4. **Modify the master schedule -** *Cape Henlopen High School moved away from a traditional 8 period daily schedule several years ago.*
    a. **Move to A Day, B Day Schedule -** *At first a 4 x 4 block was incorporated, but then was modified to an A/B block which allowed for a full year of instruction with longer class periods to deepen instruction.*
    b. **Schedule Common planning time for teachers -** *Cape Henlopen High School began scheduling common planning time for all content and specialty areas during the 2011 - 2012 school year. Every department has common time for teachers of the same content to work together collaboratively. Professional Learning Communities are scheduled every week during this common planning time.*

Cape Henlopen High School has implemented the following item in a limited manner:

Creating Split Block Periods

A split block breaks the time of a block into two sections that can be used for two separate instructional purposes. This has not been done on a school-wide basis, but the reading and math specialists have utilized this strategy to divide a large group of students scheduled for a block into two smaller groups per period. "Splitting the block" gives students 45 minutes of instruction in both math and reading. Students benefit by working with the specialist in a smaller group, which provides more individualized attention. The reading and math specialists used the split block for all periods during the 2010–2011 school year. The split block functioned in the following

manner: a student who needed both math and reading intervention would work with the math specialist in his classroom for the first 45 minutes of the period. At the middle of the period, the student would switch classes and spend the remaining 45 minutes working with the reading specialist in her classroom. By splitting the block, more students could be scheduled into the enrichment classes. The largest class roster for students who required both reading and math enrichment was 26 students, but because of the split block, neither specialist ever had more than 13 students in class at one time. Utilizing the split block had the effect of reducing class size and allowed the specialist to provide more individualized attention when working with the students.

Due to the smaller size of the individual classes in the 2011 - 2012 school year, specialists felt that instead of using a split block for all periods, the students were better served utilizing the full ninety minutes on an alternating basis. What this meant was that instead of seeing each group of students twice a week for 45 minutes and every other Monday, the specialists would work with each group for a full 90 minutes once a week and every other Monday. This also eliminated the need for a transition during the middle of the period and avoids disruptions to other classes that might have occurred with the enrichment students in the hallway. There was one exception during 2011 - 2012 school year. The specialists continued to use the split block during fifth period only because of the natural split created by "B" lunch. The "B" lunch period falls in the middle of the period, dividing it into two halves.

There are other Department of Education recommendations that have not been implemented at Cape Henlopen High School. These are:

1. **Staggering the School Day**

2. **Adding minutes to the day**

3. **Incorporating Homeroom into 1st Period**

4. **Shortening each period by a few minutes to create a "skinny".**

The suggestions of staggering the school day and adding minutes to the day pose the same obstacle - busing. Since the buses used in the Cape Henlopen School District service several schools on two different runs in the morning and the afternoon, changing the start and/or end times or the overall length of the day would cause logistical and financial difficulties for the district. Any changes to Cape Henlopen High School's instructional day would have to be orchestrated by the Superintendent and District Personnel and approved by the School Board. This is not a modification that the high school could initiate on its own and, therefore, will not be considered at this time.

Another recommendation made by the Department of Education that is not currently being used at the school is to incorporate homeroom into 1st period. (Delaware Department of Education, 2009) What this means is that students report to their scheduled 1st period, a portion of which is used for homeroom. No special scheduling of students to a separate homeroom is required. The 1st period class is simply made longer to accommodate the time needed for RTI. This does pose an equity issue among teachers, however, because those teachers who have planning time during 1st period do not have to act as homeroom teachers.

The Department of Education's suggestion to shorten each period by a few minutes to create a "skinny" has the most promise to add flexibility to the Cape Henlopen High School Schedule. A "skinny" is a class period that is shorter than a block. A skinny is usually half the time or less. Creating a skinny has two benefits:

1. It creates a separate time outside of the main block periods to deliver RTI interventions as well as other school-wide initiatives that are not directly tied to RTI, and,
2. It offers the opportunity to re-balance the master schedule to better distribute educational minutes more evenly across the weekly schedule.

The Modified Master Schedule Proposal and Rationale

Based on these findings, the master schedule that I am proposing will incorporate a separate, year long, 25-minute homeroom period (skinny) built from time reallocated from the block periods during the day. (Table 19) This homeroom, which will meet on Tuesday through Friday, reallocates 100 minutes of instructional time per week to be used primarily for RTI. Monday will not have a homeroom. Having no homeroom on Monday will allow 6th period to be lengthened, which will better align the number of minutes 6th period meets per week to the other periods in the schedule. In the current schedule, 6th period meets 211 minutes per week. This is a full thirty-one minutes less than the 242 minutes of instructional time per week that 5th period meets. For students who require RTI interventions, Cape Henlopen High School can use this time to deliver interventions for both Tier II and Tier III. The scheduled 100 minutes of homeroom sufficiently meets the Delaware Department of

Education's requirement for 90 minutes of RTI time per week for Tier II interventions. Tier II interventions require at least 90 minutes of targeted instruction per week that is outside of the students' regularly scheduled class time. These interventions must focus on each student's area or areas of identified need.

More difficult to schedule are the students who require Tier III interventions. The Department of Education mandates that if a student has not made sufficient progress during a cycle of Tier II interventions, a minimum of 150 minutes of targeted intervention in the student's area or areas of identified need must be provided in a minimum of four sessions per week. Utilizing the 100 minutes of homeroom time for Tier III interventions minimizes the amount of additional time that must be found for Tier III to 50 minutes. The thirty-five minutes of class time found in the strip day on Mondays could be used creatively to provide not only supplemental instruction to struggling students but also extension instruction to students who are performing at or above proficiency. However, this still does not quite satisfy the State's Tier III requirement of 150 minutes of RTI time per week outside of the students' regular class time. Alternate solutions will need to be found to make up the 50 minutes difference. These alternate solutions could include looking for other areas of flexibility within the schedule, utilizing Enrichment classes exclusively for Tier III interventions, or using a "pull out" system where a specialist will take students from their core courses to provide additional intervention support time during the week. The challenge created by Tier III will be presented to a school-wide RTI team. They will be given the task to find a workable solution.

Table 19 Proposed High School Daily Schedule for RTI Intervention

Strip Day	Time	Minutes
Student Arrival	7:30	
Breakfast	7:30 - 7:50	20
Homeroom	None	
1	7:55 - 8:35	40
2	8:40 - 9:20	40
3	9:25 - 10:05	40
4	10:10 - 10:50	40
5	10:55 - 12:35	100
5 (Lunch A)	10:55 - 11:25	30
5 (Lunch B)	11:30 - 12:00	30
5 (Lunch C)	12:05 - 12:35	30
6	12:40 - 1:20	40
7	1:25 - 2:05	40
8	2:10 - 2:50	40

Odd Period	Even Period	Time		
Student Arrival	Student Arrival	7:30		
Breakfast	Breakfast	7:30 - 7:45		15
Homeroom	Homeroom	7:50 -8:15		25
1	2	8:20 - 9:50		90
3	4	9:55 - 11:25		90
5	6	11:30 - 1:30		120
5 Lunch A	6 Lunch A	11:30 -12:00		30
5 Class A	6 Class A		12:05 -1:20	75
5 Lunch B	6 Lunch B	12:05 -12:35		30
5 Class B	6 Class B		11:30 - 12:00 and 12:40 - 1:20	80
5 Lunch C	6 Lunch C	12:50 - 1:20		30
Class C	6 Class C		11:30 - 12:50	80
7	8	1:25 - 2:55		90

References

Delaware Department of Education (Powerpoint Presentation 2009). Scheduling with RTI at the Secondary Level. Retrieved from http://www.doe.k12.de.us/infosuites/staff/profdev/scheduling2ndRTI.shtml

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