REFORMING A TURNAROUND HIGH SCHOOL: A FOCUS ON MATHEMATICS

by

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Reforming a Turnaround High School: A Focus on Mathematics

Thesis directed by Assistant Research Professor Shelley Zion and Associate Professor Alan Davis.

ABSTRACT

The focus of this program review is on the mathematics program at "New Vision Academy." Opening its doors for the 2012-2013 school year, New Vision Academy is one of two schools initiated as a response to turnaround status and years of declining enrollment, low attendance rates, low graduation rates, and low student achievement at "Windy Creek High School." This review examined Windy Creek High School's turnaround model implemented in partnership with the New Vision Schools Network and, more specifically, mathematics instruction for students at New Vision Academy. Personal interviews were conducted with teachers and New Vision Schools Network administration to gather information regarding experiences with the mathematics program. Aggregate state standardized test scores were gathered via public record. Granted that New Vision Academy has only operated for two academic years, positive changes are taking place and students are gaining momentum toward a positive future.

The form and content of this abstract are approved. I recommend its publication.

Approved: Shelley Zion and Alan Davis

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CHAPTER I

INTRODUCTION

Windy Creek High School

Since opening in 1926, Windy Creek High School has operated as a traditional 9th through 12th grade high school. As a neighborhood school, Windy Creek High School is rich in tradition and culture. Generations of families have sent their children there in hopes of a quality education. In the past ten years, Windy Creek has struggled to keep the enrollment of students high and to maintain strong academic achievement. In the spring of 2010, the school began restructuring and was required to initiate a turnaround plan model by the Colorado Department of Education. At the time, Windy Creek High School experienced declining enrollment and was one of the lowest performing high schools in the district. The decision was made by stakeholders to phase out the traditional comprehensive high school and phase in two new 6th- 12th grade schools both located within the original Windy Creek High School building. These new schools are the New Vision Academy and the "New Leadership Academy." Phasing in of New Vision Academy came with a 7-0 approval from the school district Board of Education; at the time, with current board dynamics, this was unique. This review will examine Windy Creek High School's turnaround model implemented in partnership with the New Vision Schools Network and, more specifically, mathematics instruction for students at New Vision Academy.

New Vision Academy began operations as a public school in the 2012-2013 school year hosting grades 6, 8, and 9. In 2013-2014, 449 students in total attended New Vision Academy in grades 6 and 7 (middle school), and 9 and 10 (high school). Of the

449 students, 96% were on free or reduced priced lunch and 94% are considered ethnic minority. The student body included 84% Latino/a students, 6% White students, 6% African American students, and less than 1% of each Asian American and American Indian students (Denver Public Schools, 2014a).

Necessity for Change at Windy Creek High School

In the past ten years, changes have occurred at Windy Creek High School. Root causes such as ongoing leadership turnover, declining enrollment, low attendance rates, low graduation rates, and low student achievement all demanded change from the school district and community in order to provide a more successful future for Windy Creek High School students (Denver Public Schools, 2012). Ultimately, Windy Creek failed to meet adequate yearly progress (AYP) for years, and therefore, was identified for School Improvement. Adequate Yearly Progress is a requirement of the No Child Left Behind Act of 2001 and represents the annual academic performance targets in Reading and Math that the State of Colorado, school districts, and individual schools must reach to be considered on track for 100 percent proficiency by the 2013-2014 school year (Colorado Department of Education, 2014a). The district, Denver Public Schools, calculates AYP for each school with a formula set by the Colorado Department of Education, which measures participation rates, math and reading performance, and completion rate targets for the elementary, middle and high school levels. Additionally, schools are responsible for all subgroups of students (race/ethnicity, English Language Learners, Economically Disadvantaged students, and students with disabilities) if there are thirty or more students in the subgroup at a specific grade level (Colorado Department of Education, 2014a). For Windy Creek, the path to restructuring began over ten years ago as shown in Table 1.

Table 1 – AYP Designation and Targets
*Last full academic year for Windy Creek High School Grades 9-12
(Colorado Department of Education, 2014b)

	Met AYP?	Identification	Number of Targets	Targets Made
2003-2004	No	School Improvement Year One		
2004-2005	No	School Improvement Year Two	29	20
2005-2006	No	Corrective Action	30	19
2006-2007	No	Corrective Action	25	20
2007-2008	No	Corrective Action	25	17
2008-2009	No	Restructuring Implementation	25	15
2009-2010	No	Restructuring Implementation, Year 2	25	19
2010-2011	No	Restructuring Implementation, Year 3	25	14
2011-2012*	No	Restructuring Implementation, Year 4		

In 2010, after two years of Restructuring Implementation and multiple years of failing to meet the targets of AYP, Windy Creek High School was designated a Turnaround school by the Colorado Department of Education (U.S. Department of Education, 2010a).

In the spring of 2010, the Educational Equity Committee (EEC) was formed to address the educational disparities at Windy Creek High School and devise a plan to

make the changes necessary to guide the future of the school. Total enrollment of students at Windy Creek High School since 2006 is shown in Table 2.

Table 2

Windy Creek High School – Student Enrollment (Colorado Department of Education, 2014a)

Grade	2006	2007	2008	2009	2010	2011
9	301	252	341	278	246	176
10	287	235	229	195	210	181
11	258	201	161	141	165	177
12	243	279	164	182	168	166
Total	1089	967	895	796	789	700

In addition, Windy Creek High School's graduation rate is shown in Table 3.

Table 3

Windy Creek High School – Graduation rates in 2007-2012 (Colorado Department of Education, 2014b)

Class of	Students	Students Graduating	Graduation Rate
2007	307	190	61.9%
2008	404	190	47%
2009	324	165	50.9%
2010	250	119	47.6%
2011	215	114	53%
2012	189	117	61.9%

With regard to student achievement, specifically in mathematics, 9th and 10th grade students at Windy Creek High School have not performed well on the state assessment, the Transitional Colorado Assessment Program (TCAP) in recent history. This is shown in Table 4.

Table 4

Windy Creek High School – Achievement in Mathematics, TCAP data, Advanced/Proficient/Partially Proficient results (Colorado Department of Education, 2014c)
*Last full academic year for Windy Creek High School Grades 9-12

Year	9th Grade		10th Grade	
		Total Number of Students Tested		Total Number of Students Tested
2007-2008	32%	243	27%	206
2008-2009	22%	236	24%	190
2009-2010	24%	214	31%	174
2010-2011	27%	199	28%	175
2011-2012*	30%	139	35%	155

Windy Creek High School needed significant change due to years of declining enrollment, a low graduation rate, and poor academic performance from students. Together with Denver Public Schools, the EEC proactively recommended changes for Windy Creek High School. The EEC was a representative group of community members that included alumni, parents and grandparents of current students, business owners, and non-profit representatives. The EEC studied the history of Windy Creek High School, current and past performance and community needs and then researched various school models. Ultimately, the WDEEC recommended phasing out the traditional 9th-12th grade Windy Creek High School and phase in two new 6th-12th grade schools both located within the Windy Creek High School building. In June of 2011 the Denver Public School Board approved the two new schools: New Leadership Academy and New Vision Academy. The focus of this review is New Vision Academy. New Vision Academy is a

partnership between Denver Public Schools and New Vision Schools Network, which has received national acclaim for its innovative use of time and scheduling. New Vision Schools Network is a national not-for-profit organization dedicated to whole-school and systemic innovation in urban education. Their goal is to ensure that all students – regardless of life circumstances – have access to a great education (Denver Public Schools, 2012, January 11). Below, in Table 5, is a visual explanation of phasing out Windy Creek High School, and phasing in of New Vision Academy, each by grade levels served.

Table 5

	Grade levels served	
	New Vision Academy	Windy Creek High School
2011-2012	--	9, 10, 11, 12
2012-2013	6, 8, 9	10, 11, 12
2013-2014	6, 7, 9, 10	11, 12
2014-2015	6, 7, 8, 9, 10, 11	12
2015-2016	6, 7, 8, 9, 10, 11, 12	--

School Turnaround – Windy Creek High School

Since 2009, the U.S. Department of Education has committed over $4.5 billion to School Improvement Grants. School Improvement Grants, authorized under section 1003(g) of Title I of the Elementary and Secondary Education Act of 1965 (Title I or ESEA), are grants to State educational agencies (SEAs) that SEAs use to make competitive subgrants to local educational agencies (LEAs) that demonstrate the greatest

need for the funds and the strongest commitment to use the funds to provide adequate resources in order to raise substantially the achievement of students in their lowest-performing schools (U.S. Department of Education, 2010a). In 2012, the schools housed within Windy Creek High School in Denver received $1,113,589 to begin a turnaround model as a Tier III school (Denver Public Schools, 2012). A Tier III school is comprised of the following measures:

- Any secondary school that is eligible for, but does not receive, Title I funds that:
    - Has not made Adequate Yearly Progress for at least two years; or
    - Is in the State's lowest quintile of performance based on proficiency rates on the State's assessments in reading/language arts and mathematics combined; and
    - Does not meet the requirements to be a Tier I or Tier II school

    (U.S. Department of Education, June 2010c)

The turnaround model includes the following elements:

- Replace the principal and grant the principal sufficient operational flexibility (including in staffing, calendars/time, and budgeting) to implement fully a comprehensive approach in order to substantially improve student achievement outcomes and increase high school graduation rates;
- Using locally adopted competencies to measure the effectiveness of staff who can work within the turnaround environment to meet the needs of students,
    - Screen all existing staff and rehire no more than 50 percent; and
    - Select new staff;
- Implement such strategies as financial incentives, increased opportunities for promotion and career growth, and more flexible work conditions that are designed to recruit, place, and retain staff with the skills necessary to meet the needs of the students in the turnaround school;
- Provide staff ongoing, high-quality job-embedded professional development that is aligned with the school's comprehensive instructional program and designed with school staff to ensure that they are equipped to facilitate effective teaching

and learning and have the capacity to successfully implement school reform strategies;

- Adopt a new governance structure, which may include, but is not limited to, requiring the school to report to a new "turnaround office" in the LEA or SEA, hire a "turnaround leader" who reports directly to the Superintendent or Chief Academic Officer, or enter into a multi-year contract with the LEA or SEA to obtain added flexibility in exchange for greater accountability;
- Use data to identify and implement an instructional program that is research-based and vertically aligned from one grade to the next as well as aligned with State academic standards;
- Promote the continuous use of student data (such as from formative, interim, and summative assessments) to inform and differentiate instruction in order to meet the academic needs of individual students;
- Establish schedules and implement strategies that provide increased learning time; and
- Provide appropriate social-emotional and community-oriented services and supports for students
  (U.S. Department of Education, 2010b)

With this financial support, the newly initiated schools within Windy Creek High School initiated a path toward hopeful change. Specifically, the four major improvement strategies included in the New Vision Academy Unified Improvement Plan are:

- Instruction and Instructional Systems: Utilize strategic structures, systems and processes to support increased reading, writing, and math achievement.
- Staff Professional Growth and Development - Staff members at New Vision Academy will understand the components of the achievement gap and what the specific strategies to reduce the achievement gap.
- Parent and Community Engagement: Create opportunities for parent and community engagement through consistent, formal events and planned structures for community based organizations to be involved inside and outside of school hours.
- College and Career Readiness. Additionally New Vision Academy will be submitting approval to become the State's newest Early College
  (New Vision Academy, 2013)

These improvement strategies would be the building blocks for student success in all core subject areas – reading, writing, and mathematics. Ultimately, due to these steps, the expectation would be to increase in the graduation rate and student success.

Innovation Status

In addition to being a turnaround school, New Vision Academy was also granted innovation status in March of 2012. Senate Bill 08-130, the Innovation Schools Act of 2008, allows a public school to submit an innovation plan to its district and state board of education. The innovations may include delivery of educational services, personnel administration and decision making, and budgeting (Colorado Department of Education, 2008). The innovation office is within the Innovation, Choice and Engagement Division at the Colorado Department of Education. In short, the act provides schools a path to develop innovative practices, better meet the needs of individual students and allow more autonomy to make decisions at the school-level (Colorado Department of Education, 2014e). To succinctly describe New Vision Academy, it is a public school housed in the Windy Creek High School building, sharing the space with New Leadership Academy. By the 2015-2016 school year, New Vision Academy will serve grades 6 through 12. The administration at New Vision Academy works in partnership and in collaboration with New Vision Schools Network to provide students a more rigorous, college and career focused learning environment in order to gain the knowledge and skills they need to compete in the 21st century economy.

National and State Context

When considering Windy Creek High School historically, the school has exhibited similar challenges and comparable statistics as the nation and the state of

Colorado when it comes to the achievement gap and the graduation rate. In March of 2009, President Obama and his administration announced a commitment to fund changes in America's consistently low-performing schools. With a financial commitment of $3.5 billion for the efforts, Secretary of Education Arne Duncan would lead the U.S. Department of Education's School Turnaround Grants to support interventions for 5,000 of the lowest-performing schools in the nation over the next five years. In summary, this reform would raise standards and improve assessments; recruit, retain, and support effective educators; build robust data systems that track student progress and improve practice; and, ultimately, turn around the lowest-performing schools (U.S. Department of Education, 2011). Windy Creek High School has been the recipient of a portion of this federal money in order to reform their program and provide a more rigorous and higher quality education for its students.

Achievement Gap and Graduation Rate

The achievement gap between Latino/a and White students continues to be significant on both the national and state level. Nationally on the 2009 National Assessment of Educational Progress (NAEP), in 8th grade mathematics, Latino/a students score, on average, 26 points behind White students. In Colorado, 8th grade Latino/a students score 32 points behind their White counterparts (U.S. Department of Education, 2011).

Nationally, the graduation rate also demonstrates the gap between Latino/a and White students. In 2011-2012, accounting for 3.1 million public high school students, the graduation rate for White students was 85 percent, while only 76 percent of Latino/a students received their high school diploma within four years (National Center of

Education Statistics, 2014). In Colorado, the class of 2012 graduated 82 percent of White students while only 62 percent of Latino/a students successfully completed four years of high school education (Colorado Department of Education, 2014d).

The Importance of Mathematics and Algebra

Algebra is a crucial course for future student success in high school and post-secondary education. Enrolling in a foundational course such as Algebra provides students with an advantage in pipelines that lead to decisions such as applying to college. Students who take Algebra early in their high school career have an advantage over students who do not enroll in such an introductory course (Atanda, 1999). The problem lies in the fact that Latino/a students have not been successful and have fallen behind in mathematics education in comparison to other ethnic groups. The Latino/a students in Colorado prove this point. In mathematics, Latino/a students fall behind in college readiness benchmarks as reported by ACT (ACT, 2014). This information is shown in the bar graph below (Figure 1).

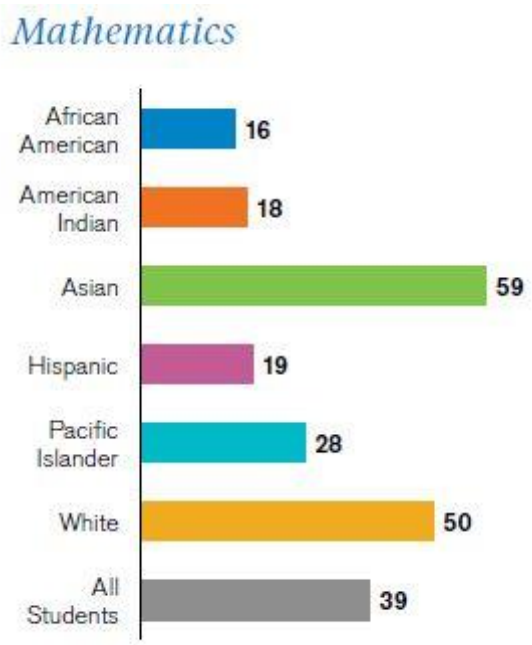

Figure 1. Percent of 2014 ACT-Tested High School Graduates Meeting ACT College Readiness Benchmarks in Colorado

As indicated from the graph above, addressing the educational disparities gap in Colorado needs attention and further resources.

Mathematics Education and Latino/a Students

In 2006, Clifford Adelman released a data essay that followed a nationally representative cohort of students from high school into post-secondary education. With regard to Latino/a students, he found that, "it is unfortunate to note that despite increased participation of minority students to post-secondary education over the past quarter century, the gap in bachelor's degree completion between whites and Asians, on the one hand, and Latinos and African-Americans, on the other, remains wide" (2006, p. xxv). He further discusses the reality of what high schools offer to students, "Unfortunately, not all high schools present adequate opportunity to learn, and some groups of students are excluded more than others. Latino students, for example, are far less likely to attend

high schools offering trigonometry (let alone calculus) than white or Asian students" (2006, p. xviii). Adelman suggests that a minimum of 3.75 Carnegie units of mathematics (highest math being calculus, pre-calculus, or trigonometry) are required in high school to obtain a bachelor's degree in college. Adelman concludes, "if mathematics momentum is as important as we contend it to be, one can see the ripples of opportunity—or lack of opportunity—that start in high school offerings. In the matter of calculus, Latino students are at a distinct disadvantage with respect to the opportunity even to confront the subject" (2006, p. 32).

In December 2013, Innovate Public Schools, released a report describing students left behind in California's Silicon Valley. These are students with ethnicities and demographics similar to students at Windy Creek High School. The report states, "The promise of college is fading for many Latino students. They're more likely to drop out and far less likely to complete the college-prep courses that would give them a chance to attend a University of California or California State University school" (Jacobs, 2013, p. 11). With regard to mathematics skills, Jacob states, "Weak math skills are a dream killer. 85% of the state's community college students are not ready for college math, estimates the Campaign for College Opportunity. By one estimate, only 22% of students who start in remedial math will go on to take a college-level math course" (2013, p. 12).

The Algebra Project

The Algebra Project is a distinctive approach to teaching algebra, first developed in the 1980s for use with African American students by civil rights activist Robert Moses. The philosophy and theory behind the Algebra Project took shape during the civil rights

movement in the 1960s. This experience guided Moses' thinking as much as his mathematical training. Moses defines citizenship in a non-traditional manner. During the industrial revolution, people were required to master the tools of literacy in reading and writing for citizenship. Without these tools, people lacked access to the political and economic institutions. The new technological revolution is demanding new literacy requirements today. Mathematics and science proficiencies are taking their place alongside reading and writing as requirements for citizenship (Silva, Moses, Rivers, & Johnson, 1990). Moses believes that economic access and full citizenship depend on math and science literacy. Now, Algebra is the gatekeeper for citizenship and without it, students find a barrier to not only college entrance, but citizenship as well. A commitment from society has been clearly made for reading and writing literacy. Now the commitment must also be made for math and science literacy in order to remove the barrier of economic access for the Latino/a population (Moses & Cobb, 2001a). While the Algebra Project focused on improving mathematics for African-American students, similarly, Windy Creek High School's high population of Latino/a students has faced its own math illiteracy dilemma observed by the Latino/a achievement gap in low graduation rates and low math literacy.

Moses believes that mathematics should be taught through experiential learning. Students will not open a math book and flaunt their knowledge on Linear Equations in Chapter 2, but they are ready and willing to use a graphic calculator, iPad, or computer. Meeting the students where they are socially and technically is essential for success in math literacy. The struggle in this model is teachers who are not prepared to meet students their students' needs. Teachers need to be comfortable taking the subject apart

and putting it back together again on the spot in response to questions of students. Getting teaching up to where technology and students are will require a revolution in teaching (Moses & Cobb, 2001a).

Multicultural Education

Carol and William Malloy, both assistant professors in the School of Education, University of North Carolina at Chapel Hill, are both similar to Robert Moses with respect to mathematics education of African-American students. However, much of what they believe translates to the Latino/a students of Windy Creek High School. With regard to teaching, "Academic mathematics courses always have been gatekeeper courses. Many mathematics teachers, at all levels, have excluded students from the mathematics culture when they thought students did not exhibit a sufficient understanding of mathematics. These teachers understand the mathematics culture(s) and its nuances, but they are slow to share the code of conduct with all students" (1998, p. 247). Malloy and Malloy also state that the social, cultural, and historical context in which students live defines and shapes students and their experiences. Culture, related to mathematics learning, impacts students' perceptions of themselves as members of the mathematics community (1998). For teachers, Malloy and Malloy state that,

> Certainly educators must make students familiar and comfortable with the culture of mathematics, but in doing so, they must expand this enculturating process by accommodating the individual in order to make the enculturation dominant rather than selective in our mathematics classrooms. Educators must consider the culture of students as they adopt an accommodating cultural pedagogy—one that gives the students the power to be a part of the mathematics culture as they use the familiar knowledge (which becomes power) of their culture. Implicit is the realization that learning preferences of any group of students are positives and can be used in instruction. (1998, p. 255)

Significance of Research

College and career readiness has become a central point for education over the past several years. Ensuring that students have what they need to be successful in the workforce, military, or post-secondary education has become a primary goal of public education. Whatever post-secondary path they choose, students are more likely to need a strong mathematics background. In a statement from the White House in 2010, there is a need for urgent action:

> A growing number of jobs require STEM skills, and America needs a world-class STEM workforce both to expand the frontiers of knowledge and discovery and to address the "grand challenges" of the 21st century, such as developing clean sources of energy that reduce our dependence on foreign oil and discovering cures for diseases. We must improve on our current performance.
>
> - Projections from the Department of Labor's Bureau of Labor Statistics indicate that over 80 percent of the fastest-growing occupations are dependent on the knowledge of mathematics and science. (U.S. Department of Education, 2010b)

These challenges and projections demonstrate the need for strong math programs in all schools. Another report from The President's Council of Advisors on Science and Technology reiterates the need and demand for assets in Science, Technology, Engineering, and Mathematics (STEM) fields:

> The success of the United States in the 21st century – its wealth and welfare – will depend on the ideas and skills of its population. These have always been the Nation's most important assets. As the world becomes increasingly technological, the value of these national assets will be determined in no small measure by the effectiveness of science, technology, engineering, and mathematics (STEM) education in the United States. STEM education will determine whether the United States will remain a leader among nations and whether we will be able to solve immense challenges in such areas as energy, health, environmental protection, and national security. It will help produce the capable and flexible workforce needed to compete in a global marketplace. (Anderson, 2011)

The report also states that while the United States has a historical record of achievement, the United States now lags behind other nations in STEM education. Moreover, some groups, African Americans, Hispanics, Native Americans, and women, are seriously underrepresented in many STEM fields. This restricts their role in well-paid, high-growth professions and, ultimately, deprives the nation of the full benefit of their talents and perspectives (Anderson, 2011). However, with all of this in mind, there is not just lack of proficiency; there is a lack of interest in STEM fields. "Recent evidence suggests that many of the most proficient students, including minority students and women, have been gravitating away from science and engineering toward other professions. Even as the United States focuses on low-performing students, we must devote considerable attention and resources to all of our most high-achieving students from across all groups" (Anderson, 2011, p. vi). Ultimately, to improve STEM education, focus must be given to both preparation and inspiration.

With the growing demand for college-educated workers, a college education is one of the surest ways into the middle class. However, nationwide, low-income students face barriers to college access. The Executive Office of the President of the United States reports:

> Low-income students often lack the guidance and support they need to prepare for college, apply to the best-fit schools, apply for financial aid, enroll and persist in their studies, and ultimately graduate. As a result, large gaps remain in educational achievement between students from low-income families and their high-income peers. Increasing college opportunity is not just an economic imperative, but a reflection of our values. We need to reach, inspire, and empower every student, regardless of background, to make sure that our country is a place where if you work hard, you have a chance to get ahead (2014).

In 2012-2013, New Vision Academy reported 96% of students were eligible for free and reduced lunch rates. Granted, these students face challenges, but by giving them access to resources and support, the likelihood of post-secondary and workforce success is greatly improved.

On a local level, my research also directly aligns to the goals and vision of the Denver Public Schools. The following goals are especially relevant: all students will graduate from the Denver Public Schools prepared for postsecondary success, all students will demonstrate at least one year's growth in the core content areas and meet or exceed state standards, and the number of high-performing schools as measured by the School Performance Framework will increase in Denver Public Schools. My review offers a glimpse into the mathematics program at New Vision Academy with attention to how these goals are being pursued in respect to mathematics learning.

Review Questions

My primary review question is: Since becoming a turnaround school in the spring of 2010, what strategies has the school engaged in to improve mathematics education and student achievement? My secondary questions include: What strategies have been the most effective for student achievement in math? What part did district administration, school administration, and New Vision Academy mathematics teachers play in this process? How do district administration, school administration, and teachers at New Vision Academy describe their involvements and experiences with the strategies of turnaround?

CHAPTER II

REVIEW METHOD

The goal of this program review is to understand the work being done by New Vision Schools Network at New Vision Academy, specifically in mathematics, as part of the turnaround, innovation process at Windy Creek High School. Qualitative data is usually gathered from interviews, observations, or narrative documents (Gliner, Morgan, & Leech, 2009).

Interviews

Before the program review began, Human Subjects Research approval was completed through the Institutional Review Board. The program review was also approved by the Denver Public Schools Research Review Board. The Executive Director of West Denver Network Schools – Denver Public Schools, and the principal of New Vision Academy, were contacted, and both granted permission to communicate with teachers at the school site. All teachers signed consent forms to participate in the program review. Full details of the program review were provided to the school personnel with all information explaining the purpose of this review and how they can opt out if they would like. Teams of grade level mathematics teachers were interviewed and asked about their overall perceptions and experiences within mathematics instruction at New Vision Academy. Table 6 illustrates information regarding the interviews.

Table 6

Date	Interviewees	Length of interview
March 25, 2014	Two 10th grade math teachers • White, male, 44 years in education • White, male, 2 years in education	40 minutes
April 15, 2014	Three 6th grade math teachers • White, female, 12 years in education • White, female, 2 years in education • Latina, 12 years in education	45 minutes
April 16, 2014	Three 7th grade math teachers • White, female, first year in education • White, female, third year in education • Latina, 20 years in education	35 minutes
May 6, 2014	Two 9th grade math teachers • White, female, 4 years in education • White, female, unknown years	25 minutes
June 30, 2014	New Vision Schools Network Administrator • White, male, more than 30 years in education	60 minutes

The only teachers interviewed were math teachers. Unfortunately, an interview did not occur with the principal of New Vision Academy or a representative from Denver Public Schools. Participants interviewed were compensated for their time with a gift card. Interview questions included, but were not limited to the following:

Personal questions

- How long have you been teaching?
- How long have you been teaching at New Vision Academy?
- Where did you receive your education training?

Questions about New Vision Academy

- Please tell me about the turnaround strategy model of your school.
- Do you feel that the turnaround model has been an overall benefit to New Vision Academy? If yes, how so? If no, why not?
- Tell me about the instructional turnaround strategies of your school.
- What successes have you had as a school? What are New Vision Academy's points of pride?
- What challenges have you experienced during the turnaround process?
- Has the implementation of turnaround strategies improved your ability to be effective in the classroom as a teacher? If yes, how so?

Questions about turnaround strategies in the math program

- Tell me about the changes made in the math program at New Vision Academy due to the turnaround process.
- In your opinion, have these changes been effective and worthwhile?
    - What is a specific example?
- Has there been resistance from teachers, students, and/or parents in implementing these changes?
    - What is a specific example?
- What support have you received from the school district in implementing the turnaround process?
- What successes have you experienced in the math program due to turnaround strategies?

- What challenges have you experienced in the math program due to turnaround strategies?
- In your opinion, what barriers still exist for New Vision Academy?
- Where do you see New Vision Academy in 5 years?

Transcription

Transcription of the audio recordings was facilitated by an online application, *Transcribe*, found at www.transcribe.wreally.com. Transcription usually occurred within 24 hours of the interview to ensure accuracy. The text of the audio recordings was then modified to a Word document that would be analyzed in Dedoose.

Coding

Using Dedoose, an online application for analyzing qualitative and mixed methods research, all audio recordings of the interviews with teachers were coded and analyzed for significance. The primary themes of the conversations became successes and challenges of the implementation of the tenets of New Vision Schools Network at New Vision Academy.

Comprehensive Assessment Data

Aggregate standardized state test scores from previous years of students in mathematics were observed to verify if scores have improved over the years, and specifically when New Vision Academy began in 2012-2013. This data was collected from public record.

The names of the individuals participating in the review remain anonymous. No harm was intended in this study, and minimized exposure in the final conclusions of this

program review. Windy Creek High School, New Vision Academy, and the New Vision Network are all pseudonyms for actual schools.

A goal of the review was to conduct the work in a thoughtful, least evasive manner, especially for school personnel. The data collected from the teachers at the school was as simple and direct as possible. This program review was not intended to rate or judge administrators or teachers' performance but to measure the overall success of the mathematics program at New Vision Academy.

CHAPTER III

DESCRIPTION OF INNOVATION

New Vision Schools Network

The first idea of the New Vision Schools Model originated in 1990. The New Vision Schools Network was launched in 2004. Together with the New York City Department of Education and the United Federation of Teachers, they implemented the model at South Shore High School, now known as Brooklyn Vision School. The school operated on a 200 day school year without increasing the teacher work year and began a college, career guidance program (New Vision Schools Network, 2014a). This past spring, Brooklyn Vision School celebrated its fourth commencement ceremony with its senior students.

The vison for the New Vision Schools Network is simple: New Vision Schools Network transforms public schools to ensure all students – regardless of life circumstances – are prepared for success in school, work, and life. Their mission: New Vision Schools Network seeks to transform public education through sustainable, scalable strategies that drive student achievement and teacher effectiveness for all students and teachers (New Vision Schools Network, 2014a). The tenets of focus for New Vision Schools Network are:

- When teachers have more time with fewer students, good things happen
- When teachers have a realistic course and student load and are given adequate planning time, good things happen
- When students have the opportunity to link learning to life, good things happen

(Denver Public Schools, 2012 January 11)

Together with New Vision Schools Network, New Vision Academy launched its first year with grades 6, 8, and 9 in 2012-2013 with the mission, "New Vision Academy will be an exceptional public school where generations of learners prepare fully for life's responsibilities, challenges and opportunities so that students can Dream Bigger. Work Harder. Care More" (Denver Public Schools, 2012 January 11, p. 5).

Strategies in Mathematics at New Vision Academy

The beliefs and tenets of New Vision Schools Network have guided the work of New Vision Academy. In mathematics, blended learning, and online mathematics curriculums such as ALEKS and Khan Academy, have built the foundation for turnaround in mathematics instruction.

Blended Learning

Blended learning is a classroom norm at New Vision Academy. Blended learning, the pairing of human instruction and personalized computer curriculum, gives teachers and students the ability to discover immediately what a child's strengths and weaknesses are in a particular subject. In 2012, the investment firm Janus gave the school district $2.1 million to link teachers, students, and software in a mix of high- and low-tech learning. The money was used to hire a director of blended learning, train teachers and buy software and hardware (Augé, 2012). During a 90 minute block of time, students focus on mathematics in a Foundation Course. New Vision Academy configures classrooms with computing stations for students, with students rotating into different teacher or tech-based learning blocks during the day (Janus Foundation, 2014). Within the 90 minute Foundation Course, mathematics is taught via multiple modes of instruction or stations. The block of time is devoted to direct instruction, individual

student work, collaborative student work, and student work on the computer via one of two online programs, Assessment and Learning in Knowledge Spaces (ALEKS) or the Khan Academy depending on the grade level. The computer programs individualize the work for each student. Along with teacher oversight, the computer program meets the student mathematically where his or her needs are. With a classroom of 20-25 students, the teacher is able to rotate students through these stations within the 90 minute block of time each day.

As part of their day, math teachers at New Vision Academy have 150 minutes of time allotted each day to plan and collaborate. This time is guided by professional development and by individual collaborative grade level teams. During this time, especially during the second year, teachers were trained by New Vision Network staff members on the blended learning model in order to implement the strategy with fidelity.

ALEKS

Assessment and Learning in Knowledge Spaces (ALEKS) is an online, artificial intelligence-based assessment and learning system. ALEKS is used as a primary source of mathematics curriculum in grades 9 and 10 at New Vision Academy. ALEKS uses adaptive questioning to quickly and accurately determine what a student knows and does not know in a course. ALEKS then instructs the student on the topics she is most ready to learn. As a student works through a course, ALEKS periodically reassesses the student to ensure that topics learned are also retained (McGraw Hill, 2014a). For one student, the subscription cost for seven months is $31.25 (McGraw Hill, 2014b). ALEKS avoids multiple-choice questions and instead uses flexible and easy to use answer input tools that mimic what would be done with paper and pencil. When a student first logs on to

ALEKS, a brief tutorial shows her how to use these ALEKS answer input tools. The student then begins the ALEKS Assessment. In a short period of time (about 45 minutes for most courses), ALEKS assesses the student's current course knowledge by asking her a small number of questions (usually 20-30). ALEKS chooses each question on the basis of her answers to all the previous questions. Each student, and therefore each set of assessment questions, is unique. It is impossible to predict the questions that will be asked (McGraw Hill, 2014c). Also within ALEKS, many topics are available in both English and Spanish. This is beneficial to many Spanish speaking students at New Vision Academy.

Khan Academy

The Khan Academy is used as a primary source of mathematics curriculum in grades 6 and 7 at New Vision Academy. Unlike ALEKS, there is no fee for use of the Khan Academy. The internet site's resources are available to anyone, anywhere. At their own pace, students make use of the extensive library of content, assessments, and videos from any computer with access to the internet. As they progress, students access their own statistics and earn rewards monitoring progress. Khan Academy keeps track of what a student has learned and makes note of where a student is spending time. Teachers have visibility into what students are learning and doing on Khan Academy. With access to each student's data, teachers view and understand all of their students' data. A classroom summary of performance is available, or teachers can also dig deeper into an individual student's profile to figure out exactly which topics are problematic. Khan Academy empowers teachers by giving them access to data immediately. Teachers know instantly

if a student is finding success or struggling and needs additional instruction from the teacher (Khan Academy, 2014).

CHAPTER IV

FINDINGS

The partnership between Denver Public Schools and the New Vision Schools Network completed the second academic year of New Vision Academy in the spring of 2014. The reform brought about by the leaders of New Vision Schools Network has built a platform for students, staff, and administration at New Vision Academy to begin the change necessary in order for the school to show academic success. However, meaningful change does not happen overnight. After only two years of work, New Vision Academy has made strides, but still has work to do.

Themes from Coding

When coding was complete from work in Dedoose, themes emerged mainly in strengths and weaknesses within multiple categories. In regard to strategies for change in mathematics, these categories include blended learning, individualization for students, the online mathematics strategies, ALEKS and Khan Academy, and care for students.

Strategies for Change in Mathematics

Upon entering an agreement with Denver Public Schools with the goal of increasing academic achievement, New Vision Schools Network has the challenge of doing the near impossible, that is, increasing overall student academic achievement in a relatively short time. The focus of the New Vision Schools Network is to implement multiple strategies that are different from the traditional paradigm of secondary schools. These strategies include utilizing time, talent and resources differently than a traditional secondary model.

Blended Learning

One of the most spoken of weaknesses in teacher interviews was lack of training and support of these strategies, specifically blended learning. In the first year, the blended learning model was expected to be implemented by administration but many of the teachers had no background or training on how to implement it with fidelity and reliability.

> The messaging we received from admin and from New Vision Schools Network at the beginning of the year was that we needed to be implementing what they referred to as a rotational blended learning model every day and we learned pretty quickly that we did not, none of us had any experience with that and we had a very little training on how to do that so that was an instructional strategy that we were not ready for and it did not end up being that effective (Teacher).

> It was pretty challenging getting into the routine of doing blended learning and having rotations. I've never taught like that before for the past 3 years. It definitely requires a good amount of classroom management in order to trust the group that's not with you, but what I've found is it has made me a more effective teacher because I can take that small group that maybe hasn't met the learning goal and redo the lesson or provide extra supports to help them. I think in that sense it's been pretty effective for me and challenged me as a teacher (Teacher).

> I know that from talking to staff when I came on board last summer that the expectation was they should have been doing blended learning. There wasn't a lot of support for it. Some people were doing it, some people were doing it not well, some people weren't doing it at all (New Vision Schools Network).

> I think there were some things put in place around blended learning, they were using ALEKS in that first year, again you have a lot of new teachers that weren't quite familiar with it didn't have the level of support they needed, leadership wasn't where it needed to be (New Vision Schools Network administrator).

On the same note, a teacher felt that too many changes were taking place without proper training and support from administration and New Vision Schools Network.

> I see two really big things they kind of go hand in hand. The greatest struggle with New Vision in general and the greatest struggle with our school in particular is a lack of consistency and follow thru on implementation of all the millions of things that we try and fix. We tend to start things reaction oriented rather than proactively and that's really harmful. I also think that we have a very severe lack of systems that are clearly communicated and the accountability for those systems

> is non-existent and so I think those two things are extremely problematic and definitely our challenge moving forward, but those are also things that you have to take a step at a time. So if we see that begin to happen I think that it could really change the school for the better. I think it's going to take a lot of buy in and consistency that is not currently available. It's just not there right now so we'll see if that happens (Teacher).

In the second year, teachers were trained on the blended learning model with fidelity. From this training, many teachers spoke of strengths in professional development and collaboration in general.

> We have made significant growth with our students according to the STAR testing from the beginning of the year until we just retested in February for the most part we've seen significant growth in our students and that stems from the professional development time we get. That's the turnaround model, so the common plan time we get, that's a huge perk to be able to collaborate and plan. And as a new teacher to have this wealth of knowledge here and be able to go "that's a great strategy" or for them to point out, that's a common error kids make so let's try to teach it this way has been for me as a new teacher has been absolutely valuable to have that time (Teacher).

> [Professional development is] done daily and that's been a huge success building and developing a team of teachers. Kudos to admin because they let us really run it and do what's best for our kids because we are the ones who know them the best and are going to reach out to them (Teacher).

One teacher voiced the fact that school administration had changed during the first year of New Vision Academy. The teacher noted that New Vision Schools Network and the school administration are both well aware of issues that need to change.

> I think that is a problem that is inherent school leadership right now. Our school leadership is also pretty aware of that which is a really good thing. I definitely think they're not like running around with they're eyes closed unaware that this is a problem. They know it is a problem and it just takes so much time (Teacher).

Individualization, Connectedness, Personalization

The daily schedule at New Vision Academy allows for students to be in school up to thirty percent longer than a traditional secondary school. Instead of the school year consisting of 180, 6 hour long days, New Vision Academy students attend 200 days

during the year, 8 hours each day, allowing the students to focus on a particular subject, such as mathematics, longer. During a 90 minute block of time in the morning, students focus on learning mathematics. Instructional time is substantially extended at New Vision Academy, allowing teachers to change their instructional approach to meet students' needs while utilizing blended learning. In the interviews with teams of grade level math teachers at New Vision Academy, teachers noted strengths of blended learning: flexibility, individualization, connectedness and personalization.

> Anytime you can subdivide the class, you can sit down and work with some of the small groups and the other kids are not misbehaving because they have other things to do, then when you rotate it's really a series of small groups, so I think every kid feels connected to the teacher, we feel like were connected to the kids (Teacher).

> I think [blended learning] has been a benefit because it's really an IEP [Individualized Education Plan] for each kid. We don't have to talk theoretically of what they should be knowing, we can go drill down to what they actually don't know, what they need help with (Teacher).

Instruction shifts from lecture to allowing teachers the flexibility to constantly change the structure of the classroom based on their students' needs based on the technology used in the classroom. One teacher noted that the technology strategies have helped improve her ability to be an effective teacher,

> I would definitely say the integration of technology [has improved my ability to be an effective teacher] because you can use the blended learning [model] there is different opportunities to really put kids into pairs and collaborative groups… really understanding how to group kids, how to meet them where they are at… how to really structure classrooms so that kids are using the academic vocabulary and having those discussions and getting deeper, it has been really positive (Teacher).

Online Mathematics Strategies

Teachers commented on both of the specific technological online math strategies, ALEKS and Khan Academy. Each grade level team of teachers noted reasons why they

work with either ALEKS or Khan Academy. The 6th grade math team started out the school year using ALEKS, but found more success with Khan Academy.

> ALEKS is what we started out the year using in math and the high school uses it as well. I think we are kind of moving away from ALEKS into Khan Academy with the kids. I use Khan Academy in the classroom with my kids because it has the video instruction so my visual and auditory learners get both in there and then also it has examples directly related to the problems. So I've been using a lot more Khan Academy. I think in the middle school it tends to catch their attention more than ALEKS does for them it connects more with them (Teacher).

Similar to the 6th grade, the 7th grade math team started out with ALEKS, but shifted to Khan Academy in January. The team found that ALEKS was "clunky" and did not engage middle school students.

> I also like the fact that [Khan Academy] will tell us what they are struggling with so if they keep doing the same skill, and they keep messing it up, it will actually pop up and say they are struggling with it. We can see that in our math intervention classes, or if they are struggling on whatever we are doing in our morning classes, we can see that they are struggling with it and immediately target them to talk with in a one on one situation, whereas in ALEKS I don't know if you could once they got stuck there they couldn't move on (Teacher).

The 9th grade team explained that while they also started out using ALEKS, a transition to Khan Academy would likely be implemented for the coming year.

> I have used only ALEKS this year but with our new math team, that's transitioning up next year, I think that the Khan academy might be more beneficial for some students. Especially students who struggle with reading because ALEKS requires you to, if you don't know something read through an explanation, where Khan Academy will show you the videos. I think that having both platforms would definitely benefit students (Teacher).

The 10th grade team stated that they continue to work with ALEKS as a "dynamic" platform that offers success with sophomore students.

> ALEKS, it's artificial intelligence that gives a diagnostic [that] puts [students] where they have to be and doesn't let them get to harder skills until they've shown

> they can do the previous skills. They were free to go through any of the topics at their own speed (Teacher).

Care for Students

While not measurable, the feeling that all of the teachers genuinely care about their students was abundantly clear. With small classes, teachers are able to build truly caring relationships with their students. This strength was distinct in all grade levels. Speaking about the challenges outside of school, one teacher said,

> They wear it heavy on their back, they bring it in, we work real hard to leave [challenges] at the door, but it's hard, it's daily, it's a new day every day, but there's going to be daily challenges every single day (Teacher).

Another said, "I think another huge success of our school is that it is the people, the staff and administration genuinely love our kids" (Teacher). Most of all, it is not about demographics inside New Vision Academy.

> A lot of people look at [demographics], when you look at low socioeconomic and high poverty and high minority, and I'm just a firm believer, when I see kids I respect it, but I don't look at color, I don't look at socioeconomic, I'm like, 'Hey, you've got a brain, you can learn!' We're going to support you, so I don't want to hear any excuses (New Vision Schools Network).

Indeed, in the two academic years that New Vision Academy has been operational, as stated by teacher interviews, many positive academic achievements are starting to surface. It is speculative to say that this academic success will continue without more hard data, but by the overall sense of interviewing the teachers at New Vision Academy, there is a positive atmosphere there among the staff toward students and community.

Comprehensive Assessment Data

Teachers at New Vision Academy progress monitor students in mathematics on a 6 week cycle using the STAR Assessment. The company, Renaissance Learning, provides the STAR Assessments to schools nationwide. These assessments are designed to help teachers quickly assess students accurately and efficiently with reliable and valid data instantly, so they may target instruction and identify students who most need remediation or enrichment in mathematics (Renaissance Learning, 2014). While students began the year well below grade level, STAR assessment data has shown growth in mathematics at every grade level (New Vision Schools Network, 2014b). Over the course of the 2013-2014 school year, students achieved significant growth averaging 1.5 grade levels in math as reflected on the STAR mathematics assessment (Piersee, 2014). With this encouraging data, New Vision Academy was excited to see results on the TCAP assessment because the STAR Assessment is a predictor of results on TCAP. However, beginning so far below grade level, an average 1.5 grade level growth on STAR does not place students where they need to be for success on TCAP which is grade level based. The TCAP results were not as encouraging as anticipated.

Given that New Vision Academy has only been operational for two academic years; results on the Transitional Colorado Assessment Program (TCAP) are limited. However, New Vision Academy is gaining momentum and helping students make positive growth. Wendy Loloff Piersee, CEO of New Vision Schools Network, commented on her disappointment in the TCAP results, "we were challenged when we saw the results of the recent Transitional Colorado Assessment Program (TCAP) that indicated New Vision Academy student scores were largely flat, mirroring what was seen

state-wide. While there was growth indicated in middle school math as well as math in the high school, the results were not at all what we expected to see, especially when we are committed to ending the achievement disparity between White and minority students" (2014). As shown in Chapter I and again below, Table 7 shows Advanced/Proficient/Partially Proficient mathematics results at Windy Creek High School in recent years. Table 8 shows Advanced/Proficient/Partially Proficient mathematics results over the past two years in the respective grade levels.

Table 7

Windy Creek High School – Achievement in Mathematics, TCAP data, Advanced/Proficient/Partially Proficient results (Colorado Department of Education, 2014c)
*Last full academic year for Windy Creek High School Grades 9-12

Year	9th Grade		10th Grade	
		Total Number of Students Tested		Total Number of Students Tested
2007-2008	32%	243	27%	206
2008-2009	22%	236	24%	190
2009-2010	24%	214	31%	174
2010-2011	27%	199	28%	175
2011-2012*	30%	139	35%	155

Table 8

New Vision Academy – Achievement in Mathematics, TCAP data, Advanced/Proficient/Partially Proficient results (Colorado Department of Education, 2014c)

	2013		2014	
Grade		Total Number of Students Tested		Total Number of Students Tested
6	71.63%	141	48.35%	91
7	N/A		63.02%	146
9	23.16%	95	30.69%	101
10	N/A		23.16%	95

Table 8 gives a disappointing look at student progress at New Vision Academy. However, it must be noted that TCAP is only one measure of student growth, given at one moment in time for students. Also, 2014 is the last year of the TCAP assessment. In the spring of 2015, Colorado students will be assessed on the Colorado Measures of Academic Success (CMAS) in mathematics. The CMAS is fully aligned to the Colorado Academic Standards. This new online generated assessment will be more rigorous and will also align with the national Common Core State Standards. At this time, schools and districts state-wide are unsure of how CMAS will reflect student growth and performance. In essence, standardized state testing will be reinvented with the implementation of CMAS.

CHAPTER V

RECOMMENDATIONS AND CONCLUSION

The New Vision Schools Network model has been implemented for two academic years at New Vision Academy for students in the Windy Creek High School neighborhood. Indeed, it is too early to tell if the changes and innovation initiative will have long term success. However, administration and teachers alike are optimistic about the future. They look forward to the first graduating class in the spring of 2016.

I offer six recommendations for the future of New Vision Academy. First, training and purposeful professional development must continue with clarity and fidelity to ensure success for teachers and students. New Vision Schools Network has implemented program elements as promised based on their beliefs and tenets of practice. Along with this implementation, there must be a focus on clear expectations, strong communication and quality, on-going professional development. Only then will teachers have the tools to implement strategies with fidelity and commitment. There is no reason to believe that this work will not result in school improvement and student success across time.

The second recommendation is to ensure strong, consistent administrative commitment and leadership. Administrators often do not stay at a school for a lengthy amount of time. It seems that in today's educational world having the same principal for more than five years is a rarity at best. This leads to a lack of vision and lack of a stable environment for students. Ensuring administrative strength, buy-in, consistency and shared vision will help New Vision Academy build upon an already strong foundation.

Multiple accomplishments at New Vision Academy are noteworthy. The relationships built between students and teachers are important. The genuine feeling of community and family amongst the students, teachers, and administration is often difficult to nurture and sustain in a school of at-risk students (demographically speaking). The third recommendation is to extend the relationship even further outside the building walls. Inviting in neighborhood families, businesses and other community members will create pride and a shared commitment to the students within the school. Tapping into community resources to create mentorships and partners for learning will provide rich learning experiences for students.

Time during the school day is indeed being used differently at New Vision Academy. The extended time spent in the rotational blended learning model is providing students more uninterrupted time to build their skills in mathematics. Because students begin mathematics already multiple grade levels behind, they must catch up to their grade level peers. And, while state assessments do not reflect it, students are gaining knowledge and skills in mathematics as reflected on STAR assessments. Along with these assessments ALEKS and the Khan Academy are providing teachers with rich data to group and regroup students based on proficiency in order to differentiate instruction and personalize learning. The fourth recommendation is to continue to gather data to inform instruction and guide student learning. This data is current, powerful, and individualized for each student. This leads to more meaningful relationships between students and teachers because teachers can identify exactly what a student needs to build on their learning.

The mathematics curriculum used at New Vision Academy is solely built on web-based platforms, ALEKS and Khan Academy. In my original profession, I was a 7th grade math teacher for 9 years. Working with a textbook offered guidance and drove my instruction on a daily basis. Granted times have changed, students have changed, and technology has changed. However, a quality mathematics textbook can offer instructional variety and robust academic diversity. The fifth recommendation is to adopt a mathematics textbook to supplement the web-based programs, ALEKS and Khan Academy. A textbook may be able to offer more rigorous depth of knowledge skills and develop higher order thinking and reasoning skills for students in mathematics.

On a final note, the School Performance Framework (SPF) Rating and Indicator Summary Report was released by Denver Public Schools for the 2013-2014 school year in late September 2014. The SPF is a system to help schools focus on strengths and areas for targeted improvement (Denver Public Schools, 2014b). New Vision Academy received an "Accredited on Probation" rating and is designated the fourth lowest achieving school in Denver. Schools rated Accredited on Probation are performing significantly below expectations and are expected to dramatically improve student performance. This is dismal news, and as indicated prior, there are many challenges yet to be faced. These challenges will not simply vanish, but with strong leadership and a clear vision, New Vision Academy might make progress. Only two academic years in, it is too early to accurately verify if the school is moving in the right direction, but accordingly, if they do not make it in the near future, it will remain to be seen how another strategy is implemented to create a successful school. Therefore, the sixth recommendation is time for work to continue at New Vision Academy. Hopefully, the

students in the first graduating class of 2016 and beyond will be equipped with the skills necessary for college, the workforce, or the future of their choice. Time will tell.

For me, this process has opened my eyes to the educational learning possibilities of the future. After working in the same, mostly middle class, school district for twenty years now, I realize that I have only a narrow view of schools and students. For better or worse, this has been my personal experience. And, indeed, I am the eternal optimist. So when I met the staff at New Vision Academy, I hoped (and still hope) for the best for both staff and the students. However, I understand that this model just may not work to reform the dismal past of Windy Creek High School. I hope that at least five academic school years are given to the model. On the other hand, if the model absolutely is not working, the kids of New Vision Academy do not have the luxury of being an experiment. A student's future should not be a sacrifice in the name of innovation.

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APPENDIX A

ANALYSIS

Themes from Coding

When coding was complete from work in Dedoose, themes emerged mainly in strengths and weaknesses within multiple categories. In regard to strategies for change in mathematics, these categories include blended learning, individualization for students, the online mathematics strategies, ALEKS and Khan Academy, and care for students.

Interviews were conducted with grade level teams of teachers, not individual teachers. Therefore, strengths and weaknesses are coded for the group of teachers, not necessarily for individuals.

Blended Learning

Strengths:

Group 1:

- I think anytime you can subdivide the class you can sit down and work with some of the small groups and the other kids are not misbehaving because they have other things to do then when you rotate it's really a series of small groups so I think every kid feels connected to the teacher we feel like were connected to the kids.

Group 2:

- We try to do 20-25 [students] in the foundation courses in the morning which is math or humanities. Students have those courses for 90 minutes and that can be very beneficial because students are receiving additional time during the day in the areas that usually our students, they struggle with a lot more, and then they also provide opportunity for extra support in the afternoons in studio courses as well as opportunities to do electives in between science and art in addition to even math intervention if they still need the additional support so that's been really incredible…we are really hoping we get to see the benefits at the end of the year.

- The integration of technology because it is not a traditional setting. Because you can use the blended learning there is different opportunities to really put kids in to pairs and collaborative groups. Being in education so long really understanding how to group kids, how to meet them where they are at. Now it is the practice, how to really structure classrooms so that kids are using the academic vocabulary, and having those discussions and getting deeper, it has been really positive.

Group 3:

- A positive of the model is the focus of having 90 minutes of math instruction and I would say a positive is the 90 minutes of math instruction. Having that 90 minutes particularly with students who are traditionally very far behind and having that every morning with middle school students has actually been really helpful and I would say one of the pluses for sure.

Group 4:

- At the beginning of the year it was pretty challenging getting into the routine of doing blended learning and having rotations. I've never taught like that before for the past 3 years. It definitely requires a good amount of classroom management in order to trust the group that's not with you, but what I've found is it has made me a more effective teacher because I can take that small group that maybe hasn't met the learning goal and redo the less or provide extra supports to help them I think in that sense it's been pretty effective for me and challenged me as a teacher.

Group 5:

- I look at where some of those teachers are now compared to a year ago its night and day what they're able to do now from a blended learning being able to differentiate personalize use data group and regroup kids based upon formative or summative data.

- I attribute a lot of it to that whole blended learning perspective and being able to differentiate being able to group and regroup being able to give kids what the need on a daily basis.

- It's all part of our UIP plan blended learning was one of those pieces in there about the instructional practices it was a priority to everyone and I think it's definitely paid off because not only making it a priority but supporting the priority from a lot of different ways.

Weaknesses:

Group 2:

- At the same time technology doesn't always work, so can sometimes create some problems. And then kids don't always do what they are supposed to do on the technology, and working in a turnaround, where you have kids who really struggle with self-motivated work, being independent learners, that technology piece can be a struggle for a lot of our kids who are not independent learners.

- Our model, it is very tricky to figure out how to put it all together because with the rotational model you are not able to use the curriculum effectively and we've asked how to, so we just need extra support if that is what we are expected, how does it work in this environment because it is different, it is very different, and it is kind of frustrating. We are different from the other schools which is why they're going to see if something is going to change especially for our demographics.

Group 3:

- The messaging we received from admin and from New Vision Network at the beginning of the year was that we needed to be implementing what they referred to as a rotational blended learning model every day and we learned pretty quickly that we did not none of us had any experience with that and we had a very little training on how to do that so that was an instructional strategy that we were not ready for and it did not end up being that effective.

Group 4:

- At the beginning of the year it was pretty challenging getting into the routine of doing blended learning and having rotations. I've never taught like that before for the past 3 years. It definitely requires a good amount of classroom management in order to trust the group that's not with you.

Group 5:

- The expectation was that should have been doing blended learning. There wasn't a lot of support for it, some people were doing it, some people were doing it not well, some people weren't doing it at all.

- I think the beginning of the year there was a lot of teachers who had done a lot with blended learning they were scared to death of it.

- I think there were some things put in place around blended learning they were using ALEKS in that first year. Again, you have a lot of new teachers that weren't quite familiar with it, didn't have the level of support they needed, leadership wasn't where it needed to be.

Individualization

Strengths:

Group 1:

- I think it has been a benefit because it's really an IEP for each kid.

- The students really holding each other accountable for their learning, but even within the year I've noticed the students just holding themselves accountable for their work, but also getting on each other at times. Part of that is with ALEKS and making sure that your friends are reaching that goal, and if they're not they help each other out, so it's really great to see that interaction.

- I think every kid feels connected to the teacher, we feel like were connected to the kids.

- I think it's kind of tough for the 10th graders because they are like the top dog. I think that is something that new schools have to take into account the first 5, 6 years of a school. I fully expect that culture to keep improving.

- Hopefully, we are a school where we have high achieving students, but also that it's a school where you get a lot of real life application projects. I think that all starts with our model of having our intensives, and getting out into the field, and seeing real jobs, and doing these awesome projects that they do during intensives, and that gradually carrying over to all the regular classrooms where its very project based.

Group 2:

- We focus on really getting the kids more involved so they have more buy in in the school so they feel this is their place to be.

- I hope it becomes a school kids want to come to I really hope that it is a really cool school. We keep getting new students which is nice so I would like to see the growth as well with the kids but I would also like to see more pride within the school.

- It is a privilege to be here instead of this is just where you are because you live close; this is just the school you picked. It represents pride an opportunity for our kids to be successful. I ran into a parent this morning who said I want you to meet my daughter she's in 5th grade and I'm hearing great things about your school an before I was not going to send my kid to your school but now I actually considering it because of the teams I'm hearing that are there the teachers the

support what you guys are doing there I'm feeling a lot better about actually sending our kids. Yes you are! There is no reason why you shouldn't.

- When [parents] get to meet the teachers and see wow! They really do care about our kids. It puts these parents at ease because they see that we are creating a family and we hope that's the whole campus but that has been a really positive thing.

Group 3:

- I think the strategies have made me think outside the box more having to find different ways for them to practice and having to push them.

- We have been successful. The students were engaged and I think they learned.

Group 4:

- I think just our community in general has turned around. Kids are becoming a lot more responsive, they're starting to buy into school a little bit more because they're seeing success. There really has been a large percentage of kids who have seen success and are coming to class and they're doing their work and building that kind of school mentality that they didn't previously have.

- I think in general in a turnaround you have to come in knowing that kids either loved or hated the school. This year is very very different, very successful.

- I feel that there is a much more close knit community among our students. I think that we have incorporated a lot more programs to help outreach to parents we have an amazing parent liaison who supports us. I think it's appreciated and that parents are starting to see that were really invested in them and their children and we want to see success for both of them.

- I think parent engagement in the school in general has gone up particularly due to that parent liaison. I think that engagement has definitely increased but we also have a very small group of students in the first place.

Group 5:

- I look at where some of those teachers are now compared to a year ago its night and day what they're able to do now, being able to differentiate, personalize use data group and regroup kids based upon formative or summative data.

- We've got to stay active on the culture piece, we've got to keep focused on keeping creating and maintaining and sustaining that positive school culture where kids feel good about coming to school.

- You might be behind in reading, but if you stick with it you're going to become a good reader. You're behind in math, stick with it were going to help you become a good math student.

Weaknesses:

Group 1:

- I think the community has more gang affiliation or want to be they've got to act out. They've got to pose but we don't see a lot of gang activity in the building see a kid with a rag hanging out once in a while and you tell them put it in your pocket and they do

- They are embarrassed; they don't know the previous material so they act out because of that. We have situations with special ed kids that's in their IEP, there are discipline problems.

- Like every other school, you've got a classroom that has students that are at a 3rd grade level and you have students that are in 10th grade that might be at an 11th or 12th grade level, such a huge range, unfortunately a lot of those students are below grade level so it's obviously the biggest challenge trying to teach the content of 10th grade to students who are well below.

- The community of students we have now as 10th graders, last year when they were freshmen, brand new operation going on, that they retain some of the middle school behaviors and walk out of class whenever they want they get loud. This year I've noticed a substantial change in their behavior.

Group 2:

- There are challenges for the students and teachers. Real life challenges for students to connect to their life because they have a lot of problems.

- They wear it heavy on their back, they bring it in, we work real hard to leave it at the door, but it's hard, it's daily, it's a new day every day, but there's going to be daily challenges every single day.

Group 3:

- Overall I feel like it takes a lot longer to get through what we need to get through and they don't always grasp it fully, and it takes them a lot longer to get the

concept or whatever were talking about. Just having to move them through so many different things in one class period if a lot for them to handle.

- I think we're going to have to supplement again the pacing guide. [We] have tried to blend the Colorado academic standards with the incoming common core, although they're kind of the same thing, they're trying to do that, but there's still so many gaps as there always are because there are too many standards and not enough days.

Group 5:

- The same with math, if we're going to push kids to higher levels of math comprehension and get them to higher and more rigorous math standards, then you've got to give kids time to do it you've got to give them time to fail and learn from it.

Online Mathematics Strategies

Strengths:

Group 1:

- ALEKS gives them a verification test. You've met this once; do you know how to use it now? If not, it takes those skills away from them they have to re-earn them, so it's really dynamic.

- I've noticed the students holding themselves accountable for their work but also getting on each other at times. Part of that is with ALEKS, and making sure that your friends are reaching that goal, and if they're not, they help each other out, so it's really great to see that interaction.

Group 3:

- I think now using Khan Academy that's changed a little bit and trying to build in some projects that use technology used a lot that was really good.

- ALEKS is kind of like the Khan Academy of the 1990s. This one updates a lot faster, it's a lot more live, real time, and it's a lot more interactive for the kids, rather than for adults. I think that ALEKS, in terms of pulling reports, was really good for us, but I think Khan is a lot more kid friendly.

Group 4:

- The idea of incorporating ALEKS into the math curriculum, it really helps to focus on those splinter skills that we can't always take a whole day and teach to individual kids. I think the big picture there was that we have these kids who are grade levels behind, some are English Language Learners, some are special ed students, some are both, some of them are gifted, and we have such an array of students that when you did something that could be very specific to meet their needs. It's been successful, you have to get the kids to buy into it, I definitely think that we are turning around and you can see that based on not only the ALEKS scores but also on our STAR math scores. We had kids grow this year grade levels, those kinds of things are exciting. I have used only ALEKS this year but with our new math team that's transitioning up next year; I think that the Khan Academy might be more beneficial for some students, especially students who struggle with reading because ALEKS requires you to, if you don't know something, read through an explanation, where Khan Academy will show you the videos. I think that having both platforms would definitely benefit students.

Group 5:

- We're looking at potentially other resources this year, but the first couple of years we've used ALEKS and the kids have really liked it. It's been able to on a daily basis allow teachers to assess where kids are and differentiate kids can use Spanish or English that's been super helpful.

Weaknesses:

Group 3:

- We began the year using ALEKS found that it really didn't engage middle school students very well and that is was very clunky in terms of maneuvering through it so actually shifted in January to using Khan Academy.

- It was hard for them and it was hard for us because they've never done something like that. But were still struggling to come up with ways to do that kind of stuff, do those kinds of projects and activities on the computer in an effective way.

- It seems to be a lot more engaging for them I think because it's new. Because they did ALEKS all last year and so it's something different for them and I think it's just more fun for them even just the backgrounds different colors getting to earn different things it's just more engaging for them than ALEKS ever was ALEKS was difficult for us to manage.

- Khan Academy, that's changed a little bit and trying to build in some projects that use technology used a lot that was really good, but I still find myself not really authentically using the technology in my classroom but rather using it as something to get students out of the way for 20 minutes so I can work with a smaller group of students.

Group 5:

- They were using ALEKS in that first year again you have a lot of new teachers that weren't quite familiar with it, didn't have the level of support they needed; leadership wasn't where it needed to be.

Care for Students

Strengths:

Group 1:

- I think every kid feels connected to the teacher, we feel like were connected to the kids.

Group 2:

- I think another huge success of our school is that it is the people the staff and admin genuinely love our kids.

- They wear it heavy on their back, they bring it in, we work real hard to leave it at the door, but it's hard, it's daily, it's a new day every day, but there's going to be daily challenges every single day.

Group 4:

- There really has been a large percentage of kids who have seen success and are coming to class and they're doing their work and building that kind of school mentality that they didn't previously have.

Group 5:

- It's for all kids but I think particularly when you get kids that are academically deficient and behind, you really need to blend it, you really need to differentiate, you really need to personalize it. I think all kids deserve that, but when you're below grade level in reading and math you've got to accelerate kids, you've got to

get them caught up before it's too late, and you don't have any time to work with them, and then they can't access the American Dream. They can't get out there even if they're smart and wanted to go to college they may not be able to access it.

- We certainly can influence and have a larger control impact on when they walk in here for 8 hours a day.

- When you look at low socioeconomic and high poverty and high minority, I'm just a firm believer when I see kids I respect it, but I don't look at color, I don't look at socioeconomic, I'm like "Hey you've got a brain! You can learn! We're going to support you, so I don't want to hear any excuses!"

APPENDIX B

LITERATURE REVIEW

Educational attainment is more important to our economic success of the United States than ever before. As more jobs require more education, workers with only a high school diploma are finding it increasingly difficult to enter the middle class. And, in fact, while half of all people from high-income families have a bachelor's degree by age 25, just 1 in 10 people from low-income families do (White House, 2014). New Vision Academy reported a 96% free and reduced lunch population during the 2013-2014 school year (Denver Public Schools, 2014a). In theory, without intervention, this means only 45 New Vision Academy students will obtain a bachelor's degree by age 25. The model of instruction at New Vision Academy is trying to change this trajectory. In fact, studies show that technology based learning, increased instructional time, and personalized approaches have been shown to improve high school algebra scores, including for students who enter high school underprepared in math (Balfanz, Byrnes, & Legters, n.d., Pane, Griffin, McCaffrey, & Karam, 2013; White House, 2014). With regard to the model at New Vision Academy, there is an evidence base for the various strategies used by the school in an effort to turnaround math performance. However, more research and evaluation is needed.

Blended Learning Model

The blended learning model is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part a

supervised brick-and-mortar location away from home (Bernatek et al., 2012). New Vision Academy implemented blended learning by configuring classrooms with computing stations for students, with students rotating into different teacher or tech-based learning blocks during the school day (Janus Foundation, 2014). After two academic years, New Vision Academy did not see the academic growth that was expected from students. While students did make some growth, students started grade levels behind and had much ground to cover to meet expectations. With a School Performance Framework (SPF) rating of 26% in 2013, the Donnell-Kay Foundation does not define New Vision Academy as a "quality school" (2014). As a new school in the district, the Donnell-Kay Foundation is concerned. The Foundation states,

> The inability of the district to operate quality schools serving secondary grades either by opening new schools or by improving existing schools is deeply concerning. Indeed, the lack of progress in this area over the past five years should greatly temper the enthusiasm over the district's aggregated scores overall and raise serious questions about the efficacy of many of its policies. (2014, p. 19)

The Foundation continues in recommending a re-examination of innovation schools such as New Vision Academy. The analysis saw little substantive difference in academic outcomes between innovation schools and other district operated schools. The Foundation calls for the district to reconsider the autonomy, and expectations from innovation schools. The innovation schools effort has been deeply disappointing in both school model and results (2014).

Increased Instructional Time

At New Vision Academy, one piece of blended learning is increased instructional time. In a research study by Balfanz, Byrnes, and Legters (n.d.) comparing the efficacy

of two strategies for supporting under-prepared 9th graders in Algebra I, researchers found that there is limited rigorous evidence on the impact of different approaches or conditions under which they can succeed. Both approaches assumed that additional instructional time is needed for success. The increased class time provides teachers with expanded opportunities to explain and provide practice with Algebra topics, as well as to demonstrate alternative methods and approaches. Additional time combined with the curriculum made a statistically significant and educationally substantial difference in student outcomes, and hence may be considered part of the tools and tactics applied to enable all students to succeed with the common core. In the final analysis, however, large numbers of freshman in both groups still performed poorly in Algebra, leaving the districts in our sample far to go in securing success in Algebra for all students. In this study, the call remains for schools and communities to develop more informed collaborative strategies for supporting high need students in their pursuit of educational and socio-economic advancement.

Online Mathematics Strategies

New Vision Academy offers mathematics curriculum based on one of two web-based programs. These programs are Assessment and Learning in Knowledge Spaces (ALEKS) and Khan Academy. More research and evaluation is needed to determine the effectiveness of these programs with regard to student learning and achievement

ALEKS

While there are multiple research studies regarding ALEKS and college level students, there are few evaluations with regard to ALEKS and middle and high school students. However, Richardson, Kenney, and Koehler, conducted an external evaluation

of ALEKS in May 2014. The evaluation found that research on the effectiveness of ALEKS has shown an increased average successful learning rate when used as a supplemental or remediation tool in a traditional or web-enhanced classroom environment (Carpenter, 2006; Hampikian, 2006; Taylor, 2006). From the evaluation, some strengths and challenges are noted:

Strengths:

- The instant feedback provided by ALEKS allows a student to know immediately if he/she has a correct answer or not.
- ALEKS assess what a student is ready to lean and what they have already mastered to some degree, allowing teachers to utilize more targeted instruction (one-on-one and small group instruction) working with students who are at the same level or have the same difficulties.

Challenges:

- Some students are not developmentally ready for self-guided learning, and having the freedom to choose which topic to work on can be an issue.
- Very little higher-level mathematical thinking is built into the ALEKS curriculum. No question items require extended thinking or complex reasoning or require students to explain their reasoning and understand if or why an answer is reasonable.

Also, of note, the perception is that the teachers' role has been taken over by the use of ALEKS and that students are teaching themselves. Indeed the teachers' role has changed, but they are a very necessary part of the learning experience (Richardson, Kenney, & Koehler, 2014).

Khan Academy

In contrast to ALEKS, there is deeper research to date regarding Khan Academy in K-12 environments. SRI Education, with the support of the Bill & Melinda Gates Foundation, along with Khan Academy recruited a variety of California schools to participate in a two-year pilot starting in fall 2011. A majority of the schools served

students from low-income communities (Murphy, Gallagher, Krumm, Mislevy, & Hafter, 2014). A school in the study was demographically comparable to New Vision Academy. The findings included the following points. Like ALEKS, the use of a personalized learning tool like Khan Academy does not mean that teachers relinquish their responsibility for leading instruction. In the study, Khan Academy was used as one component of a broader system of math curriculum and instruction rather than as the primary source of instruction. From the study, some strengths and challenges are noted regarding Khan Academy:

Strengths:

- Student perceptions of their time spent on Khan Academy was high positive.
- Teachers reported that integrating Khan Academy into their instruction has increased their capacity to support their students in a number of areas.

Challenges:

- Lack of alignment of Khan Academy content with core curriculum posed a significant challenge for integrating Khan Academy into the classroom. This had a moderate to significant negative effect on their ability to use Khan Academy effectively with their students.
- Teachers need online content that is curated, assignable, and clearly mapped to grade-level content standards. Teachers could not easily specify the Khan Academy content they wanted students to work on, such as topics recently covered in a lesson or skills that students needed to develop or improve (SRI Education, 2014).

APPENDIX C

LIMITATIONS

When I first began thinking about what topic I should pursue for my dissertation, I knew that I would focus on mathematics. As a former math teacher, I am passionate about the subject and believe that all students have the chance to succeed in math. Unfortunately, the high school that I first contacted was uninterested in my review. After spending the good part of a semester trying to contact the first school, I was then able to contact New Vision Academy and was able to get my review started after district and IRB approval.

As a full time assistant principal and scheduler in a traditional 9-12 high school with approximately 1100 students, completing this review was not my full time job. If I had been able to dedicate myself full time to this review, I would have been able to interview more people and gain more insight and depth into the reform process at Windy Creek High School. Also, not having the personal contacts within the school or school district made it difficult and time consuming to start the process.

Given more time to dedicate the project, I would have gained more insight into the history of Windy Creek High School. For instance, I would have researched historical detail regarding the Windy Creek High School neighborhood and the changes that have happened over the years. I also would have spoken to former parents and students who chose not to attend Windy Creek High School. What were the personal reasons for choosing another school?

There are many more qualitative interviews that would have added depth to my review. I am remiss that I was not able to speak with the current principal of New Vision Academy as well as the former principal from the first year the school was open. An interview with the principal would have gleaned insight from an administrative point of view that would have added to my qualitative data. Interviews with current parents at New Vision Academy would have garnered a perspective regarding why they chose the school for their student. At the same time, interviews with students would have given rich data and opinions from students living the New Vision Academy model. Spending a week in the school, conducting observations, shadowing teachers would have given me a very personal experience into the model and the daily routine of the school. Additional neglected interviews include other New Vision Academy school leaders, funding administrators from both the Janus Foundation and the Donnell-Kay Foundation. There are no excuses here. Given the time frame and personal time restrictions to dedicate to the review, accomplishments were limited.

Looking back, gathering data to compare New Vision Academy to other comparable schools within the district would have been valuable. Making a comparison of the two new schools at Windy Creek High School, New Vision Academy and New Leadership Academy would have been an interesting evaluation and comparison. While each school has its own focus and model, how are they the same? How are they different? What are their successes and challenges? Are they meeting the needs of the neighborhood students and families? Beyond that, making a comparison between New Vision Academy and other comparable middle and high schools in the district. Are

students more or less academically successful at other schools with similar needs and demographics?

With regard to the assessment data gathered in the review, the data was all aggregated data for the school. What information could have been gained from individual student data on both the STAR and TCAP assessment? Would correlations have been made with regard to outcomes on STAR and TCAP? And, truly, another complete study might be able to answer the million dollar question – why does the STAR assessment data not directly and accurately translate to outcomes on the TCAP assessment for students?