

ABSTRACT

MORRIS-BRYANT, EDYE DARLENE. Learning and Leading with Technology: A Case Study of Centennial Campus Magnet Middle School. (Under the direction of Dr. Paul F. Bitting.)

The purpose of this single case study is to describe and document the implementation of a 1:1 laptop program for a middle school with a unique school-university partnership. The goal of this study is two-fold; one being to describe the implementation of a 1:1 laptop program and to document the lessons learned in leading a 1:1 laptop program. This study is significant as it reveals the journey of Centennial Campus Magnet Middle School designed as a model middle school for meeting the needs of young adolescents. The original conception of this school included connections with the university and community, curriculum collaboration to provide “real world” active learning about substantive issues and extensive use of technology.

For ten years, the school has worked to implement this concept. The school has reached many of its original goals, and this study focuses on the implementation of “extensive use of cutting-edge technology.” A single case study is significant as the goal is not to compare with other 1:1 programs, but to describe how the current practices of Centennial Campus Magnet Middle School through the implementation of a unique 1:1 laptop program supports the original mission and vision conceived for the school.

Through survey responses, artifact reviews, interviews and a focus group session, I determined that sustainability, structure and support were critical to the development and implementation of the 1:1 laptop program at Centennial Campus Magnet Middle School. The

lessons learned will benefit the Centennial Campus Magnet Middle School staff family and help other schools to develop 1:1 laptop programs and identify appropriate support needed in other school settings.

Centennial Campus Magnet Middle School continues to support a shared vision of not only being recognized as a model middle school focused on teaching and learning practices best suited for young adolescents, but to extend its philosophy and practices as a model for other schools. My role, as the primary researcher for this study is to tell the story of one school's journey to inform and inspire other middle schools to adopt practices that will provide a collaborative learning and leading environment integrated with technology.

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Learning and Leading with Technology: A Case Study of
Centennial Campus Magnet Middle School

by
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DEDICATION

I dedicate this journey to my children Christopher, Daniel and Sydney. My hope is that they will always work with a spirit of excellence and never give up on their dreams. I appreciate the love and support of my parents, WJ and Carole Morris. I am forever thankful for my faith, family and friends.

BIOGRAPHY



Edye Morris-Bryant is currently a principal with the Wake County Public School System at Centennial Campus Magnet Middle School. She earned a Bachelor of Science degree in Middle Grades Education with dual certification in Language Arts and Social Studies from North Carolina State University. She completed a Master of Education degree in Curriculum and Instruction at North Carolina State University. She earned National Board Teacher certification and served as president of the North Carolina Council for the Social Studies. She completed a Master of School Administration degree at North Carolina State University. Currently, she has state licensure in the areas of Academically Gifted, Instructional Specialist, and K-12 Principal. She received her Superintendent license in 2006.

Edye Morris-Bryant has been with the Wake County Public School System for seventeen years. During this time, she served as a classroom teacher at the middle school level for six years, a district lead teacher serving elementary schools, an instructional specialist on loan to the North Carolina State Department of Public Instruction, and an assistant principal for five years at the middle school level. She has served as principal for the past six years. Edye Morris-Bryant is passionate about building relationships with students, teachers, parents and the community to prepare all children to lead productive lives and contribute to society.

ACKNOWLEDGEMENTS

I extend heartfelt thanks to the Centennial Campus Magnet Middle School family for their dedication to developing students as learners and leaders. The commitment of the Centennial Campus Magnet Middle School family makes it possible to share such dynamic examples of learning and leading with technology. It is my hope that Centennial Campus Magnet Middle School will continue to share this remarkable journey with others.

I personally wish to thank my committee for their guidance and support over the years. This journey would not have been possible without the support of family and friends.

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CHAPTER 1

INTRODUCTION

In the field of education, many school mission statements charge as their responsibility the preparedness of students for productive citizenship and global understanding. Educators have the responsibility to reflect not only on what is happening within school walls, but also on preparing students with skills for an ever-changing workforce and world. This challenge is echoed consistently among government, business, and school leaders. Former Secretary of Education, Richard Riley comments, “We are currently preparing students for jobs that don’t yet exist...using technologies that haven’t yet been invented...in order to solve problems we don’t even know are problems yet” (Trilling & Fadel, 2009, p.1). United States Secretary of Education, Arne Duncan challenged educators in North Dakota, “I want to challenge you to think about what else can be done at the local level to prepare all students to be career-and college ready, to prepare all students to have the skills necessary to succeed in the global economy of the 21st century...” (*USA Today*, 2010). The advances of technology are changing at a rate so rapid that it presents instructional and fiscal challenges for school systems to keep pace in preparing students.

The Digital Learning Now! (2010) a bi-partisan report compiled by government leaders asserts, “Our vision is an education that maximizes every child’s potential for learning, prepares every child with knowledge and skills to succeed in college and careers and launches every child into the world with the ability to pursue his/her dreams” (p. 1). The goal of digital learning is to “customize and personalize education so all students learn in

their own style at their own pace, which maximizes chances for success in school and beyond” (Digital Learning Now!, 2010, p.1). Secretary of Education Arne Duncan emphasized the importance of technology in the United States Department of Education’s Race to the Top effort: “For the first time, state assessments will make widespread use of smart technology. They will provide students with realistic, complex performance tasks, immediate feedback, computer adaptive testing, and incorporate accommodations for a range of students” (Digital Learning Now!, 2010, p. 17). Assessments provide important data revealing what students know. The information from assessments is critical in differentiating instruction appropriately. Data can be used to design learning experiences that allow students to practice applying skills in the context of real world situations. This makes a connection to the learner that is relevant to them and the world in which they live.

Education’s big goal, preparing students to contribute to the world of work and civic life, has become one of our century’s biggest challenges...Learning for work and life in our times means helping as many children as possible learn to apply 21st century skills...A 21st century education for every child is the first challenge—the one that will enable all our other challenges to be met.
(Trilling & Fadel, 2009, p. 40).

Among the many aims of 21st century education, technology is one area that provides a dual reflection of looking at where we have been while simultaneously focusing on where we are going. We cannot ignore advances in technology when we compare what we may have used ten years ago or even last year has changed. For example, a phone or laptop looks and functions significantly different from one year to the next. Technology uniquely forms itself as a beacon, consistent in shining light for anyone who is lost or using less efficient

means of communicating, publishing, or inventing while at the same time persistent in its purpose of giving new direction challenging the most technologically perceptive users.

Heidi Jacobs (2010) stated, “As educators, our challenge is to match the needs of learners to a world that is changing with great rapidity. To meet this challenge, we need to become strategic learners ourselves by deliberately expanding our perspectives and updating our approaches” (p.10). Dr. Jim Goodnight, co-founder of the world's largest privately-held software company forecasted this very sentiment in his speech at the North Carolina Citizens for Business and Industry Annual Meeting in March 2005. He stated, “Obviously, if we're not producing a work force for the 21st century we will not be able to attract the industry we need to compete... We are still relying on a system that fails to reflect our changing world.”

Additionally, Goodnight provided a perspective about today's schools:

Schools should be more rigorous and relevant, he said, and should improve student-teacher relationships. To accomplish the goals, class sizes should be smaller... And computers should be on every desk... We don't take turns walking down the hall to check our e-mail at work [referring to the practice of students sharing computers in secondary schools] (speech, 3/16/2005).

Dr. Goodnight fully promoted this perspective of what today's schools encompass a year later, when in June of 2006 his corporation formed a partnership with a local school by equipping Centennial Campus Magnet Middle School with 1:1 laptop computers for every eighth grade student and teacher. This study explores the history of this school and its current implementation of a 1:1 laptop program that advocates the school's aim of “extensive use of technology.” The following terms are operationally defined as it pertains to this study:

Definition of Key Terms

Centennial Campus Magnet Middle (CCMMS) - The school serving grades 6-8 as the site for this study.

1:1 laptop program (one laptop computer for each student program)- Students have 1:1 access to a laptop computer in every core class. The laptops remain at the school site. School-

University Partnership- Relationship between the school and interaction among 12 colleges on the local university campus. The school has access to physical and human resources from the university.

School-business Partnership- Relationship between the school and a local private corporation. A local business partner provided funds to support the purchase of technology equipment, supplies, professional development, and a project leader position at CCMMS.

Background

Centennial Campus Magnet Middle School (CCMMS) has clearly defined its mission "...a collaboration of the Wake County Public School System and North Carolina State University, creates an exemplary educational community of young adolescents and adults who learn by actively discovering, integrating, and applying knowledge in a dynamic global and technological environment" (Concept document, 1995, p. 3). There are five unique emphases noted in this original planning document.

CCMMS will:

- Be highly integrative, exploring concepts, skills, and issues across many disciplines.
- Engage students in frequent, significant interaction with adults, both on the university campus and in the community.
- Emphasize "real world", hands-on active learning about substantive issues.

- Make extensive use of cutting-edge technology.
- Give careful attention to the cultural contexts and societal forces that affect adolescent development. (Appendix A).

The feature of making extensive use of cutting-edge technology stands out among unique emphases of CCMMS and aligns with 21st Century skill competencies. CCMMS has a business partnership with a local private corporation has made the “extensive use of cutting-edge technology” possible. With the implementation of a 1:1 laptop program at grade 8 in 2006 and the addition of grade 7 in 2010, CCMMS is the only 1:1 laptop program school in a school district serving 165 schools and approximately 149,000 students.

A decade has passed since the creation of CCMMS in 2000, and this naturally brings us to ask ourselves that all too familiar question: In ten years, does it matter? I often wonder if people ever check in ten years to see if it actually does. Ten years later, the question bear asking of where is CCMMS today? In reality, at CCMMS exploring the original conception of the instructional program and the implementation ten years later are of great significance as the responsibility of fulfilling the school’s mission drives decisions and resources for the school. In most circumstances, the process of using time as the litmus test as to whether the conception of an idea matches with the implementation of the idea is a natural next step approach. With technology, however, the approach to answering the question ten years later of concept implementation takes a different path.

As a model middle school on a university campus, Centennial Campus Magnet Middle has unique features that combine to meet the needs of young adolescents and shape their journey as learners and leaders. This school-university partnership is different from

traditional partnerships. Centennial Campus Magnet Middle School was described at its origin as "...the first middle school in the country to combine the resources of a respected school system, a major university and technologically advanced campus comprised of business, industry, education and government agencies" (Concept document, 1995, p. 3). The school-university connection was designed to "...involve an entire population of students, teachers and parents frequently engaged with faculty, students, and facilities of each of the university's 10 (now 12) colleges, as well as its corporate and government partners on [the business] campus" (Concept document, 1995, p.3).

As Centennial Campus Magnet Middle teachers plan lessons and units tied to curriculum objectives, they consider how the university contacts and resources can strengthen the learning experiences planned for students. A staff position, Magnet Outreach Coordinator, exists to serve as a liaison between the school and university. It is the role of the Outreach Coordinator to communicate opportunities for collaboration to take place among the now 12 colleges on the university campus. It is a reciprocal relationship in that the school not only seeks opportunities to collaborate, but also receives opportunities from the university.

Collaborative learning experiences with the university have increased to the extent that Centennial Campus Magnet Middle currently has 34 activities interacting with 12 colleges and 6 university departments. Other university resources include high tech research and development laboratories, small scale manufacturing facilities, libraries, multi-media production studios, research farms, design studios, and outdoor education. One of the unique

aspects of the school-university partnership and outreach programs includes the, "...use of cutting-edge technologies as a resource in all teaching and outreach areas" (Concept document, 1995, p. 4). It is powerful to see a sixth grade student sitting next to a university undergraduate student to write a reading response as a part of a novel study.

Likewise, eighth grade students use a video game, created by the university students, that applies their knowledge of microbiology unit concepts. In this virtual world, students are stranded on an island and must determine the diseases they encounter by analyzing the symptoms experienced by the people. These are just two examples of how the collaboration between Centennial Campus Magnet Middle and the university occurs within student learning experiences.

Centennial Campus Magnet Middle School's learning opportunities are also enhanced by its school-business partnership with a local corporation to develop a 1:1 laptop program at the school site. In the past four years through this partnership, Centennial Campus Magnet Middle has received over \$700,000.00 of technology resources and professional development from a local business partner. The 1:1 laptop program started in 2006 with 8th grade. The 1:1 laptop program expanded to 7th grade in the Spring 2010. The generous support received from the business partner includes much more than laptops. Teachers engage in on going professional development that not only includes training sessions, but also collaboration with other schools and site visits to other 1:1 programs. Teachers have access to curriculum software that helps to extend learning for teachers and students. In 2009, The Center for Digital Education reviewed the first year evaluation documents and shared preliminary

results of the school's 1:1 laptop program implementation efforts.

The Center for Digital Education reports:

At Centennial Campus Magnet Middle School students are not passive observers; they are in the driver's seat of the learning experience... Through the use of the laptops and software-which aligns with state education standards- students are able to receive instant feedback to know if they are on track. After only one year, participating students' state-mandated computer test results improved, and parents in the community showed increased interest in having their children attend the magnet school (Center for Digital Education, 2009, p.4).

The vast resources made available to Centennial Campus Magnet Middle strengthen its mission.

Purpose of the Study

The purpose of this single case study was to describe and document the implementation of a 1:1 laptop program for a middle school with a unique school-university partnership. For research purposes of this single case study, the 1:1 laptop program at this site was operationally defined as an instructional program where there is one laptop for each student in every core classroom while at school. The goal of this study was two-fold; one being to describe the implementation of a 1:1 laptop program and to document the lessons learned in leading a 1:1 laptop program. This goal proposed a thorough representation of reflecting on the original conception of "extensive use of cutting-edge technology" with current practices and the implementation of the 1:1 laptop program.

Reeves (2006) commented on the process of reflection, "Reflective leaders take time to think about the lessons learned, record their small wins and setbacks, document conflicts between values and practice, identify the difference between idiosyncratic behavior and long

term pathologies, and notice trends that emerge over time” (p. 49). An additional aspect of this study was to tell the story of how this journey equips other principals who seek to implement and develop 1:1 laptop programs. “Stories are a powerful tool for engaging people emotionally and intellectually and for leading them into the future...successful leaders must have teachable points of view about ideas, values, energy, and edge. It is through stories, however, that they tie them together and teach and energize others to move from the present into a winning future.” (Tichy & Cohen, 1997, p.42).

As the primary researcher for this study and as principal of Centennial Campus Magnet Middle School for five of the ten years the school has operated, it was important to lead this case study examining how the school’s current practices match the original concepts proposed for the school. As principal, it was critical to take this reflective inventory. I have full access to historical and current data needed to assess the school’s progress. I also have full access to the study site and participants. Above all, I have a desire to use this information for the continuous improvement of the school.

Although Centennial is unique in its instructional program and access to resources, the technology integration practices may be replicated in other schools with different variations of 1:1 computing capability. This study will benefit the educational field in gaining insight to the types of experiences and challenges faced by school administrators, faculty and staff in the journey from conception to implementation of a 1:1 laptop program. I consider myself as a lead ambassador able to share in detail with other school leaders the steps to implement a 1-to-1 laptop program and the lessons learned. Overall, the study focuses on a

single technology program within a model middle school-university partnership that was conceived in the original design of the school with unique emphases developed to guide the establishment of the school and its instructional program.

Significance of the Study

This study is significant as it reveals the journey of CCMMS designed as a model middle school for meeting the needs of young adolescents. The original conception of this school included connections with the university and community, curriculum collaboration to provide “real world” hands-on active learning about substantive issues and extensive use of technology. For ten years, the school has worked to implement this concept. The school has reached many of its original goals, and this study focuses on the implementation of “extensive use of cutting-edge technology.” A single case study is significant as the goal is not to compare with other 1:1 programs, but to describe how the current practices of CCMMS through the implementation of a unique 1:1 laptop program supports the original mission and vision conceived for the school.

The Setting

The setting of this single case study is in the second smallest middle school out of thirty-two middle schools. This district is the largest school district in the state and 18th largest school district in the United States. CCMMS is recognized in the school district as a leader in innovative technology practices. Although a sense of utopia may be perceived due to the access to resources not found in other schools, the reality of learning and teaching challenges is not absence from CCMMS. A smaller, widely diverse student population brings

fewer staff positions, instructional challenges, and implication challenges to secure funding. Inspiration for the educational field comes from the possible replication and sustainability that others can gain from sharing the CCMMS experience.

This study will identify the lessons learned from implementing a 1:1 laptop program. It is significant as there are aspects that can be implemented in schools with varied levels of 1:1 laptop student access. The message is that the learning is in instruction, not just the existence of computer hardware. The lessons learned will further assist in helping interested educators to know what works and does not work in a 1:1 laptop program. This single case study of a 1:1 laptop program will describe the various components and resources needed in a middle school with many of the essential components of a model middle school in place.

Research Questions

There was a clear vision and plan developed for Centennial Campus Magnet Middle School when it opened in 2000. The overall goal is for this study to inform the Centennial Campus Magnet Middle School staff and community of its progress in achieving one of the unique emphases on which the school was conceived, while providing direction for continuous improvement in extending the “extensive use of cutting-edge technology” in a dynamic, global, technological and educational setting.

- How was the 1:1 laptop program at Centennial Campus Magnet Middle School originally conceived?
- How is the 1:1 laptop program today consistent with the original mission of the extensive use of technology?

- How was the 1:1 laptop program implemented?

These questions will unfold details of a powerful story revealing what it takes to develop and implement a 1:1 laptop program. Reeves (2006) supports the use of stories as he asserts, “stories are a powerful tool for engaging people emotionally and intellectually and for leading them into the future” (p.50). This study will explore the research questions in order to gain valuable information and next steps for the Centennial Campus Magnet Middle School’s continuous improvement.

Limitations

This single case study focuses on the account of one school’s experience. It is not the intent to compare this school’s 1:1 laptop program to other sites, as there is great value in exploring the conception of a school’s overall vision with the implementation and development of the 1:1 laptop program in this setting. This study focuses on the connection of one program within one site that supports ten years of working toward a school’s vision. In addition, reflecting on the ten-year journey is of great benefit to educators who seek to create unique collaborative programs in a middle school setting.

One limitation is that this study examines one program in a model middle school environment. In addition, despite the school’s existence for ten years, the laptop program at grade eight began in 2006 and grade seven is just starting in 2010. However, the focus of this single case study is to describe and document the implementation phase of the 1:1 laptop program as part of the original vision of the school. Another limitation would be the possible inability of other schools to replicate the 1:1 laptop program because of the unique resources

found only at CCMMS and its contrast from other district middle schools. As expressed in the initial school plan, “Unquestionably, [Centennial Magnet Middle School] will be a unique school having certain resources that other [district] schools do not. While no school will be able to do all that [Centennial Magnet Middle] undertakes, many will be able to implement individual ideas, activities, and programs.” (Concept Plan, 1995, p.6)

While the concept of a school-university partnership is unique to the school in this study, the middle school concept experience is not. Many middle schools are continuing in the transition from a junior high model by incorporating some of the concepts: flexible scheduling, collaborative planning, differentiated instruction and flexible student grouping, and supportive elective programs to meet the interests and needs of students. The shared vision of Centennial Magnet Middle School is to be recognized not only as an exemplary school, but also extend ourselves so other schools can learn from our experiences.

Another limitation is that this study does not focus on test scores or other measures of academic achievement. The focus is on the implementation and lessons learned in developing the 1:1 laptop program. This study does not seek to assess the program’s effectiveness with regard to increasing student achievement. However, the researcher acknowledges student achievement as the desired outcome associated with any program in the school. The focus is on the development and “how to” phase of 1:1 laptop program implementation. The journeys and perspectives of teachers and 1:1 laptop program leaders are captured throughout this research study. The individual and collective voices of the teachers and leaders represent the history and foundation of the 1:1 laptop program at Centennial Campus Magnet Middle

School.

Time is another limitation associated with this study. Although the 1:1 laptop program has been in existence for since 2006 in eighth grade, seventh grade is in its first year at the time of this research study. Clearly, half the teachers involved in the study have limited experience with implementing a 1:1 laptop program. Student and parent voices are not explored in this study. While the focus of this research study does not include the in depth perspective of students and parents, future research may want to explore this perspective to determine the long-term impact of the 1:1 laptop program. The identified limitations are minimal in view of the overall benefits the information gained from the student will afford the school, school system and university partnership.

Historical Context

A View of My Journey

There is much to be said for full circle moments. Full circle moments are times when things come together again in a time and place that is familiar. While familiar, it is yet different, as experiences have sharpened our senses such that we have a clearer picture of how we view the world and ourselves in it. We become able to filter moments with wisdom and experience urging me to truly ask that all too familiar question: In ten years, has the school fulfilled its original purpose? Has CCMMS accomplished what it said it would do and if so, how does the 1:1 laptop program contribute to the fulfillment of the CCMMS mission?

In the early 1990's I was junior in a middle grades education program at a local university, I sat in a middle grades teaching methods course and listened to discussions of a

novel idea for an exemplary middle school from my professors. One of my course assignments was to identify the essential components and ideal resources for creating a model middle school learning environment. The notion of the school being located on a university campus physically attached to a teacher training center that would provide professional development for teachers was novel at that time.

In the fall of 1993, at the time of my graduation from the Middle Grades Education program, a planning committee composed of the local school district teachers and administrators, along with university professors and local business representatives began the process of developing an educational program and governance agreement for the school and Teacher Development/Outreach program (Plan, November 1995). I was embarking on my first year of teaching at the same time the now Centennial Magnet Middle School was being planned. In 2003, I visited CCMMS as a site participant in the Assessment Center course for assistant principals who aspired to one day become principals.

As I walked the halls of the school, I was struck by how much the physical structure of the school supported the middle school learning philosophy. I spent the day filled with planning, writing correspondence on a variety of issues and participating in simulated exercises. Exactly ten after my start as a teacher and the plans for the model middle school were being made; there I stood taking a big step towards reflecting on my knowledge, ability, skills, and aspirations of becoming a principal. This professional journey brought me to answer the question: Would my hearing about the very conception of the model middle school idea have a personal impact on my professional journey in ten years? Little did I know

the answer would be a resounding YES! I walked through the doors of Centennial Campus Magnet Middle School on June 5, 2006 as its second principal.

On June 20, 2006, I was invited to a meeting that would in the short-term change ten classrooms, but in the long term would change classrooms across the state. I was greeted with an invitation to meet and discuss a great gift given to our school with a guarantee that Centennial Magnet Middle could make something happen across the state that would benefit learning and teaching in thousands of classrooms. Centennial Magnet Middle School received 200 laptops for an eighth grade 1:1 laptop program. The gift of technology was accompanied by a request for our teachers to use a software curriculum resource package. This software allows teachers to access curriculum resources, primary sources to reinforce objectives and skills covered in the Standard Course of Study for all curriculum areas.

The Past Meets the Present

It was a warm June afternoon when three eighth grade Social Studies teachers were brought together to develop classroom assessment items for the State Department of Public Instruction Classroom Assessment Team. Three teachers, one from the mountains, piedmont, and coastal region, sprawled on the floor with the Standard Course of Study outlining the curriculum, lesson plan notebooks, and stacks of textbooks spread out among them to develop assessments. The atmosphere was filled with curriculum chatter, as these teachers shared stories about students, hobbies and ideal teaching experiences. It was remarkable how three colleagues who just met for the first time could ignite the development of an extensive technology learning experience for teachers and students across the state. Recognizing that

“true” learning extends far beyond the four walls of the classroom, teachers must create opportunities for students to broaden their view of the world in which they live.

I, as one of the three selected teachers, had the opportunity to collaborate with two other teachers to create a distance-learning project designed to expose students from different regions of the state by heightening their awareness of our state government, geography, and history as well as fostering their communication skills. This vision originated from the mind spring of three teachers from different parts of our state. Students integrated technology in their learning by conducting a videoconference, sending weekly weather reports, maintaining a journal, writing papers, and developing a portfolio covering a region other than the one in which they lived. We continued this journey with technology for five years. Each year we added a grade level or a new activity; we changed points of emphasis and themes over the years. One aspect that never changed was that curriculum determined what was taught and technology documented what was learned.

The significance of the aforementioned experiences reflects the power of stories in documenting the journey of learning and leading with technology. “Stories are a powerful tool for engaging people emotionally and intellectually and for leading them into the future...successful leaders must have teachable points of view about ideas, values, energy, and edge. It is through stories, however, that they tie them together and teach and energize others to move from the present into a winning future.” (Tichy & Cohen, 1997, p.42). The focus of this single case study is to describe and document how Centennial Campus Magnet Middle School moved from conception to implementation of an innovative learning

environment through the “extensive use of cutting-edge technology”. The goal of this study is to determine if the ten-year journey has in fact made any difference.

Summary

The focus of this study is to describe and document the initial implementation of a 1:1 laptop program. It is critical to the educational field to study an exemplary model middle school leadership for two important reasons. First, the original conception of Centennial Campus Magnet Middle School was planned and communicated to the community. Ten years later, we look closely at the development of technology as one part of the overall vision. The educational field will benefit from a study that describes the conception of vision and implementation of a mission as a shared responsibility among schools. Second, the implementation of this program will inform the Centennial Campus Magnet Middle School staff family and help other schools to develop 1:1 laptop programs and identify appropriate support needed in other school settings.

CCMMS continues to support a shared vision of not only being recognized as a model middle school focused on teaching and learning practices best suited for young adolescents, but to extend their philosophy and practices as a model for other schools. My role, as the primary researcher for this study is to tell the story of one school’s journey to inform and inspire other middle schools to adopt practices that will provide a collaborative, powerful learning and leading environment integrated with technology. The educational community has been waiting to hear again from Centennial Campus Magnet Middle School. In the words of the school’s founder and first principal Dr. Ken Branch,

Therefore, it is my hope that someone will continue to document the evolution of Centennial Campus Middle School, its program, and its partnership with North Carolina State University as the story of this special school continues to unfold. Finally it is my hope that the faculty and staff of Centennial Campus Middle School will continue to dance (Branch, 2003, p. 171).

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The goal of this case study is two-fold; one being to describe the original conception of “extensive use of cutting-edge technology” with current practices and the implementation of the 1:1 laptop program. In addition, the goal is to document the lessons learned in leading a 1:1 laptop program. The review of related literature will focus on three interrelated topics organized under the headings of 1:1 Laptop Programs, Middle School, and School-University Partnership. The literature review discussion of 1:1 Laptop Programs includes research on the need and examples of 1:1 laptop programs. This research will highlight the benefits and challenges experienced by 1:1 laptop schools. This section will provide background information for the research questions:

- How was the 1:1 laptop program at Centennial Campus Magnet Middle School originally conceived?
- How is the 1:1 laptop program today consistent with the original mission of the extensive use of technology?
- How was the 1:1 laptop program implemented?

The literature review discussion of Middle School and School-University Partnership includes research on the history of the middle school concept and school-university partnerships. This section will provide background information for the research question: How is the 1:1 laptop program today consistent with the original mission of the extensive use

of technology? The focus of this aspect of the study is to explore how the original conception of Centennial Campus Magnet Middle School matches with current middle school and school-university practices. With this review of literature, other areas of research become evident and document the need for this study.

Technology Integration and 1:1 Laptop Programs

This single case study focuses on the beginning stages of 1:1 laptop program development. The focus on implementation is important in developing a quality 1:1 laptop program. However, when reviewing 1:1 laptop programs, the question “Does learning with laptops make a difference in how students achieve?” is valid and relevant in the discussion. This focus holds especially true as schools, businesses and government must be selective as to how funding should be allocated. The funding decision must rest on far more than needs for the future and current educational trends. Funding must support practices proven to engage students and increase achievement for a particular academic setting.

New national standards signal this same laser focus to reverse what education reformers and lawmakers cite as “...watered-down expectations in the face of a decade-long federal push to get greater percentages of students scoring higher on state skills tests”. (“USA Today”, 2010). The proposed revisions of the 2001 No Child Left Behind school reform law are a push to provide a new focus. Dane Linn reports, educators demand “... ‘fewer, clearer and higher’ standards that are uniform nationwide, giving students in urban, suburban and rural school districts equal access to high-quality material” (“USA Today”, 2010).

Changes in national standards are coming at the same time that many school districts

are forced to close schools due to lack of financial resources. For example, the plan, passed by the Kansas City school board, to close 29 out of 61 schools at the end of the school year was proposed by Superintendent John Covington. Covington reports the reason being, “One reason it’s[quality of education] not good enough is that we’ve tried to spread our resources over far too many schools” (“USA Today”, 2010). While many districts and schools are coping with shrinking budgets, now more than ever school leaders must make sure their focus and funding are clear. The Center for Digital Education discusses the challenge school leaders face with new standards and shrinking budgets,

Often, lack of funding can suppress a leader’s ideas for change. After all, the basics must be covered first before experimental programs and new technologies are purchased... While it is true that during a crisis leaders have a willingness to work together toward a common goal, explore ideas previously dismissed and take greater strides toward efficiency and improved learning; as innovative leaders know, the opportunity comes much earlier with everyday ideas, inspiration and dreams for achieving more (Center for Digital Education, 2009, p. 3).

In this type of climate, school leaders have to stay informed about future projections in order to make wise decisions in the present that are best suited for their academic settings.

Guiding questions for school leaders are posed by Heidi Jacobs, “What are the key global trends that we need to pay attention to? What does a well-educated person in the 21st century need to know and be able to do? How can we get all of our students globally ready?” Jacobs discusses the five global trends in *Curriculum 21 Essential Education for a Changing World*. The five global trends are identified as Economic, Science and Technology, Demographic, Security and Citizenship and Education.

Economic Trends

The Committee for Economic Development (20e06), a nonprofit organization of more than 200 business leaders and university presidents, describes a workforce that “...increasingly need employees with knowledge of foreign languages and cultures...to work effectively with foreign employees and partners” (p. 1-2). This economic trend is supported by the fact that in 2004 “... one in five U.S. jobs is tied to international trade, a proportion that will continue to increase.”

Science and Technology, Demographic Trends

Trends in the area of Science and Technology support the economic trend in Thomas Friedman’s 2005 work, *The World is Flat*. He describes how technology has advanced and increased the efficiency of what people can accomplish. Friedman also discusses how the our work collaborations now span the globe increasing the importance of having the ability to work with people of other cultures and languages in a professional setting. Demographic trends point to diversity in US communities increasing as new immigrants come from all over the world. This diversity reflects the world and is “...transforming the cultures of local communities, workplaces...that requires new skills and perspectives” (Jacobs, 2010, p.99).

Security and Citizenship, Education Trends

The trend in the area of Security and Citizenship links with our relationships with other cultures and understanding one another. “US citizens will increasingly be called upon to vote and to act on issues” dealing from energy to national security. The fifth trend of education is of particular interest to the aims of this research study. “International

comparisons from the Organization for Economic Co-operation and Development (OECD) show the United States is now 18th in the world in high school graduation rates and 13th in college completion (OCED, 2008). It is clear that many students may not be prepared for “...demands and opportunities of this global age...” (Jacobs, 2010, pp. 98-101). While complex, it is simple; students must be prepared to compete globally. Patterns across the global trends discussed here reflect themes such as collaboration, diversity, language, and cultures. Technology breaks barriers and is a key factor in preparing our students for the future.

Wavering (1995) noted that “...a teacher’s job is to get people ready for the world, not just the classroom beyond the current grade level” (Jacobs, 1995, p. 235). In 2010, preparing students for the world looks different from 1995. Technology has advanced such that “...the amount of information involved is already well beyond the scope of anyone’s ability to master in its entirety, regardless of one’s IQ- and IQ accounts for only 4% to 10% of career success anyway.” (Pink, 2005, p.58). Friedman’s (2005) work on the global realities of a flat world, “Knowing how to ‘learn how to learn,’ will be one of the most important assets any worker can have” (Jacobs, 2010, p.239). We have to extend learning beyond the classroom door, engaging students in experiences that develop their ability to work together with respect for ideas and people that are different from their own.

Education Week featured an online article by Gewertz (2007), “In an increasingly global, technological economy, they say, it isn’t enough to be academically strong. Young people must also be able to work comfortably with people from other cultures, solve

problems creatively, write and speak well, think in a multidisciplinary way, and evaluate information critically”. This stance is also supported by the National Center on Education and the Economy’s (2007) latest report, *Tough Choices or Tough Times*:

Strong skills in English, mathematics, technology, and science, as well as literature, history and the arts will be essential for many; beyond this, [job] candidates will have to be comfortable with ideas and abstractions, good at both analysis and synthesis, creative, innovative, self-disciplined and well

organized, able to learn quickly and work well as a member of a team and have the flexibility to adapt quickly to frequent changes in the labor market as the shifts become ever faster and more dramatic. (p.8).

The Charge for Middle Schools

Based on the five trends and needs of America’s workforce, a critical question becomes, how will schools prepare students for a future in a rapidly changing world? Specific to middle schools, Jacobs reports that “Using technology to empower adolescent learners with the capacity to make meaningful and significant differences in their lives fundamentally changes learning from a passive process of consuming to an active process of producing. They learn they can give to others, that they can make a contribution that is valued, that matters... “(Jacobs, 2010, p.40) Technology, incidentally, has reinforced those elements that make the middle school concept unique—collaborative learning, strong student voice, and students engaged with larger world issues. Tyson states, “...today’s technology tool set is not something added to the middle school setting ...the digital environment affords us a new way to conduct teaching and learning that is relevant, engaging and leverages the cognitive and creative capacity of young adolescents”(Jacobs, 2010, p. 40).

Therefore, what can schools do, especially in the wake of strained financial conditions, to equip students with the necessary skills and learning experiences that will prepare them for the future? In *The Tipping Point: How Little Things Can Make a Big Difference* (2000), Gladwell describes how a trend or an idea starts out small and then “tips,” becoming ubiquitous. One new trend that is tipping is 1:1 laptop programs for students. The report from the National Center for Educational Statistics (2005) indicates the prevalence of 1:1 laptop programs, “8% of surveyed schools indicated they had some type of laptop program already in place, and another 6% were planning programs.”

Significantly, higher achievement was found after one year of students’ using laptops in the Harvest Park Middle School program. A total of 259 middle school students were followed for three years. The data collection included students’ overall cumulative grade point averages (GPAs), end-of-course grades, writing test scores, and state-mandated norm- and criterion-referenced standardized test scores. The baseline data for all measures showed that there was no statistically significant difference in English language arts, mathematics, writing, and overall grade point average achievement between students with laptops and non-laptop students prior to enrollment in the program. However, students with laptops showed significantly higher achievement in nearly all measures after one year in the program.

Implementation Phase of Middle School Statewide Programs

Laptop programs in Virginia, Maine, and Michigan are noted for their success over time with 1:1 laptop programs. The benefits and challenges experienced in each of these states have been highly publicized. Pamela Livingston explored laptop programs that work in

her 2006 publication, *1-to-1 Learning*. In 2000, Henrico County, Virginia was in its fifth year of district wide 1:1 laptop program implementation. Although the commitment was strong, there were challenges with trying to provide the best technology for the students. The school buildings were older and not equipped with space and electrical capacity. The move to 1:1 laptops was necessary, and the planning began at the district level to secure the funding. Nearly 30,000 laptops are now in the Henrico program. Time and professional development helped teachers become comfortable and prepared for the laptops. Teachers saw how laptops strengthened relationships between home and school, increased communication and assisted in grading.

In Maine, the scope was statewide, initially providing every seventh grader in Maine with a laptop computer. Learning with technology has lit a spark beyond the individual school level. So much that, in Maine the entire state took on a widespread 1:1 laptop implementation. Maine was the first state in the nation to take on the task of widespread implementation of one-to-one (ubiquitous) computing through the Maine Learning Technology Initiative (MLTI). MLTI has as its mission to transform teaching and learning in Maine's public schools. Transforming teaching and learning is accomplished through its goal to provide a laptop computer to every student and teacher in grades 7 through 12. Schools have had infrastructures installed for wireless, portable Internet access; and wireless computers have been deployed to every 7th and 8th grade student and teacher in Maine. More than 37,000 laptop computers have been installed in Maine's 239 middle schools. In addition, teachers have been provided professional development opportunities, including two

days of initial training, regional content-based workshops, and local offerings.

The governor had a budget surplus and could afford to fulfill this vision. Bette Manchester, the laptop statewide program leader, describes the level of teacher support:

Our meetings with principals, technology personnel, and teacher leaders are held within each of the nine superintendent regions in Maine. Thirty building leadership groups meet within each region. During the first 2 years of the project, we met 3 or 4 times a year along with a 2 ½ day retreat for the teacher leaders and 2-day workshops for the leadership team regarding the change process, embedding technology in the curriculum and data driven decision making. We continue to meet twice a year during the school year in each region of the state, convening 30 schools at a time in the fall and spring. We also hold workshops each year at the principals' conference. (Livingston, 2006, p. 48)

In Michigan, speaker of the house Rick Johnson was looking for ways to help the students in need. He studied the programs in Maine and Henrico County, Virginia. He began in Michigan with eight different 1-1 laptop programs. The schools could decide to have laptops or handhelds funded, as long as they were wireless. A total of 8,000 students were involved. Michigan now has 22,000 students using laptops in their Freedom to Learn program. Bruce Montgomery the laptop program leader describes the teacher support:

Teachers receive professional development through state demonstration and advisory sites. "Michigan manages the program like a business, with planning tools, timeframes and assessments: 'We use both formative (ongoing) and summative evaluation tools to measure success in the classroom and across the state. Our classroom assessment tools allow us to measure our progress school by school, and student by student'" (Livingston, 2006, p.55).

The three schools systems have one critical element in common- a project leader. In

Henrico County project leader, Lloyd Brown led the initiative, with one of the goals being to encourage innovative teaching:

We wanted...fewer lectures and more engaged, active learning using dynamic, current content...Today, in many of our classrooms, there is a new sense of discovery and the feel of a research laboratory. Every student has access to a universe of online libraries. A class exploring Italian Renaissance artists, for example, reaches a depth and breadth of study well beyond what they would have been exposed to previously (eSchool news, 2006).

In Maine project leader Bette Manchester, appointed by the Design Team for Curriculum and Professional Development, led the initiative. Manchester made it clear that the Maine laptop program needed to reach out to teachers directly and involve them. According to project leader Manchester (personal communication, November 23, 2005) this collaborative method of planning has been instrumental in the program's success:

This is about shared leadership and shared ownership... [We wanted to] pay attention to the transition, pay attention to the changes that stakeholders were going through, their fear factors, [so as to] develop and sustain a sense of learning community (Livingston, 2006, p. 48)

In Michigan, Rick Johnson began the initiative and it moved from the pilot program "Learning Without Limits to the Freedom to Learn Program." Bruce Montgomery was hired to lead the "Freedom to Learn Program". Montgomery points out (personal communication, January 4, 2006):

If you are just measuring the effectiveness of the program based on standardized tests, what educators fear is that the whole notion of critical thinking, independent learning, and the construction of new understanding will be ignore These progressive goals have to be accommodated even

while schools and districts hew to the accountability line. Schools must look to improve student achievement on standardized tests, but they also must keep students engaged. I am of the mind that you can do with a 1-to-1 teaching and learning program that is student centered. That's what we have to do to move these programs forward- show that they can lead to improved student performance while at the same time supporting project-based, constructivist learning activities (Livingston, 2006, p. 54)

While all three programs have project leaders in place that are critical to providing support and sustainability efforts needed, all three have also faced their own challenges. Henrico County documents among their lessons learned: how to deal with inappropriate downloads, repairs, recycling and media attention. Out of their experiences, they created a “Kid-Friendly Laptop Support Page” to provide information for students how to care for their laptop. Maine’s statewide implementation faced challenges of keeping everyone informed. Maine was the first state to launch a massive 1:1 plan. More than 37,000 laptops were

distributed in 239 middle schools (Muir, Manchester, & Moulton, 2005, p.1). Dr. Mike Muir reflects:

By February of 2002, teacher leaders, technology staff, and principals were all coming to us saying, “Why didn’t we get this [implementation] information?” The fact is, we were giving them information, as soon as we got it ourselves. They just thought we already had [more information], when we didn’t.(Livingston, 2006, p. 48).

Livington (2006) reports, Muir created a half-hour documentary on the initiative and distributed it to all the schools. This was a response to the problem and an effort to inform

teachers and ease concerns. Manchester stated that instead of teaching technical skills (personal communication, November 23, 2005) principals and superintendents should have received additional training:

Working on leadership with principals and superintendents needs to be cyclical and systematic...People in leadership roles cycle in and out of Maine. Perhaps they are new to their position; others are new to technology. There should be a way to formalize and make systemic the teaching of technology leadership, especially [for a program that] is this important (Livingston, 2006, p. 49).

In Michigan, Bruce Montgomery learned to integrate their advisory council discussions and team composition to address a challenge with focus and communication. In 2003, the advisory council included representatives from every major hardware manufacturer. These early meetings proved frustrating and unhelpful...the makeup of the advisory council was subsequently changed to refocus the discussion on education rather than hardware. Meetings included technology coordinators, curriculum specialists, and education association representatives (Livingston, 2006, p. 53). Montgomery recommends having representatives from all three areas- education, industry and government- to include all perspectives, especially when Title 2 funds were used to supplement. It was important to gain consensus with all stakeholders. The primary challenge here is sustainability. “Sustainability will continue to be an issue until businesses, educational stakeholders, parents, and taxpayers see the value of this program. That is the challenge.” (Livingston, 2006, p.55-56)

Livingston (2006) documents the celebrations and challenges faced by the hallmark

1:1 laptop programs. She reviews the progress of the 1:1 programs through the framework Educators, Planning, and Commitment. E stands for educators and the importance as Livingstone states, “Educators...should also take the lead in the strategy and implementation meetings in which a laptop program is planned, steered, assessed, and renewed year after year.” P stands for planning and the time needed in advance of receiving laptops, “Considerable planning needs to happen before a single laptop is purchased.” C stands for commitment garnering the support and sustainability in order to maintain 1:1 laptop programs, “This commitment means believing in the results even though challenges will arise and time-honored habits and traditions will change.” (p. 11). Livingston (2006) summarizes, “Effective use of technology requires continual planning, ongoing professional development, frequent assessment, and the commitment of resources, including dollars and staff.” (p. 12). The focus of this single case study centers on the planning and implementation process of a 1:1 laptop program.

Successful Implementation of 1:1 Laptop Programs

Although it is beneficial to the educational field to describe the steps of implementing a 1:1 laptop program, the bottom line question of whether 1:1 laptop programs make a difference warrants discussion. The 1:1 laptop programs in Virginia, Maine and Michigan have documented gains for students, teachers and schools. The research also includes valuable lessons learned. The successful implementation gains and lessons learned provide valuable data for educators. This study fills a gap in the literature as its unique model middle school setting focused on the “extensive use of technology” in a way that is developmentally

responsive and supported by a school-university partnership.

Henrico County, Virginia documents one of its goals “to encourage innovative teaching.” In 2006, six years after the laptop program began, the following gains were noted, “...Today, in many of our classrooms, there is a new sense of discovery and the feel of a research laboratory. Every student has access to a universe of online libraries. A class exploring Italian Renaissance artists, for example, reaches a depth and breadth of study well beyond what they would have been exposed to previously.” (eSchool news, 2006). Improvement in test scores has also been documented, “After 2 years of a laptop initiative in Henrico County, high school score results increased on all 11 of Virginia Standards of Learning tests. In 2000, only 60% of Henrico’s regular schools was accredited according to Virginia Standards of Learning criteria. By 2003, 100% of Henrico’s regular schools were accredited. This included 40 elementary schools, 11 middle schools and 9 high schools. (Barrios, 2004, p.22). The lessons learned in Henrico County were in regard to inappropriate downloads, kid friendly technical support page added to the school web site to help students learn about how to care and use their laptops. The Henrico County laptop program grew from 18,000 laptops in 2000-2001 to 30,000 by 2006.

Maine documents one of its goals for the 1-to-1 laptop program was to provide “the tools and training necessary to ensure that Maine’s students become the most technologically savvy students in the world” (Livingston, 2006, p.). In 2002, 37,000 laptops were distributed to seventh and eighth grade students across the state. Among the gains found in the Maine 1-to-1 laptop program documented by Sargent (2003), relates to teacher’s

communication. "...approximately 55% of the teachers surveyed reported that they use their laptop to communicate with colleagues at least a few times a week" (p. 7). Sargent (2003) further captures teacher perspectives, "Teachers feel the laptops are very helpful in developing integrated lessons and extending learning... 'The laptop is such an integral part of all my management routines that I can't imagine life without it. I use the Web to find rich teaching resources'" (p. 11). Silvernail & Harris reported in 2003 research from the Maine initiative, "Teachers reported that having the laptop as a tool enables them, in many cases, to expand their own knowledge and increase their efficiency" (p. 10). A seventh grade parent shared the benefit for her son, "[He's] done virtually all of his homework since November...and in general enjoyed every discovery...He feels good about his accomplishments in a way I haven't seen for the past 7 years. He's learning more material, and he's learning it faster. He's excited about learning".(Lane, 2003, p.18).

The lessons learned in the Maine initiative documented by Dr. Muir is first that, "Although carts are a good first step toward 1-to-1, there are significant differences between the two [taking the laptops home], with benefits of 1-to-1 which aren't realized with a cart program." Other lessons learned from the Maine initiative include putting teaching and learning first, strong leadership and policies for management, sustaining funding and support for teachers. In addition to these lessons, Muir emphasizes ongoing professional development. Bette Manchester, the project leader for the Maine initiative offers the following caution in a personal communication, November 23, 2005. "Definitely talk to people who have been involved in [similar laptop] projects...Set a purpose. Purpose drives

what happens... vision and purpose must also be discussed at the building level.”

In Michigan, the Freedom to Learn Program’s goal is “to help individuals develop into self sustaining, self directed learners” (Livingston, 2006, p.54). The Michigan program began with 8,000 students in 2003 and in 2006, 22,000 students were using laptops. Solomon (2005) reports that the Michigan Educational Assessment 2005 test showed that seventh graders scored proficient in reading increased from 29% to 41% and eighth graders math scores rose from 31% to 63% in one middle schools. In another Michigan middle school, writing scores increased from 53% to 84%.

Bruce Montgomery, the executive director of the Michigan Freedom to Learn program, identifies the significance, “Usually, such overwhelmingly positive results like this aren’t seen for three or four years out, Clearly FTL (Freedom to Learn) is doing what it is designed to do...enhance student learning and achievement in core academic subjects”. Lessons learned through challenges with securing funding on an annual basis reiterate the importance of securing adequate funding to sustain 1:1 laptop programs.

Above all, the benefit for the 1:1 laptop programs cited in this review of literature enhances the learning environments. The gap in literature that this study will address is looking specifically at one individual school’s approach to implementing 1:1 laptop programs while sustaining a model middle school learning environment supported by a school-university partnership. The next section takes a closer review of the middle school concept.

Middle School: A Historical Context

This single case study is situated in a grade 6-8 middle school, it is important to explore the historical, conceptual and curricular context of middle schools. Historically speaking the move from junior high to middle school has become increasingly popular. According to the National Middle School Association (Miles & Valentine, 2001), in the year 2000, there were 8,371 middle schools in the United States with a grade 6-8 configuration, which is the most frequently occurring grade configuration for middle schools, compared to 1,662 in 1971 (an increase of over 400% over 30 years). Although there has been an increase in the number of middle schools, there still exists the challenge of replacing junior high school practices with those aligned with middle school philosophy. The National Middle School Association (1995) defined, "...effective middle schools curriculum should be exploratory, integrative, and challenging". This aligns with the developmental needs of early adolescents. Turning Points (Jackson & Davis, 2000) define:

Early adolescence is a time of discovery, when young people have significantly greater capacity for complex thinking. They are more able to be out in the world, to participate in the wider universe of activities. They are better equipped to make important decisions affecting themselves and others, but their lack of experience leaves them vulnerable. They are better able to fend for themselves, yet they are caught up almost daily in a vortex of new risk (p.7).

Branch (2003) cited "...this explanation of early adolescence assists in establishing the fact that the period of time in a child's life between the ages of 10 and 14 is one of great change and uncertainty. It also establishes that these youngsters deserve additional attention and guidance as they muddle through the challenges of an awkward age." (p.14). Lounsbury

(1991) asserted that middle schools exist to "...guide, support, and educate youth during life's most critical phase, a significant and demanding task in and of itself. And if it does that successfully the high school will be negotiated successfully" (p.6).

The middle school movement began in 1909 as a reorganization effort to respond to the developmental needs of young adolescents. The middle school and middle school concept are often assumed the same. However, the label "middle school" does not mean that the program practices align with the middle school concept. Lounsbury (2009) defines the middle school concept:

The middle school concept is a philosophy of education with a special spirit and deep theoretical roots-a set of beliefs about kids, education, and the human experience. Those who adhere to it are passionate and determined advocates. The concept's ideals and recommendations are direct reflections of its two prime foundations, the nature and needs of young adolescents and the accepted principles of learning, both undergirded by a commitment to our democratic way of life. The middle school concept is applicable wherever any 10-to 15 year olds are enrolled (p.32).

The middle school concept as outlined here extends far beyond the grade configuration of a middle school. Balfanz (2007) that "this [middle school concept] was particularly important at the middle level when young adolescents are beginning to define their own identity and place in the world, and when "students make an independent choice about school engagement and effort." (p. 2). Branch (2003) is clear that "the middle school is not an advanced elementary setting; neither is it a little high school."

Middle School: Applied Practices

Middle School expert Dr. John Arnold, featured in the National Middle School Association publication, instructs, “A developmentally responsive approach to teaching and learning necessarily implies one that is differentiated and personalized, taking into account individual needs, interests, and abilities”(National Middle School Association, 2001, p. 30). Such an approach is characterized by starting where students are and gearing instruction to their levels of development, and understanding. At CCMMS, sixth grade teachers take the time to conduct learning style inventories at the beginning of the year. Each teacher color-codes their roll books to reflect the learning styles in each class. Teachers develop academic experiences that match how students learn best.

Dr. Arnold’s second characteristic involves varying degrees of structure. At Centennial Campus Magnet Middle School, teachers provide a range of options for students to demonstrate mastery. Teachers give options for students to select from when completing classroom assessments such as the Apartheid Assignment. Students can create a booklet, write a paper, or design a poster to show the impact of apartheid. The third characteristic noted by Dr. Arnold is a “varied pace of learning”. At Centennial Campus Magnet Middle School, the 1:1 laptop program allows students to work at their own pace. This assists the teacher to differentiate for students by allowing students who are ready to move on while those needing help can pace themselves.

The fourth characteristic is a “variety of teaching/learning strategies.” At Centennial Campus Magnet Middle School, many classes reflect an array of strategies even in one

lesson. From cooperative learning, direct instruction, independent study to service learning Arnold, emphasizes that “most effective strategies are activity-oriented and inquiry based” (National Middle School Association, 2001, p.30). An example of a variety of teaching/learning strategies at Centennial Campus Magnet Middle School is how

...all sixth-graders participate in the GPS activities, “Gold Rush and “Rocket Rush” and build scent stations in the adjacent woods, where digital photography sends live feeds to a computer as nocturnal critters visit. Sixth graders also participate in the testing of the online Web 2.0 Readers Theatre to improve their creative writing skills. In the Narrative Theatre, students are assisted in crafting a more sophisticated narrative writing product via a virtual world where characters “come alive” to animate their stories (magnet merit application, 2010).

The fifth characteristic involves a curriculum that is rich and helps students gain understanding of themselves and their world. At Centennial Campus Magnet Middle School, integrated units of study begin with an essential question that is relevant and developmentally responsive. An example of an essential question, “What happens when cultures collide?” The unit is studied across core and exploratory classes. A sixth characteristic involves “significant opportunities for students to assume initiative and responsibility with regard to curriculum and school life.” At Centennial Campus Magnet Middle School, a student service learning team decides on the top issues they would like to research and address. Examples of opportunities such as promoting literacy, encouraging students to stay in school, youth obesity, math challenge and peer tutoring English Language Learners are all service learning

activities and each follows the steps: research, real world application and reflection.

Examples of Effective Middle School Programs

There are examples of middle schools that have implemented innovative ways of guiding the education of young adolescents. The Alpha Team at Shelburne Community School in Vermont has been an example of what can happen when educators break out of the conventional barriers for 35 years (Kuntz, 2005). “Putting aside existing practices, members of that multiage team created a highly successful education program that has helped young adolescents become independent learners and democratic citizens as well as high achievers.” The Watershed, Soundings, and Crossroads programs at Radnor Middle School in Wayne, Pennsylvania (Springer 1994; 2006), are other impressive examples of “how meaningful educational experiences can be when freed from the restrictions of classes, periods, and subjects. Students in these programs equal or exceed their peers in academic achievement, while gaining the skills and dispositions to be lifelong learners and responsible adults.” (Lounsbury, 2009, p. 31-36).

The setting for this study is a middle school designed as a model with the essential components embedded in the organizational structure. Flexible grouping of students, trained teaching personnel, interdisciplinary teaming, advisor-advisee groups, intramural program and exploratory program are among the components of a model middle school program. The characteristics found in exemplary middle school programs such as the aforementioned examples are practiced daily within the Centennial Campus Magnet Middle School setting.

Exemplary Middle School Characteristics

Characteristics of the most effective middle schools around the nation, listed below, are research-based components of the “middle school concept” as noted in the Centennial Campus Concept Guide (1995):

- A student-centered environment. At Centennial Campus Magnet Middle School, data based on student interest, learning styles and progress is used to make instructional decisions. Research based strategies that emphasize students being engaged and responsible for their learning and leadership development. For example, a student exit slip data may be used by a teacher to determine the warm up questions needed for review the next day. Exit slips are quick assessments of the lesson objectives for that day given to students at the close of class. Another example of a student centered learning environment may be a formative assessment that offers options for student to choose which format to complete an assignment or project at the end of a unit. Likewise, intramural offerings may be determined by a student interest survey data.
- A structured, orderly environment for learning. At Centennial Campus Magnet Middle School, the Positive Behavior Intervention Support Program strengthens the leadership skills of students and staff. The school wide expectations are posted in every school area (i.e. busses, hallways, cafeteria, classroom and restrooms). Students are taught the HOWL (honor, order, wisdom leadership) expectations within the first three weeks of school. Students receive tickets for displaying the appropriate behavior

- throughout the school year. Every quarter the teams in each house calculate the
- number of tickets earned for their teams and celebrate. A wolf rally is held every quarter for students who do not receive any discipline referrals.
- Interdisciplinary teams of teachers. At Centennial Campus Magnet Middle School, teachers are assigned to teams for the core subject areas of Language Arts, Math, Social Studies and Science. In sixth grade teachers are organized in 2 person teams. Until the 2010-2011 school year, seventh grade teams were organized in 2 person teams. Currently seventh and eighth grade teams are organized as 4 person teams.
- Common planning time for teachers. At Centennial Campus Magnet Middle School, each teacher receives one 90-minute block of planning time every day. Each house schedules time weekly to conduct three important meetings. The content meeting is where teachers of like subjects meet to discuss plans and student progress. The curriculum meeting is when interdisciplinary connections are planned and progress discussed. The house meeting is where procedures, culminating activities and events are discussed.
- Small communities of students for learning. At Centennial Campus Magnet Middle School, the students are organized by grades in houses. The house area includes core classrooms that are connected by doors allowing flexibility for team activities and transitions and a common den area for presentations, special events and student celebrations.

- Diverse, age-appropriate instruction that appeals to the exploratory nature of middle school students. At Centennial Campus Magnet Middle School, academic experiences are varied to match diverse learning styles and interests of students.
- Emphasis on the mastery of basic communication and mathematics skills. At Centennial Campus Magnet Middle School, students are able to individually and collectively demonstrate mastery through Advisor-Advisee activities, classroom presentations, daily math warm up activities and challenge questions.
- Flexible scheduling. At Centennial Campus Magnet Middle School, each house runs a different master schedule allowing flexibility for academic instruction. As a result, there are no bells allowing teachers to decide the instructional time for students on a daily basis. Sixth and seventh grade classes are 45-50 minutes in length as a standard. Teachers may adjust this time as needed allowing larger blocks of instructional time. Eighth grade classes are blocked on an A/B day schedule and are 90 minutes in length.
- Exploratory courses. At Centennial Campus Magnet Middle School, students are able to take a wide range of courses for example, Spanish, dance, art, technology, career decisions, physical education and healthful living. The exploratory or elective teachers have the opportunity to plan with the academic teachers so that they can contribute to the themes and issues being explored. Exploratory opportunities for the students may include, but are not limited to electives in the visual and fine arts,

foreign languages, family and consumer sciences, technology education, business education and computer skills. Physical education plays an important role as the teachers work to provide a solid foundation for healthful living.

- Connection between school, home, and community. At Centennial Campus Magnet Middle School, the connection between school and home is strengthened by parents involved in academic activities for example, Gold Rush, Medieval festival. The connection between school and the community is achieved through service learning activities. Service learning involves the research, real world application and reflection activities based on addressing a problem or need in the community.
- Advisor-advisee program to promote the development of interpersonal relationships. At Centennial Campus Magnet Middle School, students meet daily for fifteen minutes at the beginning of the day. This time is used to develop the Covey leadership habits based on the work of Dr. Stephen Covey. It is also used for academic coaching in various subject areas. Teachers provide a series of leadership activities for students to reflect on their individual leadership development.
- Success experiences for all students. At Centennial Campus Magnet Middle School, all students can participate in morning and afterschool intramural activities. A variety of clubs and activities are offered for students to participate based on their interests. Student accomplishments are celebrated weekly in den meetings. “Wolf of the Week” awards are given to students displaying leadership. Each quarter, academic

recognitions are made in the award celebrations.

Design of Instructional Program

The Centennial Campus Concept Guide (1995) notes the model middle school instructional program is outlined under eight principles. These principles are aligned with the seven tenets for a developmentally responsive middle grades program highlighted in *Turning Points*. The instructional program aligned with the middle school concept includes:

- Integrates the disciplines.
- Promotes critical and creative thinking.
- Encourages students to question and discover.
- Responds to individual needs, learning styles, and backgrounds of the students.
- Encourages individual initiative and responsibility.
- Utilizes the surrounding environment.
- Includes a variety of teaching and learning strategies.
- Promotes positive relationships within the school and community.

Turning Points (2000) provides the seven fold tenets central to establishing a developmentally responsive middle grades program. As a point of establishing Centennial Campus Magnet Middle School as a true middle school model, under each tenet identified in *Turning Points* our school's example will be highlighted.

- Teach curriculum grounded in rigorous, public academic standards for what students should know and be able to do, relevant to the concerns of adolescents.

At Centennial Campus Magnet Middle School, Curriculum Mapping provides a road map for teachers to build relevant connections across curriculum areas emphasizing higher order thinking skills in the analysis, synthesis and evaluation of information through rich

integration stemming from an essential question.

- Use instructional methods designed to prepare all students to achieve higher standards and become lifelong learners.

At Centennial Campus Magnet Middle School, research-based methods designed for young adolescents are employed in the instructional delivery and experiences developed for students which takes into account the unique, varied learning styles of middle grades learners.

- Staff middle grades school with teachers who are experts at teaching young adolescents and engage in on going targeted professional development opportunities.

At Centennial Campus Magnet Middle School, all forty-three classroom teachers are highly qualified for the areas they teach. Thirty of the forty-three teachers hold a minimum certification in two areas and participate in on-going professional development for identified areas of need with specific emphasis on the integration of technology.

- Organize relationships for learning to create a climate of intellectual development.

At Centennial Campus Magnet Middle School, students are exposed to collaborative opportunities that extend beyond the walls of the classroom through partnerships that provide access to resources and experiences that challenge and enhance the skills and concepts taught.

- Govern democratically through direct or representative participation by all school staff members, the adults that know the students best.

At Centennial Campus Magnet Middle School, the leadership team exercises decision

making by seeking input, weighing pros/cons of available options, selecting a course of action, communicating, supporting, and evaluating the decision.

- Provide safe and healthy school environment as part of improving academic performance and developing caring and ethical citizens.

At Centennial Campus Magnet Middle School, we develop students as learners and leaders through using Positive Behavior Support which involves the establishment and communication of expectations for behavior, individual and collective recognition of appropriate behavior and creating opportunities for student scholarship and leadership.

- Involve parents and community in supporting student learning and healthy development.

At Centennial, a family culture has been established through meaningful involvement in the classroom, community, and partnership activities.

Challenges

Creating and maintaining middle schools that respect the nature of early adolescence in an era when the larger society seems not to value such a commitment presents a stiff challenge to middle level educators.

Significant progress has been made in the journey to provide young adolescents with a developmentally responsive education...Structural changes in middle grades education- how students and teachers are organized for learning- have been fairly widespread and have produced good results...However, our observations suggest that relatively little has changed at the core of most students' school experience: curriculum, assessment, and instruction (Jackson & Davis, 2000, p.5)

Jackson and Davis (2000), authors of the influential *Turning Points 2000*, refuted the notion that the middle school has failed and, instead, optimistically claimed, "Far from having failed, middle grades education is ripe for a great leap forward" (p. 17). In addition, Dickinson (2001) has stated emphatically, "There is nothing wrong with the middle school concept. ... The concept is as valid today as it was in either of its previous iterations at the turn of the 20th century or in the early 1960s." The problem, he said, is that the middle school itself is suffering from "arrested development" (pp. 3–4).

Bloomsbury (2009) cites barriers to the implementation of the middle school philosophy in schools that may explain what Dickinson referred to as "arrested development." A major barrier to more widespread implementation of the middle level philosophy is the lack of understanding among the public about the period of early adolescence and an appreciation of its special importance. Another barrier is the status quo. Departmentalization, for instance, has been difficult to remove, as it is supported by discipline-specific textbooks, tests, and teacher certification as well as long-standing tradition (p. 35-36).

Curriculum and Instruction

Belair and Freeman (2000) state that "early adolescents succeed more and learn best when they are required to be practitioners of knowledge rather than just receivers of

knowledge" (p. 5). The challenge to those who believe in the middle school movement is to prove that academic rigor and responsiveness to the developmental needs of middle school students are not mutually exclusive. Thompson (2000) concludes that the public and some educators misunderstand the standards movement. Critics of middle school philosophy often comment the lack of rigor is what is found in integrated instruction. The teaching and learning is not like traditional teaching where the teacher is the disseminator of knowledge. In Thompson's view, critics of middle schools appear to want to see more lecture-based learning (e.g., would prefer to see students learning about buoyancy from a textbook and lecture-and-discussion format rather than through a demonstration done in a swimming pool or other body of water).

An important current challenge for middle schools is to align curriculum in ways that are integrative, exploratory, and engaging, while simultaneously helping students score well on standardized tests (Thompson, 2000). The challenge for principals is to lead schools focused on developing 21st Century skills most of which require higher order thinking skills. At the same time, principals must provide teaching and learning opportunities to prepare students to master the level of knowledge and comprehension thinking skills tested on state assessments.

Anfara and Waks (2001) discuss middle school curriculum philosophy and the contrast between academic rigor and developmentally appropriate practice for young

adolescents. They state that middle school students need experiences that allow them to *apply* knowledge and the relationships between subjects. They believe middle school students need to see the applicability of knowledge to their own lives. Presenting knowledge for its own sake as a short-term goal does not work with middle school students because (1) this approach offers little context to students, (2) the material has little motivational power, and (3) difficult curricular content must be watered down to be comprehensible, robbing it further of its usefulness (p.54-56).

Assessments

Assessment accomplishes its major purpose when middle level students know what they are supposed to be learning, have regular feedback on their accomplishments, and have the opportunity to reflect on their work. Parents should also know what their children can do academically and be familiar with the school's expectations so they can provide assistance and encouragement. Teachers and administrators need to acquire information that will help them know what students can do academically and what needs to be done to help students become more proficient at the academic tasks they experience at school (Daniels, 2002, p. 54-56).

Students maintaining data notebooks, which record their academic progress, generally emphasizes the importance of student accountability for self-assessment. It promotes reflection as student's journal their areas of strength, needing improvement and creating goals for improvement. Student led conferencing is also a tool of accountability as students

share with their parents their progress. The teacher is available for clarification if needed; however, students are responsible for presenting their work and discussing their academic needs.

One of the most striking assets for teachers at Centennial Campus Magnet Middle School is that teachers do not work in isolation to meet the needs of students. Teachers are fortunate to have the support of colleagues and students at North Carolina State University through the University Connections and Leadership magnet themes. Through this unique school-university partnership, students and teachers receive an opportunity to engage in innovative, integrated, exploratory, and problem-based learning.

School -University Partnerships

The collaborative partnership between Centennial Campus Magnet Middle School and North Carolina State University is one of the unique aspects of the school. The original planning document presents the uniqueness of this partnership, “CCMS will... be the first middle school in the country to combine the resources of a respected school system, a major university, and a technologically advanced campus comprised of business, industry, educational and government agencies” (WCPSS & NCSU, concept planning guide, p. 3). Educational partnerships between schools and universities have existed for a hundred years. Some partnerships have been more successful than others. Peel (2002) comments, “Successful partnerships focused on complex issues related to staff development, teacher training, and school leadership require extensive collaboration, reflection and continued

revision on part of those involved in order to make a positive impact on student learning” (p. 319).

The school university partnership described by the planners of Centennial Campus Magnet Middle School extends beyond the focus on new teacher preparation opportunities to a focus on student achievement, special project grant opportunities, corporation and community resources. In this regard Centennial Campus Magnet Middle School was never designed as a laboratory school defined by the National Association of Laboratory Schools as being “...created during a period of nation wide interest in and support of the idea that some schools were needed as sites for testing, demonstrating, or disseminating instructional innovations” (National Association of Laboratory Schools, 1991, p.35). Additionally, Centennial Campus Magnet Middle School’s university partnership was not designed to be kept solely within the College of Education. Ravid & Handler’s (2001) work, *The Many Faces of School University Collaboration*, documents models between schools and the university education departments. While this research presents great models and expanded aims beyond teacher preparation, it does not expand research beyond other colleges on the university campus. While Centennial Campus Magnet Middle School supports teacher preparation by providing student teaching opportunities, the school university partnership is further extended by the interaction among twelve colleges on the campus. The relationship between the school and university is designed to enhance interdisciplinary curriculum study and academic experiences of students.

Documented in the Magnet Schools of America merit application for Centennial

Campus Magnet Middle School, the university liaison Elwood Peters summarizes the school university relationship beyond the traditional alliance between schools and universities. He states, “The university connections magnet theme goal focuses on sustaining and deepening the robust partnerships developed with the 12 colleges at NCSU. Collaborations are curriculum aligned with the North Carolina Standard Course of Study. Significant sustained university connections include, The “Wolf Pack Writing Partners” and *The Outsiders* Project, where college classes actually meet one day a week with sixth and seventh grade students now, in its sixth year. The Internship with the State Climate Office is in its eighth year. Last year CCMMS students developed habitat websites for the NC Wildlife Commission. Exciting new collaborations were also begun with the College of Business Management and CCMMS business and marketing classes and the Graduate School of Design and sixth grade innovators. A seventh grade initiative involves a genetics professor and graduate students leading students through genetics experiments with diseased plants. Students from the College of Business Management mentored eighth grade students in business and marketing as they devised business plans and learned entrepreneurship. Students also presented a short film on soil runoff at the Neuse River Film Festival, released 2,000 shad fish into Walnut Creek next to the school, and participated in water quality studies on the university golf course adjacent to the school. All of these projects were collaborations between CCMMS teachers and students and University faculty or North Carolina Wildlife and US Fish and Wildlife personnel.

Extra-curricular collaborations occur as well. The Park Scholars are in their seventh

year of co-directing and co-producing our annual “Broadway Play.” Graduate students from the College of Computer Science are in their third year of offering their once a month, Saturday from 10-3, SPARCS academy to students interested in computer science. Overall, there are 18 robust, annual, curriculum aligned connections with the university and with government agencies and businesses on the Centennial Campus. In addition, scores of students tutor as part of federal work-study and observe classes or mentor at-risk middle school students. Graduate students and professors present labs and guest lecture quarterly. Regular collaborations also occur with researchers at the adjacent Friday Institute for Educational Innovation at NCSU on best practices in middle grades education through curriculum aligned, technological innovation” (Magnet Schools of America merit application, 2010, p. 2-3). This real world example of the school-university partnership between Centennial and NCSU paints a vivid picture of how the university connection comes to life.

This We Believe (1995) clearly defines the purpose of middle level curriculum is to be “challenging, integrated and exploratory” (p. 20). This definition is reflected in the aforementioned example of the partnership between Centennial Campus Magnet Middle School and North Carolina State University. This example also indicates what middle school expert Dr. John Arnold states, “If high expectations are to be realized, we must empower students to become intellectually engaged, to develop skills, to be responsible citizen who put forth sustained effort. Our concern must encompass their social, psychological and moral development as well as their academic growth” (p. 30). Arnold further reminds us of middle

level educators' responsibility, "A developmentally responsive approach to teaching and learning necessarily implies one that is differentiated and personalized, taking into account individual needs, interests and abilities" (Arnold, 2001, p. 30).

This responsibility of middle grade educators is exemplified through the efforts of Centennial Campus Magnet Middle School to develop learners and leaders through their partnership with the university. "A key goal in the leadership magnet development is the implementation of a tiered grade level leadership plan. This plan is modeled upon and developed in collaboration with mentors and volunteers from the NCSU Center for Student Leadership, Ethics and Public Service. A pilot phase is in progress this year.

By May 2012, the program will be in place based upon a developmental adaptation for middle school students of the NCSU Visionary Leaders Certificate. A teacher at CCMMS completed this certificate at NCSU in 2010. She and her students are participating in the pilot and assisting with the implementation of this program. The weeklong Summer Leadership Institute, primarily designed to orient rising sixth-graders to the CCMMS leadership culture, is in its third year. Nearly a hundred students participate each year. These efforts exemplify the vision of CCMMS is to create a culture that: produces student leaders, embraces both cultural and academic diversity, encourages the holistic development of life-long learners, implements data-driven, research-based instruction and values technology as an integral tool in education.

Unique values include collaboration with community and university mentors through service learning and empowering students to discover their leadership potential by valuing

and nurturing unique talents. It is apparent how the field of education benefits from this rich description of a school-university partnership. The focus of this study is to provide a reflective self-inventory for the benefit of the Centennial Campus Magnet Middle School staff family in order to promote continuous improvement. As principal, my ability to lead this reflective practice is beneficial to creating the climate for continuous improvement.

The Power of Reflection

The principal is a key factor in how well the teachers adapt to teaching and learning in a 1:1 laptop program classroom. Teacher support impacts the ability of teachers to provide quality instruction that is integrated with technology and relevant to the lives of middle school students. Why look at the support teachers need? This question is a valid since the teacher has been the focus of much reflective practice research. The focus on teachers is understandable as they make decisions, deliver instruction, and review student assessments regularly. The teachers also have continuous interaction with students and parents. At one time, we could look at teacher reflective practices solely from this perspective; however, principals are held responsible for leadership of more than management and maintenance. In the nineteenth century and beginning of the twentieth century, building upkeep, student supervision, school financial records, and daily operations was the focus of the principal's work. Now as accountability and student achievement is analyzed at state and national levels, principals are held responsible for instructional practices at a much higher level.

Principals are responsible for how the curriculum and instruction is delivered and assessed. As teachers use data to inform instructional practices and assess student

performance, principals assist by providing data and facilitating the dialogue of identifying strengths, areas needing improvement, trends and next steps. A principal's ability to lead and move a school forward requires a skill set that extends beyond acquiring information. It involves applying the appropriate information across various contexts addressing diverse learning needs of all students in order to increase student achievement.

What role can reflection provide? A window of reflection provides the ability to see oneself and the impact that individual practices and assumptions have on collective perception and progress. The power of reflection is the promise of internal and external change that is experienced individually and collectively. "As building leaders, principals can communicate the importance of reflection and inquiry as a tool to improve practice by actively using these strategies in their own professional lives." (MacGregor, 2003, p.6). Reflection is the key component to supporting, developing, and sustaining principal leadership securing a pathway for succession.

The power of reflective practice is captured in a question posed by MacGregor & Salisbury (2003), "What exactly is a reflective practitioner? To many, reflection means spitting back what they have read, but there is a distinct difference between retelling and reflection: A framework for reflection can provide the structure for looking back with the goal of moving forward. Reflection requires one to look back and consider many dimensions of an event, such as, influencing factors, identifying controlling factors, and then deciding if any adjustments can be made for the next time" (p.11).

Reflection: A Historical Context

John Dewey (1933) is recognized as a key originator of the concept of reflection. Dewey's work provides a foundation for research on reflective practices of the twentieth and twenty-first centuries. Van Manen (1977), proposed three levels of reflection from the earlier work of Habermas (1973) to construct the first level, technical reflection which is chiefly concerned with the efficiency and effectiveness of means to achieve certain ends. The second level practical reflection allows for open examination of the means, goals, assumptions, and outcomes that meaning comes through discussion of the relationship of the means, goals, assumptions, and outcomes. Critical reflection is the third level, which incorporates moral and ethical criteria and includes the personal domain within wider contexts.

A second perspective on reflection derived from Schon (1983) clearly views reflection to be related with action. He looks at "reflection-on- action" and "reflection in- action". Schon defines "reflection-in-action" as simultaneously reflecting and doing, modifying actions instantaneously. This occurs while the events were originally unfolding "Reflection-on action" involves looking back on action after it has taken place.

A third perspective on reflection, conducted by Hatton and Smith (1995), recognized four issues from Dewey's original work on reflection. Reflection is related to action, time frames, problem-centered or not and ability of one to reflect critically taking in account wider historic, cultural and political values or beliefs. This study is clear that the difference between reflective thinking versus reflective action should be made with the distinction that reflective action refers to addressing solutions.

Hatton and Smith's (1995) study looking at teacher education, which happens to be most of principal's first introduction to reflective practice, provides an interesting look at the evolution of reflective practice needed at the principal's level. Technical reflection is an essential part to developing student teacher competence. Critical reflection is integral to teacher education as it is concerned with moral, equity and justice as strong filters for decision making in academic and social arenas when dealing with students. An individual's readiness to reflect at the more complex level of critical reflection will depend on the level of coaching and support that is provided.

Summary

This single case study will not only provide a description of how the 1:1 laptop program was implemented. In addition, the study will explore how the original conception of "extensive use of technology" at CCMMS matches the current academic practices. As evident in the discussion of technology, the various settings highlighted in this literature review focused on the initial stages of implementation. The section on Middle School provided clarity of how the learner's needs are met in a model middle school setting. The discussion on reflection provides background for the principal's role as researcher. The educational community has been waiting for to hear again from Centennial Campus Magnet Middle School. In the words of the school's founder and first principal Dr. Ken Branch,

Therefore, it is my hope that someone will continue to document the evolution of Centennial Campus Middle School, its program, and its partnership with North Carolina State University as the story of this special school continues to unfold. Finally it is my hope that the faculty and staff of Centennial Campus Middle School

will continue to dance (Branch, 2003, p. 171).

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this qualitative case study was to describe the implementation and development of a 1:1 laptop program and document the lessons learned by analyzing survey results, artifact review and interview responses. An overarching goal was to analyze through interviews and artifact reviews the degree to which the 1:1 laptop program aligned with the original conception of “extensive use of cutting-edge technology”. This study focused on how a 1:1 laptop program situated in a model middle school with a unique local university partnership reflected the overall vision of the school. Yin (1989) provided rationale for a single case study “...where the case represents an extreme or unique case” (p.47). A single case study captured the benefits and challenges of implementing the 1:1 laptop program from the participants engaged in the process.

First, this study described the components of the 1:1 laptop program. Second, the study documented the benefits and challenges of implementing a 1:1 laptop program. The research contributed to the field of education by presenting an structured plan of implementation that can be replicated in other schools. The contribution to the field of education was achieved through the benefits, challenges and lessons learned from the implementation of the Centennial Campus Magnet Middle School 1:1 laptop program. This research study presented a general approach of providing a description of how the original conception of “extensive use of technology” matched current practices. The description of

how the 1:1 laptop program was implemented and lessons learned in a unique learning environment supported a single case study of Centennial Campus Magnet Middle School.

Research Questions

There was a clear vision and plan developed for Centennial Campus Magnet Middle School when it opened in 2000. The overall goal was for this study to inform the Centennial Campus Magnet Middle School staff and community of its progress, while providing direction for continuous improvement in extending the “extensive use of cutting-edge technology” in a dynamic global and technological setting.

- How was the 1:1 laptop program at Magnet Middle School originally conceived?
- How is the 1:1 laptop program today consistent with the original mission of the extensive use of cutting-edge technology?
- How was the 1:1 laptop program implemented?

Site Selection

Centennial Campus Magnet Middle School was selected as the site for this study because of its history, mission, and implementation of 1-to-1 laptop program. The history of Centennial Campus Magnet Middle School is significant as ten years prior to this research study the school opened. It was not a typical opening as the expectations were great and shared among the university, school district, and community. Conceived as a model middle school with a focus on “extensive use of technology,” Centennial Campus Magnet Middle School was designed to deliver curriculum that is developmentally responsive for young adolescents. The last study was conducted in 2003 by the principal providing a thick, detailed

description of how the model middle school with a unique university partnership was conceived. His research highlighted the five unique emphases from the original conception of Centennial Campus Magnet Middle School:

- It will be highly integrative, exploring concepts, skills, and issues across many disciplines.
- It will engage students in frequent, significant interaction with adults, both on the university campus and in the community.
- It will emphasize “real world”, hands-on active learning about substantive issues.
- It will make extensive use of cutting-edge technology.
- It will give careful attention to the cultural contexts and societal forces that affect adolescent development. (Appendix A).

This study allowed the administrators, teachers, students and partners to take self-inventory to determine the status of their progress with the “extensive use of cutting-edge technology”.

How the current practices being implemented matched the original conception was critical to understanding how the school’s mission was being fulfilled. In addition, the steps to implement a 1:1 laptop program as an example of “extensive use of technology” was beneficial to the educational field. Educators who consider developing their own 1:1 laptop program will find the steps and lessons learned beneficial to their own success. The site has historical significance as the school has been operating for ten years. It was the unique university partnership, middle school concept, and technologically progressive learning and teaching environment that makes Centennial Campus Magnet Middle School worthy of a

follow up research study. This made the site ideal to explore the implementation of a technologically rich program in a model middle school setting.

Additionally, Centennial Campus Magnet Middle School was selected as the site for this study because of its unique features. It is the only school (out of thirty-two middle schools) in the school district that has a school-university partnership. Centennial Campus Magnet Middle is connected with a local university both physically and programmatically. CCMMS is designed to meet the needs of young adolescents through university connections, curriculum delivery, and technology integration. The district is the largest in the state and 18th largest school district in the United States, and Centennial Campus Magnet Middle is the second smallest middle school out of thirty two middle schools in the district. The school has sustained the 1:1 laptop program at eighth grade since 2006. In 2010, the seventh grade level was added. The story of the 1:1 laptop development is of interest to other schools looking to implement technology as an integral part of the instructional program. My interest as principal of this school stemmed from accepting the charge to lead 625 students and 70 staff members to fulfill part of the overall vision and mission of being a school that makes extensive use of cutting-edge technology.

Although there are many things that contribute to CCMMS being a unique learning and teaching environment, the focus of this study was to look at the implementation and development of a 1:1 laptop program. Therefore, student achievement outcomes, while important, are not the focus of this particular study. As there are many unique features of this model middle school designed to address the needs of young adolescents, this study focused

on the 1:1 laptop program feature. The review of surveys, interviews and artifacts about essential program components are powerful evidence of documentation. The single focus of this study provided clear direction on how to implement a 1:1 laptop program. As principal, “How did you implement the 1:1 laptop program?” is the question most frequently posed to me. The experiences at CCMMS are valuable to other sites as they work to develop similar 1:1 laptop programs.

Research Design

Hatch (2002) determines that qualitative research, “...seeks to understand the world from the perspectives of those living in it” (p. 7). As a single within-site case study, the stories and experiences of teachers and project leaders engaged in a 1:1 learning environment are valuable in describing what is needed for a 1:1 laptop program. Hatch (2002) provides valuable researcher support for the intended purpose of using a qualitative research design. The following experts provide a strong foundation connecting the focus of this study with the essential elements of qualitative case study research. Erikson (1986) identifies key questions that qualitative researchers ask as: “What is happening here, specifically? What do these happenings mean to the people engaged in them?” (p. 124). Bogdan & Biklen (1992) remind us that, “The perspectives or voices of participants ought to be prominent in any qualitative report” (p. 7). The aforementioned statements from the research literature represented key perspectives highlighted in developing the qualitative approach for this study.

According to Creswell (1998) a case study is “...to examine a case bounded in time and place and look for contextual material about the setting from multiple sources of

information to provide an in-depth picture of the case”(p. 61). This research study included multiple sources of data such as surveys, artifact reviews, and interviews in order to provide a full description of the case. In summary this qualitative case study approach is best described by Lincoln and Guba as a “...format [that] calls for an explication of the problem, a thorough description of the context or setting and the processes observed, a discussion of important elements, and, finally, ‘lessons to be learned’”(Creswell, 1998, p.221). This study accomplishes both a thorough description of the 1:1 laptop program and lessons learned.

This research study focused on a single program known as a within-site study. Multiple sources of information would include interviews, artifact reviews, and surveys. Most significant to this case study is that the uniqueness of the setting requires an intrinsic case study. The goal is to look at this specific case not so much as a tool for comparison but to provide in depth information regarding the central focus of this study, the 1:1 laptop program itself. According to Stake (1995), “We are interested in it [case study], not because by studying it we learn about other cases or about some general problem, but because we need to learn about that particular case. We have intrinsic interest.” (p. 8).

What made the study of this specific case challenging is that I am part of the actual environment being studied. Delyser (2001) stated, “Because gaining perspective on something you’re in the middle of poses distinct challenges, texts on qualitative research methods often advise students not to study communities or situations of which they are already a part”(p. 441). Kitchin and Tate (2000) warned that those conducting insider research, “...may fail to notice pertinent questions or issues because of the inability to step

back from a situation and fully assess the circumstances.” As the researcher and principal of the school, it was important that multiple sources of data were collected and reviewed by participants of the study. Additionally, the following suggestions from the experts addressed the essential elements to include with insider research studies.

Reason and Bradbury (2001) stated, “the primary ‘rule’ in Action Research practice is to be aware of the choices one is making and their consequences”. One way to increase this awareness is suggested by Herr and Anderson (2005) to, “. . .at least in part be served by the keeping of a research journal that systematically records choices and their consequences for one’s self and others” (p. 77). In addition to keeping a research journal, my roles as school principal and primary researcher of this study required thought to the following questions raised by Herr and Anderson (2005), “Who is the researcher to the research process? What is the researcher bringing in terms of roles, values, beliefs, and experiences? Who is the researcher in terms of hierarchy and status?” How do these multiple positions impact the research design and process?” Herr and Anderson’s suggestion addresses the complexity and reality of the insider roles in this research as principal and researcher, “Because action researchers are so involved in the research process at multiple levels, and in multiple roles, it is common . . .to utilize critical friends (Anderson, Herr & Nihlen, 1994), or a validation team . . .”(p. 78). Critical friends are willing to meet with a researcher to pose questions that challenge the data collected. Herr & Anderson (2005) stated “Action researchers, because of the intensity and longevity of the research process, can use critical friends as vital sounding

boards, to help them step back or out of research enough to more thoroughly understand what it is they are seeing and doing” (p. 78).

Evans’ (1995) dissertation work as support for the role of critical friends in that she acknowledges that she cannot address contradictions between her values and actions. She asserts, “I need a group of people to challenge my thinking, to put alternative points of view, to point out inconsistencies in my thinking, to make problematic the assumptions I have taken for granted” (p. 270). This is what a validation meeting can provide if the members are carefully selected in a balanced way. Bone (1996) describes it as follows, “I selected my critical friends in order to get a range of different responses to my work. They helped me to reflect on my practice and values” (p. 156)

It was my goal to present compelling documentation that the aforementioned risks do not outweigh the value of providing the field of education with a guide for implementing a 1:1 laptop program. The support to the field of education and its leaders searching for approaches embedding technology in the curriculum delivery and experiences of students continues to be in great demand. It is my desire to share experiences through this study that are unique but can be applied in education settings with others interested in the concept. It is through these experiences that the specific components, processes, celebrations, and challenges can be documented and replicated. It is my belief that the stories and experiences of people from within can garner staff buy in, administrative and community support, and program sustainability needed in other schools.

Data Collection

For this study, I approached data collection as Creswell (1998) suggests, “...visualize data collection as a series of interrelated activities aimed at gathering good information to answer emerging research questions” (p.110). It was important that the data collected reflected the purpose of the study. Therefore, my approach included a thick description of the implementation and development of the 1:1 laptop program. In addition, the data collected captured the celebrations, challenges, and lessons learned. Yin (1989) specifically addresses the importance of having multiple forms of data collection such as documents, interviews, physical artifacts, archival records, and observations. This study included the recommendations from Yin’s work, *Case Study Research: Design and Method* (p. 84). My approach was to collect data through analyzing survey responses, artifacts, and conducting interview sessions (p. 84).

The Process: Surveys, Artifacts, Interviews

Surveys

The anonymous survey of classroom teachers followed by a focus group interview was conducted to gain insight of first hand experiences from the teachers who work directly with students using laptops. The on-line survey was created using a web based resource and the link was sent via email to teachers. The email requesting participation in the survey was sent to the teachers involved 1:1 laptop program at Centennial Campus Magnet Middle School. Out of twenty teachers, sixteen (80%) completed the survey. The period for completing the survey opened on June 1, 2011 and

closed on June 15, 2011. The survey consisted of five open-ended questions (Appendix C). The questions posed to the teachers were directly aligned to the implementation of the 1:1 laptop program. The survey questions are included but not limited to the following:

- What would you identify as the key components to initiating a 1:1 laptop program?
- What would you identify as important steps in the development of a 1:1 laptop program?
- What would you identify as celebrations of the 1:1 laptop program?
- What would you identify as challenges of the 1:1 laptop program?
- What are lessons learned in the 1:1 laptop program?

The survey responses were analyzed by grouping similar ideas represented in the responses from the teachers participating in the laptop program. The teacher responses were compiled under each question and categorized based on the responses mentioned the most. I compiled the responses for each question and tallied the number of responses for each question first. Secondly, some of the responses were similar in topic and were categorized based on topic similarity. The number of similar responses were then tallied to determine the most frequent response.

Artifacts

Artifact review was essential to describing the implementation and development of the 1:1 laptop program. As principal, I gathered artifacts that document the planning, communication, and professional development associated with the 1:1 laptop program. As a part of this study, I reviewed planning documents citing the original conception and vision of the school in order to analyze how the current 1:1 laptop program reflects and aligns with the original plans upon which CCMMS was founded. The inclusion of conception and vision

analysis was important especially for schools that plan to replicate this 1:1 laptop program can gain insight into specific efforts to align and sustain a school's vision. These artifacts provide a wide variety of historical data and current practices to implement and develop the 1:1 laptop program. The artifacts reviewed include the contractual agreement, meeting agendas, goal development sheet and email correspondence. These artifacts provided historical background information and timeline for the 1:1 laptop program implementation. The review of information from the contract, meeting agendas, planning documents, goal development sheet and email correspondence was organized into categories based on related responsibilities: Instructional Support and Outreach, Planning and Management of Resources. The information within the artifacts reviewed related to these areas which emerged as key themes from the data. The information collected provided supporting details for the information shared through survey and interview responses.

Interviews

A third source of data collected was through interviews. There were four interviews with representatives from the school, district, university, and business partners. The roles and responsibilities to the 1:1 laptop program vary among the interviewees, but they shared a common role as participants in the planning process with the 1:1 laptop program. The interview questions were aligned with the research questions and I used the following format in developing the questions. I constructed the interview questions to align with the research questions. I used notes and the original planning documents located in the Concept Planning Guide to develop the interview questions. The interviews lasted approximately 60 minutes.

The same eight questions were posed to in all interview sessions (Appendix C). Interview questions included but were not limited to the following:

- Describe your role and responsibilities with the 1:1 laptop program at Centennial Campus Magnet Middle School?
- How would you characterize the original idea behind the creation of Centennial Campus Magnet Middle School?
- What would you identify as the key components to initiating a 1:1 laptop program?
- What would you identify as essential steps in the development of a 1:1 laptop program?
- Share about the biggest success.
- Share about the biggest challenge.
- What are lessons learned in the 1:1 laptop program?
- In what ways, does the 1:1 laptop program reflect the original vision of Magnet Middle School?

These questions explored perspectives of the implementation, development, benefits, and challenges associated with the 1:1 laptop program.

I interviewed the 1:1 laptop project leader and school's lead teacher because their roles continue to be integral to the structure, support and sustainability of the 1:1 laptop program. This gave a useful perspective that represents the leadership experiences associated with the celebrations and challenges with the 1:1 laptop program. For example, the lead teacher served in various capacities within the 1:1 laptop program at our school first as a 1:1 laptop teacher, lead teacher and co-project leader for the new 7th grade 1:1 laptop program. The journeys of the project leader and lead teacher identified celebrations, challenges, and lessons learned along the way. This was valuable as both of these interview candidates currently hold positions that are instrumental in the school developing next steps for continuous improvement.

In addition, I conducted interviews external to the school site to offer another

perspective on the implementation of the 1:1 laptop program. The two interviews included a representative from our 1:1 laptop business partner and university liaison representative who contributed to the development of the 1:1 laptop program and conducted teacher surveys for the 1:1 laptop program. The interviewees were carefully selected to provide a detailed, thick description and first hand perspective on the implementation and development of the 1:1 laptop program. This type of interviewee selection is known as criterion sample. “Criterion samples are made up of individuals who fit particular predetermined criteria” (Hatch, 2002, p. 99). Hatch (2002) describes the importance of interviewee selection, “It’s a matter of selecting those individuals you believe will make good informants, be available, and agree to be interviewed. Good informants have knowledge about everyday life in the settings being studied, and they are willing and able to communicate that knowledge...” (p.98).

Focus Group Interview

A fourth source of data collected was from a focus group interview session. Six teachers participated in the focus group interview and it lasted approximately 98 minutes. The questions for the follow up focus group interview were developed from the survey data. The purpose of the focus group interview is to clarify or extend ideas that emerge from the survey. The interview was audiotaped. The interaction among the focus group participants was important to understanding the collaboration and support within the participants of the 1:1 laptop program. Interview data was transcribed by an external person as documentation for this study. There were four focus group session interview questions (Appendix C)

- What would you identify as the greatest gain for students?

- What would you identify as next steps in the development of the 1:1 laptop program at Centennial Campus Magnet Middle School?
- Share what support would benefit the implementation of the 1:1 laptop program.
- Share about what you have gained as a professional.

The interview responses were analyzed and responses were compiled under each question.

As key themes emerged, quotes from interviewees were used as supporting details and examples for the themes and lessons learned.

A fifth source of data collected were participant observation. While there are conflicting views about the role of the participant observer, there were benefits to analyzing how participants interacted with the day-to-day routines in a 1:1 laptop program. I used personal memos documenting observations of how the project leaders interacted with others and prioritized their tasks. The observations from personal memos were shared through a reflective closing statement from my perspective as researcher and principal. Creswell discussed how the multiple forms of data collection provide triangulation to address the “corroborating evidence from different sources to shed light” of a 1:1 laptop program in a unique, “one of a kind,” setting that can be transferred to other schools (p.202).

Creswell (1998) also cited, “The rich, thick descriptions allow “the reader to make decisions regarding transferability because the writer describes in detail the participants or setting under study. With such detailed description, the researcher enables readers to transfer information to other settings and to determine whether the findings can be transferred ‘because of shared characteristics’” (Erlandson et al., 1993, p. 32). An additional data source includes existing research consisting of teacher/student survey data, and external/internal participant interviews. Since 2006, students, teachers, parents, district leaders, and business

and university partners have been interviewed about the implementation of the 1-to-1 laptop program at Centennial Campus Magnet Middle School.

Data Analysis

Hatch (2002) defines data analysis as “a systematic search for meaning. It is a way to process qualitative data so that what has been learned can be communicated to others.

Analysis means organizing and interrogating data in ways that allows researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques or generate theories” (p. 148). Similarly, I began analyzing data with a cyclical approach used in school improvement planning design: Study, Plan, Do, Reflect.

Using the same school improvement planning steps, I created the cyclical figure noted below to illustrate the process for data analysis.

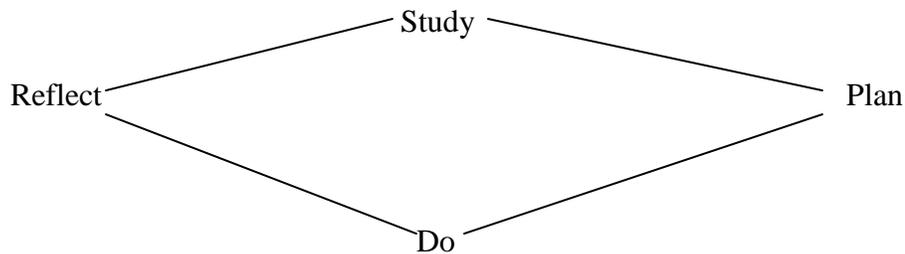


Figure 3.1 Data Analysis Process Steps

My analysis included the study of survey responses and artifact reviews that represented the implementation and development of the 1:1 laptop program. I planned based on my review of data by allowing the patterns to reveal categories and concepts needed to organize data. I refer to these categories as “Key Themes from the Data”. I conducted interviews as part of the “do” step in the cycle. Conducting interviews with a semi-structured open-ended question format that allowed room for posing additional questions based on the information gained from the artifact reviews. In addition, personal memo notes support information observed from participates and generated new questions needed for clarification. This approach required the need for follow up interviews. Once all data was gathered, my system to organize data consisted of categories. The categories were labeled according to themes that emerged from the data.

Role of Researcher

My role as the primary researcher and principal of the research site selected initially raised valid concerns. The concern was whether I would be able to collect, analyze and report data as principal of the school being studied. Herr and Anderson (2005) addressed this concern of insider action research,

...we suggest that as the doctoral student is laying out the proposal, a key piece of this work is to think through the doctoral student's multiple roles in the project- as a researcher, as insider, perhaps as employee or facilitator... we suggest that this complexity of roles be brought into the research from the beginning and acknowledged rather than be rendered invisible (p. 77).

As the principal of Centennial Campus Magnet Middle School, it is important to lead this

study to examine how we are fulfilling the original conception of “extensive use of cutting-edge technology”. As principal for five of the school’s ten years in existence, it was critical to take this inventory. I had full access to historical and current data needed to assess the school’s progress. I also had full access to the study site and participants. Above all, I had a desire to use this information for the continuous improvement of the school. I considered myself a lead ambassador able to share in detail with other school leaders the steps to implement a 1-to-1 laptop program and the lessons learned.

I have explained the role of critical friends, artifact reviews, external and internal interviews and participant observation to control the role of bias in the data analysis process. The leadership required to embrace our current state and future challenges begins with reflective practice. The entire school family worked collaboratively to determine the next steps for continuous improvement. Courageous leadership was needed to motivate, guide, and support the visionary work for continuous improvement. The value of this study to the educational community and the perspective as principal will enable other interested school leaders to implement a similar program in their schools. While there are aspects of my role as a researcher that must be acknowledged, the value of the research and its contribution to education far outweighs any “role” concerns. The use of research journaling and critical friends were used to address the role concerns that may have existed.

The focus of this study was on the process used to develop and implement a 1:1 laptop program. The impact of my supervisory position with participants and examining my own school program placed me in a position to provide a valuable perspective. This research

study is a continuation of Branch's (2003) study of Centennial Campus Magnet Middle. Branch researched his own school program during his tenure as the first principal of the school. Likewise, as principal my perspective will inform other school leaders wanting to implement a 1:1 laptop program.

The review of data collected and conclusions drawn will be of great interest to our school family and other school leaders as they look at strategies to support the implementation of a 1:1 laptop program. Anderson and Jones (2000) reviewed dissertations in educational leadership and noticed, "...these practitioners were partly motivated by the convenience of studying their own site, where they had a deep level of tacit knowledge. However, more important, they wanted their research to make a contribution to their own setting and clients. In many cases, they wanted to empower themselves professionally and personally and to bring about organizational change" (Herr and Anderson, 2005, p. 29).

Trustworthiness

The term trustworthiness was used here to emphasize what Herr and Anderson (2005) reported as, the interpretations of the data being credible, or "ringing true", to those who provided the data (p. 50). Wolcott's (1990) reconceptualization of validity as it "neither guides nor informs his work"...Wolcott's goal was to identify 'critical elements' and write "plausible interpretations from them". He ultimately tried to understand rather than convince and voiced the view that validity distracts from his work of understanding what is really going on" (Herr & Anderson, 2005, p.50). Trustworthiness was achieved in this study through triangulation with the use of multiple data sources to corroborate evidence.

Prolonged engagement and persistent observation provided the ability to learn the culture and decide how is important to the focus of the study.

It is understandable that as a researcher there will be more information than needed or relevant to the purpose of the study. Information gained by learning participants and the culture will help to disaggregate this data. Member checking was used to by having interview candidates to review the information they presented. Rich, thick descriptions will provide the details and setting context needed for readers to transfer into similar school environments. Researcher bias was addressed prior to the study so that the reader could view research with the total picture clarified.

In regard to generalizability, the intent of this study was not to be compared with other cases, but to create an understanding through description and documentation of how Centennial Campus Magnet Middle School's 1:1 laptop program was implemented and developed. The narrow focus of one program feature within a unique learning and teaching environment is purposeful in presenting valuable information for other schools interested in a similar program. The first step is not to generalize but to gain a clear picture of the program itself. This study supports Stake's (1995) conclusion,

The real business of case study is particularization, not generalization. We take a particular case and come to know it well, not primarily as to how it is different from others but what it is, what it does. "There is emphasis on uniqueness, and that implies knowledge of others that the case is different from, but the first emphasis is on the understanding the case itself (p.8).

While the goal was not to compare this program with others, it is the intent of this

study through description and documentation to establish transferability. Lincoln and Guba's (1985) notion of transferability,

if there is to be transferability, the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can and do. The best advice is to give to anyone seeking to make a transfer is to accumulate empirical evidence about contextual similarity; the responsibility of the original investigator ends in providing sufficient descriptive data to make such similarity judgments possible. (p.298)

Transferability may benefit school leaders who want to implement a 1:1 laptop program.

As other school leaders consider their academic settings and technology resources, they will be able to utilize the findings to implement a 1:1 laptop program at their respective school sites.

Summary

This chapter presented the details and steps of this single case research study. A qualitative approach was selected to present the rich description of the setting and the unique story. The teacher surveys, artifact reviews, individual and focus group interviews provided valuable data for analysis and unfolded the story of this journey. Historical and current data determined how the original conception of "extensive use of cutting-edge technology" connects with the school's current practices with the 1:1 laptop program. As patterns emerge, it is my hope that the steps for implementing the 1:1 laptop program and lessons learned will be revealed. The overall goal was for this study to inform the Centennial Campus Magnet Middle School family, directions for continuous improvement.

CHAPTER 4

FINDINGS

Background

The purpose of this qualitative case study was to describe the implementation and development of a 1:1 laptop program and document the lessons learned. An overarching goal was to analyze through interviews and artifact reviews whether this 1:1 laptop program aligns with the original conception of “extensive use of cutting-edge technology.” The research method for this case study was a qualitative design. This study tells a story about how a 1:1 laptop program situated in a model middle school with a unique local university partnership reflected the overall vision of the school.

The research questions that formed the foundation for this study are:

- How was the 1:1 laptop program at Centennial Magnet Middle School originally conceived?
- How is the 1:1 laptop program today consistent with the original mission of the extensive use of technology?
- How was the 1:1 laptop program implemented?

These questions unfold a powerful story revealing what it takes to develop and implement a 1:1 laptop program. Reeves (2006) supported the use of stories as he asserted, “stories are a powerful tool for engaging people emotionally and intellectually and for leading them into the future” (p.50). This study explored the research questions in order to gain valuable information and next steps for the Centennial Campus Magnet Middle School’s continuous

improvement.

The Story Unfolds

Journal entries from my first month on the job introduce this story. On June 20, 2006, as principal I was invited to a meeting that would in the short-term change ten classrooms, but in the long term had the possibility of changing classrooms across the state. The purpose of this meeting was to discuss a gift given to the school by a business partner. Centennial Campus Magnet Middle School received 200 laptop computers for an eighth grade 1:1 laptop program. This grant accompanied a request for teachers to use a curriculum software package created by the business partner. This resource allowed teachers to access curriculum resources, primary sources to reinforce objectives and skills covered in the Standard Course of Study for various curricula areas.

This meeting was significant for many reasons. First, this was not just a small pilot with technology. An entire grade level received laptops for every student and teacher. Second, this idea of an extensive use of technology and a 1:1 computing program was part of the original vision for the school. The school opened in July 2000 and in 2006, the vision was becoming a reality. Prior to 2006, the founding principal engaged in conversations with the business partner about the possibility of implementing a 1:1 laptop program at the school. It was June 2006, that the plan for implementation was created. Third, it was evident from the start that it was a collaborative venture. The presence of partner representatives spoke volumes to the level of input and involvement that was associated with this 1:1 laptop program. Lastly, I had only been on the job as principal for 14 days, and this was my first

assignment as principal. As an introduction to my first principalship, this was an opportunity to lead and learn. The research questions that formed the foundation of this study were addressed through surveys, artifact reviews, interviews, and focus group sessions.

Surveys

The survey involved 1:1 laptop program teachers at Centennial Campus Magnet Middle School. Out of twenty teachers, sixteen (80%) completed the survey. The period for completing the survey opened on June 1, 2011 and closed on June 15, 2011. The survey consisted of five questions. The survey questions were the following:

- What would you identify as the key components to initiating a 1:1 laptop program?
- What would you identify as important steps in the development of a 1:1 laptop program?
- What would you identify as celebrations of the 1:1 laptop program?
- What would you identify as challenges of the 1:1 laptop program?
- What are lessons learned in the 1:1 laptop program?

Each table below represents the responses to an open-ended survey question. The data collected includes a grouping of similar ideas represented in the responses from the teachers participating in the laptop program. The teacher responses were compiled under each question and categorized based on the responses mentioned the most. Some of the responses were similar in topic and were categorized based on topic similarity. Teachers surveyed identified essential steps during the initial phase of 1:1 laptop program implementation.

Table 4.1: Laptop Program Essential Steps

Question #1: What are the essential steps when initiating a 1:1 laptop program?

Number of responses by teachers surveyed	Topics in response to the essential steps when initiating a 1:1 Laptop Program
3	Setting clear expectations for use of technology to implement higher order thinking
3	Proactive training for teachers on the use of technology and current web tools
3	Time to plan technology integration in teacher lessons
2	Funds available to purchase items and secure technical support
2	Give guidance for laptop management, safety and teaching students to value laptops
1	Collaboration and consensus among grade level members to establish guidelines
1	Instruct students on laptop procedures
1	Teach student show to use Google searches etc...
Total = 16	

The most frequent response to this question was setting clear expectations for effective use of technology; teachers commented that technology should be used to help with teaching higher order thinking skills and rigor. Three teachers also commented about the importance of clear expectations for effective use of technology and teaching higher order thinking skills. Proactive training for teachers that includes training on the use of current web tools was also noted as important in the initial phase of 1:1 laptop program implementation. Teachers defined this training as time to plan the integration of technology into lessons and

collaborate with colleagues. Another priority for teachers surveyed was having funds available to purchase necessary items and to secure technical support as part of the initial steps in the development of 1:1 laptop program. Additionally, the survey indicates that guidance for laptop management and safety was needed to help students value laptops. The steps that were important beyond the initial phase, during the development of the program were as follows:

Table 4.2: Laptop Program Development

Question: What are the steps in the development of a 1:1 laptop program?

Number of responses by teachers	Topics in response to the steps in the development of 1:1 laptop program
3	Develop procedures which explain how laptops will be used in all classes. How to report misuse or property damage and rules as how they will be used in the classroom
3	Have an expert on the campus
2	Professional Development on how to effectively and rigorously use technology curriculum support
2	Establish guidelines for care/use and provide clear student and teacher expectations
2	One grade at a time with experienced grade helping the next grade to step up
1	Don't overwhelm teachers with "tasks", resources
1	Establish rigorous instruction using the laptops
1	Allow the teachers to ease into the program and its resources
1	Adequate supply of resources
Total= 16	

The survey responses to this question indicate the importance of laptop management procedures and professional development on a continuous basis. Teacher comments were stated with preference to careful program pacing, Kim stated, “Don’t overwhelm teachers with “tasks,” “resources.” Denise added, “Allow teachers to ease into the program and its resources.” Having an expert on campus to assist with technical and program needs were mentioned in both interview and survey responses.

Table 4.3: Laptop Program Success

Question: What are the successes of the 1: 1 laptop program?

Number of responses by teachers	Topics in response to the Success/Celebrations of the 1:1 laptop program
12	Student engagement-increased student End Of Grade achievement, increased student motivation, helped students to take ownership, and improved access to unlimited information and increase knowledge of 21 st Century skills.
2	Increased resources for teachers-knowledge of 21 st Century skills and differentiation, provided an adequate supply of laptops, and access to effective technology for ALL students, and provided instant feedback on student progress.
1	Student work products- developed global awareness and greater understanding of how to use computers.
1	Media Coverage of the 1:1 laptop program
Total = 16	

The above table identifies student engagement as a celebration of the 1:1 laptop program. Student engagement was also noted in interview responses as the biggest success of the program. The success of increased resources and knowledge gained were cited as helping teachers to work in a more efficient manner. Students were able to produce work of higher quality. Another success identified were students taking greater ownership for their work. Teachers commented frequently about being able to develop student and teacher 21st Century Skills.

Table 4.4: Laptop Program Challenges

Question: What are the challenges of the 1:1 laptop program?

Number of responses by teachers	Topics in responses to Challenges of the 1:1 laptop program
3	Identified technology outdates—slow running, memory issues, battery life, outdated software, and not being able to connect to the Internet. Once dependent, teachers are given less of other resources or updated textbooks
3	Lack of full time technical support—keeping laptops repaired
2	District blockage of valuable resources—You Tube, great video tutorials
2	Not enough class time to use/put away computers
1	Student knowledge to take care of computers
1	Appropriate website resources for low level learners
1	Pacing guide needs to be adapted so students can also reinforce at home.
1	Kee p class sizes reasonable for the number of computers
1	Make sure 1:1 laptop computers are utilized at all times

Table 4.4: (continued)

1	Difficult to monitor how long students have been reading online versus staring at a blank document at the end of the day-- cannot force or trick students into learning.
Total= 16	

Technology outdates was listed as the biggest challenge for the 1:1 laptop program. The lack of full time support was frequently mentioned in interview and survey responses.

Table 4.5: Laptop Program Lessons Learned

Question: What are the lessons learned in a 1:1 laptop program?

Number of responses by teachers	Topics in response to Lessons Learned
3	Technology can be an effective tool for promoting rigor and provide meaningful differentiation for Academically Gifted and below grade level or English Language Learner students.
3	Imperative to have students/staff able to troubleshoot hardware/software problems. Classroom teachers need to train students to help get out and put away laptop computers.
3	Learned how to integrate technology with lessons and organize rooms to support learning. Need to be more careful with limited time
2	Make sure students are aware of the privilege of having one laptop computer to use per student
1	Stay informed of current trends
1	Teachers take for granted that students have technological skills necessary for learning and use of laptops effectively.
1	It is so important to have this technology in the classroom.
1	Takes time to develop the switch from no laptops and everyday access valuable for differentiation.
1	Be prepared with back up plan when technology does not work it is rare but important to be prepared.
Total = 16	

The survey responses for lessons learned included comments and lessons that teachers learned from the 1:1 laptop program implementation. The most frequent responses included the lessons learned about the differentiation, student technology skills, and importance of technical support. The survey responses provided the foundation for identifying artifacts to review and perspectives established through interviews.

Artifact Reviews

The artifacts reviewed include the contractual agreement, meeting agendas, goal development sheet and email correspondence. These artifacts provided historical background information and timeline for the 1:1 laptop program implementation.

Artifact #1 Contractual Agreements

The grant contract agreement was written between the school, district and business partner. Another contract agreement was written between the project leader and the school. Each agreement outlined the responsibilities of each partner and expectations for fulfillment of the grant gifted to the school. The main grant contract agreement was reviewed by legal representatives from the business partner and the school district. The contract was routed through the district Grants Administration, Finance, and Superintendent offices.

The business partner's legal team suggested and revised the agreement. Signatures were obtained for the contract from the Board of Education chairperson, Area Superintendent and Principal because of the grant amount exceeding \$100,000.00. The business partner representative signed the contract as well after the legal department reviewed the contract. Reviewing both contract documents involved careful highlighting of the responsibilities for

each partner in a different color. This information provided the foundation for developing the perspective statements for each partner.

Artifact #2 Meeting Agendas & Goal Development Sheet

The planning team comprised of the school principal, University Outreach Coordinator, Project Leader, Business Partner representative, and teacher representative. Initially our monthly meetings were guided by a working agenda. The meetings after the first semester moved to quarterly planning meetings. Communication continued throughout through email correspondence and phone conversations. The planning team agenda is organized according to the implementation timeline. Dates are carefully noted on the agenda so that discussions move forward. The agendas highlight areas of concern from each partner. These concerns helped to provide the foundation for developing the perspective statements for each partner.

The teacher meeting agenda is organized by a goal development sheet. The “Arms”. Each “Arm” is listed on the agenda with its corresponding goal statement. The goal statement was set by teachers at the beginning of the program. The role of this agenda at the teacher meeting is to make sure dialogue is taking place on each aspect of the 1:1 laptop implementation. Weekly meetings began with teachers. In addition, quarterly meetings were held for the first year with partners from the district, school, university, and business. The agendas provided an opportunity for every represented group to have a voice in the development of the 1:1 laptop program. Agenda items such as equipment, supply lists, professional development, email correspondence, and funding documented the priority areas

focused on the preparation and planning of the 1:1 laptop program. The minutes from the meeting are placed on the shared directory for teachers to review what was discussed and agreed upon in the teacher meetings.

Artifact #3 Email Correspondence

There was another method for communicating the 1:1 laptop program goals, needs and plans. Email was used by everyone involved in the 1:1 laptop program development. Reviewing the emails provided details to the concerns, issues, and plans discussed among the partners throughout the years of the 1:1 laptop program development. The email correspondence documents the team members who were involved throughout the planning and implementation stages. The review of these artifacts provided insight to the perspectives from the school, university, district, and business partners.

Key Themes from Artifacts

The review of information from the contract agreements, meeting agendas and goal development sheet, and email correspondence was organized into categories based on related responsibilities: Instructional Support and Outreach, Planning and Management of Resources.

Instructional Support and Outreach

The responsibilities of the project leader position were outlined in the contractual agreement. The responsibilities included collaborating with teachers and other instructional staff to develop curriculum materials and specific lesson plans that integrate technology,

model the integration of technology in all curriculum areas, and conduct staff development. Staff development was focused in the areas of developing technology integration and meeting the North Carolina Technology Competencies for Educators. The project leader provided instructional support by implementing best practices related to technology use

In addition, the project leader was responsible for facilitating the school participation in technology programs and activities collaborating with the school media coordinator to provide leadership in the school's use of instructional technology resources to enhance learning. The responsibility of the project leader was extended to promote family, business, and community partnerships that supported the academic success, career readiness, and general well-being of all children.

Planning and Resource Management

The project leader was responsible for collaborating with the school's media coordinator to provide leadership in the school's use of instructional technology resources to enhance learning. The principal, project leader, and school instructional staff provided access to technology resources and services of the technology facilitator as needed. Additional responsibilities included the instructional planning with teachers in the selection of resources that are compatible with the school technology infrastructure so that information resources are continually available to the school community. The project leader communicated copyright as well as other laws and guidelines pertaining to the distribution and ethical use of all resources. The project leader assisted in maintaining and addressing hardware, software,

and network infrastructure issues. The project leader responsibilities are part of the planning and resource management with the 1:1 laptop program. The review of artifacts supports the Instructional Support and Outreach, Planning and Resource Management categories.

Additionally, the review of artifacts provided insight to the development of the perspectives from each partner.

Perspectives

One of the unique aspects of the 1:1 laptop program development at Centennial Campus Magnet Middle School was the involvement of external partners from the university and business partner. The relationship with the external partners was not just on paper, but participatory in the planning, implementation and monitoring of the 1:1 laptop program.

There were questions that arose from each partner. These questions were not barriers to the implementation of the 1:1 laptop program; however, they were recurring points of interest throughout the program implementation. The next section explores the perspectives from the school, school district, university, and business partner. Each perspective provides valuable information describing the development and implementation of the 1:1 laptop program. Over time, the questions were reviewed and discussed from different perspectives. A review of artifacts such as meeting agendas, email correspondence, and meeting minutes provided insight to recall and gained information from the different partners' perspectives.

Perspectives: Centennial Campus Magnet Middle School

From the school, the main question dealt with the expectations and pace associated with the school for implementing the 1:1 laptop program. Early on, the input and

involvement of the teachers was a priority for the school. Each teacher led a main component of the 1:1 laptop program, called “Arms” of the project and was responsible for leading their house in that area of interest. Arms include curriculum development, management, professional development, evaluation, parental involvement, exploratory, historian, and student. Teachers developed goals under each arm area and first year action steps. At the weekly house meetings, teachers reported on the status of their arm’s development. Teachers interviewed described this approach, Jane shared “I think the way Centennial went about preparing for the program was awesome...Phenomenal...we used at least a half a year or more to prepare for this 1:1 program. We did not rush anything; we thought it through, everything. We collaborated and worked out every detail possible, from how the laptops would come into our rooms, to how the students would retrieve the laptops and how that would be on their desks. I mean every detail of management...” Angie commented, “Yes, every detail! We took a lot of time to develop that which allowed this program to be implemented easily. As a professional, I felt hugely impacted by that because of the collaboration effort, the way we worked together...The ownership of it all because we were all involved.” The 1:1 laptop program preparation discussed by the teachers derived from a series of collaborative planning sessions. Teachers from the school were required to attend a minimum of three meetings with [business partners]. The meetings took place at least once during each school term during the 2009-10 school year.

The project leaders’ position was definitely a critical component from the school’s perspective. There was a high priority placed by the school to secure the funds for the

position as a part of the grant. Linda stated, “I feel like having that manager is almost essential to continue to implement new ideas, new programs, and getting use to the technology...” Denise asserted, “A project manager is a must!” The significance of the project leader position was captured by another teacher when Renee reflected, “I feel support with training is very important. Giving time to learn about tools and learning how to use them, keeping the laptop manager position, someone has got to be in that position. Someone we can call on when we are having technical difficulties. When you’re in the middle of a lesson, that’s one of the things about technology and something goes down, it has shot your lesson completely, unless you have someone you can call on to come assist right then and troubleshoot your next door neighbor/teammate, then you have to revamp everything you’re doing or have to wait for someone to assist you. This person is invaluable in keeping laptops repaired, any issue that comes up...Any little issue, keyboarding piece falls off, screen messes up, wireless card goes bad, and we need someone who can do those repairs!” The ongoing support of the project leader was a recurring theme in the surveys and interviews conducted for this study.

Perspectives: Business Partner

A business representative entered discussions with the district leadership about the idea of starting a 1:1 laptop program at Centennial Campus Magnet Middle School. In 2006, this discussion moved from conversation to reality. The business partner planned to fully equip and support the school for this 1:1 laptop program. This gift included laptop computers, LCD projectors, printers, professional development, site visit opportunities, and

conference presentations. From our business partner, there were the questions: Would the laptops go home with students? Will the district contribute support for the project leader position? What professional development do teachers need?

The one negotiated item was the contract dollars for a project leader position. A review of the contract agreement provided an outline of job responsibilities. The partnership did more than develop on paper and through budget transactions. The business partners were active at every meeting inquiring about next steps, teacher and student progress, providing new opportunities for teacher leadership at conferences and presentations. In addition to meeting attendance, the business partners visited classrooms and brought other schools to visit the school. The publicity from the business partners varied from television news stories, journals, company publications, national and local news spotlights.

Notably, the professional development sessions were hand delivered as representatives from large corporations came to the school to provide “Tips for successful 1:1 laptop Implementation.” Another corporation hosted a vision-planning meeting that provided an international partnership opportunity. Professional meetings, “Business Summits” provided an opportunity for our school to present our progress. Funding from the business partner provided an opportunity for the school to present to superintendents and principals from districts across the nation at the National Magnet Conference.

The Budget

The responsibilities of the business partner was to make available to Centennial Campus Magnet Middle School a one time grant gifted to the school in the total of

\$380,284.00 to be applied exclusively to the equipment costs and compensation for technology support services. The budget for this grant gifted to the school was managed by the school. The funds were disbursed in the form of a check written to the district for the total amount. The funds must be spent by June 30 of the same fiscal year. If there were remaining funds, permission from the business partner was granted via an email statement that extended the grant budget to the next fiscal year. Every year this email statement from the business partner was submitted to the district from the school principal. At the close of each year, the program and financial information mainly balances in each line item would be shared with the business partner as requested.

As the school’s budget manager, I was responsible for creating line items that aligned with the agreement of how the funds would be spent. The line items created included equipment and supplies, contract pay and indirect costs. The expenses were shared with the district, school, and business partner. However, the business partner funded over 90% of the funds. The following table details the grant line item amounts:

Table 4.6: Laptop Program Budget 8th grade 2006

Item	Source	Total Cost
Equipment, Supplies (laptops, carts, extra batteries, extra hard drives, LCD projectors)	Business Partner	298,882
Equipment, Supplies (USB flash drives, wireless access points, port wireless controller)	District	10,742

Table 4.6: (continued)

Equipment, Supplies (nylon sleeves, USB flash drives, wireless access points)	School	14658
Contract	Business Partner	56000
Total Costs		380,284

This table details the initial start up fund allocation for the first year. However, at the end of year one the business partner provided additional funds (\$6,000.00) to cover professional development costs such as substitute teachers, visits to another 1:1 school, travel, and conference registration. In addition, funds were also provided (\$32,000.00) at the end of the first year to extend the project leader contract. The total was \$38,000.00.

Initially, this was a one-time grant gifted to the school with the thought that the district will assist with future expansion. The vision of the school to become a 1:1 computing campus combined with the progress of the eighth grade 1:1 laptop program influenced a changed in the initial one time grant gift. The business partner decided to support a second grant donation for equipping seventh grade with a 1:1 laptop program for (\$391,026.00). The following table details the grant line item amounts:

Table 4.7: Laptop Program Budget 7th grade 2010

Item	Source	Total Cost
Equipment, Supplies (laptops, carts, damage protection, LCD projectors)	Business Partner	330,653
Equipment, Supplies (wireless access points, port wireless controller)	District	5,000
Equipment, Supplies (cart locks, toner, surge protectors,)	School	5,369
Contract	Business Partner	48000
Curriculum Pay	Business Partner	2,000
Total Costs		391,022

The seventh grade budget details include the additional line item of curriculum pay that supported the ongoing professional development opportunities provided to teachers. The business partner agreed to provide professional development for teachers who were utilizing the business software products at the school. Most of the training took place on –site at the school. In addition, the business partner was responsible for adhering to district policies and practices including, following procedures established by the district Evaluation and Research Department for external research requests and the protection of student and staff confidentiality.

Perspectives: The School District

From the district, questions surrounded installing wireless access points, mounting LCD projectors and security issues. As outlined in the grant agreement the expectations of the district, communicated through the school principal, supported the project leader's ability to coordinate services and provide oversight of the 1:1 laptop program. It was the district's responsibility to employ a certified teacher to provide technology support services. The district secured these services through contracting, stipends, and/or extra-duty payments. The school district agreed to provide the business partner with usage information so they could assess the impact of the grant on teaching and learning at the school. This included a minimum of the following: End of Grade scores in Language Arts, Social Studies, Math and Science for all eighth grade students at the school, and End of Course scores in core subjects for all eighth grade students at the school. In addition, the district provided access to demographic data for the school and comparable student performance within the school system. With support from the school district, the university designed survey instruments for students at the school. In addition, the district assisted with the installation of projectors for the 1:1 laptop program. The district responsibilities were monitoring and input for evaluation activities and assisting with installation of hardware.

Perspectives: The University

The unique school-university relationship provided an opportunity for additional support in the development of the 1:1 laptop program. From the university perspective the following questions were frequently raised, would evaluation involve student and teacher

surveys? Would there be classroom observations? What would be the university's role in providing professional development? Close proximity to the school made it convenient to assist with the instructional planning with ideas, resources, and professional development. The university was responsible for collaborating with the school district to conduct and compile an evaluation report on the 1:1 laptop program progress. The university representative provided input on program implementation and worked to make university resources available to teachers involved in the 1:1 laptop program. The university contact assisted teachers in the classroom. A university professor provided input with curriculum planning, 1:1 effectiveness training and teacher technology assessments.

The university provided seats for our teachers when they sponsored training on 1:1 laptops to their innovation center. The university provided teacher leadership opportunities for Centennial's 1:1 laptop teachers as they served on panels to discuss their experiences with 1:1 laptop implementation. The initial university representative mentioned above changed job assignments and was no longer able to support the 1:1 laptop program. The transition was seamless as our on-site university contact was present from the start and continued to provide support. His role continues to be making contact with the university for access to resources and teacher leadership opportunities. A definite goal is to expand and increase the university connections in regard specifically to the 1:1 laptop program. The responsibilities and relationships among the four partners (school, district, and university and business partner) faced challenges in the area of communication and changes in personnel.

When a school is fortunate to be the recipient of a 1:1 laptop program, the curriculum

content nor their standard course of study changes, only the delivery of the content changes. As Nancy explained in the partner interview, “When Centennial Campus Magnet Middle School learned they would be lucky recipients of such a 1:1 laptop program, they immediately began work on their implementation plan. The key to success was teacher planning and collaboration. In weekly curriculum meetings, teachers discussed goals and strategies, called Arms of the initiative: Professional Development, Curriculum, Management, Students, Parental Involvement, and Evaluation Arm. These Arms greatly contributed to the program success as they integrated technology and curriculum.”

In 2010-2011, over 400 seventh and eighth grade students had access to 1:1 laptop technology at Centennial. With the economic crisis and shrinking school budgets cutting thousands of dollars and hundreds of positions, Centennial uses a curriculum software resource, available at no cost, which provides standards based content in the core academic disciplines-English, mathematics, social studies, science, and Spanish. This software features on-line ready-to-use lessons, interactivities, and virtual labs with free webinar training sessions-live and on-demand. The benefits of 1:1 laptop technology as captured through the teacher surveys and artifact reviews conducted in this study included:

- Motivation of time on task
- Student attitude toward learning
- Students can explore subject more in-depth
- Easy for teachers to individualize learning
- Virtual textbook updates
- Virtual science labs too difficult, expensive, or dangerous to be done in a conventional lab, can be done through virtual labs on-line
- In math, geometric figures can be manipulated easily for a visual
- Students read and listed to excerpts from primary source documents
- Improved quality of projects with variety of available applications

- Electronic classrooms-teachers and students using electronic documents in daily classroom instruction
- On-line student/teacher collaboration

John commented in the partner interview, “We need to make learning as easy and exciting as possible for our students – that means information “on-demand.” Virtual knowledge base technology has afforded Centennial students and teachers the opportunity to reach beyond the walls of the classroom using computers as virtual textbooks.” Eric states as a focus group member, “With daily access to technology, students are more motivated to learn, particularly at risk and special needs students. Quality of work has improved, and teachers report considerable evidence that laptops have had a positive impact on student behavior and academic achievement.” Nancy reflected in the partner interviews, “1:1 technology is not just a trend anymore but necessary for students to compete in a global market. One to one technology has transformed the way teachers teach and students learn at Centennial Campus Magnet Middle School.”

Centennial’s 1:1 Laptop Program Organization Structure: The “Arms”

The focus of the 1:1 laptop program was to incorporate technology into classroom instruction and improve student performance on both classroom and state level assessments- “student achievement and teacher effectiveness.” Appropriate staff members from all partners met monthly during the first year to facilitate the 1:1 laptop program implementation. To ensure success of the 1:1 laptop program, Centennial teachers met weekly for curriculum mapping and the development and evaluation of procedures,

expectations, goals, and strategies called “Arms” of the project. Arms represent the essential components associated with the implementation and development of the 1:1 laptop program. The idea of “Arms” originated from an earlier technology project led by the principal called “From the Mountains to the Sea.” This project united students across the state in three counties each located in a different region. The term “Arms” was used to describe the different student activities associated with the interactions of students from across the state such as care packages, student portfolios, video conferencing that provided “life and structure” to the “From the Mountains to the Sea” project.

The term “Arms” is now used for the 1:1 laptop program at Centennial Campus Magnet Middle School to identify, define, develop the essential components, and evaluate the progress of the 1:1 laptop program. At every grade level with the 1:1 laptop program, a teacher or group of teachers select a particular “Arm” to lead. Teacher leadership involves making sure development of the “Arm” is being discussed among all teachers. Ideas for improvement and student growth are presented and led by the assigned teacher. For example, if there is a concern with laptop security or inappropriate use by students then the teacher for the Management Arm will receive the concerns and lead the grade level discussion in finding a solution. Additionally, the Management Arm teacher may present relevant research to help solve problems and implement new ideas.

The Arms Defined

There were specific goals and responsibilities associated with each “Arm.” The nine “Arms” are listed and defined below:

Curriculum Arm-The Curriculum Arm was the foundation of the laptop program. This arm focused on curriculum organization using curriculum mapping to integrate relevant technology resources. Inquiry-based integrated common assessments were created quarterly. Students integrated technology skills into curriculum through a variety of technology applications.

Management Arm- was a process implemented for coding, storing, distributing, and maintaining laptops. “Policies and Procedures” and “Management and Security” documents were created.

Professional Development Arm- Provided opportunities for teachers to increase their technology skills for curriculum integration.

Extension Arm- Extended teaching and learning opportunities outside the instructional day for example offering the development of an on-line literary magazine.

Exploratory Arm- Facilitated a system for exploratory teacher communication with support of 8th grade curriculum integration.

Parental Involvement Arm- Involved parents through an advisory council. This partnership offers technology support to parents and expert contacts to teachers.

Historian Arm- Documented the on-going progress of the one-to-one laptop project.

Published teacher lesson ideas and student work samples.

Evaluation Arm- Communicated with the district Evaluation and Research, and all partners to evaluate and document classroom performance, skills, and climate for teachers and students. The Evaluation Arm collected data from students and teachers using an on-line

survey designed by the university. Additional data is collected from classroom observations conducted by the university as well as a collection of student products.

Student Arm- Developed student leadership by utilizing student committees- student technology teams troubleshooted the more common problems, assisted with laptop management , and assisted with software applications.

This study continues to tell a story about how a 1:1 laptop program situated in a model middle school with a unique local university partnership reflected the overall vision of the school. The summary included the review of artifacts such a contracts, meeting agendas and planning documents. Yin (1989) specifically addressed the importance of having multiple forms of data collection such as “documents, interviews, physical artifacts, archival records, and observations.” This study reflects all of the recommendations from Yin’s work, *Case Study Research: Design and Method*. The approach used with this study was to collect data through reviewing documents, conducting interviews and conduct participant observations (p. 84).

Interviews and Focus Group Sessions

Interviews are another form of data collection. There were four interviews with representatives from the school, district, university, and business partners. The roles and responsibilities vary among the interviewees depending on the affiliation of the entity. The interviewees shared a common role with the 1:1 laptop program, as they were all participants in the planning process. Through the interview process, their roles and responsibilities were defined from each perspective. The primary role of the business partner was allocating the

funds for the 1:1 laptop program. The total allocation of approximately \$750,000.00 provided equipment and supplies, professional development costs and a project leader contract to the school. The business partner defined its role "...to be involved in the planning in case needs arose...to stay engaged in the planning to support the school." Evident in this response the business partner responsibility was self-defined as "allocating the funds and resources" used for the 1:1 laptop program.

Centennial Campus Magnet Middle School 1:1 laptop leaders identified a variety of responsibilities associated with the 1:1 laptop program. The responsibilities defined in a partner interview by Eric as, "The primary role is looking at curriculum resources, managing the relationship with the business partner, marketing the program, teacher training by assessing their [teacher] comfort, helping them to utilize resources. I oversaw surveys and needs of the business partners. I troubleshoot any problems the teachers may have." The response "...marketing the program" was mentioned by Eric and asked to be further defined during the interview. The responsibilities associated with the task of marketing the program involved "Preparing and presenting at conferences. Working out the logistics finding the teachers that best fit the conferences...finding which teachers would have a good cross reference of our program." Evident in this response is the school level responsibility of "managing the relationships" with teachers and the business partner. Nancy presented the role and responsibility in a partner interview associated with the 1:1 laptop program. The role and responsibility included "...making sure all hardware and software are working properly and that teachers and students are comfortable using the technology, if not training is

provided. I continually assessed the equipment needs of the project and prepared the necessary purchase orders.”

The school project leader’s role and responsibility was presented as one that changed as the 1:1 laptop program develops, “...Now that the project has been in place for five years, the teachers are becoming quite technology savvy; however, at the same time, the equipment is aging. As a result, it has been necessary for me to focus more on equipment repairs than during the initial start of the project.” Evident in this response is the priority changes that evolved as the laptop program developed. The responsibility of the project leader in addressing equipment repairs included, “... research for competitive equipment prices, and cross reference this list with items on the state contract.” One partner defined his role as making the connection to secure the project leader for the school. He further described his role as sitting in on all meetings “...My role was informational by contributing to the discussion.”

There were key words that emerged in each response from the question characterizing the original idea behind the creation of Centennial Campus Magnet Middle School. The key words *collaboration*, *model middle school*, and *leadership* were associated with the idea behind why Centennial Campus Magnet Middle School was created. The intent of how these words were translated within the school walls was described in each interview. The following phrases comment on collaboration, Jean shared as a focus group member, “It [Centennial Campus Magnet Middle School] was built on collaboration which was supported by shared spaces used for assemblies, student activities. This collaborative environment was designed

to provide individualized attention to each student.” Another view expressed in a partner interview was, Denise added, “The collaboration is more about integration and a deep partnership.” All interviewees mentioned aspects of a “model middle school” to characterize the original idea behind the creation of Centennial Campus Magnet Middle School. Barbara described the “model middle school” setting to include “...an environment where smaller classrooms are available with fewer students...differentiation and individualization is encouraged. Teams work in no more than 100 students.” Carmen commented as a focus group member, “A place where research based strategies is employed. A school not based on size restraints. Using what research says about middle school students, classroom environment, classroom size, outside resources...”

The idea of “...leadership in a nutshell” was used to describe the original idea behind the creation of Centennial. Leadership was discussed in the context of the original idea behind the creation of Centennial Campus Magnet Middle School. Jean shared as a focus group member, “With our focus on developing ‘lifelong learners’, introducing interactive technology at the middle school level will prepare students to handle on-line courseware in an educational setting (high school and college) and to face the 21st Century job market.” Evident in this response was the level of understanding of how a “model middle school” is defined. Furthermore, the original idea of Centennial Campus Magnet Middle School was described similarly across all interviewee respondents. Knowledge of the original idea came from the publicized process during the planning or sharing of the school’s history over the years.

One of the original ideas behind the creation of Centennial Campus Magnet Middle School was that there would be an “extensive use of cutting-edge technology.” Initiating a 1:1 laptop program would represent an example of “extensive use of technology.” When interviewees identified key components of initiating a 1:1 laptop program, there were common responses among all interviews. The most frequent responses for the key components of initiating a 1:1 laptop program were strong school leadership, pre planning involving all partners [school, district, business and university], and resources.

Comments regarding strong leadership included, Denise stated in a partner interview, “...protecting teachers against initiative just being dropped in the school for teachers to do, starting slowly with teachers being brought in and engaged in the program development.” Pre planning was agreed upon by all interviewees as a key component in initiating a 1:1 laptop program. Nancy commented in a partner interview, “The communication and collaboration was foundational without it no way could we have moved forward. We were driven by a common vision of a laptop program would have kids doing school the way they live”. Another description of the planning meetings and artifact review of planning documents, agendas also support the priority given to this response as a key component. Eric shared, “1:1 committee members met (and continue to meet) weekly 1) as grade level, 2) as a team, and 3) as content area to discuss the weaknesses and successes of the program –offering suggestions and solutions. These meetings were attended by participating Centennial staff and the following individuals 1:1 project manager, university representative, Centennial

administrators, local business members, University Outreach Coordinator, IRT [Instructional Resource Teacher], and media specialist. I attribute these meetings as a key factor to the success of the program.”

Both financial and human resources were the next most frequent response. Qualified staff and training for teachers and a project manager were critical human related resources. Available funding for what Nancy recalls “...providing not just 1:1 laptops, but additional supportive equipment (i.e. security carts, whiteboards, or LCD projectors, classroom printers, presenters...) Prior to the arrival of eighth grade 1:1 equipment, we had a county commitment for high-end wireless ports. Likewise, prior to seventh grade, we had a commitment from the county for campus-wide wireless. The wireless infrastructure was imperative and critical to the success of the program. With 425 laptops, it would have been impossible to string enough Cat-5 cable to patch into the network and not cause a safety issue in the classroom.” The components of strong leadership, pre planning, and resources identified as key to initiating a 1:1 laptop program were common among interviewees.

During one interview, a discussion evolved describing relationship dynamics that were unique considering the communication and collaboration with diverse entities as Centennial, district, business partner, and university. John reflected as a partner interview, “It was evident that the business partners were used to operating from a timetable, more of an executive model focused on moving forward, allocating funds, and putting things in place without barriers. The College was concerned with policies through Institutional Review Board with research and making sure everyone was heard.” The school was focused on

careful pacing of the rollout and making sure the building was physically equipped to support the 1:1 laptop program, which was implemented with all the eighth grade students.

John continued, “Bureaucracy was a hindrance especially with the district, school, and financial piece. The processes to get permission took time. Proximity issues also seeing as we [Centennial] are joined at the hip with the university versus the north side [district] of town.” Evident in this response is the issue of how relationships were impacted by communication processes and proximity. The relationships and perspectives were impacted by the different views and relationships established with the school. “Most of the conversation was about cultures and backgrounds—who owned what and who is in charge of what piece. Individuals were hurt through communication skills not being effective. I’m not assessing value judgments on the process but communication was a factor...I wonder although if a factor was that it was not uncommon that everyone in the planning room was used to being the smartest person in the room.” This would explain the importance of clearly defining roles.

The essential steps in the development of a 1:1 laptop program were identified through the interview responses. The common response identifying essential steps was teachers being the essential part as a 1:1 laptop program develops. Sam advised as a focus group member, “Continue to listen to teachers making sure their needs are met...the school leader was determined to have a tech facilitator present. Teachers were supported, having the appropriate staff present, not letting the program be guided without the teacher’s involvement,” Eric supported the same view in a partner interview, “A core group [teachers]

that understands how to use technology and curriculum resources. This core group helps you to break apart getting it [the project] rolled out and own different pieces like the arms. Have different people take charge of different components (i.e. curriculum, how to assign students, logistics, checking resources)” were responses that identify teacher leadership as an essential step. Other responses related to the essential involvement of teachers, Carmen shared as a focus group member, “Collaboration with the grade level, team, content areas and in the business meetings...Training for teachers and students. The first training for our students was the teaching of ethics and responsibility. It was important to us to instill ownership of the laptops. I attribute that (ownership) as the number one reason all 200 of the five year old eighth grade laptops are still working today.” There were a total of four in depth responses related to the teacher’s level of involvement as essential steps in the development of a 1:1 laptop program.

Another response (n= 6) identified the arms as an essential step, “...the development of arms which was crucial from a strategic level. It allowed teachers to have ownership without being overwhelmed it got at the shared/distributed leadership aspect.” Additional responses (n= 12) also highlighted specific staff appointments that were essential in the development of the 1:1 laptop program, John commented in a partner interview, “The project manager had a strong background knowledge about technology. Her demeanor showed her expertise and graciousness. This was a big plus with the business partner and teachers...positioned her to be a real catalyst, hiring a key technology literate lead teacher. He was the most tech savvy and a fortunate hire...he was ahead in terms of his knowledge of

technology. He knew how to use it and how it works. He was comfortable incorporating technology in Math and using new technologies. He had students create lessons and video with sound instruction.” It was evident in the responses that the role and responsibilities distributed to teachers along with two highly skilled 1:1 laptop support leaders was essential in the development of the 1:1 laptop program.

Other steps mentioned involved having a “plan for distribution, policies, security, and management of laptops.” Questions raised during the development of the 1:1 laptop program ranged from “Are they [laptops] going home overnight? Are they going to move from one classroom to another? Do they leave the eighth grade house? How are they secured overnight?” The answers to these questions and a plan for parent involvement were developed during the implementation of the laptop program as indicated in the review of artifacts such as the 1:1 laptop program kickoff evening for all partners. There were a total of twelve responses related to the importance of staff appointments in the development of the 1:1 laptop program.

When asked about the biggest success of the 1:1 laptop program the response agreed upon by everyone interviewed was “student engagement.” One interviewee captured the biggest success as “Student engagement, especially for special needs students. Students have a better attitude about completing their work. They are not at risk of getting the wrong answer in front of everyone. Tutorials on the computer make it so students are not afraid to ask questions. I see improvement with a student centered environment.”

One of our business partner representatives shared her site visit observation, “The

level of student engagement I see when I visit. They [students] don't know or care when adults come in the room because they are so engaged." The benefits for students is described by another interviewee, "Students have the opportunity of not missing any work because teachers post daily outlines, classroom instruction presentations, and long term projects on their websites." There were a total of ten responses related to student engagement as the success of the 1:1 laptop program.

School and university interviewees commented on student work quality and were discussed in detail. "I have seen improvement in student products- a variety of applications and the quality of their work exceeds what one would expect from middle school students. They [students] create oral presentations with voice overlays, video documentation, and design websites of high quality." This comment was further supported, "It was evident when we presented at the National Magnet Conference in Charlotte. When we showed documentaries, the administrators and teachers were amazed by the quality and depth of research students were creating with technology. It really has taken the limits off what high achieving students have an opportunity to do and create. The flipside is it's more engaging for developing students." There were a total of five responses related to student work as the success of the 1:1 laptop program.

Another success was cited, "The big reward is the tell-tell sign that technology in the classroom is working and evident in our test scores. The technology expertise of the staff has grown exponentially and they continue to add a variety of on-line communication tools in their classroom." Another interviewee commented, "Technology is the tool that helps/assists

putting students in charge of their learning and teacher effectiveness improves by utilizing this resource.” It was evident by the interview responses that student engagement, work products, and increased expertise with technology were cited as the success of the 1:1 laptop program. There were a total of three responses related to increased expertise as the success of the 1:1 laptop program.

The biggest challenges were identified in the interview responses. Sustainability of the 1:1 laptop program, stakeholders’ understanding, and supporting the vision of the 1:1 laptop program. Sustainability was discussed in two ways in the interview responses. Nancy remarked, “Once technology is in the classroom, students and teachers become dependent on it and find it difficult to imagine a classroom without it. Out of warranty, machines require technical expertise to keep them working. A plan for sustainability is necessary, not for students and teacher involvement, but for the hardware upkeep,...Classroom wiring can also be a challenge because batteries do not last from 8 am-3 pm. The older the laptop, the more frequently it needs to be charged. AC power infrastructure was important to configure from the onset. Outlets were strategically placed so laptops could be charged with no safety issues.”

Eric mentioned sustainability with regard for the students themselves, “After they leave [CCMMS] then what happens? Students still have four years of critical development...How do we make sure that they do not lose what they in learned in one or two years here—how do we make the skills remain relevant. My concern is not having the ability to check on these students. Are one or two years enough to create/change different outcomes

for students having access to the program? Does it help with what we are concerned about students graduating and attending higher institutions?” It was evident with the interview responses that sustainability of the hardware and program are both viewed as challenges. There were a total of nine responses related to sustainability as the biggest challenge of the 1:1 laptop program.

Interview responses captured the importance of ensuring that equipment was sustained and that students could continue to build upon their technology skills. Another common challenge John cited in the partner interview the importance of “making sure the district understood this could be a model...something that could be in their district plan and instilling the idea that the funding for staff support would be there...because that’s a critical component”.

Another challenge has been the money for staff technology support because that has been supported by our business partner to this point. Staff support is a key component that we believe is essential for the project to be successful.” This response presents a support and funding challenge between the district and business sponsor of the 1:1 laptop program. Eric identifies in a partner interview an additional challenge among stakeholders, “Making sure all teachers understand the vision of the program. The laptop is not a resource to tell teachers how many times to open the textbook. The technology seen as a valuable resource not another “to do” item, so the teachers view technology as a curriculum tool, not gadget they use.” It is evident that sustainability and a shared understanding of a common vision is a

challenge among the 1:1 laptop program partners. There were a total of three responses related to a shared understanding as a challenge of the 1:1 laptop program. The focus of the interview shifted to ask in what ways, does the 1:1 laptop program reflect the original vision of Centennial Campus Magnet Middle School?

The most common response was that the 1:1 laptop program created a student centered, student led learning environment. Diane reflected as a focus group member that the 1:1 laptop program reflects the original vision of the school in that “It enables the differentiation of instruction and attention to the needs of individual students... The atmosphere that every student received instruction as needed, as appropriate for their ability...the computers make that much easier.” Carmen discussed as a focus group member how the 1:1 laptop program is consistent with the vision of Centennial Campus Magnet Middle School, “It [1:1 laptop program] is research based providing immediate feedback, tool that increases motivation, use of current resources...it presents how we want instruction to look like...developing global responsible citizens...How to get resources, take care of resources. How to communicate with students and adults using message boards, emails. It helps with both students and teachers.” For example, John stated in a partner interview, “It is a common practice [at Centennial] of kids doing research to email professors and experts at the university with inquiries and questions about what they are studying. The network developed of experts for when students do research they can contact them. Students have to copy teachers and me as a way to monitor their work and serve the purpose of safety and

smoothing any ruffled feathers.” It is the continued role of the university outreach coordinator to serve as the liaison between the school and the university.

Interview responses support the school’s vision for teachers as reflected in the 1:1 laptop program, Nancy concluded in a partner interview, “We can tap into and challenge teachers to be better, more reflective, seek strategies, and stay fresh. The technology is a tool that requires new skills and finds resources. Teachers stay fresh, cutting edge and reflective.” The university connections offers, “Summer training right next door for teachers and even during the year by providing workshops for teachers using 1:1 laptops...Opportunity [for others] to learn practice and theory but to also come and see it in a real school setting.” Our business partner comments, “The professional development that teachers received and the way they work always sharing their ideas and plans has helped this to take a life of its own.” It is evident in the responses that differentiation of instruction, ongoing professional development are ways that the 1:1 laptop program reflects the original vision of Centennial Campus Magnet Middle School. “We [Centennial Campus Magnet Middle School] have truly been a leader in technology having been the forerunner in the district for the 1:1 laptop program. We were selected to have the United States Assistant Secretary of Education, Dr. Melendez, visit our school. We were seen by the county as leaders and county officials frequently focus and highlight Centennial Campus Magnet Middle School when the county needs to be brought to public attention in the area of middle school technology and leadership.”

Key Themes from the Data

Various responses to the question, “What were the lessons learned?” were provided through the surveys and interviews. The following lessons represent key themes that emerged from analysis of the data collected. The themes and supporting statements were compiled based on the interview responses. This reflects the common agreement among interviewees about the lessons learned. The three most frequent responses are listed first as lessons learned.

Lesson 1: Leadership throughout all levels is needed

The importance of the active involvement from leadership at the school, school district, university, and business levels was stressed. Nancy remarked, “Good leadership at all levels not only the school, but district leadership that understands what you are trying to do is needed. You will need buy in and outside resources to support the program. I have seen here business and school can have one idea about the overall goals and outcomes and the district can have a different one.” It is evident that stakeholders’ view that the commitment needs to be less about what they can or cannot contribute and more about a consensus on the 1:1 laptop program goals.

Lesson 2: Develop a plan for sustainability

Eric commented, “Don’t want to lose momentum because of a financial need i.e. computers too slow to get on and teachers can’t use effectively because they are outdated...Sustainability is important especially when looking to expand. Always look to

expand but have to make sure you can support it.” Additionally, Johns remarked” It is a major project with finance, technical, policy aspects. Such huge pieces having good project team with a certain level of savvy and expertise in political and financial planning is needed. You’ve got to have someone who understands the process. They don’t have to be an expert but be able to navigate the process.” It is evident that there is a concern by the school and partners that a firm plan for sustainability is in place to ensure the 1:1 laptop program remains effective for students and teachers.

Lesson 3: Strategy is “super important”

The organization and preparation of the 1:1 laptop program was frequently mentioned in the interviews “...with the Arms strategy it worked at a big level with agencies and with the teachers. The arms strategy worked in house and out of house.” An additional teacher responded about lessons learned, “The procedures and policies created here can be useful to other schools in the district. I hope the district is aware of the policies within this program...hopefully, this is being shared.” Another response, “It [laptop program] has taught responsibility and ethics to students by being part of the program. They [students] have had an opportunity to take a leadership role.”

Lesson 4: A core group of enthusiastic teachers

Some of the interview responses that support the core group of teachers leading and seeing the benefit for children, “Teachers find it easier to individualize in a digital world.” The benefits for students are expressed by Nancy “...Especially how we work with students to help with tech support. It takes time [starting the student tech team], but it’s worth it. For

any school developing a 1:1 laptop program, it [student tech team] needs to be at the top of the agenda. If not, it slows the program down. Not only does it do amazing things for student's self-esteem, it gets things fixed."

Lesson 5: Professional Development

Interviewees agree that it is critical to "provide professional development both using technology and implementing curriculum more effectively." Sam emphasized lessons learned, "On the front end more teacher training-not logistical training. Identify good curriculum resources and how to use strategies they already have with 1:1 laptops...Increase professional development how to make it 21st Century integrated environment. Not just figure that part out as you go along." Nancy indicated a need to "...raise the level of training-teachers allow students to be partners. Our tech team was effective because the students were responsible and had knowledge to support the technology." It was evident that ongoing professional development and extended student leadership opportunities are critical for teachers to keep their skills sharp and for students to stay engaged. In summary of the lessons learned, "Professional development, peer support, and project leader are all important [a 1:1 laptop program] can not have one without the other two in order to be effective."

Summary

This chapter presented findings from the surveys, artifact reviews, interviews, and the focus group session. The responses were reviewed and categorized based on the themes that naturally emerged. The surveys provided the opportunity for teachers to respond anonymously. They were able to share thoughts based on their experience while at the same

time, share their own growth through the lessons learned. The artifacts reviewed formed a foundation for the perspectives from the partners. The artifacts unfolded a story of the 1:1 laptop program history and development of all the components. The comments from interviewees provided supporting details throughout the reporting of the data. The interviews were from members of the planning team. They were with the 1:1 laptop program from the start. Their comments provided a deeper perspective to the specific challenges associated with the responsibilities and relationships of the partners. The focus group session offered a deeper discussion of the common ideas that emerged from the survey. It is the multiple sources of data that provide a thick description of the implementation and lessons learned through the 1:1 laptop program.

CHAPTER 5

SUMMARY AND SUGGESTIONS FOR FUTURE RESEARCH

Introduction

The purpose of this qualitative case study was to describe the implementation and development of a 1:1 laptop program and document the lessons learned. An overarching goal was to analyze through interviews and artifact reviews whether this 1:1 laptop program aligns with the original conception of “extensive use of technology.” The research method for this case study was a qualitative design. This study told a story about how a 1:1 laptop program situated in a model middle school with a unique local university partnership reflected the overall vision of the school. This chapter responded to the research questions that form the foundation for this study:

- How was the 1:1 laptop program at Centennial Campus Magnet Middle School originally conceived?
- How is the 1:1 laptop program today consistent with the original mission of the extensive use of technology?
- How was the 1:1 laptop program implemented?

This chapter summarized the findings from surveys, artifact reviews, interviews, and focus group sessions. This chapter also included suggestions for future research concerning the “extensive use of technology” at Centennial Campus Magnet Middle School. It is my hope that the story will continue to unfold describing the journey of a school that is a “special place” for teaching and learning. As founding principal of Centennial Campus Magnet

Middle School Dr. Kenneth Branch (2003) stated, “Centennial Campus Middle School is a special place... Therefore, it is also my hope that someone will continue to document the evolution of Centennial Campus Middle School, its program, and its partnership with the university as the story of this special school continues to unfold” (p.171). Now, ten years after the opening of this special school the study took a close look at the 1:1 laptop program as one example of Centennial Campus Magnet Middle School’s “extensive use of technology.”

The research questions that formed the foundation for this study were explored and addressed through reviews of multiple sources of data such as surveys, artifact reviews, interviews, and focus group interview sessions. The following summary statements address each of the research questions.

How was the 1:1 laptop program conceived?

As part of the original plans for the school, one of the five aims was the “extensive use of technology.” The 1:1 laptop program is a joint venture among the school, district, university and business partner. A local business partner provided the funding for the 1:1 laptop program with the expectation that teachers would access software resources developed by their company. It was definitely a mutually benefiting opportunity from the school’s perspective. A laptop for every student supported the school’s original vision of having “extensive use of technology” available. The 1:1 laptop program was a result of the collaboration among the school, school district, university, and business partners.

Collaboration was the key to creating the 1:1 laptop program. The school was

responsible for the conception and implementation of the 1:1 laptop program. The content of what teachers taught remained the same; however, the tools changed when integrating the 1:1 level of technology access. The district was responsible for the mounting of LCD projectors and monitoring of the program. The university was responsible for providing professional development and conducting the program evaluation of the 1:1 laptop program. The business partner was responsible for the funding of the equipment, supplies, project leader contract, and professional development for participating teachers. The plan for implementation came from this collaborative work team. Input from every partner was critical to make sure that the 1:1 laptop program contained the essential elements for success. Through this collaboration, the vision, mission, implementation timeline, student and teacher needs were considered and included in the development of the 1:1 laptop program.

The culture of Centennial Campus Magnet Middle School reflected the importance of collaboration as the means to get things accomplished in an inclusive and effective manner at the school. The conception of the 1:1 laptop program mirrored the original vision and mission of the school. The founding principal Dr. Kenneth Branch wrote about collaboration and recognized it as the key to the successful conception and planning of Centennial Campus Middle School. He stated, “Multiple meetings, constant exchange of ideas, draft upon draft of plans- all contributed to a time-consuming effort...one side patient with the notion of inclusiveness and the need for buy-in from constituents and the other, not as accustomed to community input, eager to get on with the work at hand” (Branch, 2003, pp. 143-145). This

comment accurately described the initial phase of work to develop the 1:1 laptop program at Centennial Campus Middle School. It began with the collaborative work of a team comprised of the school principal and representatives from the business partner, university, and school district.

The review of artifacts such as meeting agendas, original school planning documents, email correspondence, and meeting notes documents how the 1:1 laptop program was conceived. It also documents the role of the participants in the initial planning of the laptop program. The review of the school's original planning documents cross-referenced with the planning meeting agendas, contractual agreements and 1:1 laptop program job responsibilities provided the historical background to the development of the eighth grade 1:1 laptop program at Centennial Campus Magnet Middle School. The documentation provides a blueprint of not only what was done, but the perspectives from all the partners.

As the researcher, it is my conclusion that this background information is vital to the overall goal of this study to share lesson learned with the Centennial Campus Magnet Middle School family and community partners. In doing so, other grade levels will have clear direction on how to effectively implement a 1:1 laptop program. The documentation is representative of all partner's level of involvement from conception to implementation. It is my recommendation that other schools maintain detailed records of planning meetings, planning documents, partner correspondence, conference presentations, and media publicity in order to keep the historical record for others to follow.

How is the 1:1 laptop program today consistent with the original mission of the extensive use of technology?

The original mission of the extensive use of technology was recorded in the Centennial Campus Middle School Proposed Plan document published in 1995. The goal was to be a computing campus. This research study documents that two thirds of the school is currently participating in the 1:1 laptop program. From 2006-2010, the school increased the number of laptop computers from 200 to 425, providing 425 of the school 625 students with a laptop in every core class. Just as when Centennial Campus Middle School was designed Branch (2003) commented, “The planners learned that their efforts were not just in creating the vision for the school but in actually making that vision a reality” (p. 146).

The laptop program does not stop with having the hardware in place. The original mission of the “extensive use of technology” was focused on innovative use of technology to reinforce and extend student learning. Centennial Campus Magnet Middle School’s 1:1 laptop program was not only interested in promoting student learning but extending learning for teachers as well. The focus group session discussed at length the greatest gain for students and teachers. Angie commented, “...I know the teachers here will agree the ability to teach real 21st century skills like simple things how to compose an email, how to send an attachment, how to build a website...These are tools these students are going to need when they go out to the workforce...And then the global learning opportunities that it opens up, the ability to research global problems and the ability to make partnerships with other countries...to skype”. Linda reflected the original mission of “extensive use of technology,”

“taking basic to advanced computer skills with improvement on online research methods, increase in literacy skills and evaluating the quality of online web resources but absolutely the global opportunities being able to take students around the world but still remain in your classroom which gives these kids opportunities that they would otherwise not be able to see at this point in their lifetime.”

Additionally, Denise, a focus group session participant, acknowledged that, the 1:1 laptop program, “allows students to take ownership of their work and their learning giving them more options to what they want to research not just confining them to a textbook.”

There are extensive uses in the continuous advancement of technologies, Jean stated, “The other thing that amazes me too is I’ll learn of a new tool and at the beginning I’d freak out because I didn’t know how to do that tool...one particular is PREZI ...I think it would be really powerful replacement for PowerPoint, but I’m going to be honest with you, I don’t really know how to use it.”. This comment reflected that teachers are also learning with the students.

The original mission of “extensive use of technology” also included teachers as continuous learners, which was reflected in the vision of Centennial Campus Middle School. The original plans for the school included a teacher development center to be built next to the school that would offer, “...current and future middle school professionals, locally and nationally, to learn about, develop and implement exemplary educational practices for young adolescents. Joining research and professional development to a “real world” school, it will offer numerous training opportunities and disseminate research findings and descriptions of

exemplary practice through the assistance of advanced technologies.” (Centennial Campus Proposed Plan, 1995, p. 24). This center exists and is utilized frequently by the staff and students at Centennial Campus Magnet Middle School.

The 1:1 laptop program was consistent with the original mission of “extensive use of technology” for teachers. As a result of Angie’s involvement, “The 1:1 laptop program is solely responsible for my choice to go back to grad school because once I got exposed to technology, I realized there was a huge gap in my own education...it also impacted me on a professional level in that I built a website for my class, I, you know, created a class calendar online, class resources online”. Sally commented, “Absolutely! I am also pursuing future studies in graduate school at [university], it made what they were trying to teach me, I was actually able to put it into practice and test it out on a daily basis, record it, research it and see results.” Through the artifact review of the original planning documents, survey responses and focus group session feedback, the evidence is well documented that the 1:1 laptop program is consistent with the original mission of “extensive use of technology.”

As the researcher, it is my conclusion that the school is achieving its plan for expansion, the plan for sustainability must be secured before further expansion of the laptop program. It is my recommendation that a refresh of laptop computers for eighth grade is an immediate need. It is a recommended next step that the school engages in conversations with the district and its business partner to secure funding for an eighth grade laptop computer refresh.

How was the 1:1 laptop program implemented?

The 1:1 laptop program was implemented by the school with support of partners in 2006. The meeting minutes and program artifacts document the “Arms” structure that was the foundation for how the program was implemented at the school. The “Arms” provided a framework for maintaining the essential components of the 1:1 laptop program. Teachers identified an “Arm” to lead. The responsibility of the teacher was to stay abreast of issues, concerns, or opportunities that related to their “Arm.” For example, the teacher leading the Curriculum Arm made sure that during the Professional Learning Community (PLC) meetings discussion of how technology was used to enhance content objectives is on the agenda. The Management Arm was led by a teacher that examined the management of laptops for example, how they were being stored, student use recorded, and technical concerns.

The Student Arm was led by a teacher who organized, trained, and monitored the performance of the student tech teams. Four students from each team were appointed by their teacher to serve on the student tech team. These students help to troubleshoot technical issues that arise in the classroom. The Professional Development Arm was led by a teacher that was interested in ongoing professional development in technology. The teacher assessed needs of colleagues and worked with the project leader and administration to find sessions and conference presentations/attendance for staff. The Exploratory Arm was led by a teacher that collaborates with elective teachers to reinforce the integration of technology. During the focus group session Jean shared, “I even had X-house [elective] teachers emailing me and

going, my kids are asking me if they could use PREZI for this project they are doing for me. Do you know what this is all about? And I would have to email the teacher and say yeah it's just another type of PowerPoint on steroids type thing, let them use it, it's really cool...I had another teacher say the same thing about Dipity.” The Evaluation Arm was led by the project leader to coordinate teacher and student surveys about their technology skills and reflection statements about the 1:1 laptop program.

The Historian Arm was led by a teacher that documents the progress of 1:1 laptop implementation. It was the teacher's responsibility to maintain notes and artifacts associated with the 1:1 laptop program. The Extension Arm was led by the teacher interested in the visionary aspect of the 1:1 laptop program. One of the teachers has worked to create a template for an online literary magazine. The Parent Arm was led by the magnet coordinator. This arm coordinated extended learning opportunities in the community for students and teachers. The planning agendas would allot time for updates for each Arm. Teachers set goals for each year based on the Arm they lead. The implementation structure allows all teachers to be involved in a collaborative manner.

In addition, the pace of rollout was guided by the teachers in that steps to take advantage of professional development offerings were at a careful pace. Jean commented on the implementation of the 1:1 laptop program, “I just wanted to talk briefly about preparation for the laptop program. I think the way Centennial went about preparing for the program was awesome...phenomenal...we used at least half a year or more to prepare for this 1:1 laptop program. We didn't rush anything, we thought it through, everything we collaborated and

worked out every detail possible, from how the laptops would come into our rooms, to how the student would retrieve the laptops, and how they would be on their desks, I mean every detail of management.” Cynthia shared, “Yes, every detail! We took a lot of time to develop which allowed this program to be implemented easily. As a professional, I felt hugely impacted by that because of the collaboration effort, the way we worked together...” Linda recalled, “The ownership of it all because we were all involved.” This was supported by Diane, “...The ownership, we were all involved, and we were all on the same page that was just an awesome experience.”

The review of survey results, artifacts presented, and interview responses provided a clear evidence of the steps that Centennial Campus Magnet Middle School and its partners took in implementing the 1:1 laptop program. As the researcher, it is my conclusion that the “Arms” structure provided the organizational blueprint to ensure that all elements were addressed throughout the implementation of the 1:1 laptop program. It is my recommendation that the “Arms” structure continue to be used as the 1:1 laptop program expands. It is also my recommendation that the “Arms” structure is used to self assess the progress of 1:1 laptop program development. It will be essential to share this structure with other schools interested in developing a 1:1 laptop program as it provides essential components and an opportunity for teacher leadership development. Most important, it is my recommendation that Centennial Campus Middle School frequently use the “Arms” structure to orient new teachers to the goals of the 1:1 laptop program. Frequent reviews of the “Arms” structure will also ensure that expansion occurs in all areas of the 1:1 laptop program.

The goal of this research study included the documentation of lessons learned because of implementing a 1:1 laptop program at Centennial Campus Magnet Middle School. The lessons learned in this research study were presented from two perspectives one from the participant and the other as observer. Careful review of the lessons learned from both perspectives yielded a prioritized recommendation for next steps to improve the Centennial Campus Magnet Middle School 1:1 laptop program.

As the researcher, it is my conclusion that common themes existed between the participants and observer as to the lessons learned. The themes provided a focus for the school's efforts toward continuous improvement. The order of the themes was prioritized by the number of similar responses. This priority ordering will provide the school with direction as they develop next steps.

It is my recommendation that the following themes be addressed by the school. Sustainability, Project Leader Support, and Professional Development focused on student products and leadership development with technology. It is my recommendation that while each area gets time and attention dedicated to assessing the current level of effectiveness, goal setting and action steps for improvement. It is my recommendation that this prioritized next steps approach will address the need to secure technology updates with ongoing curriculum and technical support. These next step areas will also ensure the continued development of teachers and students as learners and leaders.

Lessons Learned

This study captures the story of a journey. As with any journey, there are sometimes bumps along the way that causes things to not run as smooth as planned or preferred. These bumps can be lessons learned that benefit others who are just starting on the journey. The lessons learned are also poignant reminders of the growth process, which includes successes and failures. The lessons learned were shared by the Centennial Campus Magnet Middle School 1:1 laptop program participants in the previous chapter. As observer and principal, this journey continues to teach me valuable lessons to learn and lead a model middle school with an “extensive use of technology.” The lessons below are a summary of the lessons learned from this research and my experience as a school leader.

Lesson 1: Sustainability Secured

The lesson titled “Sustainability Secured” refers to the importance of planning for the future. While the mission of expanding the 1:1 laptop program at Centennial was consistent with the original vision of the school, the plan to sustain the hardware was discussed, but not secured. The warranty that accompanied the laptop computers provided an unsafe safety net. There was a breakdown in the agreement between the district and business partner as key program players changed their affiliation with the 1:1 laptop program as career advances and other responsibilities shifted within each of the affiliated partners. The excitement of a generous gift such as 200 laptops to be given to the school was worthy of celebration. Equally important was the discussion of how hardware would be sustained beyond the initial implementation phase and warranty conditions. The discussion needed to move from

conversation to confirmed agreements. The earlier these discussions could be held the better. The 1:1 laptop program at Centennial held discussions early on and no official agreements were finalized. However, it was clear from the business partner's perspective that the school district and school would be responsible for maintaining the program. The gift was accepted with this understanding.

Discussions of this nature could not happen in the beginning without revisiting the areas of interest throughout the program implementation. As key players transitioned to other positions or moved from the program, the initial discussions were easily lost and dependent on those who remained. Equipment was expensive and prices changed frequently, so what was paid four years ago may not meet the current needs. With new initiatives and leadership, it becomes a challenge to rewind to four years earlier to implement sustainability plans today. The lesson learned here was to continue providing detailed historical context and documentation of sustainability needs to every new member of the team. This is best achieved by including sustainability as a recurring agenda item.

Another lesson learned in this area was to create a plan for student sustainability. As students leave one school program and transition to another level, how will they continue developing their skills if there is not a 1:1 laptop program? One suggestion from the interviews was to provide follow up student development sessions exposing them to new technologies so that they can continue to develop their knowledge base. Another suggestion was to create a small high school pilot study that extended the 1:1 laptop program for a small cohort of students. It is paramount to secure a plan for sustainability to ensure the success of

a 1:1 laptop program.

Lesson 2: Project Leader Promise

The lesson titled “Project Leader Protected” refers to the importance of having a project leader available to teachers for curriculum and technical support. This sentiment was echoed through the survey responses and interviews. If there were one critical factor to implement a 1:1 laptop program effectively, it would be the position of project leader. The 1:1 laptop program at Centennial Campus Magnet Middle School is fortunate to have a highly qualified project leader who is skilled in providing curriculum and technical support. The caveat was that over the course of the laptop program the contracted time has lessened. In 2010-2011, the project leader comes once a week to address teacher concerns, assess condition of laptops, and address program needs. Twelve teachers commented that they could feel the loss in the classroom. With older machines more of them are experiencing breakdowns, help with technical support is sparse and they are on their own to share best practices with each other. The lesson learned here was that the comfort and connection that teachers need comes from the project leader being present and able to support. It is important that the project leader’s time meet the needs of the teachers and program.

Lesson 3: Teacher Led not Teacher Fed

The lesson titled “Teacher Led not Teacher Fed” refers to the importance of the Arms structure. So many times programs are developed in schools and then given to teachers to just implement with little to no input. The Centennial Campus Magnet Middle School structure of the Arms allowed the teachers to assume a level of 1:1 laptop program ownership early on in

the program implementation. The leadership role of the Arms offered teachers an opportunity to lead an area they were strong or wanted to grow. The teachers were not assigned an area to lead, they chose the area. The careful pacing of implementation was a result of the teachers being at the planning table and sharing their classroom experience. This provided a well-rounded context for all partners to gain understanding of how to balance what is needed with what was actually happening. The match to meet the needs based on what was taking place in the classrooms connected as explained by the teachers.

Teacher ownership received a high priority early on and was maintained throughout implementation. The lesson learned was to provide clear roles of leadership for teachers at the initial phase of implementation and allow their voices to be heard. As the school leader, it was my responsibility to maintain the volume of teacher voices and use it as a guide of what to do next. This was maintained in the 1:1 laptop program at Centennial Campus Magnet Middle School.

Lesson 4: Professional Development Promoted and Provided

The lesson titled “Professional Development Promoted and Provided” refers to the importance of promoting growth for teachers throughout the implementation process. The focus of providing ongoing professional development gives teachers the tools to increase the level of engagement and academic performance for students. The role of professional development is critical to teacher growth and the variety of instructional tools and strategies used in the classroom. Consistent assessment of teacher skills, needs and latest researched based technologies was key to providing meaningful professional development. Simply put,

professional development promotes growth. This professional development should also be shared with the full staff. The Centennial Campus Magnet Middle School teachers have had opportunities to give and receive professional development. However, in the last two years they have shared more than they received collectively. Individually, many of the teachers have honed their skills and participated in professional development. As a school, there have been more people to come and visit our campus than the number of teachers from the school who have gone to visit others. The lesson learned here was that give and take has to be balanced and opportunities provided for both to occur.

Lesson 5: Student Ownership Saluted (SOS)

The lesson titled “Student Ownership Saluted (SOS)” refers to teachers not merely taking advantage of opportunities for students to lead with technology, but creating opportunities for them to do so. The original vision of Centennial Campus Magnet Middle School captured students owning their learning in a dynamic and global teaching and learning environment. Just like teachers, students must be included in the 1:1 laptop program implementation during the early stages. Student input and development should be a part of the discussion, especially when determining the next steps. One of the consistent practices at Centennial Campus Magnet Middle School was students presenting what they learned in a variety of technology formats.

Students did not just take advantage of learning opportunities; they created opportunities to integrate technology. These opportunities came from teachers providing choices for how students could demonstrate what they learned. The benefit of instant

feedback on assessments and differentiated learning provided students with the responsibility to learn what they do and do not know. The lesson learned was that young adolescents should be provided with experiences that allow them to draw connections, build upon interests, and expand their ideas. The 1:1 laptop program achieved this by providing individual access to a tool that made this possible.

Lesson 6: Changing with the Times

The lesson titled “Changing with the Times” refers to the importance of close monitoring of the 1:1 laptop program needs and matching the responsibilities of partners and participants to meet the changing needs. The Centennial Campus Magnet Middle School’s 1:1 laptop program began in 2006. The responsibilities and priorities differed as the years progress. As change with responsibilities and priorities happened, the roles of each of the partners changed. For example, the project leader in the beginning spent a great deal of time ordering equipment and training teachers. As the 1:1 laptop program developed, the project leader spent more time fixing laptops, addressing security concerns and troubleshooting technical issues. In the early phases of implementation, teachers established processes and procedures for students, by teaching using a few resources; however, as they grew they were looking to explore the latest advances. Likewise for business and university partners, as they were instrumental in bringing ideas and resources to the table during the early phase of implementation.

As the program developed, the business and university partners observed and provided support for the 1:1 laptop program. The lesson learned was that as roles changed it

was worthwhile to revisit expectations and responsibilities. This assisted in keeping everyone invested but also in a way that was useful. This discussion of revised roles and responsibilities should be a shared agreement and communicated. This would avoid individuals feeling left out the loop of communication or more importantly, it ensured that program and individual needs were met. Needs changed just as time changed and careful monitoring of both provided support for successful 1:1 laptop program implementation.

As a school, the lessons learned are turned into action items as we continue on our journey. As a leader, I have identified my next steps within each of the lessons learned in order to continue learning and leading the 1:1 laptop program at Centennial Campus Magnet Middle School.

Recommendations

The following recommendations are based on the findings and lessons learned from this study. The refresh of 1:1 laptop program equipment and access to new technologies is significant to the sustainability of the program. Additionally, the roles of project leader and teacher support are critical factors in the successful implementation of a 1:1 laptop program.

District Level Commitment

The district level commitment to provide the resources necessary is critical. In order to ensure that the commitment is fulfilled, communication from the school and business partner with the district must take place throughout the implementation of the 1:1 laptop program. Whether meeting face to face or through email correspondence, a recurring agenda item for discussion should be sustainability efforts and responsibility. It is important to

establish a district contact to address sustainability concerns. The sustainability plan should be in writing and revised as needed during the implementation of the 1:1 laptop program. This process will ensure that the program needs are well-communicated and resources needed are known.

Project Leader Position

The project leader position is vital to the curriculum development and technical support of the 1:1 laptop program. The project leader needs to be responsive to teacher and student needs. The project leader is a contact for teacher's questions and concerns. The position went from full time to part time. The teachers are in need of full time support. Initially, the planning team thought that full time support would be needed in the beginning and as teachers felt more comfortable, less time would be needed. What occurred was opposite as teachers became more comfortable, their desire to learn and do more with technology increased requiring more support. Additionally, as the equipment grew older, the more maintenance was required for upkeep. This makes the consistency of support through the project leader position critical to meet the 1:1 laptop program needs.

Teacher Support and Selection

The type of teacher support provided by the project leader may look different from one year to the next. The types of support vary based on the needs of teachers, students, and progress of the overall 1:1 laptop program. It is important to get feedback from teachers

about the support needed in order to move beyond sustaining the 1:1 laptop program to promoting growth for teachers and students. The variations of support include response to technical problems, on line instructional resources, professional development and student technology team development.

When selecting teachers for 1:1 laptop program positions certain characteristics are of great importance at Centennial Campus Magnet Middle School. While knowledge and comfort in teaching with technology is important, other characteristics that are considered when selecting teachers:

- Recognize that teaching young adolescents is fundamentally different from teaching their elementary or high school students.
- Know how to respond sensitively and effectively to their students.
- Be able to work as a team with other teachers.
- Know how to design instruction that responds appropriately to young adolescent developmental needs.
- Be able to manage and monitor their student's learning.
- Understand and promote the middle school concept.

These are a few of the characteristics listed on the Centennial Campus Middle School Teacher Profile (Appendix B). The importance of selecting quality teachers to support the 1:1 laptop program needs is the top priority to ensure program growth and sustainability for students and teacher leadership.

Reflection

The journey of implementing a 1:1 laptop program and the lessons learned is beneficial to the school community. The story of this journey extends beyond the walls of Centennial Campus Magnet Middle School informing others of how to establish a 1:1 laptop program at their school. Through surveys, interviews and the focus group sessions, the responses from teachers and planning team members reveals the celebrations, challenges and lessons learned. As researcher and principal, the journey has promoted my growth on personal and professional levels.

Centennial Campus Magnet Middle School was my first principalship and in my first twenty days, the 1:1 laptop program was presented for me to lead. While it was an awesome privilege, I certainly felt the responsibility as well. My time was consumed with trying to build relationships with the staff and observe the culture of the school. The learning curve was steep to say the least. Many first time principals face similar challenges. What makes my experience unique is the additional responsibility of developing relationships with the university and business partner connected to the 1:1 laptop program.

My approach was guarded as we began planning the 1:1 laptop program. It was important to me that teachers were involved in planning the pace of the program from the beginning. I continued to emphasize the importance of a slow roll out, introducing professional development carefully. The teachers had several opportunities to take professional development sessions without the experience of teaching with thirty laptops. The focus and time for teachers shifted from learning about new technology resources to

observing 1:1 laptop programs in action. Once teachers began teaching with 1:1 laptops, they were motivated to integrate new strategies and resources. The “Arms” structure provided balance across all the 1:1 laptop program components. Using the “Arms” structure maximized the involvement of teachers by their leadership of an “Arm.”

The role of the project leader was critical. It was a position that I had to negotiate with the business partner. The project leader position ensured that teachers had an immediate contact for curriculum and technical support. Funding this position over the years has been challenging. After the initial year, the school continued to rely on the business partner to fund the position. The university’s role in evaluating the 1:1 laptop program had to be approved by the district. The discussions of what could and could not be done were held over the first year of the program implementation. The result was a shared responsibility between the university and school district to evaluate the 1:1 laptop program. Changes in personnel responsible for the evaluation delayed the publication of a final report.

The district support for mounting projectors and installing wireless access points were expectations with year one, but the expansion of the 1:1 laptop program and funding for the project leader position was also a district responsibility. The district allots months of employment to schools for the principal to use for staffing. However, our school staffing plan is not able to support ten months (a full time position) to be devoted solely to the 1:1 laptop program. With Centennial being a small school, the amount of months available for staffing are limited and must cover a robust elective program. Some of the district representatives are no longer in the same position. There may be one person left to affirm the original

agreement. The failure to continue the conversation of who is responsibility for what makes it difficult to address current issues with outdated laptops. The positive from this challenge is that there is now documented progress of the 1:1 laptop program. The district continues to recognize the 1:1 laptop program and invites guests and potential business partners to observe the program in action. The relationship with the business partner has been a major responsibility for me to manage.

My main concern has been to gain understanding of the business partner's expectations of the school. Over the past six years, the expectation of the business partner has been to utilize the technology resources provided and participate in sharing the best practices from the 1:1 laptop program experience. The school has engaged in several professional development sessions and conference presentations. I did decline some opportunities that were presented at a time that overwhelmed teachers. Based on the interview responses, careful pacing of the 1:1 laptop program was appreciated by teachers.

As I reflect on this journey now the current areas of concern are aligned with the findings of this study: sustainability, structure, and support are critical to the successful implementation of a 1:1 laptop program. Currently, the discussion of sustainability continues with the school district. The eighth grade laptops are now five years old and in need of replacement. The school is exploring possible grants to assist with expanding the 1:1 laptop program. Centennial Campus Magnet Middle School's magnet theme includes the Leadership-Technology Pathway with a local elementary and high school. The pathway also provides a structure for developing the components of the 1:1 laptop program. For example,

the pathway schools are currently developing the idea of e-portfolios for students to maintain from elementary through high school. We are also implementing Science, Technology, Engineering, and Math (STEM) programs in our schools. As we are developing the pathway relationships, specific technology-rich examples are being developed and shared with our partner schools. This is aligned with the vision of Centennial Campus Magnet Middle School to share best practices with others.

Currently our project leader is volunteering once a week at the school. This support is less than four days a week that we began the program with and as a result, the teachers are careful about implementing new technologies. The teacher's apprehension comes from lack of a full time project leader support and limited access to new on-line resources. We are looking to add the project leader responsibilities to another staff member in order to strengthen the curriculum and technical support for teachers. Teachers are also assuming some of the technical troubleshooting tasks. Additionally, our student technology team has been a beneficial resource for teachers as they have the training to focus on preventive maintenance for the laptops. We are discussing with the district removing some of the access barriers so that teachers may utilize new technologies for classroom instruction.

When I consider what is next for the school, there are four immediate next steps that I accept responsibility for addressing at this time. Attention to the following next steps will promote continued growth of the 1:1 laptop program. First, securing funding for refresh of the eighth grade laptops before expanding to sixth grade is top priority. Second, provide consistency in the project leader position to support teachers and provide professional

development. Third, create opportunities for student leadership development through collaboration with the district Leadership-Technology Pathway. The focus here is to increase the effectiveness of student technology teams utilized throughout the school. Additionally, enhance student work products using new technologies. Fourth, continue to hire teachers that possess the technology skills needed for the 1:1 laptop program. However, it is important to bring teachers into the 1:1 laptop program that are willing to learn and create opportunities integrating technology. This journey for me has been Learning and Leading with Technology. I will continue to promote our celebrations, address our challenges, and share our lessons learned.

Suggestions for Future Research

This study reveals the story of one school's journey to learn and lead with technology. The focus of this study was the original mission and current practices of a model middle school that included the "extensive use of technology" as its vision. This study explored whether the school's current 1:1 laptop program was consistent with the original mission of the school. The study also described the 1:1 laptop program implementation and the lessons learned. There are other aspects of the 1:1 laptop program that warrant attention and pose as viable topics for future research.

- How does having 1:1 laptop access in middle school prepare students for their first year in high school? This study would compare students with 1:1 laptop computer access in high school with students without 1:1 laptop computer access.
- What are the professional development sessions most beneficial to teachers? This

study would examine the types of professional development that teachers transferred to classroom practice. The study would explore what format of professional development helps teachers learn and implement to practice best.

- How will two full years of 1:1 laptop access equip students to increase performance in reading, math, and science?
- What skills are developed and demonstrated by students? This would be to follow a cohort of students that had 1:1 laptop access at seventh and eighth grade at Centennial and review their performance at the end of eighth grade as measured by End of Grade test and middle school promotion project at the end of eighth grade.
- What leadership skills do principals need to lead schools with 1:1 laptop programs?
This would consist of interviewing principals with 1:1 laptop programs in the schools.

Concluding Statement

The conclusions drawn by this researcher are based on the research findings obtained in this study. This study was conducted as a qualitative case study to describe the development of a 1:1 laptop program at a model middle school and document the lessons learned. Since this was a single site qualitative case study, the conclusions drawn were not designed to be generalized to the general population of schools and school programs. However, studies such as this one can help develop a deeper understanding of learning and leading in a dynamic, complex learning environment. Studies of this nature are grounded in “lived reality” which provides a rich, detailed understanding of the experiences involved in the implementation and development of the 1:1 laptop program at Centennial Campus

Magnet Middle School.

The overall vision of Centennial Campus Magnet Middle School emphasized meeting the unique needs of young adolescents. One of the aims for the school was the extensive use of technology. The 1:1 laptop program is an example of the extensive use of technology.

The project leader remarks,

I have observed students learning today in a different way. They are getting immediate feedback versus a traditional classroom where they take a test on Tuesday and get results on Friday. Today they [students] learn in a digital world and if they learn in this digital world then we should teach them in a digital world. They want 'information on-demand'- they research a topic and get instant results. The most up-to-date resources are available 24/7. How frustrating it would be to be given an assignment, then have to wait for an available time in the media center or mom or dad to take them to the public library to get the facts they need to work on an assignment. I can't imagine how they would react to stepping back in time...Having a digital tool in the hands of students makes the difference- that is the way they learn and the way we need to teach."

Technology has dramatically changed in ten years since Centennial Campus Magnet Middle School opened, the students are living in a digital world. We should commit to teaching the way the students. This commitment is needed in more than just one school. The commitment to developing students as technology learners and leaders is shared among the schools, institutions of higher learning, private businesses, and district leaders. This is not a local challenge, but a national challenge. Access to technology, as this research study explores, is the first step to opening the door of opportunity for students and teachers. The business partner that opened the door for the 1:1 laptop program opportunity at Centennial Campus Magnet Middle School shared, "Our goal was not to create an island of excellence where everyone stands to applaud. These concepts and lessons learned should be spread." As principal, it is my desire as the story of the 1:1 laptop program at Centennial Campus Magnet

Middle School continues to unfold, that this special journey of learning and leading with technology is shared with others.

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APPENDICES

APPENDIX A

A

PROPOSED PLAN

FOR THE
Centennial

MAGNET MIDDLE SCHOOL

Campus

REPORT OF THE

**WAKE COUNTY PUBLIC SCHOOL SYSTEM/
NORTH CAROLINA STATE UNIVERSITY
COLLABORATIVE PLANNING COMMITTEE**

NOVEMBER 1995

INTRODUCTION

Though WCPSS and NC State have collaborated on numerous projects over the years, this endeavor goes well beyond others in scale, breadth and commitment. The Centennial Campus Magnet Middle School (CCMMS) will involve an entire population of students, teachers and parents frequently engaged with faculty, students, and facilities of each of the university's 10 colleges, as well as its corporate and government partners on Centennial Campus. CCMMS will thus be the first middle school in the country to combine the resources of a respected school system, a major university and a technologically advanced campus comprised of business, industry, educational and government agencies. As such, it holds enormous promise to help young adolescents reach their full potential, to reach out to the community, and to influence significantly middle level education throughout the state and nation.

Mission

The Centennial Campus Magnet Middle School, a collaboration of the Wake County Public School System and NC State University, creates an exemplary educational community of young adolescents and adults who learn by actively discovering, integrating, and applying knowledge in a dynamic global and technological environment. This collaboration promotes educational change through a comprehensive state and national outreach program for educators, parents, and community members.

The school will be located on NC State's Centennial Campus, a research and advanced technology community of university, industry, and government partners. This setting nurtures the following unique aspects of the school and its outreach programs:

- *Extensive interaction between students and adults, including community members, industry and government researchers, and NC State professors and students.*
- *Exploration of adolescent concerns and real-world issues through a curriculum which integrates skills and concepts of various disciplines.*

- *Use of cutting-edge technologies as a resource in all teaching and outreach areas.*
- *Maximized linkages with other educators, parents and youth-serving professionals in developing and disseminating innovative teaching/learning strategies.*
- *Broad opportunities for ongoing research, evaluation, teacher preparation, and professional development.*

The Centennial Campus Magnet Middle School features a unique governance structure which promotes site-based decision-making. It will hold high expectations for all, and will provide a high-quality education which honors the diversity and unique needs of middle school students.

Particulars

- *CCMMS will be designed to house 600 students.*
- *Because of Centennial Campus architectural standards, no trailers or utility buildings may be added to accommodate more students.*
- *The school will consist of grades 6-8, with approximately 200 students in each grade.*
- *A pupil assignment plan in keeping with WCPSS magnet school policy will be devised prior to the opening of school to insure that the student body is racially, culturally, and socio-economically diverse and balanced for gender.*
- *The target date for the school opening is August, 1998.*
- *The affiliated teacher development/outreach facility will be open as soon thereafter as possible. Its opening date will depend on the availability and timing of funding from private sources.*

Relationship to NC State & Centennial Campus

As a land-grant, Research I University, NC State has a multitude of resources which can facilitate the mission of CCMMS. The College of Education and Psychology, with an established middle grades education program and expertise relative to

Further, there is a fast growing group of corporate and government Centennial Campus partners, including the National Weather Service, with whom promising links may be developed. Some of these partners are physically located on campus; others are off-campus research partners with whom technological linkages might be established. A current listing of partners is attached in Appendix I.

Finally, NC State has partnerships with off-campus agencies which can contribute to the school. Among these are the North Carolina Museum of Natural Sciences, MCNC, the North Carolina Biotechnology Center, and other state funded agencies.

Relationship to Other WCPSS Middle Schools

CCMMS is best understood as an innovation undertaken in behalf of the other schools in the system. Personnel from other schools have contributed significantly to the planning of CCMMS, and we fully anticipate that a flow of ideas and suggestions will continue once the school is opened.

Unquestionably, CCMMS will be a unique school having certain resources at hand that other WCPSS schools do not. While no school will be able to do *all* that CCMMS undertakes, many will be able to implement *individual* ideas, activities, and programs. CCMMS will be strongly committed to helping other schools in the system. Through staff development, observations, and curriculum development with CCMMS, every middle school in Wake County will potentially become a better school. Moreover, planning has already identified far more NC State faculty and community expertise than CCMMS can utilize. It is quite likely that CCMMS will serve as a catalyst in making much of this expertise increasingly accessible to other WCPSS schools.



Unique Emphases

The curriculum of the Centennial Campus Magnet Middle School, designed to be responsive to the unique needs of young adolescents, will have five major emphases:

- (1) *It will be highly integrative, exploring concepts, skills and issues across many disciplines.*
- (2) *It will engage students in frequent, significant interaction with adults, both on the university campuses and in the community.*
- (3) *It will emphasize "real world", hands-on, active learning about substantive issues.*
- (4) *It will make extensive use of cutting-edge technology.*
- (5) *It will give careful attention to the cultural contexts and societal forces which affect adolescent development.*

The CCMMS *integrative curriculum* extends far beyond the "correlation of topics" and occasional "interdisciplinary units" characteristic of many schools. Frequently, inquiry-based themes and issues rather than subjects will be a curricular focus. The themes and issues selected will be designed to speak to the needs, interests, and concerns of young adolescents, and will actively engage them in planning and assessing activities. Many themes will emerge where students' personal concerns intersect with significant societal issues. Thus the adolescent concern about physical growth and society's concern about health may lead to an exploration of wellness; youths' concerns about violence and conflict resolution might result in investigating themes such as war, peacemaking, and mediation. In pursuing these themes, skills and concepts required in the major disciplines by the *North Carolina Standard Course of Study* and the WCPSS curriculum will be intertwined. Appendices II and III provide several examples of integrative curriculum.

As the introduction suggests, *opportunities for students to interact significantly with adults are extensive.* In addition to CCMMS faculty and staff, many professors, corporate and government professionals (both on and off campus), graduate and undergraduate students, and parents will be accessible to students. There is great potential for individual interaction with

adults: conceivably, every student could do independent study, receive tutoring, have a "big brother/sister," or engage in an internship/apprenticeship, depending upon need and interest. Group interaction with adults may occur through "professors in residence" offerings, mini-courses, demonstrations, visits to labs and agencies, research projects, community service projects, student teaching, social work and psychology internships, and volunteer coaching activities.

To give a few examples of *real world, hands-on, active aspects of this curriculum* (as well as its integrative aspects and interaction with adults) students may:

- *Learn how trees grow; how to identify animal habitats; and how to test the effects of humans on atmosphere, water, soil, plants and animals in conjunction with Project Learning Tree and Project Wild in the College of Forest Resources.*
- *Monitor pollution levels, flora and fauna in Lake Raleigh and the streams nearby, creating a data base.*
- *Be mentored by an aerospace engineering student, who must design and build a plane that flies in order to graduate.*
- *Through the College of Veterinary Medicine, help monitor the vital signs of an anesthetized horse during surgery.*
- *Work with a College of Textiles student who might be engaged in braiding carbon fibers into rocket nozzles for the Mission to Mars, producing synthetic skin for burn victims, or recycling crab shells into miracle fibers for bandages.*
- *Teleconference with staff of the National Weather Service to track a hurricane that is threatening the coast, or to find out if school might close the next day due to a snowstorm.*
- *Conduct oral history interviews with various ethnic groups in the Research Triangle area, publishing a series of monographs on the findings.*
- *Design a transportation system for the Centennial Campus (See Appendix II for a suggested approach).*

Many of these *activities will use technology extensively*. In addition, students may create an electronic magazine on the World-Wide Web, gathering articles and ideas from young adolescents around the world; exchange videotapes they make about their homes, school and community with students in

Ghana; be tutored in writing through E-mail exchanges with community professionals; explore the effects of global politics on education with students in Russia; engage in urban planning simulations; and a host of other activities.

Sensitivity to *cultural contexts* will be reflected throughout the curriculum, both in terms of the topics explored and the manner in which they are investigated. Students will be especially encouraged to examine issues from a variety of perspectives.

Teachers & Curricular Integration

All teachers, including those conventionally identified with academic core subjects, the unified arts, and special services will be engaged in the active, integrative type of curriculum described above. Academic teachers will work and plan together in two teacher teams representing the core disciplines, a feature which especially facilitates integrative learning. In addition, they will incorporate advisor/advisee and co-curricular activities into their thematic approaches.

The computer specialist will work primarily in regular classrooms in consort with the academic teams. (A separate keyboarding course will be offered until the time students arrive from feeder elementary schools with adequate keyboarding skills.) While "exploratory teachers"—those who teach art, music, dance, drama, physical education, home economics and technology education—will have their own space and offer discrete courses, they will facilitate curricular integration in two major ways. First, they will engage in special planning sessions with academic teams so that they contribute significantly to the themes and issues being explored. Part of this planning will be to devise exploratory activities which the two teacher teams can use in their classrooms or in special project rooms located in each of the three academic houses. Secondly, the exploratory teachers, who will function as a team and have regularly scheduled planning time together, will develop and implement themes and special projects of their own design.

The integrative role of special education teachers, librarians, counselors, and health personnel will be discussed under "Special Services."

Instruction

A curriculum featuring integrative, active, real world learning that involves significant contact with adults implies new roles for both teachers and students. It is essential that teachers continue to be learners and problem solvers themselves. In many instances, they will not know the "answers" in advance; they and students may jointly develop insight and understanding. Effective teachers become "models of good learners," illustrating how to pursue questions and how to make connections while structuring and facilitating student learning. By the same token, students cannot be passive learners, simply memorizing information presented to them which they give back on tests. They must develop initiative and responsibility, learn to ask and pursue significant questions, and to collaborate with others.

Thus instruction, which is inseparable from curriculum, will:

- Promote critical and creative thinking.
- Encourage students to question and discover.
- Respond to the individual needs, various intelligences, learning styles, and socio-cultural backgrounds of all students.
- Facilitate individual initiative and responsibility.
- Promote positive relationships within the school and community.
- Utilize the surrounding environment.
- Develop appreciation and respect for individual and cultural differences.
- Include a variety of teaching/learning strategies such as cooperative learning, reading/writing workshop, long term projects, work with manipulative materials, peer teaching, field trips, seminars, and community-based activities.
- Incorporate ongoing teacher and student self-assessment as part of instruction.
- Seek out new resources.

Co-Curricular Activities

A co-curricular program provides activities that support students' interests and greatly enrich the school's program. Most of the activities will be fully integrated into the regular school day; others will occur in an extended day program that involves students, parents and the community. Some of the most significant components will be:

■ *A school/community service learning program for all students. Each team will participate in at least one comprehensive service learning program every year. Activities may include beautification projects or aide work at school, service related to nursing homes, day care centers, social agencies, fund raising, environmental projects, tutoring, etc. As teams serve in various projects, they will also study about the issues involved in the project. For example, students involved in nursing homes will learn about the aging process; those engaged in environmental endeavors will study political and economic ramifications, alternative solutions, etc.*

■ *Extensive collaborative efforts with the university and the larger community agencies, including internships, apprenticeships and special projects. These will be in addition to regular activities discussed relative to the integrative curriculum.*

■ *A comprehensive intramural athletics program instead of interscholastic sports. The intramural program will emphasize participation, fitness, coordination, and skill development. In addition to regular team and individualized sports, the program will offer outdoor education challenge activities, "new games," and unique contests some of which will be designed by students and faculty, which promote friendly competition among teams and houses. It is anticipated that many NC State students will serve as coaches or facilitators.*

■ *An extensive club program and a mini-course program which will draw heavily upon the adult resources on the Centennial Campus.*

■ *House and occasional all-school town meetings to involve students in participatory democracy and decision making.*

School counselors will be key personnel in the human resources center. Through programs and personal interactions, they will promote self-awareness, positive relations with peers and adults, and competence and achievement for all students.

Counselors will work closely with classroom teachers, helping them to develop skills to become effective advisors and advocates for their students. They will also provide solution-focused personal counseling for students as needed. Counselors will help develop programs relative to career exploration, school-to-work transitions, peer helping, business community partnerships, mentoring, tutoring, etc. For parents, programs on early adolescent development, communication, discipline, and other topics of interest will be developed through the Teacher Development/ Outreach Program.

The extent of the human resources program will depend upon grant money and community services available.

Special Education

Special education will provide a flexible program to meet the bio-psycho-social developmental needs of a wide range of students. However, CCMMS will not likely be assigned students with severe cognitive or behavioral disorders who require self-contained classrooms. Exceptional students will be mainstreamed into house and team activities and the integrative curriculum to the greatest extent feasible. Personalized curricular plans and evaluation standards will be developed within this context, with parents frequently consulted. Special efforts will be made to tailor programs to student learning styles and various types of intelligence and to promote effective student decision-making.

Special education teachers will be closely affiliated with academic teams, jointly planning and often working with them in the classrooms. In addition, they will consult frequently with the team of exploratory teachers. All teachers in the school will be trained to teach all children with special educators frequently serving as mentors to other teachers in developing the necessary skills.

Exceptional students will have wide access to faculty, community, and college student mentor/tutors as well as technological

resources. Educational programs for parents of exceptional students through the school's outreach efforts will be available.

The special needs of gifted and talented programs will be met through individualized classroom projects and through thoughtful involvement in enrichment activities available to all students such as independent study with professors, graduate students, and Centennial Campus professionals; intern/apprenticeships; mini-courses; etc.

A special education resource room will be located in each house for classes in which students cannot be mainstreamed. Special education teachers will share office space with the academic teams in the houses.

ASSessment AND EVALUATION

Assessment and evaluation at CCMMS will encompass three categories: student achievement and development, personnel performance, and program effectiveness. All three areas will be designed to provide basic information, foster improvement, and ensure accountability.

Student assessment (the process of collecting information to understand better how schooling is being experienced from a student's point of view) and *evaluation* (using specific criteria to judge and critique the quality of a student's work) are central aspects of learning. Assessment asks: What do students learn? What else do they need to know? How do they judge their efforts? Evaluation insures accountability and informs the learning process. The major goal of both procedures is to help students learn more effectively.

Assessment procedures will strive to be developmentally appropriate, technologically advanced, and equitable. As an integral part of the learning process, they will address various learning styles and reflect the goals of the school's integrative curriculum. Portfolios, student/advisor conferences, parent conferences, journals, exhibitions, anecdotal records, videotapes, feedback sheets, and written comments on reports may be used. Owing to the young adolescent's need to become independent, *major emphasis will be placed upon student goal setting and self-assessment through advisory conferences and various types of analyses developed upon the completion of a project.* Student evaluation procedures will include skills checklists, criterion reference tests and those procedures mandated by the state of North Carolina and by WCPSS.

In providing information for individual feedback to students, instructional planning, and accountability, assessment/evaluation at CCMMS will go beyond measuring academic achievement to examine outcomes such as teamwork, citizenship, cross-cultural competencies, workplace skills, and school and community service. We anticipate that over time, new ways to measure students' cognitive levels, intellectual curiosity and creativity will be developed in conjunction with research efforts of the Teacher Development/Outreach Program.

Program evaluation will focus primarily on the contribution of various programs to the overall goals of CCMMS. Evaluations by students, teachers, administrators and parents (and on occasion, outside evaluators) will address the methods, essential components, and outcomes of innovative strategies associated with the CCMMS mission. They will seek to make clear what interventions were used, how services were delivered, what advantages and disadvantages were identified during implementation, and the extent to which instructional strategies and programs were implemented as planned. Regular indicators such as standardized test scores, attendance, promotion/retention, and behavior, used for all schools in North Carolina, will provide additional measures of the overall success of the program. An added goal is that performance of CCMMS students will be examined on a longitudinal basis after they leave the school through research grants and/or doctoral student dissertations.

Personnel evaluation at CCMMS by administrators will involve individual and team goal-setting and review tied to the mission of the school and the particular needs of individual staff members. Whereas new teachers are presently required to be evaluated by the Teacher Performance Appraisal Instrument (TPAI), all staff will be encouraged to use videotapes, student evaluations of teachers/administrators, and portfolios to evaluate their own performance. Peer/collegial groups and professional credentialing groups are expected to play an important role in providing feedback and support.

The school's Personnel Advisory Council (see governance document) will provide input on all assessment/evaluation processes used at CCMMS. NC State faculty will play a leadership role in designing diagnostic instruments and new approaches to assessment that are geared to the needs of teachers and middle school students. This will entail the active involvement of CCMMS faculty and staff in the design and implementation of instruments and the use of results for instructional development and program improvement.

ADMINISTRATION AND STAFFING

The school will conduct an extensive search to attract an innovative principal who is highly experienced with integrative curriculum development. In addition, the principal must be a knowledgeable and skilled administrator, one supportive of site-based decision-making who can relate to and lead effectively the various constituencies affiliated with the school. An assistant principal with many of these same qualities will also be sought. Two clerical assistants will be needed for administrative support.

Each house will have a house leader to coordinate its curriculum development and activities. House leaders will be master teachers who lead by example. They may well be employed part-time and/or in the summer as clinical instructors in various NC State teacher education programs.

Experienced faculty with expertise in integrative curriculum and who reflect gender and cultural diversity will be actively recruited. Grant money will be vigorously pursued to hire faculty a semester in advance so that they can engage in extensive staff development and planning for the new school. Specific staff needs include:

- 24 academic core teachers (including house leaders)
- 4 vocational education (2 technology, home ec., computers)
- 2 healthful living teachers
- 1 art teacher
- 1 dance/drama teacher
- 1 music teacher (part time)
- 3 special education teachers
- 1 media specialist
- 2 counselors
- 1 public health service nurse
- 1 outreach coordinator who will help develop programs and link university, corporate, government and community personnel to the school
- Part-time consulting physician, psychologist, social worker, nutritionist, and consultants for exceptional children
- Secretarial and clerical support

The number of staff actually assigned to the school will be dependent upon magnet staffing patterns in 1998 when CCMMS opens.

Goals & Principles

In designing and constructing CCMMS, the intention will be to create an attractive, innovative building which facilitates the school's unique goals and curriculum. It should have a comfortable, de-institutionalized atmosphere, with buildings and grounds that are educative (e.g., color coded wires and pipes; plants with identification tags). An added goal is for CCMMS to have a positive influence on school architecture, demonstrating ways that schools with limited land availability can be imaginatively and effectively designed.

The CCMMS building must be highly flexible, supporting a variety of student groupings and ways of learning. To the extent possible, all rooms should provide natural light and openness to the external environment to encourage its use as an extended classroom; flexible walls and movable furnishings to address changes in instructional strategies; classroom storage facilities for equipment and materials; space and storage to support technology instruction in all classrooms; white boards; tack walls; and shades and lighting that can be easily controlled. Space throughout the school must be accessible to students with physical handicapping conditions.

The unified arts rooms (art, music, dance/drama, technology, home economics) should be in close proximity to one another to foster communication among teachers. Also, this arrangement allows students to move easily from area to area when working on projects that involve several disciplines.

Grounds around the school will be equipped for various games, outdoor education and challenge activities, gardening and horticulture, animal care, and environmental studies. Some of these facilities will be available for community use as well.

Finally, as a Centennial Campus edifice, the school must be built and operated in accordance with the following 12 master planning goals of the Campus:

1. Enhance and fulfill university, college and unit missions.
2. Be beautiful places that express the uniqueness of the university.

T **TEACHER DEVELOPMENT/OUTREACH PROGRAM**

Purpose

The primary purpose of the CCMMS Teacher Development/Outreach Program (TDOP) will be to encourage current and future middle school professionals, locally and nationally, to learn about, develop, and implement exemplary educational practices for young adolescents. Joining research and professional development to a "real world" school, it will offer numerous training opportunities and disseminate research findings and descriptions of exemplary practice through the assistance of advanced technologies. Further, it will provide educational services for parents and community professionals.

The remainder of the TDOP facility will be leased to various educational agencies, many of them NC State funded projects which offer K-12 outreach to public schools. These agencies will collaborate with various CCMMS outreach programs as well as pursuing their own agendas.

Funding & Phased Development

The TDOP facility will be constructed primarily with private funds. Since funds cannot be sought until after the partnership agreement between WCPSS and NC State is signed, it is likely that this facility will not become operational until the after the middle school opens. Whether the facility will be spatially integrated into the school, be built on a separate floor, or comprise a second building cannot be ascertained at this time. It is anticipated that much of the initial equipment needed can be obtained from grants and donations.

Financial support for overhead and maintenance will come from rental fees, indirect costs from grants, and possibly endowments. Partner agencies who have a presence in the facility will lease office and storage space. Also, a fee will be assessed for use of shared instructional spaces and technological facilities.

Program

The Teacher Development/Outreach Program will have five major components:

- (1) *teacher preparation;*
- (2) *staff development;*
- (3) *community outreach;*
- (4) *research; and*
- (5) *dissemination.*

In addition to meeting specific needs, these programs will facilitate dialogue among educational practitioners, scholars, parents, business partners, and interested professionals.

The TDOP will become a locus for innovative *teacher preparation*. In particular it will enhance teacher development programs at NC State. It will support internships, clinical teaching experiences, seminars, and observation opportunities on-site, and supervision via telecommunication of student teachers in rural sites. By being involved in a stimulating school staffed by excellent teachers, preservice and inservice teachers will have unique opportunities to learn about adolescent development, integrative curriculum, team teaching, innovative uses of technology, new methods and assessment techniques, and advisor/advisee relationships. The role of the teacher as a reflective practitioner will be especially stressed; classroom theory and practice will be more closely allied.

Staff development will provide ongoing education for CCMMS faculty, and a multitude opportunities for teachers from WCPSS, the state, and the nation. Observations, workshops, summer institutes, conferences, and seminars will occur on-site. Staff development will reach a wider audience through distance learning and other technologies, interactive classroom activities, electronic bulletin boards, on-line mentorships, teleconferences, seminars, courses, interactive media presentations, videos, software packages, etc.

Community outreach programs (both on-and off-site) may include topics such as adolescent development, parenting skills, discipline, working with exceptional children, interpersonal relationships, cross-cultural competencies, and communication skills. A home-school outreach program, using social workers, interns, and student field placements will be explored, as well as

Evaluation

The Teacher Development/Outreach Program will be evaluated in accordance with its effectiveness as a resource to CCMMS, the Wake County community, NC State, North Carolina, and the nation. Effectiveness will be measured through end of course/ workshop/ conference assessments; ongoing evaluation of various programs, including number of clients served, level and quality of services delivered; products developed; and grant activity. In addition, aspects of the teacher education programs will be reviewed periodically by the National Council for the Accreditation of Teacher Education, The North Carolina Department of Public Instruction, the Southern Association of Schools and Colleges, and the NC State Graduate School.

Space & Staff Needs

Assuming full funding for the Teacher Development/ Outreach facility, space will be needed for:

- A distance learning laboratory
- A software production laboratory
- A television production studio
- A demonstration interactive media classroom
- An auditorium for conferences
- Workshop and seminar spaces
- Laboratories
- Classrooms
- Library
- Staff offices
- Instructional space and/or offices, storage for various centers, projects, and agencies.

The resources of the Teacher Education and Outreach Program will enhance and complement those of CCMMS by integrating technologies and sharing the television production studio, media center, software production laboratory, and auditorium facilities. Approximately 28,655 square feet will be need to accommodate the TDOP. The media center will be supervised by the CCMMS media specialist and a technology specialist from the TDOP. In addition, the TDOP will have a full time director, a grants, contracts, and communications coordinator, a technology technician, and two clerical staff positions for support. A WCPSS program specialist from the Wake Center for

Professional Development will be adjunct to the TDOP, providing assistance to staff development initiatives.

A full description of architectural requirements for the Teacher Development/Outreach Facility may be found in the previously mentioned companion document, *An Architectural Program for the Centennial Campus Magnet Middle School*.

A PPENDIX 1: CENTENNIAL CAMPUS AND PARTNERS

Centennial Campus Residents & Partners

The reach of Centennial Campus goes far beyond its list of tenants. Each resident center, institute and program represents a partnership of university, industry and government members, sponsors and researchers. Their interaction makes it possible for each partner to do things which couldn't be done alone, speeding the pace of research and technology transfer, as well as the quality of teaching and learning. We proudly acknowledge the important contributions of each Centennial Campus resident and its partners.

Air-Sea Interaction Laboratory

Partners:

- Indian Institute of Science, Bangalore, India
- Indian Institute of Technology, New Delhi, India
- National Science Foundation
- NCSU Dept. of Marine, Earth and Atmospheric Sciences
- Office of Naval Research
- U. S. Department of Energy
- U.S. Environmental Protection Agency

Applied Mathematics, Inc.

Partners:

- NCSU Center for Research in Scientific Computation
- NCSU College of Physical and Mathematical Sciences
- NCSU College of Textiles
- U. S. Coast Guard
- U. S. Submarine Force

Asea Brown Boveri—ABB Transmission Technology Institute

Partners:

- NCSU College of Engineering
- NCSU College of Physical and Mathematical Sciences

Centennial Campus Development Office

Partners:

- Office of Finance and Business
- Office of Research, Outreach and Extension

EPRI Textile Office

Partners:

- NCSU College of Textiles
- Electric Power Research Institute

Engineering Research Center for Advanced Electronic Materials Processing

Partners:

Advanced Micro Devices
AG Associates
Air Products & Chemicals
Duke University
Harris Semiconductor
IBM
Intel
Keithley Instruments
LSI Logic
MCNC
National Science Foundation
National Security Agency
National Semiconductor
NCSU Dept. of Electrical and Computer Engineering
NCSU Dept. of Materials Science and Engineering
NCSU Dept. of Physics
North Carolina A&T State University
Research Triangle Institute
SEMATECH (a consortium of 12 member companies)
SRC (a consortium of 62 member companies)
Texas Instruments
UNC-Chapel Hill
UNC-Charlotte

Facility for Ocean/Atmosphere Modeling and Visualization (FOAMv)

Partners:

IBM Environmental Research Program: Improving the Environment Through Innovative Uses of Information Technology
National Weather Service
NCSU Dept. of Marine, Earth and Atmospheric Sciences

Industrial Electrotechnology Laboratory

Partners:

Alternative Energy Corporation
NCSU College of Textiles

Kenan Institute for Engineering, Technology and Science

Partners:

William R. Kenan, Jr. Charitable Trust
North Carolina State University
Asia Pacific Economic Council
Federal Emergency Management Agency
Hoechst Celanese Corporation
Louisiana State University
National Institute for Standards and Technology

National Science Foundation
North Carolina Alliance for Competitive Technologies
North Carolina Biotechnology Center
North Carolina Division of Coastal Management
Novopharm Pharmaceuticals
Science Service, Inc.
Thailand National Science and Technology Development Agency
University of California at Davis
University of Florence, Italy
University of North Carolina at Chapel Hill
University of Pisa, Italy
University of Turin, Italy

Materials Analytical Services, Inc.

Partners:

NCSU Analytical Instrumentation Facility
NCSU Precision Engineering Center

Materials Research Center

Partners:

Advanced Research Projects Agency, Dept. of the Navy
Army Research Office
Battelle Pacific
National Science Foundation
NCSU Department of Chemistry
NCSU Department of Electrical and Computer Engineering
NCSU Department of Physics
NCSU Dept. of Materials Science and Engineering
Office of Naval Research

NASA Mars Mission Research Center

Partners:

CTA, Inc.
NASA
National Science Foundation
NCSU College of Textiles
NCSU Department of Mathematics
NCSU Dept. of Mechanical and Aerospace Engineering
NCSU Dept. of Nuclear Engineering
U. S. Air Force

National Weather Service Regional Forecast Office

Partners:

National Oceanic and Atmospheric Administration
NCSU Dept. of Marine, Earth and Atmospheric Sciences

NC-STAR: Storage Rings for Technology and Applied Research

Partners:

IBM
IEP Group, Inc.
Louisiana State University
MCNC
NCSU Analytical
Instrumentation Facility
NCSU Dept. of Chemistry

NCSU Dept. of Physics
North Carolina A&T State
University
Titan Corporation
TVJ, Inc.
U. S. Department of Defense
University of Wisconsin

NCSU College of Textiles

Partners (Partial List):

3M Corporation
A. B. Carter, Inc.
Albany International
Research Co.
Alternative Energy Corp.
American Cynamic Company
American Textile Mfg. Institute
Akzo America, Inc.
Allied-Signal Foundation, Inc.
American Apparel Education
Foundation
American Association of Textile
Chemists and Colorists
American Barmag Corporation
American Dornier Machinery
Corporation
American and Efird, Inc.
American Truetzchler, Inc.
Amoco Fabrics and Fibers Co.
Amoco Foundation, Inc.
Artistic Identification Systems, Inc.
Avondale Mills, Inc.
BASF
Bonas U.S.A., Inc.
Branch Banking and Trust
Burlington Industries
Carolina Mills, Incorporated
Carolina Power and Light Co.
Chatham Foundation, Inc.
Ciba-Geigy Corporation
Close Foundation, Inc.
Collins & Aikman Corp.
Cone Mills Corporation
Cotton Incorporated
Dan River Mills, Inc.
Datatex TIS, Inc.

Dickson Foundation, Inc.
Digital Equipment Corp.
Draper
E. I. Du Pont de Nemours
and Co., Inc.
Duke Power Company
Electric Membership
Cooperatives
Electric Power Research
Institute
FAB Industries
Fiber Dynamics
FiberTech Group, Inc.
Fiberweb Group, Inc.
Fieldcrest Cannon, Inc.
First Union
Flynt Fabrics, Inc.
Ford Motor Company
Freudenberg Spunweb
Gaston County Dyeing
Machine Co.
Greenville Machinery
Corporation
Groz-Beckert, USA, Inc.
Guilford Mills,
Incorporated
HDK Industries, Inc.
Haggar Apparel Company
Harriet and Henderson
Yarns, Inc.
Hercules, Inc.
Hoechst-Celanese Corp.
IBM Corporation
ICBT, Inc.
Jacques Weber
Foundation, Inc.

James River Corporation
 Sara Lee Knit Products
 Kimberly-Clark Corporation
 Levi Strauss & Company
 Lineberger Foundation, Inc.
 Marine Polymer
 Marshall and Williams Co.
 Melco Industries, Inc.
 Microdynamics, Inc.
 Milliken and Company
 Monarch-Vanguard Supreme
 Morton Machine Works, Inc.
 Murata of America, Inc.
 National Knitwear Mfg. Assn.
 National Science Foundation
 National Spinning Company,
 Scholarship
 National Textile Center
 NationsBank of North
 Carolina, N.A.
 North Carolina Power Company
 North Carolina Textile
 Foundation, Inc.
 North Carolina Textile
 Manufacturers Assn., Inc.
 Parkdale Mills, Inc.
 Phillips
 Ramtex, Inc.
 Reeves Brothers Corporation
 Rieter Corporation

Rohm and Haas Company
 Russell Corporation
 Picanol of America, Inc.
 Sandoz Chemicals Corp.
 Sandoz Foundation
 Schlafhorst, Inc.
 Shuford Mills, Inc.
 Spectrum Dyed Yarns
 Springs Industries, Inc.
 Steel Heddle
 Teijin Seiki
 Textile Clothing Technology
 Corporation [TC]²
 Textile Distributors Assn., Inc.
 Textured Yarn Association of
 America, Inc.
 Thies Corporation
 Tultex Corporation
 Tuscarora Yarns, Inc.
 Unifi, Inc.
 U. S. Dept. of Agriculture
 Vanguard Supreme
 Veratec
 Vintage Yarns, Inc.
 Wachovia Bank of North
 Carolina, N.A.
 West Point-Pepperell
 Weyerhaeuser Company
 Wrangler
 Zellweger Uster, Inc.

**NOAA/Southeast Consortium for Severe Thunderstorms and
 Tornadoes**

Partners:

Florida State University
 Georgia Institute of Technology
 National Weather Service

NCSU Dept. of Marine,
 Earth and Atmospheric Sciences
 University of Alabama at Huntsville

Non-Wovens Cooperative Research Center

Partners:

Albany International
 Research Company
 American Cyanamid Co.
 AMOCO Fabrics and
 Fibers Company
 Collins and Aikman
 Cotton, Inc.
 E.I. DuPont de Nemours
 & Co.

Fiber Dynamics
 FiberTech Group, Inc.
 Fiberweb Group, Inc.
 Freudenberg Spunweb
 Gaston County Dyeing
 Machine Co.
 Hercules, Inc.
 Hoechst-Celanese Fibers
 Operation

HDK Industries, Inc.
Kimberly-Clark Corporation
National Science Foundation
NCSU College of Textiles
Rohm and Haas Company

State of North Carolina
3M Company
U. S. Dept. of Agriculture
Veratec
Weyerhaeuser

Power Semiconductor Research Center

Partners:

C. P. Clare Corporation
Daimler-Benz AG, Germany
Ford Motor Company
Fuji Electric Company,
Ltd., Japan
Hitachi Research Laboratories,
Japan
Mitsubishi Electric Corp., Japan
Motorola, Inc.
Philips Laboratories

NCSU Dept. of Electrical and
Computer Engineering
Sanken Electric Co., Ltd.,
Japan
SRC (a consortium of 62
companies)
Shindengen America, Inc.
Shindengen Electric Mfg. Co.,
Ltd., Japan
Toyoda Automatic Loom Works,

Precision Engineering Center

Partners:

Aerotech
Eastman Kodak Company
Lawrence Livermore National
Laboratory
Los Alamos National Laboratory
National Science Foundation
NCSU Dept. of Computer Science
NCSU Dept. of Materials Science
and Engineering

NCSU Dept. of Mechanical and
Aerospace Engineering
NCSU Dept. of Physics
Office of Naval Research
Rank Taylor Hobson, Ltd.
StorageTek, Inc.
Texas Instruments, Inc.
3M Company

R&D Analysis, Inc.

Partner: Office of Research, Outreach & Extension

Real-Time Diagnostics and Control Laboratory

Partners:

NCSU Dept. of Physics Office of Naval Research

Textile Protection and Comfort Center (*See College of Textiles*)

University Research Initiative

Partners:

NCSU Dept. of Electrical
and Mechanical Engineering NCSU Dept. of Physics
NCSU Dept. of Materials
Science and Engineering Office of Naval Research

Wake Vortex Project

Partners:

NASA
NCSU Dept. of Marine, Earth and Atmospheric Sciences

APPENDIX II: DEVELOPING A TRANSPORTATION SYSTEM FOR CENTENNIAL CAMPUS

Jim Haynie, Assot. Professor, Technology Ed., HCSU

In our planning meetings we have frequently spoken of the desirability of extending traditional disciplinary lines and allowing children to learn in a holistic manner. Often, different people in the group have spoken of using "projects" and activities in all subjects. We have a unique opportunity to do this—to integrate art, music, healthful living, and other areas throughout the curriculum instead of the traditional approach of leaving these areas as asides. I envision the integration of the curriculum around large-scale, activity-based, laboratory-based projects which develop and utilize students' creativity, problem solving skills, higher order learning skills, and research (both library and experiential). The projects should involve work with tools, machines, equipment, materials, computers, simulation software, and other aspects of modern technology to challenge students to think and actively learn. In the construction of such projects, students will also develop skills which may be applied in community service projects, explore a variety of career options, develop a realistic approach to problem solving, learn to work together in a cooperative manner, learn to appreciate each others' unique abilities, and encounter new areas of interest which may become an avocational interest later in life (education is for life and these children will have a longer period of retirement than any previous generation). The following is one such large-scale project from the area transportation technology.

PICTURE THIS WITH ME —

Topic: Develop a transportation system for the Centennial Campus

Method: Groups of students work in teams and use this topic to integrate learning in as many traditional disciplines as possible. The products which result must include written, orally presented, and tangible items. Some groups will likely develop monorail systems, shuttle bus systems, or more exotic approaches.

Broad Range of Sub Topics Included (and how they correlate to the traditional curriculum):

- *Needs Assessment: Applying statistics (math and technology) to determine needs. Also includes some communication in developing and conducting surveys.*

to the system, new opportunities for interaction with others while riding it, ease of access to campus and community learning resources from the perspectives of students and the community at large, the six impacts: economic, social, political, ethical, environmental, and cultural—think broadly.

- *Development of route maps and instructions for passengers are in the realm of communication. What about foreign language instructions and schedules??*
- *Surveys should be done outside the school in the community. What better way to get the community involved in the school?*
- *Creative problem solving, research of all types, and higher order thinking will be applied with the tools and materials of technology to learn in an integrated manner.*

The learning opportunities with this type of large scale, cooperative, integrated project are limitless. Other topics which might deserve similar treatment: Develop a center similar to Harbor Place (Baltimore) or Waterside (Norfolk) which would front the lake on the campus; A closed traffic campus for NCSU with only perimeter parking and shuttles; A new airport with transportation to local communities; An alternate energy vehicle; An underwater city; A space colony; A paperless school through technology; A bio-engineering factory producing “living” computer chips. Think broadly—the more outlandish may be the better!!!

Modern Technology Education is supposed to help teachers lead their students through studies of this sort—it can serve as THE integrating point of the curriculum. Students cannot, however, simply go to a shop and be turned loose with potentially dangerous equipment. This sort of study requires three main things:

1. *Well equipped technology education laboratories with technology teachers who are technically competent and have the creative spirit to encourage this broad thinking—no birdhouse builders here!*
2. *Students who know how to use the tools and equipment at a minimal level and are taught by academic teachers who encourage active learning and projects.*
3. *Flexibility that allows for overlaps in times and activities supported by an actively engaged community.*

INSTRUCTIONAL OBJECTIVES

(MAJOR PROCESS AND CONTENT OBJECTIVES)

The learner will:

- demonstrate a positive attitude toward self as a unique and worthy person, and will become aware that all persons have the need to belong and be accepted by others.
- have an understanding of the structure, function, and care of the human body.
- use the language arts to collect, organize, analyze, evaluate, draw conclusions, and express opinions about information.
- apply mathematical concepts of computation, graphing, and averaging to real life situations.
- participate effectively in groups and demonstrate growth in self-management.
- demonstrate an understanding of computers, their operation and their possible applications to solving relevant problems.

ACTIVITY 1 I AM UNIQUE

A. At the beginning of the unit, ask students to work in pairs and draw an outline of each other on plain white or butcher paper. These outlines will represent the uniqueness of each student and will be a focal point of several activities intended to celebrate this uniqueness during the semester study. Ask students to cut out their outlines, put their names on them and tape them around the walls of the classroom. (They could be arranged by height, however, there will be other activities that will point up the wide range of differences within the class.)

1. Ask students to find out from their parents how much they weighed and how long they were at birth, convert to kg/cm and record the information on their body outlines the next day. This information will be used in an activity to compare the differences of the class at birth with differences now.

2. In pairs, ask students to measure height in cm and weight in kg and enter information into a computer graphing program to produce a classroom graph. If there is reason to believe that some students would be embarrassed by their names being used, use a number instead. The purpose of the activity is to create a graph that points out differences. Graph the "at birth" data to use for comparison.

3. Use AA time or group discussion to point out how this period of life is filled with extreme differences and the importance of being unique.

B. Provide paper and ask students to mark the length of their foot on. Each student's foot length can be cut as a 3" strip. By arranging strips by length and taping on the wall, the class will have constructed another type of graph.

During the study, students will conduct self-assessments related to the different topics of study, including favorite things, creative writings, eating habits, exercise habits, etc. The information will be placed on the body outlines. From these assessments, each student will create his own LIVING MACHINE PROFILE and plan for the future.

ACTIVITY 2 SYSTEMS OF THE BODY

A. As the systems of the body are introduced, assign students to heterogeneous groups and allow them to select a system of interest to explore and present to the class. Provide a short list of key questions to guide students in their research. Plan with the media coordinator so that when they come to the media center in small groups, s/he can provide assistance in locating appropriate resources. Require information from a variety of resources (i.e., current periodicals, audiovisual and print resources.)

B. Provide a list of suggestions for ways to present the information to the class. Encourage creativity and do not overlook creative dramatics, songs, or student-made videos, filmstrips, tapes, etc. Several presentations can be given to senior citizens in homes. The class can vote to decide which ones to perform.

C. Make a timeline for the whole process, building in checks, in order to keep students on task and to keep teachers informed of progress. Use group work time to interact with various groups to offer support, direction, and assistance. Make the computer program, SCIENCE TOOLKIT, by Broderbund, available to student groups so that they can conduct safe

made more sensitive to the limiting factors and factors that are NOT limited by various handicaps. Blindness and deafness and /or confinement to a wheelchair are often of interest to students. This activity could be introduced with a videotape, a booktalk, or story read by media coordinator.

1. Students can simulate the handicap and try to perform in the school environment for a specified amount of time. Assign students to alternate (take turns) being "blind," "hearing impaired," or confined to a wheelchair and continue the class in a regular fashion, allowing them to experience the limitations. The reactions they have and the reactions of other students to them would make good topics for AA or group discussion.

2. Ask students to write how they felt as they participated in the activity. Put their writing on their body outline.

ACTIVITY 4 WHAT HAPPENS WHEN WE GET OLDER?

If the teacher is interested in sensitizing students to aging:

A. Ask students to smear mud on glasses, plug their ears, wear gloves and put extra weight in their shoes and continue to perform classroom activities, such as reading, writing and moving about.

B. After the designated time, students discuss their feelings and do a creative writing activity.

C. Divide into groups and role-play being old in the grocery store, trying to find a telephone number, etc.

D. Outside class activities:

1. Interview a senior citizen to find out what they do with their time, what they do for recreation.

2. In conjunction with health and folklore, students could interview older family members or other senior citizens to determine old remedies for illnesses they used, or still use to treat illnesses and injuries, such as putting snuff on a bee sting. This activity could be followed up by research activities to determine the reasons some may have worked so well, or inviting in a medical expert to be a guest speaker on the topic. Taping the interviews and transcribing would extend the activity further. Compile the remedies into a book and present to senior citizens who contributed and/or share with seniors visited when performances are done.

experiments using the computer. Use or introduce to student groups, the School Television Series that would be appropriate for their group work, such as THE INSIDE STORY WITH SLIM GOODBODY.

D. Make the presentations a "big deal." Student rating sheets can evaluate.

E. Other activities:

Some systems are more complex to understand and may not be selected by student groups. Teachers may decide to present certain systems and initiate activities. For example, understanding how the body responds (Nervous System) is a complex concept. Concrete activities can help students understand concepts such as reaction time:

1. Ask students to stand in a circle, holding hands. The first student squeezes the hand of the student next to him or her and the squeeze is passed from student to student as it is felt. Clock the amount of time it takes for the squeeze to go all the way around the circle. Repeat several times and divide the time in seconds by the number of students for an average reaction time. Students are invited to estimate the time it will take beforehand, form hypotheses, test, and use many of the science process skills.

2. Another similar reaction time activity asks students to catch a ruler between the thumb and forefinger. Results can be charted or graphed.

F. As a culminating activity, role play the systems of the body, having students move on a GIANT LIVING MACHINE, drawn on the playground in chalk. Props can be used as students simulate blood flow (red and blue hats or scarves) by walking through the GIANT.

ACTIVITY 3 HOW MY FAMILY AFFECTS ME-WHAT DO WE INHERIT?

A. Ask students to survey family and/or members of the community regarding inherited characteristics. Include such noncontroversial items as eye color, attached or unattached ear lobes, ability to roll tongue, hitchhiker's thumb, longer index or ring finger, right or left-handed, hair on finger mid-digit, and top hand in hand clasp. Use results of the survey in a variety of subactivities.

B. WHAT HAPPENS WHEN SOMETHING GOES WRONG?

If the teacher wishes to examine handicapping conditions, students can be

ACTIVITY 5 HOW CAN I TELL IF I'M HEALTHY?

- A. Set up a center that provides necessary equipment for students to measure blood pressure and conduct experiments to measure heart rate. Allow students to measure each other at rest, after activity, and length of time it takes to recover to below 80 beats per minute. Engage in activities such as walking, running, sitting and reading, and record rates on individual charts that will be placed on the body outline. Use EASY GRAPH II, a computer program, to create a bar graph showing averages for boys and girls.
- B. Have students read the article about Fast Foods in CONSUMER REPORTS, June, 1988. Ask them to chart everything they eat for 3 days. Use their intake to determine eating habits, caloric intake, etc. Use the computer program produced by MECC to do a nutritional analysis of the food.
- C. Use the computer program, SURVEY TAKER, allowing students to generate questions regarding eating habits. Place the program in the media center and allow students to complete the survey on a random basis. Review and analyze results of the survey in a large group setting. Discuss implications.
- D. Bring food labels from home and analyze contents of various foods within food groups.
- E. Ask students to create posters encouraging good health practices.

ORGANIZATION

This unit will take a full semester. It can be taught in a teaming environment or in a self-contained classroom, as well. Provision has been made for large group, small group and individual activities. The discovery learning opportunities and problem solving activities meet students' developmental needs.

EVALUATION

The activities allow group and individual evaluation. Products that result from activities, such as the posters and writings can be graded by the teacher or jointly by the teacher and student. A content test addressing the concepts tested in the schoolwide testing program would provide the teacher with information regarding progress and mastery levels.

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APPENDIX B

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Appendix O

Centennial Campus Middle School Teacher Profile

Teachers at CCMS should:

- Recognize that teaching young adolescents is fundamentally different from teaching either elementary or high school students.
- Be masters of their subject matter.
- See themselves as part of a wider resource of services designed to meet the needs of their students.
- Know how to respond sensitively and effectively to their students.
- Be able to work as a team with other teachers.
- Have a willingness to learn about other subject matter and be willing to educate other teachers about their subject matter.
- Have a holistic view of the teaching and learning processes.
- Know how to design instruction that responds appropriately to young adolescent developmental needs.
- Be able to manage and monitor their students' learning.
- Ensure success experiences for all students and provide support in failure.
- Be able to engage families in their children's education; be able to work with families of all socioeconomic levels.
- Want to connect school with community.
- Understand adolescent development; be able to promote the physical, social, and emotional growth of young adolescents; advocate for the whole adolescent.
- Be sensitive to cultural differences.
- Understand principles of guidance for use in an advisory role.
- Understand and promote the middle school concept.
- Believe in the authentic assessment of learning.
- Know how to plan and implement curricular experiences that focus on the learner.
- Know how to encourage students to take ownership in their learning.
- Loves to teach this age group.
- Thrive on the energy and enthusiasm generated from being with young adolescents.
- Find middle school-teaching rewarding.
- Believe that teaching middle school students is an important service.
- Believe they can make a difference in the lives of their students.
- Be able to design instruction that responds appropriately to young adolescent developmental needs.
- Advocate for the whole young adolescent.
- Understand that young adolescents need freedom of movement and interaction with peers.

- Have positive self-concepts.
- Display optimism.
- Show enthusiasm.
- Exhibit a good sense of humor.
- Demonstrate flexibility.
- Be good listeners and communicators.
- Be able to use a variety of learning activities and materials.
- Self-evaluate for professional growth.
- Promote a classroom and school climate based on mutual respect.

APPENDIX C

Interview Questions

Interview questions will include but are not limited to the following:

- Describe your role and responsibilities with the 1:1 laptop program at Centennial Campus Magnet Middle School?
- How would you characterize the original idea behind the creation of Centennial Campus Magnet Middle School?
- What would you identify as the key components to initiating a 1:1 laptop program?
- What would you identify as essential steps in the development of a 1:1 laptop program?
- Share about the biggest success.
- Share about the biggest challenge.
- What are lessons learned in the 1:1 laptop program?
- In what ways, does the 1:1 laptop program reflect the original vision of Magnet Middle School?

These questions will explore perspectives of the implementation, development, benefits, and challenges associated with the 1:1 laptop program.

Survey Questions

The survey questions are included but not limited to the following:

- What would you identify as the key components to initiating a 1:1 laptop program?
- What would you identify as important steps in the development of a 1:1 laptop program?
- What would you identify as celebrations of the 1:1 laptop program?
- What would you identify as challenges of the 1:1 laptop program?
- What are lessons learned in the 1:1 laptop program?

Focus Group Interview Questions

- What would you identify as the greatest gain for students?
- What would you identify as next steps in the development of the 1:1 laptop program at Centennial Campus Magnet Middle School?
- Share what support would benefit the implementation of the 1:1 laptop program.
- Share about what you have gained as a professional.

SAMPLE PARTICIPANT LETTER FOR INTERVIEWS

March 21, 2011

Dear 1:1 Laptop project personnel

I am currently enrolled as a doctoral student at North Carolina State University. My dissertation is a case study of Learning and Leading with Technology at Centennial Campus Magnet Middle School. As part of the data collection, I am asking you to participate in an anonymous, online survey and in a focus group with other teachers at Centennial Campus Magnet Middle School about the 1:1 laptop program that exists at the school.

The purpose of this research is to describe and document the implementation of a 1:1 laptop program for a middle school with a unique school-university partnership. The goal of this study is two-fold; one being to describe the implementation of a 1:1 laptop program and to document the lessons learned in leading a 1:1 laptop program. Secondly, the goal is to reflect on the original conception of “extensive use of cutting-edge technology” with current practices and the implementation the 1:1 laptop program.

Your participation or non-participation in the research will not impact your job in any way. This research is being conducted after teacher evaluations have been submitted for the year.

If you agree to participate in the anonymous survey, please follow the link provided below. By completing and submitting the online survey, you will indicate your willingness to participate.

If you are willing to participate in the focus group, please reply with the best time for me to contact you. I would like to complete the interview in May 2011. Thank you for your consideration.

Sincerely,

Edye Morris-Bryant