Utilizing Technology as Leverage for Instructional Improvement in the Classroom

by

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DEDICATION

In loving memory of my grandparents

Ben and Betty Kofsky.

Though many years have passed,

you are dearly remembered.

Your strong moral compass

continues to guide me today.

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First, and foremost, I would like to extend my thanks to this district's middle school facilitator for making this dissertation possible. I am forever grateful to her for how she welcomed me into the district and set the tone for my inclusion and acceptance within the group. Her skill as a teacher, her laughter and enthusiasm, and her tireless support for the many teachers attempting to improve their practice were an inspiration.

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INTRODUCTION

Teachers in the U.S. generally experience a patchwork of professional development workshops (Wilson & Berne, 1999). As Ball and Cohen (1999) describe, "although a good deal of money is spent on staff development in the US, most is spent on sessions and workshops that are often intellectually superficial, disconnected from deep issues of curriculum and learning, fragmented, and noncumulative" (pp. 3-4). All too often, teachers may begin adapting and adjusting the curriculum while the underlying context of beliefs and classroom roles remain basically unchanged (Borko, 2004; Ertmer, 1999; Peterson, McCarthey & Elmore, 1997; Hargreaves, 1997)

For significant and sustained instructional improvement to occur, professional development must do more than support teachers' acquisition of new skills or knowledge (Darling-Hammond & McLaughlin, 1996). Teachers need also acquire an operational understanding of the complex relationships among content, pedagogy, and technology. As such, effective professional development must create multiple occasions for educators to seek new knowledge and turn that knowledge into new practice (Elmore & Burney, 1997) and to discuss and problem-solve the dilemmas of practice which arise as a result.

Instructional reform initiatives involving technology are no exception. Typical approaches to technology professional development suggest implicitly that teachers need only be trained to use particular educational technologies and exposed to possible curriculum-based uses

of those tools and resources (Harris & Mishra, 2007). However, stand-alone training programs that teach specific technology skills are insufficient since learning about technology is different than learning what to do with it instructionally, linking it to curriculum-based content standards, assessment and/or meeting individual learning needs.

This dissertation examines one affluent suburban district's reform initiative called Inspire in the middle schools and Engage in the elementary schools. This initiative focuses on providing professional development opportunities aimed at pushing every junior grade teacher and all middle school English Language Arts and Social Studies teachers to utilize technology as leverage to make their classroom teaching more purposive and constructivist in nature.

Having taught in schools for a decade, I have participated in numerous initiatives with similar aims. Inspire's uniqueness was what captured my attention. It was district-wide and on-going. It had the financial resources to provide teachers with a full range of technologies and supports which included facilitators who conducted the monthly training sessions and who were available for planning and coaching support throughout the year. Lastly, unlike many of the professional development programs I had attended with district office commitment behind them, this one was mandated and was separate from in-service professional development days which are provided by the district for the entire staff.

When I thought of the many teachers I have known professionally, including the two dozen or so student teachers whom I have mentored, I wondered how they would have responded to this district's expectations for practice. Of course, there were many dedicated teachers who volunteered to attend workshops and conferences. Many were already excellent teachers. But I

wanted to explore how this district would achieve instructional improvement in those situations where teachers may not wish to participate and/or in which they may not have the capacities necessary to meet the instructional aims expected of them.

Moreover, I wished to explore how affluence may impact upon the success of this initiative. I have had several years of experience working in both high and low poverty schools. In the high poverty schools, almost half of my students were not native English speakers. Parents who did not speak English well were unable to help their children do their homework. Students without adequate homework supervision and support often did not complete their work. In addition, although report cards were translated into their native languages, these parents often felt uncomfortable coming in for parent-teacher conferences.

Many students came from single parent households. Some moved around a lot and had been to three of more schools during the elementary years. It was not uncommon for students to come to school hungry or tired because the housing development in which they lived was noisy or extra people were staying there for the night. Several students came into my classroom early in the morning and stayed late after school because they were told not to come home if the parent was sleeping or if their boy/girlfriend was home.

Not only did it seem as if the students‘ situations were unstable, but the school itself also seemed less stable. The high poverty schools where I worked had high rates of teacher and administrator turn over. Many of the teachers had been placed there because they had asked for an administrative transfer after not being able to secure another job for themselves. As such, these two schools seemed to be dumping grounds for teachers that had been ineffective teachers

elsewhere. The school did not seem as safe either. While fights can break out and teachers and students can have items stolen in any school, these seemed to occur on a very regular basis. Even when I was not on yard duty, I supervised my class at recess time so that insults and disputes could be dealt with before they spilled over into class time. Many students were disrespectful to their teachers as well.

In general, the environment at the two affluent schools at which I taught was very different. I had smaller classes. Overall, parents were very involved in the education of their children. They read to them on a regular basis, supervised homework completion, helped with projects and monitored their progress. Many of the parents also worked with their children on reading and math skills at home or took them to private tutors. It was not uncommon for kindergarten students to come to school already knowing how to read and count to fifty. They were well-fed and well-rested. They wore glasses if their regular doctor‘s visits had uncovered the need.

While all these schools had been clean, and bright, the more affluent schools were far better equipped. The library was bigger and housed more books. Classrooms had more computers, manipulatives and books. The PTOs provided funds to purchase additional materials you requested. Being pleasant to work in, well resourced and having parent body creating academic push and demanding academic press, these schools had teachers and administrators who had been there for years.

I wanted to investigate how a mandated instructional reform initiative would be received and implemented. I wondered if this initiative had a better chance to succeed without all the

social and educational complications that come with higher poverty schools. This initiative afforded the opportunity to study instructional reform in a district which had already surpassed the technology acquisition phase and where student achievement was sufficiently high to minimize the salience and pressure to do well on mandated state-wide assessments.

This study is important because of its unique context. Academically, student achievement in this district is one of the highest in the state. Financially, this district is resource-rich and has the financial resources to fully equip each school and classroom with the technologies, support structures and equipment maintenance necessary to support this initiative. Teacher turnover is low and 87% of its teaching force holds advance degrees. Few teach out-of-field. There are ample funds for professional development. Parents support classroom work, create academic press and provide substantial funds each year to support the teachers and schools. In many ways, this district allows researchers to investigate reform efforts in a context with minimal compounding factors.

On paper, it seems as if this initiative would have every chance of succeeding in altering classroom practice. However, I wondered if affluence really impacted actual classroom instruction since, in my experience, instruction at these schools was not wholly different. At each school, there were some fabulous teachers and some who relied on dittos which they used year after year. In each school, there were those teachers who probably would have jumped at the chance to participate in a professional development program such as this and those who dismissed it as a fad which took away from the teaching of ~~th~~he basics". Perhaps money, stability, qualified teachers and parent involvement do not guarantee reform implementation.

This study focuses specifically on the Grade **7** English Language Arts and Social Studies teachers who were participating in Inspire during the 2010-2011 school year. The research was guided by two over-arching research questions: In what ways did the training help to build teachers' technical and pedagogical capacities so that they could utilize technology as leverage for enacting instruction which is student-centered, problem-based and collaborative? And, what role did school administrators play in providing support for their staff as they attempted to alter their instructional practice? The data set for this study consists of transcripts of the nine monthly training sessions and two board meetings, 25 interviews (14 teachers, 5 administrators, 3 facilitators and 2 superintendents and one pioneer teacher), two teacher surveys, any teacher's lesson plans posted on-line and a sample of students' work posted on-line.

This dissertation is arranged in five chapters. This first chapter situates Inspire by summarizing what is already known about 21st century teaching and learning, the uses of technology in schools, effective professional development, and instructional school leadership. The conceptual framework developed in this first chapter forms the foundation for both the analysis and interpretation of the data collected for this dissertation.

In the second chapter, I outline the history behind the development of Inspire and describe its goals and primary design features. The chapter ends with a brief discussion of Inspire's possible strengths and weaknesses according to the literature presented in Chapter One. Chapter three discusses the questions guiding this study and the procedures for both the collection and the analysis of the data gathered. It should be noted that, in order to protect the

identities of those who chose to participate in this study, the names of the initiative, the district, its schools and all the teachers mentioned in this dissertation have been changed.

Chapter four outlines the findings of this study and presents some of its limitations. In the last chapter, Chapter Five, I summarize the findings and interpret them with respect to the literature presented in the first two chapters. This chapter concludes with suggestions for improving instructional practice in the field and for future research.

CHAPTER 1
Review of the Literature

"If we teach today as we taught yesterday,
we rob children of tomorrow" John Dewey

1.1 A Quick Look Back:

For those with a background in education history, the educational philosophies of 21st century teaching and learning will sound very familiar. Back at the turn of the twentieth century, John Dewey and other proponents of progressive education also sought to redefine and reshape American educational practice. For one thing, they argued that education needed to be more democratic, offering all students an intellectually rich education that would not limit their occupational or life choices.

Secondly, and more significantly, progressive educators such as Dewey aimed to redefine the teacher's role in the classroom away from that of the imparter of information and the strict disciplinarian. They asserted that the proper role for a teacher was not that of someone who stood at the front of the room doling out bits of information to be memorized and absorbed by passive students.

Thirdly, Progressives opposed a curriculum that was broken down into a series of skills which were disconnected from the world and the students‘ experiences within it. Quite the contrary, they believed that students thrived in an environment where they were allowed to experience and interact with the curriculum. They felt very strongly that all students should have the opportunity to take part in their own learning. Furthermore, Dewey and other progressive educators argued that, in order for education to be most effective, content had to be presented in a way that allowed the student to relate the new information to prior experiences, thus deepening the connection with this new knowledge.

While some misunderstood Dewey as advocating that children should determine what they wished to study, Dewey was backing an educational system that was able to strike a balance between delivering knowledge while also taking into account the interests and experiences of the student. Thus the teacher becomes a partner in the learning process, guiding students to independently discover meaning within the subject area. As Dewey (1897) explains it:

> The teacher is not in the school to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child and to assist him in properly responding to these influences (p. 9).

These ideas had real implications for classroom instruction. In an era when most teachers defined good pedagogy as drill and practice grounded in textbooks, good instructional practice was now being reshaped as developing an awareness of students‘ capabilities, needs and experiences, leading group discussions and facilitating students exploration and understanding of the curriculum within a real-world context. For example, Harold Rugg, a professor at Teachers

College in Chicago, argued that social studies epitomized a curriculum which was fragmented and unnecessarily compartmentalized. Instead, he proposed unified social studies which correlated history, geography, civics, economics, and sociology. He wrote,

> More effective outcomes will be secured by weaving together lesson by lesson the facts, movements, conditions, principles and social, economic and political —laws‘ that depend upon one another *and that can be fully comprehended only when they are woven together*. (Rugg, 1921, p. 128)

Instruction such as this also required a shift in the understanding of the nature of children and the role of the student. Educators such as Dewey and Rugg felt that children were, by nature, curious and creative with a wide range of worthwhile interests. A broader curriculum was seen as being more respectful of these interests. Moreover, such a curriculum was felt to also serve to engage the child therefore making harsh discipline and strong routine unnecessary. Learning could be fun when games, field trips, and films blurred the lines between work and play. Teachers could be kind and patient so that all students could feel comfortable and experience academic and social success.

Building upon the ideas of Dewey and the child-centered Progressives, schools have undergone many changes during the last century. Young children are given more opportunities for music, art, drama. Elementary students often learn math and literacy while –playing" with manipulatives. At all levels of schooling there has been growth in extracurricular activities as clubs and teams proliferated. A number of health and social services for the physical and emotional needs of the whole child have also been incorporated into the school system. Open classrooms, schools without walls, cooperative learning, multiage approaches, whole language,

the social curriculum, experiential education, and numerous forms of alternative schools are more recent adaptations with philosophical roots in progressive education. 21st century teaching and learning is one of the newest reiterations of these ideas.

1.2 21st Century Teaching and Learning:

While conceptions of what 21st century learning means vary, there are some common aims and assumptions. Advocates of 21st century learning seek to challenge the status quo of current conceptions of education and push for the transformation of our schools into learning organizations that match the times in which we live. They argue that we are in a new era-that of the Knowledge Age-where work can be done anywhere, by anyone who has the expertise and either a cell phone or a laptop and an internet connection. Furthermore, they assert that Knowledge Age work requires a new mix of skills: More complex thinking, communicating, abstract problem-solving and applied skills, mental flexibility, creativity, and self-direction. They argue that having workers who will have these essential skills in the future requires an education system that produces them (Jacobs, 2010; Trilling & Fadel, 2009).

However, this requires replacing existing teaching practices with new methods of instruction and a better integration of technology and pedagogy. The requisite curricula would need to address the soft skills required in today's global, information-driven workforce and prepare students to deal with the challenges of their times such as global economies, global

population increases, consumption of the earth‘s materials and energy resources, climate change, global unrest, and poverty.

The ideal 21st century education reflects a curriculum of processes that serve as leverage for learning any content. Rather than preparing students for one job, it teaches students high degrees of flexibility and adaptability, how to be self-directed and to take initiative, and helps them to develop social and cross-cultural skills so that they may take on multiple jobs and roles throughout their lives. Like Harold Rugg and the Progressives, proponents of 21st century learning also assert that the curriculum must teach skills through interdisciplinary themes that give students practice engaging in complex problems, dilemmas, and conflicts whose resolutions are not immediately apparent.

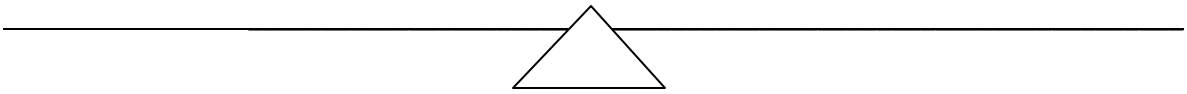
Thus, the 21st century learning movement is not solely about utilizing technology. The aim is to extend students‘ intellectual capacity through the use of contemporary tools and to create powerful learning situations which can extend their experiences and foster the acquisition of higher-order thinking skills (Trilling & Fadel, 2009).

Accordingly, the ideal 21st century education reflects a curriculum of processes that serve as leverage for learning any content. Rather than preparing students for one job, it teaches students high degrees of flexibility and adaptability, how to be self-directed and to take initiative, and helps them to develop social and cross-cultural skills so that they may take on multiple jobs and roles throughout their lives. The skill-based paradigm is replaced by one that is knowledge-based paradigm. The idea is to allow students to build mental models (either visceral or virtual), incorporate new experiences into them, and modify them over time.

Such an education should also be authentic because this is believed to harness internal motivation, increase engagement and develop intellectual curiosity. The result is that teaching requires teaching students skills (such as critical reflection, empirical reasoning, metacognition and collective intelligence) through interdisciplinary themes and giving students practice engaging in complex problems, dilemmas, and conflicts whose resolutions are not immediately apparent. The diagram below provides a good summary of the education being advocated for the 21st century.

Diagram A: A New Balance: Education for the 21st Century

Teacher-directed	Learner-centered
Direct instruction	Interactive exchange
Knowledge	Skills
Content	Process
Basic Skills	Applied skills
Facts and principles	Questions and problems
Theory	Practice
Curriculum	Projects
Time-slotted	On-demand
One-size-fits-all	Personalized
Competitive	Collaborative
Classroom	Global community
Text-based	Web-based
Summative tests	Formative evaluations
Learning for school	Learning for life



Taken from *21st Century Skills: Learning for Life in our Times* by Bernie Trilling & Charles Fadel, 2009, p. 38.

There are several organizations which promote 21st century teaching and learning. For example, there is Assessment and Teaching of 21st Century Skills (ATCS21) which argues that today's curricula does not fully prepare students to live and work in an information-age society. Working with researchers and educators, ATCS21 is developing methods to assess skills that will form the basis for 21st-century curricula, with an emphasis on communication and collaboration, problem-solving, citizenship, and digital fluency.

Another primary organization like this is The Partnership for 21st Century Skills (P21). This group had produced a large proportion of the books and websites on 21st century learning and was the organization which was referenced by the school district studied in this research. As such, I feel that it is important to provide more information about this group.

For several years, a group of individuals working in Marketing or Research and Development departments in technology and educational material companies happened to share office space with a group of educational lobbyists. It seems that they came to the realization that they could accomplish their goals better if they collaborated. In 2002, they merged and created the P21 organization. Its stated mission is to ~~k~~kick-start a national conversation on the importance of 21st century skills" (www.P21.org).

While I do not wish to imply that P21 has little interest in how these skills are taught in the classroom, it is important to point out that, since its inception, almost all members of P21's Strategic Planning Committee have been individuals who are either CEO's of computer Marketing or Research and Development departments (such as Apple, Dell, Hewlett Packard, or Microsoft), CEO's of technology service providers (like Adobe, Verizon, or NetTrekker), CEO's

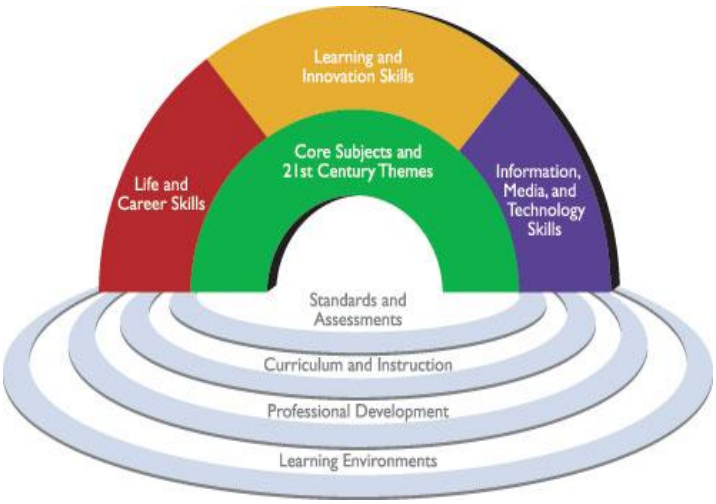
of companies which provide schools with textbooks and/or curricular and assessment materials (such as McGraw-Hill, Houghton-Mifflin Harcourt, LEGO, Crayola or Scholastic), and representatives from various private educational consulting firms.

The Partnership for 21st Century skills and its Steering Committee members have been both vocal and prolific. Even several of the books written on the subject of 21st century learning have their origin in P21. For example, Charles Fadel is a member of the Strategic Planning Committee at P21. He is an executive at Cisco Systems which is a company which provides web technologies which support video collaboration. Bernie Trilling is the Senior Director at Oracle Education Foundation, an American multinational computer technology corporation that specializes in developing and marketing software products. Together, they wrote a book entitled, *21st Century Skills: Learning for Life in Our Times* which was one of the books utilized as a resource for Inspire and which was provided for all administrators in the district as well as many of its teachers.

This information is important not because it may speak to P21's motives. Knowing that P21 has few educators amongst its ranks helps explain why it outlines educational goals far more specifically than it does the educational methods by which they may be attained. For example, the district in which this study was conducted utilized the P21 website and two books written by members of its Strategic Planning Committee as resources in developing their Inspire and Engage initiatives. Like other districts who have posted comments and articles on the P21 website, this district relied, in large part, on the P21 framework of skills and supports as a guide

for their programs. This framework is represented by the diagram below and is seen in P21 books as well as on this district's website and in its brochures and in its schools.

Diagram B: P21 Common Core Toolkit: A Framework for 21st Century Learning



Downloaded from http://www.p21.org/

Student outcomes are represented by the arches of the rainbow and 21st century skills support systems are represented by the ripples below. While the graphic represents each element distinctly for descriptive purposes, they are viewed as being fully interconnected. It should be noted that P21 has redefined the core subjects. In this framework, they are not Reading, Writing

and Arithmetic. They are English, Mathematics, Science, World Languages, Civics/Government/Economics, and Arts/History/Geography. Although not formally included as a core subject, the framework stresses that Information Literacy, Media Literacy and Information, Communications and Technology Literacy need also be taught. The Learning and Innovation Skills located in the arch of the rainbow are also referred to as *The Four C's*: Critical thinking and problem-solving, communication, collaboration and creativity.

While this framework points out that learning environments will need to be modified and that new curricular materials, assessments and professional development for teachers will required, it provides educators in the district, schools and classrooms with little guidance for implementation. This is both crucial and daunting for most districts since teachers are generally unprepared to meaningfully integrate technology into the curriculum (Cuban, 2001).

First of all, schools require the technologies, software, supporting products and equipment maintenance in order to begin using them. However, the literature indicates that, even when 21st century technology tools are available, they are not being used for the kind of teaching and learning that a 21st century context should promote (Baylor & Ritchie, 2002; Becker, 2001). In order to make effective use of technology to improve student learning, teachers would require intensive and on-going professional development to understand what they are being asked to do and to develop the capacities to become skilled technology users as well as skilled educators. Change of this kind would also require administrative support so as to facilitate student and teacher collaboration.

Supplying schools with technology, providing effective professional development for teachers and training administrators to nurture and support the change process will now each be discussed in turn. Each section will discuss what is known as well as the critical issues which the research shows must be resolved in order for implementation to be effective.

1.3 Technology in Schools and Classrooms:

Bernajean Porter has identified three phases of technology implementation which emerge over time as schools grapple with technology's role (Porter, 2003). She calls the first stage Equipment Acquisition and it primarily involves organizing a school's budget for equipment acquisition (Porter, 2003). These first plans are often informal and focused on the choosing from available technologies. In this phase, technology is typically considered an add-on to the rest of the curriculum and little change is required across the rest of the school. Decisions are left to a few technology leaders and student learning is not yet typically defined beyond acquiring technical skills.

In the second phase of technology implementation, Equipment Acquisition and Learning, building the physical technology infrastructure continues and their application increases across the school as it works to develop collective goals such as "enriching or enhancing curriculum," "creating lifelong learners," "supporting state standards," or "integrating technology throughout the curriculum" (Porter, 2003). While teachers may begin adapting and adjusting the

curriculum, the underlying context of beliefs and classroom roles remained basically unchanged (Cuban, 1993; Ertmer, 1999; Fullan, 1993).

This type of change is referred to as first-order change and is characterized by doing the same things differently. Implementation goals in this phase tend to be focused the work of installing, training, and getting staff to use the technologies with students. Accountability may be wanted at this point, but will be unlikely so long as technology use is optional and unfocused, few system elements are being addressed, goals are broad and general and staff development is optional.

The third phase of technology implementation is Results, Equitable Experiences and Accountability (Porter, 2003). The focus is to scale up the technology use and address systems needs in order to sustain them. This last phase is critical since equipment and good ideas alone so not typically deliver visible and pervasive results (Schmoker, 1999). Seven concepts guide Phase III to expand and modify the system in ways that activate technology‘s potential. They are:

1. Expecting and organizing for change
2. Addressing systems elements
3. Developing formal collaborative structures for reflection and decision making
4. Targeting student results
5. Ensuring equitable learning experiences
6. Sustaining significant professional learning
7. Using accountability measures to ensure technology resources serve the highest interest of *all* students.

Schools in Phase III use the planning process itself to prepare the entire school for pervasive change by building the school‘s capacity (Porter, 2003). This phase is characterized

by second-order change as the school shifts from efforts focused on hardware and a handful of adults to specific results for all students not possible without the technology resources (Schmoker, 1999). In this phase, teachers are expected ~~to~~ intentionally incorporate technology to serve in ways that activate new roles, new tasks, and new responsibilities considered essential for *all* students as defined by national studies" (Porter, 2003, p.11). In other words, teachers are expected to not only use technologies, but to also use them as a catalyst to shape new ways of learning.

The district in which this study was conducted is in this third phase. Technology-wise, it is fully equipped. Each teacher in Inspire has a laptop cart equipped with 15 laptops which they share with another teacher in an adjacent room. They can choose to alternate and use all 15 laptops or they can keep seven in their room for daily use. Most teachers also have interactive whiteboards. All the schools have multiple media centers and WiFi as well as abundant support materials such as cables, outlets, USB ports or charging stations. Each school also has at least one iPod suitcase with 30 iPods and clickers as well as several netbook computers which may be signed out by students who do not have access to one at home. The PTO provides schools in the district with additional funds for any hardware, software, license and account fees and materials teachers may need.

However, the district's goal was to utilize these technologies as tools to make classroom instruction more innovative and constructivist and personnel in the district office understood that providing these educational technologies would not, in and of itself, ensure classroom instruction that is collaborative, project-based or multi-disciplinary. In order to help all their teachers

understand and learn the new ways of presenting, building, and assessing knowledge, this district is utilizing a variety of strategies which include professional development for teachers and leaders, new instructional support roles and the examining of instruction through administrator led classroom observations.

In fact, teachers may not have either the desire or the complex skill set required to enact such a curriculum. Studies of K-12 teachers' instructional applications of educational technologies to date show many to be pedagogically unsophisticated; limited in breadth, variety, and depth; and not well integrated into curriculum-based teaching and learning (McCrory-Wallace, 2004; Earle, 2002; Zhao et al., 2002; Cuban, 2001). Larry Cuban et al. (2001) points out that while computers can be useful when teachers sufficiently understand the technology themselves, believe it will enhance learning, and have the power to shape their own curricula, it appears that most teachers only use computers to support their current traditional teaching practices.

According to the literature on technology use in schools, several critical issues must be resolved in order for a district like this one to experience success in their endeavor to make the effective utilization of technologies becomes the norm in all of its classrooms. First, districts must do sufficient planning for technology acquisition and use. Typically, district technology plans specify what hardware, software, and networking capability will be purchased. Some districts also include limited plans for the maintenance and professional development aimed at how to use the technologies. However, this is not sufficient.

Successful technology plans must also explicitly address systemic issues of usability, scalability and sustainability (Fishman and Pinkard, 2001). As budgets are being created, district personnel should be discussing the myriad of issues related to technology use so that monies are not wasted and so that schools may make proper use of the technologies being purchased. Budgetary planning for acquisition includes many factors. For example, districts must decide on how space will be utilized. If the computers are going into a centralized media room, districts may need to purchase tables specific for their use and libraries may require structural modifications in order to accommodate a media center. In addition, districts should determine whether they want technology use to be ubiquitous since, media labs lend themselves to particular types of activities such as special projects (Becker, 2000; Means et al., 1993). Plans should also include how teachers will sign up to use the media room and how access will be made equitable (Butzin, 2001).

If the technologies are to be distributed across the classrooms, then districts need to ensure classrooms have the tables, outlets, cables and chargers, carts, wifi and other materials that they will require. They also need to plan for how laptop carts or iPod cases will be shared and how students without access to computers at home will be able to access them so that they may complete their assigned work. Budgets should also include funding for the on-going costs associated with technology such as maintaining site licenses, replacing hardware and other support materials and purchasing new hardware and/or software as they become available.

Careful planning for acquisition must be paired with careful planning for technology use. When the hardware available across a district is highly variable, districts run into difficulties

getting programs to work on all systems, finding curricular materials that are compatible with the machines available, training their staff how to use the technologies or finding someone able to repair the myriad of technologies within the system (Fishman et al., 2004; Blumenfeld et al., 2000).

In fact, additional staff may need to be hired for the repair of these technologies as they increase in number across the district. The failure to be able to trouble-shoot problems as they arise leaves teachers scrambling for what to do with their students and increases teacher frustration with technology (Bitner & Bitner, 2002; Blumenfeld et al., 2000; Means et al., 1993). This is particularly salient in schools where veteran teachers are not often technologically proficient (Baylor & Ritchie, 2002). Technology is less likely to be an add-on in districts with on-site technology support and maintenance.

Lastly, research indicates that technology use by teachers in schools increases and becomes more sophisticated when districts make the technologies within the system readily available to teachers (Bitner & Bitner, 2002). As teachers "play" with technologies, they develop their technology skills and confidence and are more likely to begin using them in the classroom (Ringstaff & Kelley, 2002; Schrum, 1999; Metzler & Sherman, 1997; Honey et al. 2000; Henriquez & Riconscente, 1999). Mehlinger (1997) estimates that in order for teachers to begin adopting a technology, they require about thirty hours of training and experience. This time commitment may necessitate that teachers use the technologies at home as well as in the classroom.

Providing teachers with technology is the first step. However, ultimately, it is the teachers themselves who determine the ~~"~~if, when, and how" of technology use (NCTM, 2000, p. 26). As such, improving the quality of teachers in schools is a keystone of educational improvement. Envisioning instruction as personalized, student-centered, performance-based, technology-rich, learner-constructed, collaborative, authentic, and global in focus, requires that schools have a critical mass of teachers (Means et al., 1993) able increase their knowledge base, develop and revise the curriculum and reflect on new approaches to working with children (Corcoran, 1995). In turn, this requires the provision of substantive professional development.

1.4 Effective Professional Development for Teachers:

Professional development has been defined as a set of processes or activities that change and improve the knowledge, skills, behavior, attitudes, professionalism, and practice of staff in the school organization so that they may result in improved student performance and achievement (Guskey, 2000). However, it can be difficult to determine what counts as an instance of PD since it can range from a brief conversation to multiple workshops. In addition, the list of what may be productively addressed is long (classroom management, assessment, content knowledge, diversity, parental involvement etc.).

A great deal of research has focused on the question of what makes professional development more effective in changing and improving instructional practices in the classroom. From this work, we know that providing a series of workshops and seminars fails to adequately support teacher learning (Lieberman, 1996). There are two primary advantages of on-going

professional development. First, it helps establish district commitment to and expectations for instructional improvement. Secondly, on-going professional development affords teachers multiple opportunities to learn and practice implementing new skills. Research done by Showers et al. (1987) found that, for complex models of teaching, teachers require approximately 25 implementation episodes in order to fully incorporate the new skill into their regular classroom practice.

Research also indicates that professional development is more effective when it is centered on the ~~–e~~ritical activities of the profession" and based upon the ~~–in~~vestigation of practice" (Ball & Cohen, 1999, pp. 12-13). Professional development must focus on specific instructional practices and provide active learning opportunities in order to give teachers the pedagogical means to implement new instructional strategies (Desimone et al., 2002; Garet et al, 2001; Blumenfeld et al., 2000; Sandholtz et al., 1997). They should also have multiple opportunities to discuss content, student conceptions and misconceptions of that content and ways in which student knowledge may be assessed both formatively and summatively (Garet, 2001; Sandholtz, 2001; Corcoran, 1995). Lastly, professional development should provide teachers with modeling and coaching opportunities (Ertmer, 2005; Ertmer, 1999; Marx et al., 1997; McLaughlin, 1990; Showers et al., 1987).

There are several benefits of professional development that addresses these points. It allows for teachers to be taught in ways that are consistent with what they are being asked to teach (Desimone, 2002; Cuban, 2001). Also, teachers are more likely to keep and use new instructional strategies if they receive coaching support while they are trying out these strategies

in the classroom (Showers et al., 1987). This may be because teachers often work in isolation and may need exposure to new strategies for classroom management, content presentation, facilitating group discussions etc..

Professional development of this type also helps teachers to develop a professional discourse (Ball & Cohen, 1999) on classroom practice (Darling-Hammond & McLaughlin, 1996), curriculum development and adaptation (Showers et al., 1987; Loucks-Horsley et al., 1998) and assessment (Sandholtz, 2001; Loucks-Horsley et al., 1998; Little, 1993). The little empirical research that has been done on the subject indicates that non-routine teaching practices require complex decision making of teachers. Such decision making is, in turn, aided by support from and interaction with colleagues (Cohen et al., 1979). As such, professional development should also allow teachers multiple opportunities to have their lessons observed and receive structured feedback (Schrum, 1999; Ertmer, 1999) so that they can become more aware of what they do and how to critically reflect on their professional practice (Loucks-Horsley et al., 1998; Darling-Hammond & McLaughlin, 1996; Ball, 1994; Showers et al., 1987; Joyce & Showers, 1980).

When done in a supportive and empathetic way, conversations which explore new ideas and reflect upon instructional practice can foster collegiality and collaboration amongst staff (Wilson, 2004). Not only does this function to reduce teacher isolation (Elmore, 2000; Fullan et al., 2004; Lieberman, 1996), but it can also provide occasions for teachers to understand the importance of what they are being asked to do, identify their pre-existing beliefs and elaborate and reshape them in ways that integrate the new information and skills presented (Newmann et

al., 2000; Ertmer, 2005; Darling-Hammond & McLaughlin, 1996; Kruse et al., 1995, Krajcik et al., 1994; Kagan, 1992).

This is critical since what teachers do depends upon what they think and value (Elmore 2000; Darling-Hammond & McLaughlin, 1996; Leiberman 1996; Fullan, 1982). Teacher autonomy means that that teachers may choose to adopt, adapt, or reject an instructional reform. Getting teachers involved in critical discussions regarding issues of instruction and student learning may also facilitate the dissemination of new ideas about practice and the development of new norms of practice (Loucks-Horsley et al., 1998). Indeed, Blumenfeld et al. (2000) found that successful school-wide change was largely a function of the commitment of individual teachers and the collaborative implementation of new (or better) instructional practices.

However, districts often receive little guidance about how to manage and improve their professional development efforts (Corcoran, 1995). Most often, professional development available to districts takes the form of "generic" workshops and seminars presented by consultants who are unaware of the climate of the school, the individual needs of the staff members, or the academic strengths and weaknesses of the students (Grossnickle & Layne, 1991). Indeed, in-service teacher learning "has traditionally been a patchwork of opportunities-formal and informal, mandatory and voluntary, serendipitous and planned-stitched together into a fragmented and incoherent "curriculum" (Wilson & Berne, 1999, p. 174).

In fact, we know very little about what teachers actually learn through the myriad of professional development enterprises in which they engage (Wilson & Berne 1999), other than that they have had little impact upon instructional practice classroom (Guskey, 2000; Schrum,

1999; Corcoran, 1995). All too often, professional development programs require only that teachers –go through the motions" (Showers et al, 1987) or are rendered ineffective by wasted time on unimportant activities, a lack of a clear mission, and a failure to address the implementation concerns that teachers had (Broyles & Tilman, 2001).

This creates several problems for districts attempting instructional reform. The decentralized education system in the United States means that most districts develop their own plans for professional development. Yet, most districts have not experienced models of effective professional development and, even if they research what is needed, they may not know where to turn for a program that meets these requirements (Elmore, 2002). Moreover, most teachers are not familiar with professional models like this either and may not react favorable to opening up their practice for scrutiny and the possibility of being shown to need improvement (Guskey, 1995). It takes a great deal of time for districts to build a community in which members trust each other enough to stop being polite and to reveal their difficulties and begin to provide meaningful feedback to their fellow teachers (Blumenfeld et al., 1994).

But this is another issue for districts seeking major instructional change to resolve. Professional development that builds capacity and fosters learning communities takes considerable time and is expensive. Districts must pay for someone to conduct the training sessions and, while contract negotiations can make it difficult to organize after-school training sessions, districts must also contend with the cost and shortage of availability of substitute teachers to cover teachers' release time during school hours.

In fact, the very culture and routines of schooling are often at odds with such reform efforts (Cuban et al., 2001). For example, state mandated testing policies, self-contained classrooms, and semester and bell schedules may undercut efforts for instructional change. In early stages of major reform, districts may well encounter multiple, pervasive and unexpected problems. As such, when a new program does require major changes be made, it may be best to ease into its use rather than expect comprehensive implementation all at once (Fullan, 1985). Easing into change, especially when the reform initiative is bottom-up, may help schools and districts to develop the capacity to cope with all the unknowns.

Research points to another major issue associated with professional development which seeks major instructional change. Decades of research show that classroom practice is resistant to reform initiatives (Spillane, 2004; Hess, 1999; Tyack & Cuban, 1995; Cohen, 1990; Cuban, 1984; Fullan, 1982). Cohen and Ball (1999) argue that more fully specified, developed, and coordinated innovation designs are more likely to be instructionally effective, but perhaps less likely to be adopted. All too often, instructional reforms are modified, co-opted into prevailing practices, or rejected outright (Cohen & Ball, 1990; Elmore & Burney, 1997; Tyack & Cuban, 1995; Elmore, 1992).

Educators working as part of the Apple Classrooms of Tomorrow program found that educators arrived into the classroom with long-standing views of education based on a personal model of learning. They found that these beliefs persisted despite the best efforts at reform and that it took considerable time and energy to change those belief systems (Dwyer, 1994). This is true in schools all over the world. Watson (2012) examined instructional reform efforts in

Australia, Canada and England and found that it was very difficult for teachers to make the shift from —sage on the stage" to —guide on the side". Even connecting teachers to external expertise while respecting their discretion and present capabilities can prove difficult (Newmann et al., 2000). For example, we know from research done by Showers et al. (1987) that the presentation of theory positively impacts implementation; however, research is often perceived by teachers as being irrelevant to their needs or those of their students (Blumenfeld et al., 2000).

1.5 TPACK: Technological Pedagogical Content Knowledge:

One theoretical framework which may be used to evaluate professional development programs is called TPACK. This stands for technological pedagogical content knowledge. This framework is primarily taken from Shulman's construct of pedagogical content knowledge (PCK) (Shulman, 1987; Shulman, 1986) but has been modified to include technology knowledge. While other frameworks exist, this is the one utilized by the district so it will now be described.

Content knowledge (CK) is of critical importance for teachers. This knowledge includes knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, as well as established practices and approaches toward developing such knowledge (Shulman, 1986).

Pedagogical knowledge (PK) is teachers' deep knowledge about the processes and practices or methods of teaching and learning. This generic form of knowledge applies to

understanding how students learn, general classroom management skills, lesson planning, and student assessment. It includes knowledge about techniques or methods used in the classroom; the nature of the target audience; and strategies for evaluating student understanding (Shulman, 1987; Shulman, 1986). A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills and how they develop habits of mind and positive dispositions toward learning. As such, pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom.

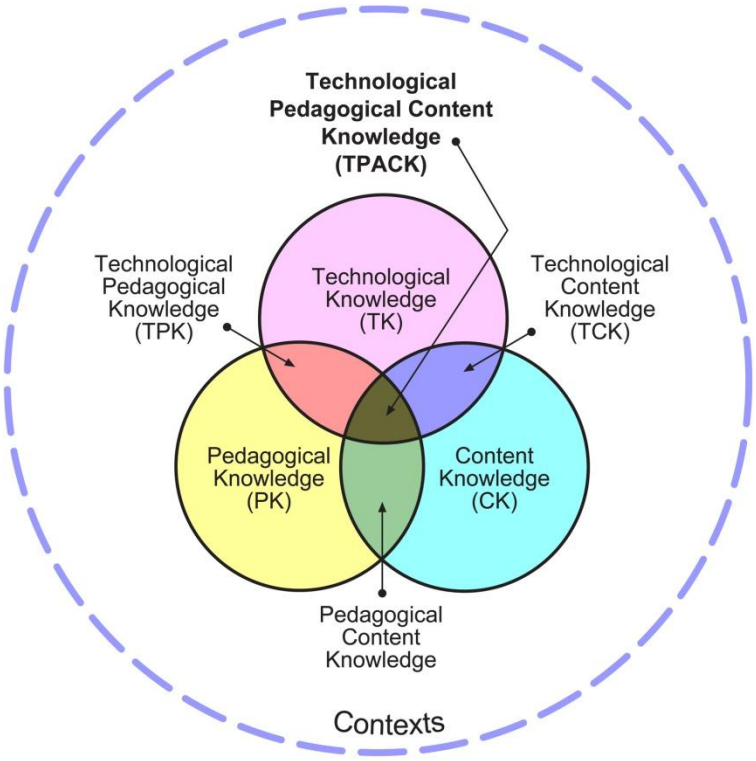
Pedagogical content knowledge (PCK) refers to how teachers transform subject matter for teaching by interpreting the subject matter, finding multiple ways to represent it, and adapting the instructional materials to students‘ knowledge and skill levels (Shulman, 1986). An awareness of common misconceptions and ways of looking at them, the importance of forging connections among different content-based ideas, students‘ prior knowledge, alternative teaching strategies, and the flexibility that comes from exploring alternative ways of looking at the same idea or problem are all essential for effective teaching.

Technological knowledge (TK) goes beyond traditional notions of computer literacy, requiring that the teacher understands information technology broadly enough to apply it productively, to recognize when information technology can assist or impede the achievement of a goal, and to continually adapt to changes in information technology. Technology knowledge enables teachers to use information technology to develop different ways of accomplishing a given task.

Teachers need to master more than the subject matter they teach; they must also have a deep understanding of the manner in which the subject matter (or the kinds of representations that can be constructed) can be changed by the application of particular technologies (Mishra & Koehler, 2006). Technological pedagogical knowledge (TPK) refers to the understanding of how the choice of technologies affords and constrains the types of content ideas that can be taught. Likewise, certain content decisions can limit the types of technologies that can be used (Mishra & Koehler, 2006). Technology can constrain the types of possible representations, but also can afford the construction of newer and more varied representations.

The interaction of these bodies of knowledge, both theoretically and in practice, produces the types of flexible knowledge needed to successfully integrate technology use into teaching. The following diagram summarizes these bodies of knowledge and how they intersect.

Diagram C: TPACK: Technological Pedagogical Content Knowledge



Koehler, M. J., & Mishra, P. (2009)

By simultaneously integrating knowledge of technology, pedagogy and content, expert teachers bring TPACK into play any time they teach. Each situation presented to teachers is a unique combination of these three factors, and accordingly, there is no single technological solution that applies for every teacher, every course, or every view of teaching. Rather, solutions lie in the ability of a teacher to flexibly navigate the spaces defined by the three elements of content, pedagogy, and technology and the complex interactions among these elements in specific contexts (Mishra & Koehler, 2006; Punya & Koehler, 2006; Peruski & Mishra, 2004).

Ignoring the complexity inherent in each knowledge component or the complexities of the relationships among the components can lead to oversimplified solutions or failure. Thus, professional development should aim to help teachers develop fluency and cognitive flexibility not just in each of the key domains (T, P, and C), but also in the manner in which these domains interrelate (TPACK). The TPACK framework suggests that content, pedagogy, technology, and learning contexts have roles to play both individually and collectively. Teaching successfully with technology requires continually creating, maintaining, and re-establishing a dynamic equilibrium among all these components.

1.6 Educational Leadership:

Effective school leadership seeks to create valuable and positive change in individuals within an organization with the end goal of nurturing new leaders who are able to aid in sustaining the change effort. With its origin in business, the concept of transformational leadership has become more commonplace within the field of education during the last decade.

Leithwood, Jantzi, & Steinbach (2003) have constructed the most substantial model of transformational leadership within the educational environment. Their model conceptualizes transformational leadership along eight dimensions: ―Building school vision; establishing school goals; providing intellectual stimulation; offering individualized support, modeling best practices and important organizational values; demonstrating high performance expectations; creating a productive school culture; and developing structures to foster participation in school decision"

(Leithwood, Jantzi, & Steinbach, 2003, p. 188). Moreover, they write that, "The accomplishment of transformational leadership in school depends on attention to all its facets…Perseverating on one or several dimensions of leadership and ignoring the remainder will not get the job done" (Leithwood, 1994, p. 514).

Vision may be defined as "a realistic, credible and attractive future for an organization-it is what the organization hopes to become" (DuFour, DuFour & Eaker, 2008, p. 472). Vision demarcates the process by which schools define the decisions to be made, the ends to be achieved and the means by which they may accomplished; and it is important because the choices teachers make about their teaching are directly related to the beliefs they hold about particular practices (Leithwood, Jantzi & Steinbach, 2003; Rowan, 1995; Fullan, 1991; Sockett, 1989; Hargreaves, 1988). Having a common vision and a set of well-defined goals (as well as the rationale behind them) lays a foundation for building consensus in attitudes and values (Leithwood, Jantzi & Steinbach, 2003; Louis, 1995; Scheerens, 1992; Lezotte, 1991; Purkey and Smith, 1983) and has been found to increase teacher buy-in and commitment (Sparks and Loucks-Horsley, 1989) while aligning individual behavior with that of the goals of the school (Senge et al, 1999; Argyris, 1993; Argyris & Schön, 1974).

However, having a vision for the school and a stated set of goals is not sufficient. Since teachers work autonomously and principals have little authority to force change, a premium is placed on the principals' ability to get others to voluntarily accept and commit to the school's set of goals and to bring their practice in line with efforts to address them (Blasé & Blasé, 1999). Ken Blanchard (2007) wrote, "If a change is introduced that is not aligned with the current

culture, you must alter the existing culture to support the new initiative or accept that the change may not be sustainable in the long term" (p. 246). Thus, far reaching changes in teaching and learning may require a wholesale ~~"re~~culturing" of schools (Fullan, 1994). While there is little research on the mechanisms by which this works, the assumptions are that first, when practices learned by teachers are congruous with prevailing beliefs and values, the normative structure of professional communities is expected to accelerate the dispersion of this practice (Argyris & Schön, 1978). Second, when newly learned practices are not in line with existing beliefs and values regarding practice, the normative structure is expected to work as a filter, causing declines in the use of the practices and leading to more cohesion in schools with more fully developed professional communities (Argyris & Schön, 1978).

Culture may be defined as the shared assumptions, history, beliefs, values and habits that manifest themselves in patterns of behavior which constitute the norms for the school and guide the work being done (DuFour, DuFour, & Eaker, 2008; Elmore, 2004). Successful school cultures are founded on a shared school vision and share several common characteristics. They are oriented toward action so that individual (and groups) of teachers learn by doing (DuFour, DuFour, & Eaker, 2008). In addition, they are supportive and trusting (Bulach, 2001; Fullan, 1996) which can help teachers to overcome the tight resources, isolation time constraints and other obstacles they commonly encounter (Kruse, Louis & Bryk, 1995). Lastly, they are collaborative (Danmore & Wiggins, 2006; Sergiovanni, 2004; Wilson, 2004; Bulach, 2001; Fullan, 1996).

As such, in order to be effective, collaboration must be a ―systematic process in which people work together, ‗interdependently', to analyze and ‗impact' professional practice in order to improve individual and collective results" (DuFour, DuFour, & Eaker, 2008, p. 464). Here, the defining characteristic of collaboration is ―the mutual development of skills or the generation of knowledge or programs that will help advance [teachers'] expertise or contribute to school performance (Kruse, Louis & Bryk, 1995, p. 33).

This requires reinventing the job of teaching so that practice is deprivatized and there is an emphasis on building mastery through continual experimentation and improvement (Senge, 1990). In this way, the teachers' learning also becomes a joint enterprise (Wenger, 1998). Teachers will be more likely to learn new strategies if their school provides them with regular opportunities to work with others and engage in open dialogue focused on student learning (Wood, 2007; Boles & Troen, 2007; Kruse, Louis & Bryk, 1995; Smylie, 1995). The assumption is that changing the conversations in schools impacts the day-to-day work of teachers by promoting the dissemination of new ideas about practice, developing new norms of practice, and promoting congruous practices while filtering incongruous ones. Talking about shared classroom experiences can also promote a common language among teachers and can further enhance communication in the school (Kruse, Louis & Bryk, 1995).

Defining the school's mission is seen as instrumental in effecting change. This involves two different functions. First, is the framing of the school's goals. While the principal need not develop the school's mission alone, he or she must work with staff to ensure that the school has clear, measurable goals that are focused on the academic progress of its students (Hallinger &

Murphy, 1985; Hallinger & Heck, 2002; Hallinger, 2003). It is the principal's responsibility to ensure that these goals are widely known and supported throughout the school community. It is believed that organizational norms, values and beliefs affect how other participants interpret organizational events and thus influence how they behave (Deal & Peterson, 1990; Leithwood & Jantzi, 1999). Organizational coherence on basic aims and values, then, is a precondition for the exercise of any effective leadership around instructional improvement (Elmore, 2004).

Although necessary, a well-defined set of goals emphasizing academic press and high expectations is not sufficient for school-wide improvement. It is imperative that, rather than merely making changes, there is a deliberate process of improvement. The sustaining characteristics of a productive school climate seem to be the following: Collaborative planning and collegial relationships, a sense of community, clear goals and high expectations which are commonly shared, and order and discipline. These variables are the dynamic of the school, altering the atmosphere that leads to increased student achievement (Purkey & Smith, 1983).

Sharon Danmore and Kathryn Wiggins (2006) argue that adult collaboration is the glue for all school improvement endeavors. Frances Bradburn (2007) would add that collaboration is a 21s century skill that teachers should learn in order to pass the skill on to their students. Yet, as necessary as collaboration is, —adults often do not know how to collaborate effectively" (Damore & Wiggins, 2006, p.20). Furthermore, collaborative cultures and the structures that support them are very hard to develop and sustain in the absence of supportive leadership from school administrators. The role of educational leadership in fostering instructional improvement will now be discussed.

Effective schools and leaders create a sense of collective responsibility for ensuring that these goals are met (Hallinger 2003) and attempt to connect and shift individual values, beliefs and goals to those of the collective (Hallinger & Heck, 2002). Not only does a sense of collective responsibility create legitimacy for collective decisions about instructional priorities, but it also helps teachers ~~–b~~uild repertoires of flexible alternatives rather than collecting rigid teaching procedures and methods" (Blasé & Blasé, 1999, p. 359). Supportive interactions among teachers in school-wide professional communities enable them to assume various roles with one another as mentor, mentee, coach, specialist, advisor, facilitator, and so on. Thus, research shows that effective principals are seen as those who align the school's standards and practices with its mission and create a climate that supports teaching and continuous learning (Hallinger, 2003; Leithwood &Beatty, 2008).

School leaders who are effective at promoting school change provide their staff with ample opportunities to talk openly with others about teaching and learning. They solicit opinions and give both feedback and praise. Furthermore, in order for these interactions to support change, they should be authentic, growth oriented, supportive, positive, and built on mutual respect and trust (Blasé & Blasé, 1999). The aim is to foster the professionalization of the schools' staff since colleagues are asked to challenge the status quo and be reflective, to take intellectual risks, re-examine assumptions and to look at their work from different perspectives in order to rethink how it can be performed (Hallinger & Heck, 2002). There is evidence that positive and professional school cultures correlate strongly with increased student achievement and motivation, and with teacher productivity and satisfaction (MacNeil, 2005).

Lastly, in order to be effective in managing the instructional program of the school, leaders are expected to employ structures aimed at problem diagnosis and conflict management. Research indicated that principals who where effective leaders were more aware of school system needs and requirements, used a much more deliberate and explicit sorting process, gave greater time and attention to initial problem clarification, assigned more weight to problems likely to be solved through the involvement of greater rather than lesser numbers of people and were better at predicting potential future problems so as to not be just managing crises (Leithwood, 1989). In addition, these principals established more formal structures to facilitate conflict resolution. For example, an effective principal might seek to provide explanations for seemingly confrontational actions or behaviors. This is important because, by challenging the status quo and championing continuous improvement, principals create a milieu in which the potential for conflict is great.

Involving teachers in sustained dialogue and decision-making about educational improvement was seen to be advantageous since teachers possess critical information about their students and how they learn and need discretionary authority to make their own curricular and instructional decisions (Hallinger, 1992).

However, being able to provide their staff with adequate opportunities for organizational learning and coordination often poses a problem for schools and school districts. Teachers require multiple opportunities to become familiar with new techniques and materials and to practice and assimilate them (Cohen & Hill, 2001). They require resources and supports to help them to reorient their classroom practice. They need opportunities to practice in the trenches

with expert mentors and coaches (Fullan, 2002). This means that principals face the challenges of setting goals, providing staff professional development opportunities, fostering mentoring and collaboration amongst the staff, shifting prep time schedules and securing adequate resources and teacher release time.

This chapter has reviewed literature on 21st century skills, technology use in classrooms, effective professional development, and the role of school leadership in promoting and supporting the change effort. In order to maximize the success of this instructional reform initiative, the literature indicates that this district ought to:

- Make the reform district-wide
- Align curriculum with its instructional goals
- Provide sustained professional development for teachers that is focused on instruction and which builds teachers' technological, pedagogical and content knowledge
- Help teachers assess student knowledge and skills in more formative, as well as summative ways
- Foster a school-wide and district-wide culture of collaboration and experimentation, and
- Ensure that its school administrators are able to frame and communicate the reform's goals, set standards and expectations for practice, coordinate efforts, protect time, acquire resources and remove barriers to change.

While modern technology has great potential to enhance teaching and learning, turning that potential into reality on a large scale is clearly a complex and multifaceted task. As is always the case in efforts to improve K-12 education, there is no magic bullet. Long-term, carefully planned commitments are required.

CHAPTER 2
Inspire

"Education is not the filling of a pail,
but the lighting of a fire." Yeats

2.1 The District:

The public school district in which this study was conducted is located in a suburb of a large Midwestern city. With 8 elementary schools, one 3-8 technology magnet school, 2 middle schools, 3 high schools, and an early childhood center, this district serves just over 8,200 students from a catchment area that spans 8 small municipalities. This district employs 585 teachers (87% of whom hold advanced degrees) to work with approximately 3,300 elementary students, 2,400 middle school students and 2600 high school students.

The composition of the district's student body is 82% White, 12% African American, 3% Asian, 1% Hispanic and 2% Other. In addition, this district is one of the more affluent in the state. While there is no official classification for being a "wealthy" school district, the National Education Association classifies schools with under one third of its student body qualifying for free and reduced lunches as "low-poverty" districts. Only 3% of students in elementary schools and 2% of students in middle and high schools in this district receive free and reduced lunches as compared to an average of 25% in the county.

This district is also resource rich. A 1997 bond issue for $98.6 million updated the high schools, renovated or replaced media centers in the elementary schools and implemented instructional technology district wide. A $102.8 million dollar bond approved by voters in 2003 was used to renovate and rebuild elementary and middle schools and to upgrade high school gyms and pools. Within this district alone, $250 million in facility improvements and renovations have been made over the last 15 years. An additional $110,000 is generated annually from the district's own education foundation. As a result, each school in the district is able to offer an extensive array of before and after school activities to enhance their academic programs. For example, each of the three high schools offers over 30 such programs including tutoring, engineering, mock trials, spring musicals, student Congress, and Amnesty International.

Above all, students in this district consistently achieve high academic standards. In 2010, each of the 14 schools in the district received an A composite grade on the NCLB report card and made AYP for 2010. Academic performance on the state's standardized assessment tests average over 95% at all levels and in all subjects and the average ACT score in the district was 24 compared to 21 for the nation. The high school graduation rate in this district averaged 97.9%. In 2010, approximately 650 students graduated high school. Amongst them were 19 National Merit Semi-Finalists, 8 National Advanced Placement Scholars, and 179 Advanced Placement Scholars.

2.2 The Development of Inspire:

The following account of the development of the Inspire reform initiative has been gleaned from interviews with the pioneer teacher, two facilitators who were initial Inspire teachers, the district Superintendent, and the Superintendent of Instruction. From these accounts, Inspire has its origin in the district's Grades 3-8 school of choice. This school operates with a special emphasis on science and technology instruction. Based on two reports by the Association for the Advancement of Science report, *Project 2061*, and *enGauge 21st Century Skills: Literacy in the Digital Age,* this school has always aimed to foster interdisciplinary inquiry, knowledge application and collaboration. It was at this particular magnet school that the seeds for instructional change were sewn and nurtured.

Back in 2007, one elementary school teacher at this school wrote a mini-grant to the PTO to purchase additional technologies for his classroom. In and of itself, this is not unusual. The PTO at each school in the district raises well over $20,000 for school and classroom initiatives and teachers in the district are encouraged to seek these funds as well as district monies for initiatives that they think would be of benefit to their students. However, this pioneering teacher was not sure that he was using the technologies he had as effectively as he could. As such, he also asked the district for funds to attend the Alan November Building Learning Communities conference that summer in Boston in 2008.

This pioneering teacher reported that, that fall, he raved about the conference and had several informal conversations with the administration and other teachers in his school regarding what he learned and what he planned to do in his classroom that year. He also stated that he

began using some of the new technologies he had purchased the previous year in creative and innovative ways. While I do not have examples from him, the district Superintendent did confirm that parents were upset that their children could not be in this class and complaining that they were not receiving the same quality of education.

It did not take long for word of what was being done in this classroom to spread. As the fall progressed, some of the parents of other students across the district became upset when they discovered that their children's classrooms did not have these technologies and that their children were not being exposed to these learning experiences. Several parents lodged formal complaints with the district.

The number of applications for enrollment at this school of choice had also been steadily rising for a number of years. As a result, the district office had already begun to debate whether to purchase another school building and create a second school of choice to handle parental demand for these types of instructional opportunities. At the same time, an internal review of the district strengths and weaknesses conducted in 2007 revealed that one of the district's weaknesses was 21st century learning which they defined as expanded opportunities and real-world learning experiences such as foreign languages, global competency, digital literacy, and cultural competency.

Wishing to maintain their reputation for academic excellence and to provide students with an education that rivaled, or was superior to that of nearby private schools, district personnel made two decisions. First, that the instructional strategies that this teacher was

employing could help develop students' 21st century skills. Second, that *all* students in the district should have access to these learning opportunities.

As a first step toward this goal, the school's administration asked if this pioneer teacher would serve as a "leader" in the school for those teachers who were willing to try integrating technology into their classroom instruction. From all accounts, including his own, he was more than willing to have teachers come into his class to see what he is doing and was willing to come into theirs in order to help them if they wish to try something new. By the winter of 2009, seven other teachers were voluntarily trying to use some of these same technologies in their classrooms.

During the winter of 2009, a committee comprised of the pioneering teacher, administrators and other early adopters was created to look at existing technologies and make purchasing suggestions. The superintendents began reading and learning about 21st century skills and the district's strategic planning committee became involved in planning for the use of technologies on a broader scale. The initiative was given the name, Engage and the decision was made to begin scaling it up by introducing it at the Grade 4 and Grade 6 level across the district for the 2009/2010 school year.

Funds were secured for all of the fourth grade teachers in the district to attend the Alan November conference during the summer of 2009. Although participation in Engage was voluntary, teachers for this grade were encouraged to attend and begin integrating technology into their classrooms in ways that would create more powerful learning opportunities. Recognizing that few formal supports were in place, the district created two facilitator positions

to support teacher learning. The two individuals hired as facilitators had worked in the district for many years and both had garnered respect from administrators, teachers and parents for being excellent teachers. Together, these facilitators created a training program for the fourth grade teachers. It was decided that funding for supply teachers would be granted so that they could attend a training session one day per month during the 2009/2010 school year. These facilitators would conduct the training sessions, trouble-shoot problems as they emerged and act as instructional coaches to participating teachers. Participation in Engage increased to 39 teachers and student participation grew from 180 to 1200.

During this same 2009/2010 school year, the district began planning how to scale up and sustain this initiative across the district. Not wanting students who had been exposed to these technologies in the classroom to simply return to more traditional classrooms the following year, the district's committee decided to extend the initiative for Grade 5 teachers for the 2010/2011 school year. Also, recognizing that these students would continue moving up through the system, the district also made the decision to extend this initiative to the middle school level.

The Superintendent of Instruction explained to me that, beginning with the 2010/2011 school year, they were mandating teacher participation in the initiative for two reasons. First, they understood that some teachers would probably never volunteer to become part of this initiative to alter instructional practice. Second, they wanted all teachers to understand that this reform was not a fad and that the district was serious about endeavors to make instruction across the entire district more inclusive of 21st century skills.

Which middle school teachers would be participating seemed to be a practical rather than tactical decision. The district had three facilitators trained to run the training sessions, work with teachers on lesson planning and act as instructional coaches. One more facilitator had just finished being trained. Wishing the teachers to become a learning community, the district made the decision to place three facilitators to work with the 36 elementary teachers [across 8 schools] that would require training during the 2010/2011 school year. That left one facilitator to work with the middle school teachers. From my interview with the facilitators and the Superintendent, it was decided that the English Language Arts and Social Studies teachers would be included because there were 15 in total. Asking Math or Science teachers to be part of the initiative would require a second facilitator which the district did not have at that time.

Lastly, it should be mentioned that although the facilitators all plan together and the training sessions are all based on the same "curriculum" that had been developed over the past two years, the district decided that elementary and middle school teachers would be trained separately. It was felt that middle school teachers taught [usually] only one subject to six consecutive classes as opposed to teaching all subjects to one class of students. The district hoped that separating the two groups would better address individual contexts and implementation concerns. It was also hoped that separating each group would help foster the development of professional learning communities at each level.

As mentioned earlier, this initiative was nurtured in a school of choice whose charter was based, in part, upon the book *enGauge 21st Century Skills: Literacy in the digital age;* and, up until this point, the initiative itself had been named, Engage. While elementary teachers still

refer to the initiative as Engage, it was renamed Inspire for the middle school level. By the 2010-2011 school year, this instructional reform initiative had grown to include 90 teachers and almost 2800 students.

Inspire will be extended once more during the 2011/2012 school year to include all sixth grade teachers and all eighth grade Language Arts and Social Studies teachers. In addition, beginning in this same school year, there will also be an Inspire Administrator. From the job description, it appears as if this role has been created to evaluate teacher implementation and to increase teacher accountability. In addition, this position was filled with an internal hire from the high school level since, at present, the plan is to encourage high school teachers to volunteer to participate in this reform initiative beginning in the 2011/2012 school year. Although no formal decisions have been announced regarding further expansion of Inspire to include other middle school subject areas, the Superintendent of Instruction and the facilitators felt that this was likely to follow.

2.3 Goals:

It must be pointed out that Inspire was not developed in order to raise students‘ academic achievement. As stated above, this district is already one of the highest achieving in the state. However, the high property values in the area means that a significant proportion of parents in this district have the financial resources to send their children to private schools. In an effort to reduce and reverse the flow of students out of the public school system and into the Catholic

School system or the nearby elite private schools, this district felt it was necessary to offer students learning opportunities that they would not have at these elite schools.

However, the district also firmly believed that it could not afford to become complacent with its current level of academic success. In his presentation to the Board of Education, the Superintendent of Instruction stated that real success comes from nurturing students who will be able to succeed and throughout their adult lives.

> The rapid changes of the 21st century require creative, adaptive thinkers who are able to apply content knowledge to new situations. The Inspire program provides a framework for teachers to leverage emerging technologies to facilitate learning. We must prepare our students to be successful in a changing world that will require them to have new and adaptive skill sets. We can no longer predict the specific range of jobs and opportunities that will be available to our students in the future, but we do know that technology skills, critical thinking and global competence will be more important than ever. (October, 2010)

Aware that the educational landscape is littered with the remnants of numerous reform initiatives, in 2009 the district asked the facilitators, those leading the training sessions and mentoring teachers as they implemented instructional change, to research what would make for sustainable change. In interviews with four of the facilitators, the research they did came from journals, the Partnership for 21st Century Skills website and books written by members of its Steering Committee, and consultation with Drs. Punya Mishra and Matthew Koehler, professors at Michigan State University whose research focuses on maximizing the relationship between technology, course content and teaching practices (Mishra & Koehler, 2006; Punya & Koehler, 2006). They concluded that, in order to bring about real and sustained instructional change, this initiative would need to be a priority across the district as a whole.

In order to explain their goals and elicit administrator buy-in, the Superintendent of Instruction gave every administrator in the district two books from the P21 website: *21st Century Skills: Learning for Life in our Times* by Bernie Trilling and Charles Fadel and *Curriculum 21: Essential Education for a Changing World* by Heidi Hayes Jacobs. The administrators were asked to prepare presentations highlighting the key points of specific chapters to the larger group during their August 2010 in-service day.

This meeting began with a talk from the district's top Superintendent in which he outlined the district's 21st century educational goals and outlined the district's total commitment to them. After the presentations by administrators, the Superintendent for Instruction reiterated three key reasons why the district wished to transforming the district's schools:

1. New technologies and tools are being developed each day. In order to be successful, worker will need to be able to continuously learn.
2. The workforce is rapidly changing and workers will need new skills such as foreign languages, digital literacy, and cultural competency so that they are able to work collaboratively on increasingly global projects. And
3. The average person will have several careers over the course of their lifetime. As a result, the current curriculum which focuses on fact acquisition will need to also emphasize the processes that may serve as leverage for the continual learning of any content in any context.

He added, "We need to extend students' intellectual capacity through the use of contemporary tools so as to create powerful learning situations and experiences and foster the acquisition of higher-order thinking skills." In order to accomplish this, the district identified a key set of tools (blogs, forums, wikis, video, audio, images, concept maps, Skype) that offered "low floors, wide walls and high ceilings" meaning that "they were easy places for teachers and

students to start but which afforded the flexibility to apply them in any direction." The district also identified a key set of skills that were to be the highest priority in Inspire. These were:

1. Communication (synchronous and asynchronous, face-to-face and electronic)
2. Multiple media representations
3. Collaboration (group brain, team work and interdependence) and
4. Higher-order thinking skills (creativity, flexibility, problem-solving, metacognition, reflection, self-direction, perseverance and curiosity/questioning)

The district belief is that technology paired with project-based, student-directed inquiry into complex problems has the power to help make education more authentic, to harness internal motivation, increase student engagement and develop intellectual curiosity. They view the teacher as becoming more of a facilitator who nurtures innovation and change by modeling curiosity, collaboration, risk-taking, exploration and reflection. As one facilitator summarized, "We want to grow on-line discussions through Socratic questioning, show student content connections using concept maps, share student learning through podcasts, and allow students to hear their own voices using blogs."

The district summarizes the skill-based goals of this reform initiative as the "4Cs". They stand for critical thinking, collaboration, communication and creativity. Paul and Elder (2006) define critical thinking as "the art of analyzing and evaluating thinking with a view to improving it" (Paul & Elder, 2006, p. 4). A good critical thinker knows how to separate facts from opinions, how to examine an issue from all sides, how to make inferences, and how to identify personal biases. In the classroom, critical thinking is evidenced when students learn how to raise vital questions, gather and assess relevant information and interpret ideas and situations in order to develop well-reasoned conclusions and solutions (Paul & Elder, 2001).

Facilitating this type of deep engagement and thinking requires that teachers pose stimulating, well thought out questions that should be tied to the higher levels of Blooms's (1956) taxonomy. Not only do these questions stimulate interaction between the teacher and the student, but they also challenge students to assess their understandings and defend their position. Clasen and Bonk (1990) posited that although there are many strategies that can impact student thinking, it is teacher questions that have the greatest impact. They went on to argue that the level of student thinking is directly proportional to the level of questions asked. As such, teachers should help students to unpack the assumptions and ideas contained within each question. Teachers can also help students engage in conversation by giving students phrases such as "I agree/disagree because", "I think this relates to" or "Can you please clarify what you mean by". In this way, teachers are communicating and modeling how to engage in constructive, critical dialogue.

Teaching critical thinking skills also requires learning tasks that allow for choice, variety, and active learning. The presumption is that students need opportunities to construct knowledge by solving real problems, asking and refining questions, designing and conducting investigations, gathering, analyzing, and interpreting information, drawing conclusions, and reporting findings (Blumenfeld et al., 2000). This type of instruction is recommended because research indicates that students learn more and retain knowledge longer if they acquire it in an active rather than passive manner (Kirschner, et al., 2006; Fink, 2003). Lastly, pairing active learning with student reflection also helps to improve the effectiveness of the learning activity, making ideas explicit, highlight the quality of understanding and pinpoint misunderstandings. In addition,

students may be asked to provide feedback and constructive feedback on work done by their peers so that they can become curators as well as creators of knowledge (Sandholtz et al. 1997).

However, most teachers who attempt to implement instruction like this end up providing students with considerable guidance (Windschitl, 2002). Students are used to being passive and dependent upon the teacher (Watson, 2012). It takes considerable time for students to learn and incorporate these skills and they require a great deal of help and feedback as they practice them. In addition, active learning requires that students grapple with complex issues and manage their work which often involves groups. Students may not have the cognitive models to deal with the calculatedly complex tasks since they may be used to completing homework that follows the examples shown in class and repeating facts on tests (Perkins, 1992).

Additionally, students are not always motivated to work at their learning. Teachers have reported student push-back when students feel unprepared for this shift in role or unhappy at having to do more work (Watson, 2012; Garet, 2008; Sandholtz et al., 1997). In addition, while teachers have reported feeling closer to students since working more closely with them and facilitating their work in small groups (Sandholtz et al, 1997), they also report that the demands placed on them increase significantly (Blumenfeld et al., 2000), especially when class sizes are large. In addition to guiding student inquiry, teachers must assess students‘ work and understandings and provide them with prompt, constructive feedback (Kirschner et al., 2006).

As with the students, not all teachers have the skills or experience to offer active learning instruction in the classroom. Like their students, teachers require professional development

opportunities that mirror the constructivist design model so that they may practice these skills while receiving support and feedback (Sandholtz et al., 1997).

Yet, there is evidence that persevering with such instructional methods is a worthy endeavor. Windschitl and Andre (1998) found that as students became more sophisticated at these critical skills, they were better able to learn in future active learning situations. In addition, they found that active learning was more effective in discovering and altering student misconceptions than homework and tests alone (Windschitl, 2002); Windschitl & Andre, 1998).

2.4 Professional Development:

The district recognized that instructional reform of this nature was, indeed, a very ambitious undertaking. With the research on affecting sustained instructional change that the facilitators had done in mind, the district concluded that teachers would require a great deal of professional development that was ~~–o~~n-site, job embedded, sustained over time, centered on active learning, and focused on student outcomes."

As an introduction to Inspire, participating teachers were invited to attend Alan November's Building Learning Communities Conference in Boston. Although Alan November's conference is not specific to education - in fact, it is attended mostly by business people - it does offer a clear message to educators. They challenge teachers to think beyond the classroom and work towards preparing students for today's global economy.

Presenters argue that asking students to solve countless problems from blackboards, dittos and textbooks does not foster their ability to apply skills that are learned. They add that problem-based instruction is better but stress the need for students to tackle real-world, meaningful problems. They emphasize a curriculum that includes problems to which there are no clear-cut answers. They argue that students learn to think more deeply and critically when they are asked to analyze a collection of data, judge its worth, synthesize it and draw out a question for further study. It was hoped that the Alan November conference would inspire their teachers and get them excited to try teaching in new ways.

When they returned, the district provided teachers with a two week in-service program where teachers had the opportunity to learn how to use new programs together with a small group of students. Attending the conference and summer session were made voluntary since teachers were not paid for this time. As a result, just over half of the Inspire teachers attended the Alan November Conference and less than half participated in the summer sessions. According to research done by Bradshaw (2002), this decline in attendance at summer professional development sessions is not uncommon.

However, in order to foster the development of learning communities and provide teachers with professional development necessary to meet the district‘s instructional goals, attendance at the monthly training sessions was mandatory. A substitute teacher was secured one monthly for all teachers in Engage and Inspire from September through May (attendance in June was optional). While the training sessions were separate for middle and elementary teachers, all the monthly training sessions were located in the district‘s Grade 3-8 school from

8:30 am until 3:00 pm. The training sessions for middle school teachers were held separately from those for the elementary level teachers.

The Inspire training sessions followed a fairly consistent format. The day began with each teacher sharing a lesson or activity that they had done with their classes since the previous meeting. This was followed by a _lesson", time for practice and a late lunch. The last 1 ½ -2 hours of the day was reserved for cross-district planning. During the first half of the day, the teachers literally became the students. The facilitators, expert teachers themselves, utilized the training days to present research, model instructional practices, ask open-ended questions and facilitate discussions. For a full outline of each month's training sessions, please see Appendix F.

Since the district did not provide teachers with any curricular materials, they wanted teachers to have the opportunity to collaborate and plan new lessons together. As such, teachers were also allowed to take one additional half day per month to plan with other teachers in the district. Lastly, realizing that issues would arise as teachers began trying to plan new lessons and utilize technologies, the district paired the pull-out approach to training and curriculum-planning with the mainstream approach of having the facilitators available to plan, model and coach in the classroom. Teachers were encouraged to take full advantage of their expertise and support.

This professional development format has the potential to be very effective. According to research done by Joyce and Showers (1983), the training sessions are aligned with the most effective model of professional development. The district designed its training sessions to

present theory, allow for practice, and provide feedback. In addition, the facilitator is there to act as an on-going coach who can provide collegial feedback, help plan unit lessons and model instructional and class management techniques.

This is similar to the professional development in Apple Classrooms of Tomorrow (ACOT) where teachers participate in a one week practicum, followed by a four week summer institute where they work with teachers and students. Throughout the year, facilitators visit these project teachers in their classrooms in order to provide individualized support and coaching. The pairing of on-going mentoring and coaching dramatically increases the implementation of change in the classroom (Garet, 2008; Schrum, 1999; Sandholtz et al., 1997; Joyce & Showers, 1987).

That being said, even the best professional development program is not likely to be effective if it is offered for a very short period of time. Teachers typically need close to 50 hours of professional development in a given area to improve their skills (Wei et al., 2009; Yoon et al., 2007) and/or have a positive impact on student achievement (Jacob & Lefgren, 2002). Since the professional development provided by this district was mandatory, teachers attended a minimum of 60 hours of professional development training.

This is very important for three reasons. It provides multiple opportunities for learning and practicing new skills. Second, participation over an extended period of time can help to build strong professional working relationships with other teachers that can extend learning beyond the training period and promote change beyond their individual classrooms (Wei et al., 2009). Lastly, learning to utilize technology to make instruction problem-based and

collaborative is complex, time-consuming and difficult. Researchers found that there was a tendency for ACOT teachers to return to traditional instruction before experimenting once again (Sandholtz et al., 1997). As such, it is essential that training and coaching be long enough in duration to help teachers through this temporary setback.

Of course, the content and structure of the professional development is also important. The district used the TPACK model in helping to develop its professional development program. However, it must be pointed out that content knowledge was not one of the "Four C's" of Inspire. The district wanted to provide students with a good education but they were already one of the top districts in the state with respect to student achievement. No time was allotted during the training sessions for research or activities aimed at building teachers' subject content knowledge.

However, the training sessions did focus on building technology knowledge and skills, building pedagogical knowledge and skills and strengthening their professional community. Further, in order to achieve these goals, the training sessions were developed to allow teachers multiple opportunities for hands-on activity and experimentation with others. For example, when teachers were introduced to podcasting, teachers listened to podcasts, worked in groups to evaluate them and then create podcasts of their own. The teachers then discussed effective uses for podcasting in their classrooms and how they might manage such an activity.

Structuring the professional development to allow teachers to focus on actual classroom practice, learn by doing and to construct their own knowledge has been found to be very important since this models the learning environment that they are being asked to implement

(Sandholdtz et al., 1997). It channels teacher‘s thoughts and energies on actual classroom practice and, by allowing them to envision how they might use these techniques, it improves classroom implementation.

In addition, experimenting and sharing were a large part of the training sessions. This served several functions. First, it forced teachers to all try at least one new lesson each month so that they would be able to participate in the sharing. It put subtle pressure on teachers to teach a lesson that they are proud to share. It also provided an opportunity to just try something new and see how it goes. ACOT found that this provided necessary motivation for teachers to continue experimenting and trying to change (Sandholtz et al., 1997). If the teacher sees that students were really engaged and they learned a great deal, the teacher may be more likely to continue experimenting. Conversely, when the technology breaks down or is hard to work with and both the students and the teacher become frustrated, it can negatively impact future attempts at change.

Second, it provided a forum to share expertise and celebrate successes. Getting talented people together to generate good ideas helps to drive instructional change (Mertens & Flowers, 2003) since it allows teachers to see applications and instructional activities that they might not have thought of. All too often, teachers work alone and do not have the opportunity to visit other classrooms. Professional isolation impedes instructional change (Elmore & Burney, 1997) since it is extremely difficult for teachers to independently improve themselves as they work. Sharing expertise is an essential component of on-the-job training (Lewis et al., 1999). Lastly, when teachers shared their lessons, they acted as instructional models for the other teachers in the

group. They had the opportunity to ask them how they handled various aspects of the activity such as the presentation of materials, assessment, the organization of student group work or how they were able to scaffold their students as they worked.

Having teacher models and the facilitator who was able to come into classrooms to work individually with teachers has been shown to improve implementation of instructional change (Garet, 2008; Steiner, 2007; Poglinco et al., 2003; Butzin, 2000; Sandholtz et al., 1997). As a result, TeachUp!, America's Choice, ACOT, Digital Opportunity Trust (DOT), and Project CHILD (Computers Helping Instruction and Learning Development) all have coaching built into their programs. However, coaches will only be effective when they are highly skilled and are able to work well with others (Deussen et al, 2007).

One of the potential strengths of Inspire is that it allows teachers one and a half days each month to train and plan together. The district personnel, the administrators and the facilitator all mentioned that this was done specifically to help promote a strong professional learning community. Collaborative cultures support a shared sense of purpose, focus on long-term improvement, and support networks of professionals who share problems, ideas, materials, and solutions (Pashler et al., 2007). These cultures are not easy to develop, but they provide regular opportunities for continuous improvement, reduce frustration and uncertainty, improve commitment to improving practice and facilitate the sharing of resources (Fullan and Hargreaves, 1991; Johnson, 1990). This is important because ACOT teachers often reported that participating in the program required extra time both at school and at home (Sandholtz et al.,

1997). They expressed the desire for a support network and felt they would benefit from seeing working and planning with other teachers.

Another strength of this initiative is that it is district-wide. By the end of the 2011-2012 school year, this initiative will expand to include all teachers from Grades 3-5, all English and Social Studies middle school teachers and a cohort of high school teachers. This has the potential to make the sustainability and the effectiveness of Inspire more likely since teachers can see that it is not a fad and since it will help develop a shared sense of responsibility and accountability (WestEd, 2002; Elmore & Burney, 1997). Furthermore, when the initiative is district-wide, teachers are more likely to see themselves as part of the system, not outside of it (Blumenfeld et al., 2000).

However, Inspire does not include any real training for school administrators. The original plans for Inspire included instructional walks. During these walks, district personnel, other administrators and teachers would walk through the school visiting classrooms. Afterwards, the entire team would sit down together to reflect and discuss what they saw and to assess the progress that was made.

In addition, these walks and the meetings afterward were intended to afford school administrators support for framing and communicating goals, coordinating curriculum and other resources, monitoring progress, promoting a positive school climate and protecting teaching time. In reality, however, busy schedules meant that few instructional walks took place. The result was that administrators were left to read their two books on 21st century skills and to find their own mentors in order to build their capacity to lead effectively.

CHAPTER 3
Research Methodology

I became a doctoral student in order to further delve into educational policies which would promote and enhance teacher learning in the field. A colleague had been coaching elementary teachers in this district. She knew of their Inspire initiative and mentioned that no one from the university was currently studying it. Knowing that it would be of interest to me, she was kind enough to give me an entrée into the district. In early October, 2010 I met with the superintendent, the superintendent of instruction and all three middle school principals. Not only were they amenable to this research project being conducted, they quickly provided letters of permission to conduct research at each of the three schools and to view student work posted on their website.

3.1 Participants:

During the 2010-2011 school year, the district mandated participation in Inspire for all those teaching Grade 5 and Grade 7 English Language Arts or Social Studies. In all, there were 36 Grade 5 teachers participating in Engage and 15 middle school teachers participating in Inspire. This study focuses specifically on the 15 Grade **7** English Language Arts and Social Studies teachers participating in Inspire.

This sample was chosen for several reasons. For one thing, the elementary teacher group was so large that they were split into two groups of eighteen. However, these groups did not remain constant each month. As such, it was not possible to observe one set of eighteen Grade 5 teachers during their monthly training sessions. The middle school teacher group was more manageable in size. In addition, the Grade 5 teachers worked with one class of students and taught all subjects. Studying the middle school teachers afforded the opportunity to isolate and examine two different subject areas in order to consider if the nature of the curriculum had an impact on Inspire's implementation. Lastly, although all the facilitators volunteered to be interviewed, not all the facilitators wanted to be play more of a role in the study. Kristen, the facilitator for the middle school teachers, was thrilled to be participating in the study. Limiting the focus of the study to just the middle school teachers meant I could respect their wishes. In addition, her warm and inclusive attitude helped set the tone for my inclusion and acceptance within the group.

The sample for this research consisted of a total of 26 individuals: 14 teachers, 5 administrators, 3 facilitators and 3 superintendents and one pioneering teacher. Three teachers were from "Spring Public School" which has grades 3-8 and is the district's science and technology magnet school. Six teachers were from "Madison Middle School" and five teachers were from "Baker Middle School". While the demographics are very similar across all three schools, Madison Middle School does have an approximately 3% higher student population which qualifies for free and reduced lunches.

Also included in this sample were the middle school Inspire facilitator, the principals at all three middle school, and two of their assistant principals. I chose to exclude one part-time assistant principal from this research sample because he had no involvement in, or knowledge of, Inspire. The district's superintendent, the superintendent of instruction and the superintendent for technology agreed to be interviewed in this research study. Lastly, in order to gain a better understanding of the professional development being provided, two facilitators for the Grade 5 teachers and the pioneer teacher were also interviewed. In order to protect the identities of those who chose to participate, the names of the schools and all individuals have been changed.

Each of the district employees was made aware that their participation was completely voluntary. As a result one teacher opted not to participate explaining that she did not wish to participate in extra projects when they were working without a contract. She, and the one part-time Assistant Principal who was excluded, were the only two people involved in the Inspire initiative who did not participate in this study.

No monetary or material compensation was provided in exchange for participation; however, the district did agree to grant partial KALPA hour credit for their participation in the study. KALPA is the name of the on-line management service which is used by the district to track professional development hours for each individual teacher and administrator. Each teacher is required to enter 30 credit hours per year, 15 of which may come from professional development programs offered by the district itself. In my preliminary discussion with the two superintendents and the three middle school principals, teachers were to be granted their full 15 hours of professional development in acknowledgement of their participation in this study.

3.2 Research Questions:

This research was guided by two over-arching questions:

1. In what ways and to what extent did the training help to build teachers‘ technical and pedagogical capacities so that they could utilize technology as leverage for enacting instruction which is student-centered, problem-based and collaborative? And,
2. What role did school administrators play in providing support for their staff as they attempt to alter their instructional practice?

In order to begin answering these questions, the following questions guided this research:

1. In what ways and to what extent did the professional development help to develop common goals, values and expectations for practice amongst teachers participating in Inspire?
2. In what ways and to what extent did the professional development help teachers develop their technology skills?

3. In what ways did the professional development attempt to provide teachers with modeling and pedagogical support for the new ways of presenting, using, and building knowledge necessary for the effective use of technology?
4. What role did administrators play in the implementation of instructional change within their school? And,
5. Were there other resources and conditions which nurtured or impeded this district's reform initiative?

3.3 Data Collection Procedures:

Between August 2010 and June 2011, data on Inspire was collected from four sources:

District Training Sessions:

Each month, the district provided substitute teachers so that all teachers participating in Inspire would have release time to attend formal training sessions run by Kristen, the facilitator. All participants were informed that I was a doctoral student at the University of Michigan and that I was there, with the district's permission, to study their Inspire initiative. I informed them that, as part of my research, I would be typing a transcript of what was said and done at these training sessions. In order to maintain transparency, the participants were also told that they could see what I was typing at any time if they so wished. The middle school facilitator did ask for a copy of each month's transcripts so that she would be able to reflect upon her practice.

In all, I attended eight out of nine training sessions. So as to avoid relying strictly upon memory, I typed a record of all conversation and documented formal training activities. The training session transcripts provided the majority of the data for this study. From them, I hoped to gain information on how Inspire was discussed and how the training set expectations for practice. They were also the primary means for being able to see how technological and pedagogical skills were being developed, modeled, practiced and scaffolded. Lastly, the training sessions provided the opportunity to see teacher‘s digital shares in order to see what was being tried, how the new lessons went and how teachers were understanding and responding to them.

Interviews:

Data was also gathered through semi-structured interviews. In order to provide time to build a rapport with the participants and earn their trust, the interviews were all conducted between January and June of 2011. Generally, teacher interviews were conducted during the afternoons on training days. In total, 26 interviews were carried out. Rather than having a formal schedule for interviews, individuals were simply asked if this was a good time to be interviewed. Although one or two teachers asked if they could go next week, none seemed hesitant to be interviewed. So that the participants would have privacy, the interviews were held in either a private conference room or in an empty classroom. Due to their busy schedules, administrator and superintendent interviews were arranged via email to be conducted at a time that was convenient for them.

Before an interview was conducted, each participant was assured that their participation was voluntary and they were told that they could decline to answer questions if they so wished. Each person was also encouraged to ask any questions they might have about the interview process and the study. After being granted permission to do so, each interview was recorded and later transcribed by myself. In order to keep their responses confidential throughout all stages of the research process, each participant was assigned a coded number. Please see Appendixes A-C for the complete interview guides.

Although the interviews were expected to be approximately 45 minutes long, they ranged from 40 minutes to 65 minutes in length. During the interviews, participants were asked open-ended questions on specific topics: Their understanding of Inspire, their experiences in the training sessions, their classroom instruction and their experiences within the school. Three different interview protocols were developed. The first was used in teacher interviews. Its first focus was on how they understood Inspire and specific details on what lessons they were trying, how they went and how students responded. The teacher interview protocol then explored how they had understood and utilized the research presented in the training sessions to modify old lesson plans. The last section of the teacher interview protocol aimed to illuminate the culture of the school in which they worked and how they viewed the role their administrators played in supporting Inspire.

The facilitator interview protocol was similar to that for teachers but it had a much larger focus on the development of Inspire, what was done in the training sessions and how they were working with teachers to plan and model lessons and trouble shoot problems as they arise. Since

the facilitators worked in more than one school, an additional set of questions was added to explore if there were differences in school culture and the role the administrators played in how they supported their teachers and Inspire.

The last interview protocol was developed specifically for the administrators. The first section of questions centered on their understanding of Inspire. The next section had questions which asked about how they supported their staff, provided time for teachers to plan, set expectations for their staff, or communicated with parents. The last section in this interview protocol focused on communication, support and inclusion in decisions across the various levels in the district.

Artifacts:

Several school artifacts were also collected and examined. The artifacts included the transcript of the professional development session for administrators, handouts given to teachers during the training sessions, and transcripts of the October and March board meetings at which the Superintendent of Instruction updated the board on the goals, purposes and progress of the Inspire initiative. In addition, written permission was obtained from the district office to examine teachers‘ on-line lesson plans and students‘ on-line class work. These artifacts included district goals and definitions, district strategic plans and surveys, and research on educational pedagogy and effective instructional practices. These artifacts helped to deepen my understanding of the district‘s plans and goals. In addition, they served as documents against

which I could compare what participants self-reported. Please note that copies of these artifacts have not been included because permission to reproduce them was not granted by the district.

Survey Instrument:

During the interview process, it was becoming apparent that some teachers were open to experimentation while others felt that they were doing everything well and did not need to make any changes in their classrooms. I felt that teacher attitudes and beliefs seemed to be playing a role in how they were implementing Inspire; yet, this was not something that I had specifically addressed in the interviews. Having already finished half of the interviews, I decided to include two surveys which would explore teachers‘ attitudes toward change, the role of the teacher and the role of the students.

During the April training session, each of the fourteen participating teachers was asked to fill out both surveys which took a total of approximately five minutes to complete. The first survey was adapted from an existing survey (Schmidt et al., 2009) and was aimed at measuring the middle school teachers‘ technological pedagogical content knowledge (TPACK). This survey was measured on a 5-point Likert Scale where respondents were asked to specify their level of agreement to each of 25 statements by indicating strongly disagree (1), disagree (2),

neither agree or disagree (3), agree (4), or strongly agree (5). For the purpose of this research, the teachers also had the option of specifying more so now after this past year in Inspire (6).

These surveys were used by Abbitt (2011) with 124 pre-service teachers. The results were shown to be both reliable and valid and were published in the *Journal of Digital Learning*. As such, this research is also asserting that these TPACK survey developed by Schmidt et al. (2009) is both valid and reliable.

The second section of the survey instrument was adapted from Park, Ertmer & Simons (2006) Teacher Beliefs Regarding Technology Use Survey. This TBTUS survey instrument was developed to measure teachers‘ beliefs about student-centered learning, teachers‘ efficacy for technology integration, and teachers‘ perceived value for computers in teaching and learning. This survey was added because this research assumes a relationship between teacher beliefs and their decisions about classroom practice. For example, researchers have documented an association between low-level technology use and teacher-centered beliefs and practices, as well as between high-level uses and student-centered beliefs (Becker, 1994; Berg et al., 1998).

This survey was also measured on a 5-point Likert Scale where respondents were asked to specify their level of agreement to each of 45 statements by indicating strongly disagree (1), disagree (2), neither agree or disagree (3), agree (4), or strongly agree (5). This survey was field-tested in 10 states by 157 professors and over 2,500 education students in 12 institutions by McCombs & Lauer (1997). Chen et al. (2003) also field tested the twelve items pertaining to teacher beliefs about the perceived benefits of technology use. In both studies, Cronbach‘s alpha was between .73 and .89. As such, this research is assuming that this survey is valid and reliable.

3.4 Data Analysis:

Interviews, artifacts and transcripts of teacher training sessions, lesson plans, and posted work were conducted and analyzed simultaneously (Marshall & Rossman, 1989). In order to analyze the data collected, two processes were used. I began by open coding the training session transcripts. Since the professional development was attended by all, it was assumed that these transcripts may provide direction for analyzing individual interviews. I then began inductively refining my coding scheme using the intended features of the Inspire reform initiative, the theory on effective professional development and instructional leadership and the categories emerging from the data (Strauss & Corbin, 1990) (See Appendix G for the complete coding scheme). After the data was coded, I went through all the data again in order to develop detail and demarcate their interrelationships. During this process, I used memos and created working diagrams to help me with the conceptualization and development of my claims. Each item was analyzed separately and then the data was examined once again in order to flush out where and how they were interconnected.

Despite using a survey tool, this research is not a mixed-methods study. The information provided by the surveys was used in the most minimal of ways and was meant only to supplement the other data collected. Its primary purpose was to augment and verify information about individual comfort with change and technology and their perceptions of the role of teacher

and student provided during the interview. Please see Appendix H for the complete survey coding scheme.

Survey data was analyzed by obtaining an average score value for each item against which individual scores were compared. They were also compared to the neutral score of three. For example, items 12, 15 and 20 from Survey 2 were taken as indicators of teachers‘ belief that their content knowledge impacted their effectiveness as a teacher. A score of 3 meant that they neither agreed nor disagreed with these three statements. By adding up the total scores on these three items for each teacher and dividing by the total number of teachers, an average score was found to be 4.6. Individual teachers‘ total scores on these three items could then be compared to 4.6 as well as to the neutral score of 3 to indicate that, on the whole, teachers did believe that their content knowledge helped them to be better teachers.

3.5 Trustworthiness of the Findings:

In order to address whether my findings were trustworthy, I employed several techniques. First, I was careful to develop an early familiarity with the culture of this district. I perused their website, attended board meetings and spoke with other educators who were familiar with this school district. Each person was given the opportunity to decline to participate, decline to answer any questions being asked, or to ask questions of their own.

Second, in designing the research procedure, I deliberately gathered data from multiple sources and multiple schools. My intention was to generate three layers of data from each

participant and each school site so as to highlight various viewpoints and experiences which could be compared with others. In addition, 92% of those involved in Inspire [the middle school section of the initiative] participated in this study. Furthermore, the participants represented all levels within the district. This improved my confidence that the information gathered was both representative and credible. Future studies could supplement the grounded theory developed here by analyzing other initiatives similar to this one.

Third, I completed "member checking" (Lincoln & Guba, 1985) with five of the participants. Over the course of the year, I returned to each of these participants and asked that they review a summary of the results of the inquiry. They were invited to offer comments on whether or not they felt the data were interpreted in a manner congruent with their own experiences. These individuals formed a sounding board against which I could to test my ideas and interpretations as they developed. In addition, each was asked whether they recognized any possible bias in what was being presented to them. All five stated that the findings were congruent with their experiences.

Fourth, to address transferability, the complete set of interview guides, survey instruments and coding schemes are included in the appendixes. Access to my "paper trail" should give other researchers sufficient detail to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting. While this study may not be directly transferable since the initiative evolved from a particular district and is particular to the people

and culture that developed it, its findings may still be appropriate to other districts also attempting instructional improvement of this nature.

3.6 Limitations:

In recent years, gaining access to districts has become increasingly more difficult. Gaining access to conduct research in districts attempting to implement large-scale reform initiatives aimed at significant instructional improvement can be even more challenging. District permission to conduct this study was a gift. However, it did come with some restrictions which impact the research.

I was not granted permission to sit in on actual classroom lessons and develop a firsthand record of their instructional practice and interactions with students. While it was possible to obtain a good record of teacher beliefs and their accounts of the work they assigned, how they assessed students and their instructional and classroom management strategies, it was not possible to assess the veracity of their statements or reflect upon the possibility that there is a disconnect between teachers‘ perceptions of their instructional practice and what they actually do in the classroom. Nor was it possible to collect first-hand data on teachers use the facilitator for planning, modeling lessons or trouble-shooting technical or class management problems. Had permission been granted, this would have improved both the trustworthiness and the quality of this research.

Another limitation of this study is that it examines the implementation of Inspire for only one year. While this research is able to provide a view of this initiative at one grade level at one particular point in time, it would have been beneficial to study teacher practice before participation in Inspire and for the year afterwards in order to gain an understanding of the impact participation had on teachers‘ instructional practice over time. This would be a most beneficial and worthwhile topic for future research endeavors.

Lastly, this study was originally intended to include a second set of interviews. The first interview was meant to focus on teachers understandings of Inspire, their efforts to implement new lessons and use new technologies and the professional development and coaching they were receiving. The second interview was going to focus on teacher beliefs about teaching, the role of the teacher and the role of the student. However, it took several months for teachers participating in the study to become comfortable enough to agree to be interviewed and it quickly became apparent that two rounds of interviews would be both unpopular with the teachers and difficult to schedule. As such, the data on teacher attitudes and beliefs is somewhat superficial, based in most part upon the surveys and comments that they may have made during the training sessions and/or interview.

CHAPTER 4
Findings

This chapter discusses the findings of this research. The findings themselves have been organized into four main themes:

1. Professional development: Defining goals, values and expectations for practice
2. Professional development: Building technological and pedagogical capacities
3. School leadership and school culture, and
4. Other conditions that supported or inhibited instructional change.

4.1 Professional Development: Defining Goals, Values, and Expectations for Practice:

Research Question: In what ways and to what extent did the professional development help to develop common goals, values and expectations for practice amongst teachers participating in Inspire?

The first step in answering this question was to define the goals, values and expectations for Inspire. On its Inspire website, the district itself defines Inspire as a "learning-centered initiative designed to emphasize collaboration, communication, creativity and critical thinking". These four elements are referred to by the district as "The Four C's" and they are posted on their website and on posters displayed in their schools and classrooms. In fact, several administrators specifically referred to them.

> Rachel - One of our half days of staff development was getting people together-I didn't want people to do it in isolation so, again, thinking about those C's, it was collaboration and it was about communication.
>
> Brian - Inspire is really about working on those 21st century skills-so, collaboration, critical thinking, communication, higher-order and our students producing products.

Their website adds that ~~t~~the district envisions students working extensively with digital tools to create podcasts, video casts, still images and mind maps, and use Web-based environments such as Moodle, blogs and wikis, to construct, communicate and collaborate with wider audiences". However, to develop a richer definition which added to these expectations for performance (without projecting any of my own beliefs, ideas or preferences onto their initiative), I perused the district's Inspire website and transcripts from the Inspire presentation to the Board of Education and the training sessions to isolate the key terms and definitions utilized the leaders and facilitators in this district. According to these sources, Inspire was meant to focus on:

- Teaching higher order thinking skills not technology
- Offering a curriculum that is based upon authentic and global problems
- Offering students choice as they collaborate to work on authentic, problem-based tasks
- Offering instruction that is multi-modal and differentiated
- Assessment that is focused on process and formative assessment, not product and summative assessment

In order to assess whether these goals, values and expectations for practice understood by the teachers participating in Inspire, transcripts from the teacher interviews were analyzed to see how teachers explained what Inspire was trying to achieve. Teacher comments and suggestions recorded in the training session transcripts were also analyzed to add to the evidence of teacher understandings of Inspire.

Claim: Teachers in the district understood the goals, values and expectations for practice required by Inspire.

First, except for two individuals, every person in the study associated Inspire with 21st century teaching and learning. For example,

> Sophie - Inspire's the big focus. I think we're all moving toward that 21st century learning…
>
> Sarah - I am taking the program because our district wants teachers in Social Studies and Language Arts to be more proficient with technology and have 21st century learning so, therefore, they set up this program for us….
>
> Beth - The Inspire program allows teachers to use new technology in sort of an innovative way in their classrooms and hoping that those skills will help students to be successful in the 21st century.

Second, there was evidence that the teachers participating in Inspire understood its goals, values and expectations for classroom practice. When asked in the interview how they would describe Inspire to a teacher in another district, more than half of the teachers explained that Inspire meant teaching not technology, students collaborating and communicating with each other, allowing students to make choices and providing instruction that was multi-modal and differentiated. Furthermore, half the teachers explained that Inspire required focusing on authentic tasks and higher order thinking skills. It should be noted that while four teachers mentioned giving students a wider and more global audience for their work, only two teachers mentioned creativity, reflection, or formative assessments. Some examples of teacher's comments were:

Bill - Inspire is how to teach essentially…Your basic textbooks, your basic tests, your lecturing-you know, your old styles of teaching-this doesn't work anymore… It doesn't have to be through technology but you have to take risks and adapt and I think in that sense, Inspire forces people to do that and that's phenomenal.

Mark - I am using blogs and Moodles and the fact that they are concept-driven….It's not facts anymore and they understand that it is also about what they can do to improve things.

Isabelle - Well, it offers a choice to kids too. It really is a natural path to differentiation too. I mean, I have some learners who really can't express themselves in writing very well. This allows them to do it in speaking. Or the reverse is true to. And you can tier that. So maybe you start off with writing something really brief but, the next time, we will wean you off of that. So this has just been a really easy path to differentiation…. And Moodle, if they have a written assignment-that's another differentiation. You can finish it at home because you are handing it in on the Moodle so it is a win-win.

Dawn – It means learning to work together as a team to problem-solve, to research, and then, to ultimately produce a product.

Sarah - I feel like I'm not so much of a teacher as I was in the past. I'm more like a facilitator.

Samantha - Its working in groups… Inspire wants us to bring collaborative learning,..I do more group work now.

Third, this study found that the messaging of Inspire was consistent across all levels within the district. For example, the district website, superintendents and administrators also mentioned that Inspire was about teaching and aimed to make instruction more student-driven, collaborative and global. While few administrators mentioned formative assessments or reflective practice, the same was true for teachers. Here are three examples of administrator comments:

George- And really, the power of 21st century teaching and learning is all about collaborative work between people… through having teachers guide students rather than lecture to students. You have to be eclectic in your approach and have them learn from and with each other.

> Lily - It‘s not just the layering of technology, it‘s the integration of it into your programming.
>
> David- You have parents and teachers who do not always feel that secure without textbooks. That is a challenge because this is like a paradigm shift. You are changing people‘s views about what education looks like in the classroom… teachers need to hear that everything that we have done in the past is not bad. Again, I like to say that a lot of it we are already doing and we are now doing it with new tools. So, helping them to shift to that but to also understand that we are not throwing out the baby with the bath water.

In an attempt to explain how the training sessions helped teachers to better understand Inspire‘s goals, values and expectations for classroom instruction, training session transcripts and materials were then analyzed.

Claim: The professional development seemed to utilize a process of stating and restating Inspire‘s goals and connecting them to teachers‘ work during the training sessions in order to provide teachers with a common language and framework of goals within which everyone could focus their efforts.

During the monthly training sessions, there was a great deal of evidence of the facilitator explicitly referring to Inspire‘s goals and its impact on classroom instruction. This was particularly true during the first four months of training sessions. In October, the facilitator made 14 comments referring to every goal of Inspire other than its global focus. In November, she made seven comments covering all but two of Inspire‘s stated goals. The following is a summary of how often and when Kristen specifically mentioned each goal.

Diagram D: Specifying Goals and Expectations for Inspire

Goal/Expectations for Practice	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May
Teaching, not technology	1	2					1	
Multi-modal, differentiated	2	1	1	2		1		1
Student-driven inquiry	3					1		
Higher order thinking skills	4	1	1			1		
Authentic tasks	1			2	1		1	3
Teacher learning on instruction	3	2	3	4			1	2
Global perspectives		1	1			1		2
Formative assessment	1							4

In each training session, Kristen continually stated and restated Inspire's goals so as to forge a common language and framework of goals within which everyone could focus their efforts. As means of an example, here are all of Kristen's training session comments on how Inspire is about teaching and not about just using technology:

> (Oct.) The thing about what Mark is doing that is most "Inspirish" is not what he is doing but it is his attitude toward what he is doing in his class…That is the definition of Inspire because it is not the technology. It is what you do with it.
>
> (Nov.) We want that balance. And what happens is that you get the new technology and you think that you're using it because it is up on your screen. But we want to integrate it in a way that does more for the kids. The idea is that it [technology] allows you to do something new. There are more affordances that you had before.
>
> (Nov.) It is about your lesson design and 21st century, not about the technology. I say this all the time.
>
> (April) (Referring to the SAMR model.) What would redefinition look like? Because it is not just about technology, it is about redefining the tasks.

It must also be noted that, in each instance, the goal was mentioned by the facilitator rather than the teachers and that, although deliberate and purposive, her comments were all under 15 seconds in duration. It is interesting to note that while teacher reflection on instructional was mentioned more than any other goal, this goal was referred to by only two teachers. Formative assessments and authentic tasks were mentioned primarily in April and May‘s sessions when the Social Studies teachers were working on Capstone.

4.2 Professional Development: Building Technological and Pedagogical Capacities:

Research Question: In what ways did the professional development attempt to provide teachers with modeling and pedagogical support for the new ways of presenting, using, and building knowledge necessary for the effective use of technology?

Specifying the instructional changes desired by a reform initiative is easier said than done. Instructional change may only be achieved if the teachers, themselves, learn new pedagogies and acquire the skill set required in order to enact it. In other words, the training sessions need to also focus on building teachers‘ capacity. The Inspire training sessions focused on developing two particular skill sets. First, it aimed to develop teachers‘ skills on how to use the technology and programs available within the district. Second, it presented teachers with research on effective technology utilization, modeled how to modify old lessons and supported new ways to manage the learning environment. Each will now be discussed in turn.

Claim: There are indications that teacher practice with respect to technology usage did change. Teachers assigned more group work, increased student choice and increased student involvement in peer review and assessment.

It is important to state that since I was not allowed to sit in on individual teacher's classes, it was not possible to evaluate the degree of lecturing teachers did, the level of student activity and participation in lessons, teacher questioning techniques, or teacher interactions with students etc. As such, rather than try to definitely determine the extent of teacher change in practice, this study sought instead to examine how this reform initiative was perceived, how the professional development afforded opportunities for teacher learning and growth and how the implementation of Inspire played out across schools. That being said, analysis of student work posted on-line did allow for some conclusions regarding practice to be drawn.

During the training sessions, teachers were given mini lessons on how to utilize the primary programs of Inspire as well as opportunities to then practice them. For example, in October, teachers were shown how to navigate the web, use a lesson template and tag their work. Teachers then tagged and posted a lesson that they did with their class as a digital share. In December, teachers gained experience in searching the district's wiki pages for websites that would provide unique opportunities for student learning. One example was Newscast which offers access to stories from over 300 major sources such as The New York Times, The Washington Post and The Associated Press. The advantage of a site like this one is that it allows teachers to pick topics and design filters so that only specific articles will be presented to students. One teacher had their students use this site to research immigration laws so that they located, selected and processed data from another information source.

Teachers then made, tagged and posted a video onto the wiki which illustrated how that site could be used to differentiate instruction and illuminate connections. In January, teachers were shown podcasts, which are like a web-based radio shows. Podcasts are a new way to distribute content which can be accessed anywhere with an iPod or iPhone. Some schools are using podcasts to deliver lessons. Some teachers are using podcasts to have students communicate information and ideas to multiple audiences. At this training session, teachers were asked to evaluate what made some better than others. They were then given a tutorial in Audacity. This free software program allows individuals to record and edit live audio. Teachers were taught how to make a podcast of their own using this software which they then uploaded onto the district's website.

During February's training session, Kristen showed everyone how to use Animoto. Like Photo Story, this software allows individuals to turn photos, video clips and music into short video shows which can be edited, customized and easily shared. During this training session, the teachers were shown to set up an educator account and how to bypass the text limits by making a slide and inserting it the Animoto. One English teacher used this software in her classroom to have students produce book trailers. While students can always write a book report, this teacher explained that making the book trailers allowed her students to apply their knowledge of the book content to create an original and expressive product. She used this instructional strategy to augment other forms of assessing student understanding.

In April, teachers had a workshop on how to have students cite their work using Easybib, an easy and free on-line bibliography maker. Both the English and Social Studies teachers liked

this software because Inspire and the district stressed that students must cite their sources and not plagiarize. The teachers expressed hope that the consistency of having all the teachers use this one tool would make citing sources easy and automatic for students. During this session, teachers were also shown applications for interactive whiteboards in the classroom.

In May, teachers were shown how to use Poll Everywhere. This program allows teachers to gather live responses. For example, math teachers can pose a question. These results can be instantly shown to the class in graph form or can be used by the teacher to check how students are understanding the concepts being presented. In order to demonstrate how teachers might use Poll Everywhere for formative assessment purposes in their classrooms, they had the opportunity to use this program while evaluating each other‘s digital shares.

Because of tutorials such as these, and because the district included as a requirement for participation that each teacher post a digital share of one Inspire lesson that they had done with their classes each month, there was evidence of technology usage in all classrooms, and the assignment of more group work, increased student choice and increased student involvement in peer review in most classrooms. All teachers used the wiki and had students complete work that was done using at least three of the following tools: Moodle, Wordle, flip cameras, interactive whiteboards, iPods, laptops, Photo Story, Inspiration, Audacity, Animoto, blogs, glogster and Easybib or Enotes. In addition, each teacher assigned group tasks at least twice during the year and required students to give constructive feedback to other groups regarding their work. All but one teacher stated that they give their students rubrics in order assist them in the evaluation of both their work and that of others. While this study cannot make comparisons to assignments

from previous years, during the interviews, eight teachers reported assigning more group work and assigning more peer review than they had in past years.

In addition, student work posted on-line showed that all students did work in groups at least twice and, according to the teacher interviews, all but four teachers allowed students to chose their groups at least once during the year. That being said, only six teachers structured the assignment to allow students real decision-making opportunities. These six teachers allowed students to decide on their topic as well as the format for demonstrating their work. This was not always the case. For example, a second English Language Arts teacher also had her students work in groups to make book trailers. However, all students were told that they would be using this one program and they all produced a book trailer on the same book. With respect to Social Studies, students worked on problem-based research projects as part of Capstone. The students created over-arching questions about natural disasters, hunger and population growth. They developed their own questions to investigate and conducted their research using multiple sources of information such as books, the internet, and newspapers. They decided what format they would use to present their project and decided what they wanted to do for their final project. As such, there was tremendous variation across teachers as to the extent to which teachers directed each step of the process or allowed students to drive the process of inquiry.

Claim: The professional development sessions introduced teachers to research models aimed at demonstrating the goals for instructional change as well as providing a framework for modifying and improving one's previous lessons in ways which are consistent with these goals.

Except for during the months of October and December, the professional development sessions were utilized to introduce teachers to research models aimed at building teacher

knowledge of pedagogy and providing a framework for building lessons consistent with these goals. The presentation of this research was always followed by giving teachers an opportunity connect this research to actual classroom practices by asking teachers to modify previous lessons, develop new lessons or evaluate lesson plans provided in ways consistent with the goals and practices of Inspire.

In November, teachers were given an article called "Shaping Technology for the Classroom" by Marc Prensky (2005). This article listed four stages of technology implementation: a) Dabbling to see what tech can do b) Doing old things in old ways-such as using a white board as a black board c) Doing old things in new ways- such as doing a podcast instead of a journal entry, and d) Doing new things in new ways such as using clickers to assess understanding as you teach. Teachers were then asked to think of a lesson that they have taught, identify what stage it was at, and brainstorm either how it could be adapted to take it up a stage or what that lesson would look like at each of these four stages. These four stages were referred to in four subsequent training sessions. For example, in December, Kristen said,

> [Is there] any other way to take this to another level using Prensky? He has it on inspiration so it is old- new… They could write a script rather than a narrative. One thing that Patrick [referring to a student in that teacher's class. For privacy, his name was changed.] did was to do it in a blog and to read it in an Irish accent.

As an aside, I found this comment interesting for a second reason. In their work, Ringstaff & Kelley (2002) have found that teachers can become distracted from content by "glitz". This example of speaking with an accent seems to be a case in point. While this may

make the activity fun and more interesting or realistic, it may not make this activity more educational.

In December, teachers split into their subject area groups. Each group then watched a four minute video that was posted on the district wiki which emphasized varying instructional strategies in order to better differentiate the curriculum and illuminate connections. The teachers were then each given a handout by Young, Hofer and Harris (2009) which presented a collection of tens of instructional strategies for the teaching of either English or Social Studies. Teachers were asked to use these activity types to develop a lesson that they could take back to their classrooms. They were asked to start with their objectives and to link their lesson to specific Grade Level Curriculum Expectations and to 21st century learning goals. As part of this assignment, teachers were asked to try to include how student learning will be assessed.

In February, teachers were introduced to the TPACK Framework for Technology Integration developed by Dr. Punya Mishra and Dr. Matthew Koehler from Michigan State University. This model proposes that the thoughtful pedagogical use of technology requires the development of a complex, situated form of knowledge that involves the interplay of three main components of the learning environment: technology, pedagogy and content. In addition to the article, teachers also watched a short video clip introducing the TPACK framework and providing both definitions and examples of technology knowledge (T), pedagogical knowledge (P), content knowledge (CK), and the combination of these three (TPACK). As a follow-up activity, teachers then evaluated five lessons which were provided through the lens of either a technology, pedagogy or content expert. Teachers were asked to, according to their assigned

role, comment on the strengths, weaknesses and overall quality of each lesson. This was followed by a large group share out.

This model was revisited in March. On a card, teachers were given Activity Types handout from December's training session. Teachers were asked to pick one new instructional strategy listed in the Activity Types handout and to develop one lesson that they could do in their classrooms in the upcoming month. Teachers then met in groups of three (as a technology expert, pedagogy expert, or content expert), to analyze these lessons and suggest ways to deepen, differentiate, and enrich them. Once the lesson plans were modified and improved, they were posted onto the district website so as to add to the lesson data base. As was the case earlier, Kristen frequently referred back to the TPACK model during future training sessions. For example, in May, she posed the question to the group, "How would you critique that using the TPACK lens?"

In April, teachers were introduced to one last research model, the SAMR Model for Transforming Instruction (Puentedura, 2009). This article outlines four stages of instructional transformation:

a) Substitution-technology is a tool substitute. There is no functional change
b) Augmentation-Technology acts as a tool substitute with functional improvement
c) Modification- Technology allows for significant task redesign and
d) Redefinition- Technology allows for the creation of new tasks previously inconceivable.

In order to connect this model to earlier research, Kristen led a discussion of how the SAMR categories compared to those of Marc Prensky's four stages which they read about in

November. As a follow up activity, teachers linked this model to their classroom practice by writing down 2-3 lessons they had recently done with their classes and then applying the SAMR lens to assess what stage they represented. Lastly, teachers in the group were asked to suggest what they could do to redefine and transform those lessons in order to take them to the next level. Kristen emphasized that "It's a process. Every stage has benefits. Even substitution has benefits. What we want you to ultimately do, is pick one lesson you do and find a way to take it through the four levels and then post it so others can learn from it too."

As one last example of how the professional development sought to build teacher capacity, the focus for May's training session was formative assessments. Teachers were shown a video clip by Rick Wormeli (downloaded from http://www.youtube.com/watch?v=rJxFXjfB_B4) which argued that while teachers spend the most time designing summative ones, formative assessments provide teachers with more information and are most useful for improving student learning. It described good formative assessments as those involving descriptive feedback that helps kids know the learning goals, what they did in relation to those goals and what needs to be done to close that gap. Ideally, kids should then be allowed to edit their work and be assessed anew so that there are many checks for learning. Not only were teachers each given clickers which they used to take surveys using Poll Everywhere, they were also given a handout with a variety of resources and links on the district's wiki that lent themselves to formative assessment. For example, they looked at Moodle Chat which allows kids to post questions during a lesson so that the teacher could look at them and then come over to clarify concepts and/or answer questions.

As such, the presentation of research during the training sessions did provide teachers with new information, elaborated the goals and performance expectations of Inspire, and afforded teachers with opportunities to modify lessons in ways consistent with them. However, there was evidence that the teachers resented these attempts to add to their pedagogical knowledge base. In the interviews, nine out of the fourteen teachers expressed feeling like they were back in college or that the readings ate up time which could be spent seeing what others were doing and planning together. Some examples of teacher comments were:

> Sophie - And when we're doing things like reading, we start to feel like what a waste of time, you know.
>
> Samantha- there have been a couple of sessions where literally, we just sit and we took a highlighter…and we just read…and it feels like we're back in teaching college which-we all know, courses in Teacher's College don't always prepare you for the inside the classroom….Each time I come in, I want to see something-or three things- that are new and take me step by step through how to use them. And then I (emphasis added) can decide, ~~–~~Hey that would be good in this unit."
>
> Jennifer - I just wish it were less philosophy. .. I don't think you have to convince us to use it…. I felt like there was a lot of filler (emphasis added) to fill up the day versus the planning (emphasis added) time and the processing (emphasis added) time that I really needed.
>
> Maya - Today, for example, where they give us articles and have us read them. That was my least favorite thing to do cause then I felt like I was in a college class but there, we could always read them at home. Doing all that in class is, I think, a waste of time.
>
> Rob- I know a lot of people thought that the little articles…a lot of people found them completely irrelevant. It was kind of a waste of time. I know from all my friends who went there that, if we had had more time to do digital shares, talk about our ideas and maybe get time to work on those ideas, it would have been more fruitful…

Claim: While the digital shares provided regular and on-going opportunities to model new instructional practices, the development of specific skills required to deliver a problem-based, student-led, collaborative instructional program were not purposively addressed during the professional development sessions.

In preparation for each month's training sessions, teachers were asked to teach one Inspire lesson and to post their lesson plan on-line. Both the superintendent and the facilitators specified that these digital shares were purposively incorporated into the professional development so as to put pressure on teachers to try new instructional strategies, to allow teachers the opportunity to model these new practices for each other, and to help generate an on-line lesson resource for teachers.

And, indeed, teachers found the time spent on digital shares, getting lesson ideas from other teachers, and having time to plan lessons together to be very valuable. They wanted lesson ideas. As Samantha put it, "The most useful part of the training, for me, is hearing how…hearing other Language Arts teachers tell me something that they did in a unit that I do the same unit about." This was the feedback that the facilitator, Kristen, also received. She commented that, "They love the digital share. My group does. They go, 'Wow!'" In fact, each and every teacher commented that they found the digital shares to be the best part of the training sessions. For example:

> Beth - some of the digital shares have been awesome. Like, "I didn't think about doing that!" That has been great.
>
> Dawn- Also, it is the sharing. They will go and look at someone's digital share and go, "I want to do that." And then that person will end up teaching them about what they did and how. And that is the 21st century model.
>
> Rob- The digital shares? I took a lot of ideas from there. I'd get a lot of things and steal some… I think the sharing, the digital shares. Getting exposed to all these technological things and all these ideas that I really hadn't thought of or even known of.

In recognition of traditional middle school instructional practice which has students sitting passively at their desks while the teacher provides information and examples and then asks students to work individually on questions for homework, November‘s training session was aimed at helping teachers understand the benefits of group work and learn its dynamics. Teachers watched a short video outlining the benefits of teamwork.

But, asking teachers to have students work in groups is very different from helping teachers understand how to do this. Kristen actually came over to me during this training session with a note explaining that she knows several teachers in the room did not have a good understanding of how to utilize teamwork. She explained that she worked with some teachers in their classroom in order to help scaffold their efforts. In an attempt to address this shortcoming, Kristen divided the teachers into small groups to discuss how to teach, model and promote teamwork in the classroom. She then led a whole group discussion on what this means in the classroom. This led to a forty-five minute discussion where teachers shared how the set up their classrooms, organize students into groups, optimal group size, how they help students to resolve conflicts, how they teach listening and other relationship skills, how to ensure work is evenly distributed, and how they assign individual grades when students work in groups. During the interviews, four teachers responded that they found this to be tremendously valuable.

Yet, the teaching of specific implementation skills - set up of the room, managing and assessing group work, enact formative assessments, questioning techniques, classroom management techniques now that students do not remain at their desks etc.- were not typically an explicit part of the training session curriculum. Rather, these aspects of implementation were

addressed when these issues came up during digital share presentations and in the questions teachers asked afterwards. As a result, the teaching of these skills was somewhat haphazard in that their coverage was dependent upon what comments the presenter made or what questions were asked. The following is an example of specific pedagogical techniques which came up during the training sessions. When the teachers were learning about podcasts, they listened to several and evaluated what made some better than others. One teacher, Bill, mentioned that on one podcast the background noise detracted from its quality. This prompted Beth to respond that she has to have the kids tape video in the hallways where there is always a lot of background noise. Mark had experience with a wide variety of tools and showed the group how to use microphones to limit that white noise. However, there is no way of knowing whether this would have been mentioned if Bill had not raised this point.

4.3 School leadership and School Culture:

Research Question: What role did administrators play in providing support for their staff as they attempt to alter their instructional practice?

Claim: Individual principals impacted how the reform initiative was regarded, defined and implemented in individual schools.

During their interviews, both Assistant Principals stated that they did not really play much of a role in the implementation of Inspire. While both participated in the teacher performance reviews, they said that neither the criteria for evaluation nor the feedback they gave

were specific to Inspire. However, this study did provide a unique opportunity to evaluate the role of the principal in setting the tone for the school's climate, supporting the implementation of Inspire, setting staff performance expectations and facilitating teachers' efforts at instructional change.

There are three middle schools in this district. Spring Middle School is a school of choice for families residing within the district and has an emphasis on providing comprehensive science and technology instruction. Instruction at this school is interdisciplinary and students in this school are grouped to offer flexibility that matches developmental needs and promotes collaboration. For example, teachers organize instruction into two-year academic cycles (grades 3-4, 5-6, and 7-8), and students remain with the same team of teachers for the duration of each two-year cycle. Teachers at Spring School plan and deliver instruction as teams for each two-year academic cycle. Perhaps because it is the only school of choice in the district, this school appears somewhat insular as well. For example, teachers at Spring did not participate in Inspire the year before this study was conducted. Nor will they be participating in the program during the following year. The principal explained,

> Brian - It was because it was felt that our teachers didn't need that kind of training cause we are at a tech school, they are already competent… The district understands we are going to have our own little tag line with it. We are going to do things in a different way. We are multi-age groupings. We are interdisciplinary. Students here all take Spanish all year, each year. We are providing opportunities that the other traditional elementary schools just can't provide whether it is due to schedule, staffing, whatever that may be. Paul [the Superintendent of Instruction, his name has been changed] said to us, "Look. I understand you guys may do this in a different way. You may bring in your own facilitator." He said, "I'm okay with that but it has to be under the umbrella of what we describe as 21st century teaching and learning."

While the two of the three teachers at this school seemed to utilize technology in effective and creative ways, it is beyond the scope of this study to be able to determine why the instruction looked as it did. Perhaps the teachers were hired for having the skills to work in this setting. Maybe their mandate specific to technology and team planning fostered technology to be used in particular ways. In addition, the fact that it is a school of choice could mean that student and parent expectations for teaching and learning were different in significant ways. For these reason, I hesitate to draw conclusions about the role the principal played in Inspire.

The other two middle schools in the district are more similar. Madison Middle School has a slightly more diverse student population with approximately 3% more of its students qualifying for free or reduced lunches than does Baker Middle School. However, both schools structure their days, grades and curriculum delivery in identical ways. According to the data gathered in this study, the primary identifiable difference between these two schools was the attitude of their principals towards the Inspire initiative.

The principal at Baker Middle School was very supportive of Inspire. She stated that she sees her role as one of trying to push all [emphasis added by participant] of her teachers to do more. As she herself said, "I want them to know that I still value what they are doing but we need to also recognize the pieces we need to add and improve and to put learning back on the student's shoulders." She stated that she purposively integrates the district's instructional goals into her everyday language. Indeed, she mentioned them eight times during our interview alone.

> Rachel: I know I use that vocabulary on a regular basis with the parents and the staff…Those are the things that I keep emphasizing so I feel that that is the message we are giving.

She also utilized her staff meetings to reinforce this expectation of the whole staff. For example, during one meeting she reviewed the instructional goals of the district (and Inspire) and issued all teachers a challenge to try one lesson which was consistent with them. At the next staff meeting, Rachel had all teachers share their lessons with the group. In addition, Rachel asked Kristen to come to another staff meeting to work with all the teachers and arranged several technology days where those teachers on staff familiar with Promethean Boards, iPads and other tools to run workshops on their use for those wishing to learn. Furthermore, Rachel ran whole school assemblies in order to create time for teacher collaboration and common planning. Rachel also explained that she used the monthly breakfast meetings with parents as a forum to highlight innovative lessons, recognize teacher efforts at instructional change and engender parent expectations for such instruction. She explained that she employed these techniques in order ―to form a culture where we work together and strive to continually improve our teaching".

Data gathered in the teacher interviews showed evidence of this. Each of the five teachers at Baker said that they would describe their school as a place where teachers worked together to improve their teaching. In addition, they described their principal as being supportive, communicating well with the staff and having a good understanding of the goals of Inspire. Three of the teachers reported feeling very comfortable going to Rachel for help with questions they had or problems they were experiencing. For example, Jennifer was doing a unit on bullying. Both Rachel and Jennifer mentioned that this was ―uncharted territory" for them

and reported that they has spent a great deal of time in Rachel's office discussing moral and ethical issues as they arose.

Madison Middle School's principal portrayed a very different attitude. When asked how he would define Inspire to an educator in another board, George responded, "There are three things we are supposed to be working on at all times. One of them is 21st century teaching and learning. The other is the RTI [Response to Intervention] pyramid working with struggling learners . The third is creating and fostering the PLC community in your building." He then continued to explain that,

> George- We don't call it Inspire up here, really. The middle schools…the reason is that Inspire started as a third grade program… I think it is helpful to have a common goal so our common goal for right now is character education-and that is a wonderful thing. If our common goal is to enhance the use of technology in the classroom, to make them better 21st century teachers so that students are better 21st century learners, that's fine.

None of these comments shows evidence of strong endorsement of Inspire and its goals. As he himself stated,

> George- Read Dewey. It's the same stuff we've been talking about forever (emphasis added). That we now relabeled it and re-teched it up and the teching it up makes it sexy. You get all these things you get to use and there are all these cool websites and all these cool programs we get to use and the kids get to be standing in front of interactive white boards and holding the pens and all that but, like, what's really important?

In fact, this principal felt that his staff was already highly skilled and he did not see any need to push his staff to continue to improve. Interestingly, the analysis of the teacher interview transcripts revealed that all but one Madison teacher explicitly echoed this sentiment.

> George - At any rate, my teachers in my building were way ahead of the curve on this. A full year before the Inspire program existed, I had a team of sixth grade teachers come to me and say, ‗Look, we want to work together in a team-based program, using technology to help kids learn. We're going to do all the leg work. We're going to write grants to bring stuff into the building. Can you support that?' … So our building was way ahead with this cause it was four years ago. So this team, my 6th grade team, is fully on board. And then, Inspire pushed into the middle school.

Perhaps as a result of these attitudes towards Inspire and his staff, George was actually proactive in undermining the process for instructional change. In November, he took it upon himself to conduct a formal, written survey amongst Madison's five participating teachers regarding the utility of the training sessions. He then wrote a report to the district,

> George- That showed that my teachers were very unhappy with the training because they didn't see it being valid for the amount of time they are away from their classes…Time on task is extremely serious so, to take them away, you'd better give them something really good if you take them away. If it's not really good, they're going to come back with a real negative opinion.

Furthermore, rather than utilize formal staff meetings as a forum to reinforce the instructional change desired by the district, George reported that he utilized staff meetings to give teachers time to meet with their Professional Learning Committees (PLC's). In fact, during the interview, he provided little evidence of using any formal meetings or informal conversations with either teachers or parents as a means to support instructional change.

The five teachers interviewed described George's leadership style as ―authoritative" and ―top-down". One teacher reported feeling that he was somewhat sexist. At the same time, teachers also reported feeling that overall, George was supportive. They said that he showed trust in them by giving them space to do things in their own way and purchase supplies for their

own classrooms. Two teachers reported that he was supportive because he gave them permission to attend conferences or ~~–o~~pt out of Inspire for awhile'. The overall culture within the school seemed to be that of teachers working primarily in isolation with an acceptance of the status quo.

Analysis of the data indicated that this seeming lack of support for Inspire and the need to push instructional change had three primary effects. First, Madison's teachers were less able to explain Inspire's goals or its implications for classroom practice. In fact, the teachers at both Spring Public School and Baker Middle School were able to state twice as many instructional goals than were the teachers at Madison.

Second, Kristen, the facilitator, reported that the teachers at this school rarely asked her to come in to help them plan or to team teach with them. Third, while the teachers at Madison did utilize technology, their digital shares and the online evidence of their instruction indicated more layering of technology onto more traditional pedagogical practices. For example, one teacher, Samantha, had students read a book independently and write a traditional book report using the format she gave them. When they were done, she gave permission for those students who wanted to make a movie trailer. As Kristen stated during her interview,

> Kristen – The buildings that have a strong principal who has been to Boston and who has really embraced 21st century learning, you are seeing a lot (emphasis added) more happening in those buildings. In the buildings where they have not been to Boston and they have other priorities, whether they are reading or writing…(And we've had one principal tell us this when we were in a meeting together), we're beating our heads against the wall. They [the teachers at Baker] started the furthest back but they have moved the most. The teachers at Madison have moved, but they should have moved further -If they had a growth mindset…

While the school leadership did impact the implementation of Inspire within school, it should be pointed out that none of the principals have really trained how to lead for instructional change. Paul, the Superintendent of Instruction, commented, "This begs questions like what are good instructional practices and how do you know when you're seeing them and not seeing them? Principals have not been groomed to be instructional leaders in this district." All but one administrator had taken a general leadership development course when they had first been promoted. Two independently pursued college degrees. All stated that in terms of formal support they sought out their own mentors.

Two last factors which were found to have impacted the implementation of Inspire will now be discussed. The first to be discussed will be the role that curriculum, or the lack of it, played in supporting or inhibiting instructional change. The second to be discussed will be teacher frustration at the amount of time they spent out of the classroom for training in Inspire.

4.4 Other Conditions that Supported or Inhibited Instructional Change- Curriculum, Time Spent Out of the Classroom, and Individual Teacher Characteristics:

Research Question: Were there other resources and conditions which nurtured or impeded this district's reform initiative?

Claim: Subject-specific curriculum and the lack of it were found to impact the implementation of Inspire.

The training sessions superficially addressed curriculum by supporting the modification of lessons done in the past, the provision of common planning time and promoting the creation of an online resource. Teachers did report that they looked at the district website to gather lesson ideas. However, the website is organized by the year and month in which a digital share was posted. In other words, if a teacher liked someone's lesson idea for a particular unit of study, they had to remember the month in which it was shared. They then had to remember who posted that lesson and click on that person's share. Teachers reported that this made searching for lesson ideas time consuming and, at times, frustrating. One suggestion would be to have a page specific to each subject with the curriculum units listed below. Lesson plans for specific units could then be posted accordingly. This would facilitate the creation of new instructional strategies specific to the required curriculum.

However, because this was not the case, teachers reported relying upon their textbooks, the Grade Level Curriculum Standards (GLCS) and their old lessons as the primary sources of their curriculum materials. Social Studies teachers were required to complete a Capstone project. This project required students to work in groups to frame and over-arching question about a critical problem. For example, one group of students asked, "How are people affected by hurricanes?" Capstone then required that they develop several sub-questions that they research. In this case, the students asked, "What causes hurricanes?", "What countries are affected by hurricanes?" and "How do local governments help their citizens cope with the aftermath of a hurricane?" As part of this research, students were required to choose another country to compare and contrast with the United States. Lastly, students needed to develop a final project or product meant to raise awareness of, or help raise funds to address this problem. Here,

students organized a fundraiser and donated the money for emergency relief. Because of these requirements, Capstone projects lent themselves toward authentic, problem-based, student-led research. The result was that there was evidence that each Social Studies teacher demonstrated at least some of these instructional shifts.

Implementing technology effectively, and without simply layering it onto older and more traditional practices, seemed more difficult for the Language Arts teachers. Their curriculum did not require a project such as Capstone. In fact, these teachers have required texts for reading but do not have a textbook. As a result, it was understandable that these teachers reported spending more time developing new lessons.

Perhaps as a result of the lack of unit clarity as to what skills to teach, in what order and in what ways relative to Social Studies, on the whole, the English teachers seemed to struggle with how to teach reading and writing skills within the framework of Inspire. English Language teachers were most likely to express concern over whether technology use would allow students to write less and not worry about spelling. They also seemed to worry about whether the use of all this technology would lead to a preference by students to express their ideas visually. Some examples of their comments were:

> Bill- I don‘t do as many written papers as I should anymore but, I think that when doing a written paper, I would almost see a little better quality.
>
> Samantha - It scares me a lot that we‘re losing individual and independent work as well.
>
> Beth - I think about their writing skills, their grammar. I don‘t know if they are just focusing on different things. It is hard to say… There is more than one way to do things and I don‘t think it needed to be so stressful…it‘s not everything. For example, if they do Animoto or Glogster, that is one way to represent your ideas...but we were talking today…the five paragraph essay. You can‘t just throw that out and do the Glogster

> because then they're missing something…. I feel they are doing this and I should be too but it is all about balance.
>
> Emma- Kristen was like, "Share. Post a digital share." I hadn't done anything in technology for two months because I'm trying to get these kids to write (emphasis added) something and the technology….it's just not where I'm at right now.
>
> Peter - My big concern is that it is crowding out time for the essentials…I am concerned about rigor and we are, in Language Arts, oxygen-deprived already. I can see the value of doing it in Social Studies of Science, making it so it comes alive and there is interaction, but when I see so much in Language Arts as being strictly skills-based and they are lacking in them, I almost want to retreat back to a basic model of here's your skills at the beginning of the year and here they are at the end of the year and so here is what your growth is. It would be great to be very focused on if you've got this skill or you don't. Adding another picture file or audio file, what it does is take away time from something that doesn't have enough time as it is.
>
> Jacob - I just think Inspire makes it easier for them to do research. It makes it the easiest thing. I would love to do a paper with them. Let's have them do it the old-fashioned way and maybe they'll write a better paper.

Without curricular materials to support the instructional shift, these teachers seemed to struggle with what a quality English education should look like and/or include. Thus, while they could see that technology provided valuable affordances for learning, there was evidence that they also believed in the effectiveness of a more traditional approach. A few teachers also reported a belief that all this technology use impeded student learning because it pandered to short attention spans. All but one of the five teachers who made this comment during the interviews were English Language teachers. These were the comments they made:

> Jacob - But the big change that I have seen with 21st Century learning is that they kids ability to sit quietly and work by themselves had diminished significantly. That, if they have to sit…For example, I mentioned the district writing assessments, they will sit down and spend the whole hour writing a paper. A lot of kids come to expect, "Where's my gizmo and what group am I in?" You know? "And, if I don't get that, I'm going to be squirrely as hell." So it is almost like catering to short attention spans and catering to the kids that hide in groups and don't really show their real learning.

> Maya- the best example that I can give you that I've heard universally cried from like eight teachers is that the ability to sit and take notes or be able to listen for more than two minutes at a time… And the other thing is it's _all about me' syndrome. The kids want very much to interrupt and talk about something that they are reminded of. They want to relate to it. Middle schoolers tend to be ego-centric as it is, but with this crop coming through with the Inspire training, it's more true than ever. They're hyper-empowered. It's all about them. It's all about their opinions. It's all about their experiences. And that, it's almost like an entitlement where, _You will listen to me tell my story because I am just as important as the teacher in the process and I am showing you that I am learning because I am talking about me."
>
> Dawn - Um, it is really hard to have them all focused and in the same place. Even if they are doing 21st century things, it is really hard to get them to listen, to follow directions. So I don't know if they are used to being in their own place. Is it a function of our society because we are all on our own technologies? I don't know. And it could just be maturity. I see less attention span. I see a lot of inappropriateness and I don't know if it is…sometimes it is socially-a lot of it is socially, sometimes it is academic.
>
> Jennifer- I really thought that these kids were lower in their skills than previous years…right at the beginning. I questioned whether it's because they came through Inspire.

Claim: Regardless of age, gender, experience, or school, teachers held a wide range of attitudes and beliefs about effective teaching, the role of the teacher and the role of the student in the classroom.

Since administrator attitudes and beliefs were discussed under school leadership and culture, the results presented here focus strictly on the teachers in Inspire. Of the fourteen teachers that participated in this study, five were men and nine were women. There was at least one male teacher at each of the three schools.

In addition, teachers' overall experience ranged widely. Some were in their first year of teaching. Others had some experience but were in their first year teaching that subject. Others had thirty years of teaching experience. Overall, the teachers from Madison were less

experienced teachers and the teachers from Baker were most experienced. However, this research finds that neither age nor experience seemed to be related to teacher confidence or skill using technology. While some younger teachers felt technology use was second nature, others like Maya and Emma said that they did not use technology much at all. In addition, some of the teachers with the most teaching experience but the least technology experience felt very comfortable playing with new technologies and trying to trouble-shoot problems as they arose.

Since this research is descriptive and did not formally evaluate teacher skill or progress, I do not wish to rate or rank them or their effectiveness as teachers. However, based upon my observations and years of teaching experience, it appeared that, regardless of their school or years of experience, the teachers differed in their level of teaching skill. Yet, this research did find that teachers ability to be related to their confidence as a teacher.

For example, Jennifer appeared to be a very skilled practitioner. She had been teaching for decades, she was well respected by her peers and adored by her students. Most importantly, lessons shared in the training sessions indicated that she was able to create and deliver lessons that were constructivist in nature. Her students utilized technology to create blogs on bullying. In groups, students directed their learning and conducted research. Their task was more authentic in that, instead of being something produced for the teacher alone, students strove to provide students with suggestions for coping with bullying. Students also viewed other group‘s work and gave them structured feedback. When all blogs were done, students discussed issues of privacy and content appropriateness and came to conclusions regarding how these issues should be resolved before making the blogs accessible to a global audience. Students then

studied the scatter map as people viewed their work and posted comments. Yet, Jennifer did not profess confidence in her ability to teach.

Mark, on the other hand, did. In fact, he was so confident in his ability to both use technology and teach, he turned to me during February‘s training sessions and told me that he had nothing to learn from the training and could be running them instead. Indeed, Mark was highly skilled with technology and his students worked with a wide range of technologies on a regular basis. However, there was evidence that Mark misunderstood that Inspire was about teaching, not technology. His students frequently used the school‘s computer lab in the media center. During the interview with the media teacher at that school, she referred to his classes as examples of how Inspire was not going well. Rather than guiding and facilitating student research as Jennifer had, Mark‘s students appeared to be left to work without much scaffolding. Videos done by Mark‘s students and posted on line seemed to indicate that some students had not received feedback letting them know when they went off topic, presented inaccurate facts or posted inappropriate information.

These two teachers exemplify how confidence seemed to hinder the teacher‘s openness to change. Jennifer did not feel she already knew everything. She wanted to continually improve her skills. During the interview, she told me that although she was nervous trying to teach this way, she knew that this was her year to delve in , do as much as she could, and take full advantage of having Kristen, the facilitator, available for support. Over all, she just seemed to have more of a growth mindset.

Other very skilled practitioners such as Bill, Isabelle, Peter and Beth stated that they knew they could become better teachers and seemed both willing and able to take risks and critically reflect upon their lessons. They were more likely to make statements during the training sessions and digital shares about how exciting it was to be trying new strategies and seeing how their students responded. They also utilized Kristen as a resource -planning lessons with her and having her come to co-teach a lesson- more frequently than did teachers like Samantha, Maya, or Mark.

Lastly, when asked to visualize their teaching five years from now, teachers such as Jennifer, Bill, Isabelle, Peter and Beth who were more open to change were also more likely to make comments about how their teaching will probably look different in many ways as they continue to improve and implement the skills they had learned. Teachers like Jacob, Mark, Samantha and Emma who were more resistant to embracing the goals and strategies of Inspire were more likely to comment that their teaching will look very similar to what it is like now.

CHAPTER 5
Discussion and Conclusions

"Major limitations of computer use in the coming decades are likely to be less a result of technological limitations than a result of limited human imagination and the constraints of old habits and social structures." (Kaput, 1992, p. 515)

5.1 Summary of Results:

Change cannot be thought of as a rational, linear, and neat process since the process of change in schools must also take into consideration both human and contextual factors. In talking about school reform, Tyack and Cuban (1995) note reformers who adopt a rational approach to educational reform and expect improvement to schools, most often discover it is not that simple.

The over-arching focus of this research was to examine the ways in which the professional development efforts of Inspire helped teachers develop technical and pedagogical capacities so that they could utilize technology as leverage for enacting instruction that is student-centered, problem-based and collaborative. Based on the results of the careful and detailed analysis of the data outlined in Chapter 4, this research supports several important findings.

First, through a process of stating and restating Inspire's goals, presenting research on pedagogical strategies for instruction and connecting both of these to teachers' work during the

training sessions, the professional development sessions did provide teachers with a common language and framework of goals within which everyone could focus their efforts. While the initiative was most commonly identified as 21st century teaching and learning, teachers did seem aware of the importance of student inquiry, collaboration and investigation. That said, teachers who worked in school in which the principal reiterated the goals for 21st century teaching and learning and used staff meetings, assemblies and informal conversations to link new pedagogies to what was being done in the school were better able to list the goals and expectations for practice required by Inspire.

Second, the professional development did, regularly, attempt to build teacher knowledge of pedagogy and model new practice. While a few teachers referred to the research presented as helpful in modifying old lessons in ways more consistent with the pedagogy of Inspire, most teachers expressed resentment facilitator attempts to expand their pedagogical knowledge base. Instead, teachers expressed a preference that the training sessions focus more on practical advice for the implementation of daily lessons and classroom management support.

Third, self-reported teacher practice did change with respect to technology usage, the assigning of group work, increased student choice and increased student involvement in peer review and assessment. Furthermore, those teachers who asked the facilitator to help plan, coach and/or model exhibited a better understanding of and increased evidence of the pedagogical shift required by Inspire.

Fourth, school culture played a major role in how the reform initiative played out in individual schools. While assistant principals seemed to play a minor role in assessment of

teacher practice, it was not specific to Inspire. School principals, on the other hand, had the biggest impact on implementation success. Instructional change was greatest in the school with the principal who used the language consistently with the whole staff, kids and parents, who expected all staff to alter classroom practices, encouraged those in the program to aid those not included and who utilized staff meetings and assemblies to build in both accountability and time for planning. Teachers were more resistant to change and less collaborative in the school in which the principal undermined the program, told staff, parents and kids that teachers were already doing this, and encouraged teachers to solve their own problems.

Fifth, because curriculum was addressed strictly by the provision of time to meet and plan, teachers utilized their textbooks and the GLCS as the primary source of their curriculum materials. The result was that curriculum played a major role in how the reform initiative played out across the subject areas. As such, modifications to teacher practice were primarily limited to capstone in Social Studies and to final projects in English Language Arts. Since Capstone lent itself toward authentic, problem-based, student-led research, Social Studies teachers were most likely to attempt an unit of study that was student-led, collaborative and constructivist in nature. Language Arts teachers seemed to have had a harder time making the pedagogical and ideological shift required frequently stating that utilizing technology to teach in these new ways would have a negative impact on students‘ reading, that they would write less, use spell check more and would develop a preference to express themselves in a visual manner.

5.2 Discussion:

A fundamental challenge of work in systemic reform contexts is planning for and creating alignment across the components of the school system such as policy, administration, instruction, professional development, curriculum, assessment, and technology use (Fishman et al., 2004; Roschelle et al., 2000; Smith & O'Day, 1991). If the challenge of alignment can be met, then a district can better create a stable structure for change and provide needed support and an innovation will have a better chance of being sustained and scaled up (Fishman et al., 2004).

However, educational systems in the United States are notoriously decentralized and loosely coupled (Cohen, 2011). Relative to other countries such as France or England, districts have a great deal of control and flexibility with respect to administration, instruction, professional development, curriculum, assessment, and technology use. This puts districts in a catch 22 situation. School improvement requires coherence, but schools are being asked to improve within districts which typically lack coherence.

The district in which this research was conducted also faced the challenge of alignment. It did so with substantial financial resources, capable office personnel, and a great deal of research instructional change. Nonetheless, there are multiple issues which would need to be successfully resolved in order for the district to create and align the necessary structures and policies needed to realize sustained, systemic instructional change: Planning sufficiently for use and scale-up, getting teachers to understand what is being asked of them and what this means for

their classroom practice, helping teachers develop the capacities needed to teach in these ways, and getting everyone on board and implementing the reform in the ways intended. Each will now be addressed.

Inspire has its origin in parental demands for greater access to classrooms with an emphasis on technology use. While the impetus for change was sudden, the district's decision to grow Inspire slowly over a three year period while creating plans and budgets was a good idea, affording time to create policy structures to support and facilitate the use of technology in its schools. While I did not have access to all the discussions, it was clear that the district put a great deal of thought into their purchasing plans. In addition, probably because they are resource-rich, the acquisition phase in this district did not seem to have been limited by a lack of available funds.

The elementary and middle schools were refitted for increased technology use (outlets, wifi, additional media rooms with spaces for classes to meet etc.). The district decided on several key programs they wanted all of its teachers and students to be able to use. These were Moodle, Photostory, Animoto, Glogster, Audacity, Inspiration, and Easybib. A great deal of equipment to support these programs was also purchased and it appears that there was a concerted effort to ensure that the schools received the same machines. This makes sense on several levels. It would be easier to train all teachers how to use them. It would aid the transition of teachers or students as they moved grades and/or schools. It would also mean that more individuals might know how to trouble-shoot problems as they occurred. I attended a meeting where the district presented teachers with two types of interactive whiteboards and

asked teachers which one they preferred. The district then purchased a large number of that whiteboard to be installed over the summer.

However, many researchers such as Fishman and Pinkard (2001) would suggest that purchasing plans must also address how the equipment will be used in the schools and classrooms. There are three examples that the district was purposive here as well. First, it was decided that each teacher would have 7 laptops - 15 if they share with their partner. When asked about the logic behind this decision, the superintendent mentioned that Apple Classrooms of Tomorrow (ACOT) recommended a 1:5 ratio of computers to students (I found this referenced in research by Statham & Torell, 1999). The facilitators said that this was done deliberately for two additional reasons. Seven computers for each classroom meant that teachers did not need to book a computer lab. It was felt that having them in the classroom would make them available for regular use and would decrease the likelihood that the technology would be used strictly for special projects. Also, not having access to a whole laptop cart necessitated that students work in groups of at least two. ACOT found that necessitating that students work in groups helped students to externalize their thinking, making both their understandings and misunderstandings more explicit (Sandholdtz et al., 1997).

Second, the district hired additional people to maintain the equipment. This was also a good decision since research shows that teachers are less likely to use technology when it technology crashes leaving them to scramble for what to do for the rest of the day and leaving them waiting months till it is repaired (Blumenfeld et al. 2000). Third, the district plans included strategies to help ensure that students had equal access to technologies. Each middle and

elementary school was provided with several netbooks that were available to be signed out. In addition, the media centers were asked to open before and after class as well as during lunch time since students would sometimes be required to finish some on-line home work.

In addition, the district's strategic plans included several policies and structures for scale-up. It was decided by the district's Superintendent and Superintendent of Instruction that, each year, two more grades would be formally included under the umbrella of Inspire and Engage. During this research, Grades 5 and 7 were added. Grade 8 was to be added the following year making it so that all grades between 3 and 8 would then be participating in these reforms. Furthermore, the year in which this research was conducted, 2010-2011, was the first year in which participation became mandatory.

While mandating participation may not seem very democratic, there is evidence that this may be necessary for systemic change. Work conducted by Means et al., (1993) indicates that a reform is more likely to be sustained when there is a critical mass of teachers willing and able to participate. While this research did not provide a recommended percentage, this critical mass may be around 50%. Work by Rogers (1983) specifies that there are five types of individuals: Innovators (2.5%), early adopters (13.5) who serve as role models, the early majority (34%) who willingly follow, the late majority (34%) who follow only when there is some pressure to do so, and the laggards (16%) (Rogers et al., 1983). Mandating participation may help put pressure on these last 50% to attempt change.

Reaching this critical mass would also help the district scale up Inspire and Engage. In addition to improving continuity within the district for teachers and students, having at least 50%

of staff members who are willing and able to implement the instructional strategies desired by the district would mean that each school has a team of home-grown experts who know the district can help translate district goals for individuals new to the system (Garet, 2001). These individuals would also have the expertise to provide on-going support for teachers less able to implement instructional change (Watson, 2001). In addition, they would be able to model and support new norms for practice. For example, during the interview, several of the teachers in Inspire said that they had been approached by other teachers who were not in English Language Arts or Social Studies for help using technology and teaching new lessons.

However, careful planning and mandated participation does not ensure that teachers understand what is being asked of them or that they develop the skills they need to implement change. As such, the district offered fairly extensive professional develop for all participating teachers. Teachers were given release time one day each month to attend training sessions which were located in the district's Grade 3-8 school. This location was chosen so that the elementary teachers in Engage could receive their training on the same days, and in the same building as the middle school teachers in Inspire.

The room itself was cozy. Tables were set up in a circle so that everyone could see each other and participate in discussions. Coffee and snacks were always available on a table on the side. This climate was conducive to having teachers work, share and collaborate. Kristen, the facilitator was always very warm, supportive and encouraging. It was also very clear from her voice, facial expressions and words, that she believed in Inspire, was excited to be working with

teachers and that she truly wanted to be there for teachers to help them learn 21st century teaching and learning.

There was a set lesson ideas for each of the professional development sessions which was used by both Inspire and Engage (Please refer to Appendix F). Kristen herself stated that while she and the other facilitators worked well together and helped each other, this curriculum was the only guidance she received for how to lead these training sessions. In this respect, her experience paralleled that of most districts who receive little guidance in how to select good professional development programs (Bradshaw, 2002; Corcoran, 1995). In their interview, no facilitator was sure exactly when this curriculum was developed or how it was pieced together. Although some seemed to come from the board, other parts were thought to be inserted by the pioneering teacher and past facilitators. However, everyone was in agreement that one component, the digital share, was from the district office.

Each training session began with everyone‘s sharing the lesson (or series of lessons) that they had taught that month that met the criteria for Inspire. As part of their digital share, teachers were asked to post their lesson plan and include how the lesson met the objectives of making instruction focus on critical thinking, authentic tasks, and collaborative inquiry. After each teacher shared the lesson they had posted, the others in the group were invited to comment and make constructive suggestions.

Both district superintendents and all facilitators said that the digital share was meant to make teachers accountable for trying one new Inspire lesson each month. Indeed, there were several teachers who stated in their interview that they felt under pressure to teach something so

that they could post there digital share on the district's Inspire website. This is critical because few teachers are intrinsically motivated to alter their instructional practice.

Pushing teachers to try new lessons is a good beginning; however real instructional change requires that districts help eradicate the strong "close the door" mentality within teaching (Richardson, 2003; Schrum, 1999) and challenge the adequacy of their beliefs and current practices (Ball, 1994). There was little evidence of this during the training sessions. In fact, almost every comment from either Kristen or a teacher was positive or encouraging people to suggest ways to build on this lesson. Overall, everyone was really far too polite. Consistent with research conducted by Blumenfeld et al., 2000), teachers remained reticent to criticize their colleagues. No one pointed out when a teacher's lesson was poor, even if they did have students work on computers in groups.

Interestingly, during the training session on formative assessments, it was clear that teachers understood that having a student do an activity did not automatically mean that they understood the concepts presented. Yet they did not seem to see a parallel to doing a lesson with students in groups did not necessarily mean that students were working collaboratively. This was true of the administrators too. Each principal said that when doing teacher evaluations, they focused on the positives.

In addition, despite making one person in each group be the content expert, subject-specific content knowledge itself was not one of the "Four C's" of Inspire. The district wanted to provide students with a good education but they were already one of the top districts in the state with respect to student achievement. No time was allotted during the training sessions for

research or activities aimed at building teachers‘ subject content knowledge. This has the potential to be a drawback. Constructivist education requires that teachers pose provocative questions as well as guide and assess student understandings. Doing so when students are creators and curators of knowledge, teacher content knowledge must often be both broader and more in-depth.

One thing that the training sessions did very successfully was to ensure that all teachers were able to use the key programs of Inspire mentioned earlier. Each teacher reported being comfortable using them and there was, for almost every teacher, evidence of student work posted on line using almost each key program. This is critical. Since 90% of teachers are self-taught (Statham & Torell, 1996), professional development must improve teacher‘s abilities to use these programs and trouble-shoot problems as they arise.

One surprising finding of this study was why it was so crucial for teachers to be able to trouble-shoot difficulties. Research indicates that teachers will become frustrated when a machine break or malfunction (Blumenfeld et al., 2000; Blumenfeld et al., 1994). However, this study found that the overwhelming source of frustration with the technology stemmed from students not knowing how to use the programs properly or accidentally altering program settings. During the training sessions, teachers had been presented with articles stating how students today were ―digital natives" (Prensky, 2005; Prensky, 2001). Teachers were told by Kristen during the training seven times that students were ―digital natives" and that they would know how to work with technologies and could help teachers trouble-shoot problems when they happened. However, this was not in accordance with the teachers‘ experiences. During their interviews,

four teachers actually mentioned being surprised at how limited their students‘ technology skills were. Selwyn (2005) reported similar findings but this was not research that had been presented to teachers during the training sessions.

Nonetheless, in addition to improving teachers‘ technology skills, professional development for successful instructional change must help improve teachers‘ pedagogical knowledge and skills. Teachers require multiple opportunities and on-going support in order to practice new instructional strategies. It also takes time to synthesize and internalize the reform‘s goals with newly acquired technology and pedagogical skills. The district‘s decision to allow teachers one whole day each month for a year was not only sound, it was far better than providing teachers with isolated workshops. Teachers had time to practice skills, discuss their efforts and participate in critical and reflective discussions about classroom practice.

But this research indicates that the district had a harder time specifying how pedagogical skills should be taught than it did specifying how the professional development should be structured. The analysis of this data set indicates that Inspire tried to do so in two primary ways: The presentation of research and the repetition of Inspire‘s goals. Each training session, teachers were presented with articles on good pedagogy. (These are included in Appendix F). After discussing the ideas presented, teachers then participated in activities which focused on lesson adoption and improvement. Research by Showers et al., (1987) and Loucks-Horsley et al (1998) argue that helping teachers adopt previous lessons in important for change. However, strategies for scaffolding students, managing classrooms and differentiating instruction were opportunistic, occurring almost exclusively when someone posed a specific question.

This was true for curriculum too. Inspire did not include any formal curricular materials. One year earlier, the district office had purchased new Social Studies textbooks that linked course content to lesson plan ideas which utilized technology or which were aligned with the goals and strategies for 21st century teaching and learning. However, many text book publishers cannot assume districts have sufficient technology or equipment so these lessons tend to be optional supplements. Curriculum guides with loosely constructed technological and pedagogical materials may be more likely to be used, but teachers may well leave them out or modify them in ways which are not consistent with the pedagogy behind them (Cohen & Ball, 2007).

In addition, teachers are too busy to do all they are expected to do and plan curriculum as well (Cuban et al., 2001). Teachers in Inspire were given an additional half day each month to collaboratively plan lessons. But these teachers were also the same ones struggling to learn what was being asked of them. They require examples of lessons prepared for them that will be educative as well (Ball & Cohen, 1996). They were also the same teachers who were just beginning to form a learning community of sorts. While teachers reported having made new friends and feeling more comfortable asking others in the group for help with something, they had not really established routines for having critical discussions about the lessons they were teaching or for dealing with conflicts which might arise during these discussions. While I was not invited to sit in on these planning sessions, it would not be unrealistic to imagine teachers getting off topic or just wanting to share what they had done previously and spending only a fraction of their time actually planning new lessons.

One last point about curriculum needs to be made. The district created an Inspire website where digital lessons were posted. Each teacher also had their own tab so that they could post other lesson ideas or rubrics etc. This was a valuable resource for teachers since many reported that they would look on-line there to scavenge for lesson ideas. However, it was created by district personnel and it was not user-friendly. It would have been an excellent idea to have a page for each subject area with a pull-down menu with the topics covered in Grade 7. Then teachers would have a place to post their lessons by subject, rather than by person. This would have facilitates the generation of a quasi text book for the teachers in each subject area.

The last major issue that the district needed to resolve was being able to get everyone on board with the initiative and motivated to continue working towards implementing it as planned. This is critical since what teachers do depends upon what they think and value (Fullan, 1982). This is particularly difficult when participation is mandatory since teachers may resent needing to participate or may feel that the district is implying their teaching is not good enough. Teachers need to be helped to understand the value and benefits of what they are being asked to do (Bitner & Bitner, 2002) if they are to commit to change. This is important because improvements which involve technology force teachers to confront their established beliefs about teaching and learning (Earle, 2000).

Although this research did not set out to measure the extent of teacher change, there was evidence that the teachers who did alter their instructional practices in more significant ways were also the teachers who seemed more open to change and more flexible in how they thought. This finding was in keeping with research by Baylor & Ritchie (2002) and Joyce & Showers

(1987). An important finding from this research is that this was true for principals too. The principals at both Baker and Madison were competent. But Baker's principal saw the benefit of 21st century teaching and learning and was open to changing her school so as to support the initiative, while Madison's principal saw the reform as nothing but a fad dressing up what everyone in the school was already doing. Teacher attitudes toward Inspire appeared to follow suit.

This is not surprising, Sandholtz et al., (1997) conducted research on ACOT classrooms and found that school level administrators played an important role in supporting the innovation. There are many different ways that they can facilitate and support change. They can reinforce the goals of the innovation by using the same language and setting expectations for their staff in terms of compliance. Principals listen to teachers, ease daily frustrations or help resolve barriers to implementation. They can motivate their staff to continue their change efforts by encouraging them and pointing out successes (Elmore & Burney, 1997). Also, principals can help arrange for teachers to have time and space to meet and collaborate.

Principals can also provide a gentle push for those teachers on staff who are the late adopters or the laggards (Schrum, 1999; Rogers, 1983). For example, even though it is difficult to evaluate whether teaching is effective (Fishman, 2003), when conducting teacher evaluations, principals can include performance goals and feedback specific to the initiative and help that teacher to formulate some ways to improve Huberman & Crandall, 1983). Yet, no principal reported that they provided teachers on evaluation with feedback specific to Inspire. No teacher did either.

This was not really surprising since Inspire does not include any real training for school administrators. The original plans for Inspire included instructional walks. During these walks, district personnel, other administrators and teachers would walk through the school visiting classrooms. Afterwards, the entire team would sit down together to reflect and discuss what they saw and to assess the progress that was made.

In addition, these walks and the meetings afterward were intended to afford school administrators support for framing and communicating goals, coordinating curriculum and other resources, monitoring progress, promoting a positive school climate and protecting teaching time. In reality, however, busy schedules meant that few instructional walks took place. This would have been an opportunity to model how to give teachers constructive feedback specific to Inspire. However, the reality of busy schedules, a heavy workload meant that, administrators were left to read their two books on 21st century skills and to find their own mentors in order to build their capacity to lead effectively. This district may not be able to sustain any gains made if it cannot provide its administrators with the professional development they need to effectively support Inspire.

In response to the feedback from teachers and facilitators, the superintendents and facilitators in this school district continue to make changes to Inspire and to the training sessions. Starting in the 2011-2012 school year, there will be one facilitator for every two elementary schools. Each elementary facilitator will spend half a day in each building and professional development will be on site. It is hoped that this will facilitate the creation of a community of

learners as well as allow the facilitators to be in a better position to help plan lessons, coach, trouble-shoot and scaffold teachers as they begin to modify their instructional practices.

The district also hoped that this would enable the district to provide more professional development with fewer teacher pull-out days. This change was made in large part as a response to teachers in both Engage and Inspire. This study found that even though the majority of teachers and administrators reported seeing the value in being pulled out of class for Inspire training, every teacher reported feeling dissatisfaction or discomfort with being out of the class so often.

This also presented one point of contradiction. While three teachers reported that they have parents who have complained to them and the principal about their frequent absences for Inspire training, no principal reported having had received any parent complaints about either Inspire or the teachers‘ absences from class.

Knowing that by the 2012 school year, all students will have had teachers from grades 3-5 and middle school English and Social Studies teachers in grades 6-8, the district has hired an Inspire Administrator from the high school who will coordinate the facilitators and train those high school teachers who wish to volunteer to participate in this reform initiative. In addition, the district is also looking toward encouraging middle school teachers in the other subject areas to utilize more technology and begin supporting instructional change there as well. This year, they have provided all teachers with an interactive whiteboard and the district has plans to provide professional development to all teachers who wish to attend. The district has also purchased more iPod cases which may be shared.

Inspire has many positive features. It is district-wide with long-term commitment. It provides teachers with on-going professional development opportunities which improves technology competencies and which models constructivist instruction. It offers on-going coaching support. It provides teachers with all their technological needs. Inspire also includes structures to help build a strong and collaborative professional culture within the district.

However, none of these guarantees instructional change in the classroom without effective leadership to support and monitor progress. We know that teachers often assign an activity but end up truncating the discussions aimed at helping students synthesize the information since they run short on time (Blumenfeld et al., 2000). This study indicates that this happens in administration too. District personnel intended to utilize instructional walks to help train administrators. However, individuals at all levels were too busy to schedule these with any consistency. As such, principals were left to find their own mentors from whom they could seek advice. Even the professional development was truncated. Teachers attended training sessions and had access to coaching support for one year. Many worried how they would be able to continue experimenting and improving their instructional practice without these supports the following year.

Lastly, like so many other reform initiatives, this one developed as it grew. While this afforded the opportunity to discover and correct for problems as they occurred, not all aspects of the planning were either coherent or well-thought out. For example, middle school teachers were selected according to how many teachers could be trained by one facilitator. This made it seem as if the district favored these teachers and led to a great deal of resentment amongst other

teachers in the middle schools. Another example is that it created specific professional learning communities in the middle schools to address problems of practice. However, teachers were left to run these meetings without guidance.

The district is expanding this initiative across both grade levels and content areas and is continually equipping its schools with more technology. While many teachers did utilize more technology and assign more group work, they tended to alter their instructional practices in fairly superficial ways. The success of Inspire will depend upon the district's ability to coordinate efforts, the principal's abilities to promote and support teacher change and collaboration, and teacher's motivation and abilities continue to learn and experiment.

5.3 Limitations:

In recent years, gaining access to districts has become increasingly difficult. Gaining access to conduct research in districts attempting to implement large-scale reform initiatives aimed at significant instructional improvement can be even more challenging. District permission to conduct this study was a gift. However, it did come with some restrictions which impact the research.

I was not granted permission to sit in on actual classroom lessons and develop a firsthand record of teachers' instructional practice and interactions with students. While it was possible to obtain a good record of teacher beliefs and their accounts of the work assigned they assigned, how they assessed students and their instructional and classroom management strategies, it was

not possible to assess the veracity of their statements or reflect upon the possibility that there is a disconnect between teachers‘ perceptions of their instructional practice and what they actually do in the classroom. Nor was it possible to collect first-hand data on teachers collaborated with the facilitator for planning, modeling lessons or brainstorming solutions to class management problems. Had permission been granted, this would have improved both the trustworthiness and the quality of this research.

Another limitation of this study is its focus on one year of implementation. While this research is able to provide a view of this initiative at one grade level at one particular point in time, it would have been beneficial to study teacher practice before participation in Inspire and for the year afterwards in order to gain an understanding of the impact participation had on teachers‘ instructional practice over time. This would be a most beneficial and worthwhile topic for future research endeavors.

5.4 Suggestions for Future Research:

This model is not fixed. Although this study provides a snap shot of one part and one year of this initiative, the district is continuing to extend Inspire and expand the amount and types of technologies available to teachers. While this model may not perfect, it does seem to provide a positive exemplar of how schools and districts can provide their staff with on-the-job professional development for technology and constructivist instruction. As more districts begin to equip their schools with technologies, it would be very valuable to see how this model for professional development might be utilized by another school district. Studies of this nature

would enable educators to begin to modify current models of in-field professional development so as to improve their effectiveness in generating significant and sustained instructional improvement.

Future research could explore the effect(s) of these changes on the implementation of Inspire. It would be valuable to know if a similar model for training was effective at the high school level, if the additional of an administrator position aids in coordinating and standardizing the reform initiative across the 14 schools in the district or if there is indeed a critical mass of teachers required for systemic change to flourish and be sustained.

It would also be valuable to follow these same Inspire teachers over the course of another year. Since all training and support occurs in the first year alone, teachers find that they are suddenly on their own trying to do their work and develop curriculum. Future research investigating how this affects teacher‘s classroom instruction and whether they returned to more traditional practices would help to evaluate and modify the effectiveness of Inspire.

Another avenue to be pursued is look at other districts whose initiatives include teacher evaluation and administrator professional development. These were not significant components of Inspire. However, when administrators are better able to support and coordinate teacher efforts and provide critical feedback, they are better able to provide a gentle push toward continued improvement.

Further, research shows that professional learning communities and structures for collaboration are important for sustained reform. Studying these teachers for several years

would provide valuable insights into how the professional learning community built during their year in Inspire, worked to support on-going teacher learning.

Future research could also study students over a two or three year period of time. Following students during their last year of high school and their first year of university would provide a chance to explore how an emphasis on technology and project-based learning impacted their future achievement. Following a cohort of students from the beginning of Grade 3 (the first year of the initiative) through Grade 4 would allow researchers to better understand how students react to the shift in role that active learning expected of them and how teachers were best able to develop their critical thinking skills. In addition, future research might also investigate how students who enter the district at the middle or high school level adjust to new classroom instructional practices.

America has many outstanding teachers and impressive schools. Researchers have studied what makes many of them effective. Our problem is that the country craves thousands of them. As such, one of the primary goals of future research on the effective use of technology to improve instruction will be to help educators identify what key features might be scalable and to improve our understanding of how this may be accomplished.

APPENDIX A
Teacher Interview Guide

Background Information:

Can you please tell me about your teaching experience? (Where you taught, how long, what grades)

Have you ever worked in another district? For how long?

Understanding of Inspire and 21st Century Skills:

I know a lot about Inspire but could you please tell me about some of the other initiatives the district is trying to implement right now? [Do you think the district's doing too many initiatives this year?]

Can you trace the history behind the development of Inspire for me?

If you had to explain Inspire to a parent or another educator, what would you say?

What do you think was the motivation behind the development of Inspire?

What were your thoughts when you first found out that you would be expected to implement Inspire and 21st century learning?

How do you think others on staff or in administration think about Inspire?

Did you have the opportunity to attend the Alan November Summer Conference or the two week summer camp? What was that experience like? How has it been helpful to you?

Classroom Implementation:

I'd like to talk a little bit now about how you have been trying to implement Inspire in your classroom.

Walk me through how you planned and conducted a lesson last year, before Inspire.

Now can you walk me through how you would now structure that lesson so as to bring in 21st century learning skills? [If Inspire reinforces what they were taught in their education training program, ask if/how Inspire helps them to improve their teaching beyond what they were taught.]

Do you notice any changes in how you go about planning a lesson [or has it mostly impacted classroom assignments]?

Do you find there have been any changes with regard to the pacing of your lessons? [Has it taken more class time, taken longer to cover a unit?]

Do you find that you are able to cover the curriculum well using Inspire?

Have you modified the kinds of classroom assessments and strategies you use for evaluating student work?

How would you balance Inspire with the idea of being able to take quizzes or tests or being able to perform on the MEAP? Are you finding that a difficult balance?

I'd like to ask you about the quality of the work your students are producing. I'm thinking of Prensky's levels and I'm wondering if you are seeing the same work in a different format or do you see a difference in what they are producing and how they are thinking about it. What changes, if any, have you seen in your students' skills?

What types of assessment assignments do you think force students to do their best work (the most research, forge better connections, most attention to detail..)?

What about classroom management. Part of the idea behind 21st century learning is that it engages students. Do you find any changes in student engagement in your classes?

Have you had to modify your classroom management strategies when teaching an Inspire -type lesson-for group work in particular?

How do your students feel about doing group work [and getting an individual grade]?

Do you think students do a better job when they work in a group or when they know it's going to be posted and other students are going to see it or maybe even be commenting on it?

Do you assign the projects or questions or do they generate them themselves? How do they feel about/respond to not being told exactly what to do?

How have you been teaching/utilizing the Habits of Mind in your classroom teaching? Is it something you're conscious of and try to make part of your lessons? [Might want to tie into when they say some students are just fast and sloppy/some will always do well.]

Do your students perceive a need to know how to assess the relevance and accuracy of a site?

Do you work with any teachers outside of Inspire training days in order to plan classroom lessons together?

Do you use the wikis and lesson plans from other teachers in order to help you build your class lessons?

Are you developing any on-line resources for your students such as podcasts of any of your lessons?

What has been the most challenging aspect of implementing Inspire?

In what ways have the training days been most helpful to you/met your learning needs?

If you were in charge of next year's training sessions, what would you do differently?

Has an Inspire facilitator come in during a lesson in order to help you? Can you tell me why/ what happened? Has anyone come in to assist you, teach a lesson to your class or watch you?

If you're having trouble, is there someone you can ask or who can come in and help you troubleshoot?

In addition to the training sessions with Kristen, what other resources (conferences, books, programs, equipment) have you been given to help you implement Inspire? Have they been helpful?

Do you have the resources that you need in order to implement Inspire in your classroom the way you want to? What additional resources (conferences, books, programs, equipment) do you wish you had been given?

Do you feel under any pressure to teach in a particular way because of Inspire? Can you explain why you say this?

If you could sneak a peek at yourself teaching a lesson five years from now, what do you think it would look like?

[How would you feel if, instead of the training days, you were paired up with a mentor teacher who could help you and work with you on a more regular basis?]

[Do you think that Inspire is one of those things that gets talked about but doesn't get implemented?]

District and School Supports:

Can you tell me a little bit about your principal and vice principal.

How would you describe them as leaders? What is their style of leadership?

What role has the principal/vice principals played in the implementation of Inspire?

Some people talk about school learning communities. These schools are often described as places where teachers have shared values such as a focus on student learning, an atmosphere of reflection and collaboration, and a commitment to continuous staff learning and improvement. Would you describe your school as a learning community?
If yes, how so? What opportunities are there for self-directed professional learning, program development or research? What opportunities do you have to collaborate with others on staff?
If no, why not? What do you think it would take to turn your school into a learning community?

In terms of being a learning community, how do you think your school compares to others in the district? Are they learning communities too?

I do not know if you are under evaluation this year, but has an administrator been into your class to observe you teach a lesson?
If yes, what feedback did you receive? Did you receive any feedback specific to Inspire?

Have you had any conversations with the principal or vice principal regarding Inspire?
If yes, can you tell me a little about them?

How about with the department head?

In what ways do your principal, vice principals or department head support the staff as it tries to implement Inspire?

Is there anything else you think your principal, vice principals or department head could be doing [to support the staff as it tries to implement Inspire]?

What role does the librarian/media specialist play in the school in terms of supporting the your classroom teaching, providing resources for both you and the students, and helping brainstorm ideas or to troubleshoot when there is a problem with the technology?

Can you tell me whether you are in a PLC and what your group is examining?

Communication with Parents:

Did you mention Inspire and/or 21st century skills to parents on curriculum night?
If yes, what did you talk about?
If no, why did you decide not to?

Did any parents ask you about Inspire and/or 21st century?

What feedback about Inspire have you received from parents?

Do you think Inspire is a selling feature for the district's schools?

How do you think they feel about the changes to curriculum that have been happening in the district over the past couple of years?

I don't want to take up too much of your time, but I do have one last question for you. Could put a finish the sentence question such as I love the program but I want you to know that… I would suggest that next year we…

APPENDIX B
Facilitator Interview Guide

Inspire:

Can you briefly trace the history behind the development of Inspire for me?

What is your understanding of the district's goals for Inspire?

Are these different in any way from your goals for Inspire?

How did you come to be facilitators?

What training did you receive? From what sources?

Training Sessions:

How was the "curriculum" for the training sessions developed?

How are you choosing the research that you are presenting in the training sessions? (Prensky, TPACK)

Some people talk about "take away" points. By this, they mean the points that they want a person to remember six months after the course. What are the "take away" points that you want the teachers to come away with?

Are these specifically used as the basis for the training sessions?

What do you see occurring during the training sessions?

21St century learning is more than using technology. It requires that teachers teach differently (more student-led, more co-operative, more authentic etc.). Have you noticed that, for some teachers, this has led to a conflict of values?

Do you try to address this in the training sessions?

In what ways to you help teachers to identify this confusion and to diffuse stress/ frustration?

What do you think is working well?

Is there anything that you do not think is working well?

What feedback have you received from teachers regarding the training sessions?

Implementation in the Schools:

What percentage of teachers is requesting your help in their classrooms? In what capacity?

In what ways/to what extent do you think teachers are reshaping their classroom teaching?

In what ways/to what extent do you think teachers are focusing on the Habits of Mind in their classroom teaching? Is it something you think they are conscious of and try to make part of their lessons? Is it part of the on-line lesson plan template? How can this aspect of the program be strengthened?

What are the plans to support these teachers in continuing to implement Inspire and improve their instructional practice next year?

What do you think will happen next year when these teachers are no longer attending the monthly training sessions and receiving monthly support and modeling?

What would you do differently next year?

The District:

Have you met with any of the principals in order to co-ordinate your efforts in terms of supporting teachers as they implement Inspire?

Have the school administrators given you any feedback regarding the implementation of Inspire or the training sessions?

Do you see any differences across the schools in terms of how/the extent to which Inspire is being implemented? If yes, what do you think accounts for these differences?

Have you noticed any change in the school climate/school norms for teaching, collaborating and reflecting (Schools as a learning community)?

Have you met with any of the superintendents regarding Inspire? Have you received any feedback from a superintendent regarding the implementation of Inspire or the training sessions?

Originally, the superintendent had mentioned that there would be instructional walks? Are these being done? How often? By whom? Any feedback?

What do you wish you had had? What additional resources (conferences, books, programs, equipment) do you wish you had been given/would you require in order to fully implement Inspire?

Is there anything else that you think needs to happen in order to implement Inspire well?

If you worked in the district office, what would you do differently?

Is there anything else that you would like me to know? Let the district/schools know?

APPENDIX C
Administrator Interview Guide

Background Information:

How many years have you been working this district?

How many years have you been the principal here?

Where were you an assistant principal? For how long?

What principal training have you received/taken?

Does the district provide any administrative training or supports?

Have you had anyone who has been a mentor to you?

Understanding of Inspire and 21st Century Skills:

Did you have the opportunity to attend the Alan November Summer Conference or hear him talk when he came out here in September? What was that experience like? What was it hoped the staff would come away with?

What is your understanding of Inspire and its goals? The district's?

How do you think your staff thinks about Inspire? Parents?

What were your goals this year with respect to Inspire?

Implementation:

How is the implementation of Inspire at your school going?

How have the teachers responded? Students?

What do you think is working well?

Is there anything that you do not think is working well?

What feedback have you received from teachers regarding the training sessions?

Have you met/spoken with Kristen to find out information about the training sessions or to ask how teachers are doing?

Originally, the superintendent had mentioned that there would be instructional walks? Are these being done? How often? By whom? Any feedback specific to the implementation of Inspire?

Are any of your Inspire teachers on evaluation this year?

When you go it to observe their teaching, do you have criteria specific to Inspire which you evaluate?

Did you feel under any pressure to get all teachers on board with this reform initiative? Can you explain why you say this?

In what ways/to what extent do you think teachers are reshaping their classroom teaching in significant ways?

Do you think Inspire may allow teachers to modify curriculum, individualize teaching to suit learning styles and interests or to better assess student learning?

Have you noticed any change in Inspire teacher‘s attitudes towards Inspire, what good teaching looks collaborating with others, reflecting on why they give the assignments they do etc?

21St century learning is more than using technology. It requires that teachers teach differently (more student-led, more co-operative, more authentic etc.). Have you noticed that, for some teachers, this has led to a conflict of values about what makes for good pedagogy?

In what ways to you help teachers to identify this confusion and to diffuse stress/ frustration?

What are the plans to support these teachers in continuing to implement Inspire and improve their instructional practice next year?

What do you think will happen next year when these teachers are no longer attending the monthly training sessions and receiving monthly modeling and support?

The School:

How are you and the principal/vice principal trying to create a common vision of Inspire for the school?

How are you and the principal/vice principal trying to create a learning community here?

Have you had any staff meetings/formal conversations aimed at supporting your staff's efforts to change what they are doing in the classroom? Can you tell me a little about them?

Do you see any differences across the schools in terms of how/the extent to which Inspire is being implemented? If yes, what do you think accounts for these differences?

Are there any changes that the district could make to help schools implement Inspire?

If you could sneak a peek at this school five years from now, what do you think Inspire would look like? (For example, will all teachers be included in the program? Will there be extensive new curriculum?)

District Supports:

Is there good communication between the schools and the district office? For example, do you feel you are kept up-to-date/allowed to give input on decisions made by the district?

Has a superintendent been to the school to specifically discuss/observe/assess your progress implementing Inspire? If yes, what Inspire feedback did you receive?

What supports have you had from the district? Have they been helpful?

What do you wish you had had? What additional resources (conferences, books, programs, equipment) do you wish you had been given/would you require in order to fully implement Inspire?

Is there anything else that you think needs to happen in order to implement Inspire well?

If you worked in the district office, would you do anything differently?

How do you see the new Inspire Administrator working?

Is there anything else that you would like me to know about the district?

Communication with Parents:

Did you mention Inspire and/or 21st century skills to parents on curriculum night?
If yes, what did you talk about?
If no, why did you decide not to?

What feedback about Inspire have you received from parents?

Have the parents expressed any concern over how their child will do on standardized tests or with assessment being based upon group work?

Is there anything else you would like me to know about how parents have responded to Inspire?

APPENDIX D
Survey Instrument 1

For each question below, please circle the number between 1 and 5 which best matches your beliefs. **You may circle 6 as a SECOND response wherever applicable.**

1=strongly disagree
2=disagree
3=neither agree nor disagree
4=agree
5=strongly agree
6=more so now after this past year in Inspire

TK1. I know how to solve my own technical problems.	1	2	3	4	5	6
TK2. I can learn technology easily.	1	2	3	4	5	6
TK3. I keep up with important new technologies.	1	2	3	4	5	6
TK4. I frequently play around with technology.	1	2	3	4	5	6
TK5. I know about a lot of different technologies.	1	2	3	4	5	6
TK6. I have the technical skills I need to use technology.	1	2	3	4	5	6
TK7. I have had sufficient opportunities to work with different technologies.	1	2	3	4	5	6
PK1. I know how to assess student performance in a classroom.	1	2	3	4	5	6
PK2. I can adapt my teaching based-upon what students currently understand or do not understand.	1	2	3	4	5	6
PK3. I can adapt my teaching style to different learners.	1	2	3	4	5	6
PK4. I can assess student learning in multiple ways.	1	2	3	4	5	6
PK5. I can use a wide range of teaching approaches in a classroom setting (collaborative or project-based learning, direct instruction, inquiry learning..)	1	2	3	4	5	6
PK6. I am familiar with common student understandings and misconceptions.	1	2	3	4	5	6
PK7. I know how to organize and maintain classroom management.	1	2	3	4	5	6
PCK1. I know how to select effective teaching approaches to guide student thinking and learning in Language Arts/Social Studies.	1	2	3	4	5	6
TCK1. I know about technologies that I can use for understanding and doing Language Arts/Social Studies.	1	2	3	4	5	6
TPK1. I can choose technologies that enhance the teaching approaches for a lesson.	1	2	3	4	5	6
TPK2. I can choose technologies that enhance students' learning for a lesson.	1	2	3	4	5	6

TPK3. I am thinking critically about how to use technology in my classroom.	1	2	3	4	5	6
TPK4. I can adapt the use of the technologies that I am learning about to different teaching activities.	1	2	3	4	5	6
TPACK1. I can teach lessons that appropriately combine English/Social Studies content, technologies and teaching approaches.	1	2	3	4	5	6
TPACK2. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.	1	2	3	4	5	6
TPACK3. I can use strategies that combine content, technologies and teaching approaches that learned about in my coursework in my classroom.	1	2	3	4	5	6
TPACK4. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.	1	2	3	4	5	6
TPACK5. I can choose technologies that enhance the content for a lesson.	1	2	3	4	5	6

APPENDIX E

Survey Instrument 2

For each question below, please circle the number between 1 and 5 which best matches your beliefs. Go with your first judgment and do not spend much time mulling over any one statement. PLEASE ANSWER EVERY QUESTION.

1=strongly disagree
2=disagree
3=neither agree nor disagree
4=agree
5=strongly agree

1.	Students have more respect for teachers they see and can relate to as real people, not just as teachers.	1	2	3	4	5
2.	There are some students simply do not have the capability to learn.	1	2	3	4	5
3.	I can't allow myself to make mistakes with my students.	1	2	3	4	5
4.	Students achieve more in classes in which teachers encourage them to express their personal beliefs and feelings.	1	2	3	4	5
5.	Too many students expect to be coddled in school.	1	2	3	4	5
6.	If students are not doing well, they need to go back to the basics and do more drill and skill development.	1	2	3	4	5
7.	In order to maximize learning, I need to help students feel comfortable in discussing their feelings and beliefs.	1	2	3	4	5
8.	It's impossible to work with students who refuse to learn.	1	2	3	4	5
9.	Addressing students' social, emotional, and physical needs is just as important to learning as meeting their intellectual needs.	1	2	3	4	5
10.	If I don't prompt and provide direction for student questions, students won't get the right answer.	1	2	3	4	5
11.	Helping students understand how they learn is as important as working on their academic skills.	1	2	3	4	5
12.	Knowing my subject matter really well is the most important contribution I can make to student learning.	1	2	3	4	5
13.	Technology can help students who are uninterested in learning get in touch with their natural motivation to learn	1	2	3	4	5
14.	No matter what I do or how hard I try, there are some students who are unreachable.	1	2	3	4	5
15.	Knowledge of the subject area is the most important part of being an effective teacher	1	2	3	4	5

16. Students will be more motivated to learn if teachers get to know them at a personal level.	1	2	3	4	5
17. Innate intelligence and ability is fairly fixed.	1	2	3	4	5
18. One of the most important things I can teach students is how to follow rules and to do what is expected of them in the classroom.	1	2	3	4	5
19. Teachers shouldn't be expected to work with students who consistently cause problems in class.	1	2	3	4	5
20. Good teachers always know more than their students.	1	2	3	4	5
21. Being willing to share who I am as a person with my students facilitates learning more than being an authority figure.	1	2	3	4	5
22. I know best what students need to know and what's important; students should take my word that something will be relevant to them.	1	2	3	4	5
23. For effective learning to occur, I need to be in control of the direction of learning.	1	2	3	4	5
24. I am responsible for what students learn and how they learn.	1	2	3	4	5
25. I believe that students should be able to solve their own problems.	1	2	3	4	5
26. I am confident that I can use technology as an effective teaching tool.	1	2	3	4	5
27. I am confident that I can develop effective lessons that incorporate technology.	1	2	3	4	5
28. I am confident that I can use technology effectively to teach content across the curriculum.	1	2	3	4	5
29. I am confident that I can overcome difficulties using technology in the classroom (time, scheduling, accountability..).	1	2	3	4	5
30. I am confident that I can manage the grouping of students while using technology as a teaching tool.	1	2	3	4	5
31. I am confident that I can meet the challenges of technology integration.	1	2	3	4	5
32. Computers can provide instruction suited to individual students' needs.	1	2	3	4	5
33. Computer use promotes student-centered learning and self-discovery.	1	2	3	4	5
34. Computers can enhance my students' creativity and imagination.	1	2	3	4	5
35. Computers can engage my students in collaborative work.	1	2	3	4	5
36. My students can learn problem-solving more effectively with computers.	1	2	3	4	5
37. Writing is easier for my students when they use computers.	1	2	3	4	5

38. Students write less when they use computers.	1	2	3	4	5
39. I encourage and model smart choices about the tools students might use to accomplish tasks, using books, a spreadsheet or digital information when each one is the best.	1	2	3	4	5
40. I encourage students to use the Internet and e-mail to communicate with experts, other students and people from around the world to enrich their learning.	1	2	3	4	5
41. I expect students to organize their thinking using Inspiration and other software program to make mind maps.	1	2	3	4	5
42. I ask students to use networked computers to explore important questions and issues arising out of the content of my class.	1	2	3	4	5
43. I am making more time now than I used to for students to do more of the thinking, analyzing, interpreting, inferring, and synthesizing of information.	1	2	3	4	5
44. I am getting quite good at recognizing worthy uses of new technologies while avoiding the silly, trendy uses that waste time without delivering much of value.	1	2	3	4	5
45. I am a more effective teacher when I am using technology in my classroom.	1	2	3	4	5

APPENDIX F
Outline of the Monthly Training Sessions

September:

- Getting to know each other
- Introduction to Inspire
- Introduction to the Inspire website and its resources
- How to post a Digital Share

October:

- Digital Shares and Feedback
    - One at a time, teachers come in front of the group and share the 21st century teaching and learning lesson that they did that month. These are also posted on the district website so that others can reference them if they wish to try that lesson.
- Online Discussions
    - Handout-MacKnight, Carol (2000). Teaching critical thinking through online discussions. *Educause Quarterly*, 4, 38-41.
    - Handout- Tuttle, H.G. (2006). Improving student learning with online discussions. *International Society for Technology in Education*, April, 25-27.
    - Teachers were asked to pick one of the articles and discuss it with someone else. Then the whole group discussed the pros and cons of online versus face-to-face discussions. After this, they were asked to take the opposite side to argue. They concluded that it is not which is better but how to use both because it is good to utilize both modalities. For example, talking can help improve writing and vice versa.
    - Handout-*Net Cetera: Talking with Kids about Being Online* available online at www.onguardonline.gov
- Habits of Mind
    - Handout- Costa, A.L. & Kallick, B (2000). *Describing 16 Habits of Mind*. Retrieved from http://www.habits-of-mind.net/pdf/16HOM2.pdf. This was followed by a brief discussion of the strategies that people have that help them to make decisions solve problems and deal with real-life situations. Some Habits of

Mind are: Persisting, managing impulsivity, listening skills, metacognition, and applying past knowledge to new situations.

- Wiki Fun-Online Lesson Templates
  - The teachers looked at the online lesson templates. The facilitator showed them where the GLCS and the Inspire objectives were listed as a tab for their easy reference.
- Cross-District Planning Time

November:

- Introduction to the dynamics of teamwork
  - Teachers watched a short video clip which was a compilation of quotes and comments about team work [Ex: together everyone achieves more; talent wins games but teamwork wins championships; sticks in a bundle are unbreakable].
- Follow-Up Activity
  - In teams of three, teachers were asked to choose a technology tool and decide how they would use, model and explicitly teach teamwork in their classrooms.
  - Teachers presented three aspects of the practices of ~~–d~~oing" teamwork in the class. Discussion included how to structure the classroom, organize the task and the groups, evaluate the task, resolve conflict and be supportive, teach listening and communication skills, and how to manage the culture of the class with respect to popularity, fitting in, wanting to be liked, gender equity etc.
- Creation of a Team Work Rubric
  - This information was combined and the teachers created a rubric for working collaboratively that they could use in their classrooms. [For example, what would you write to get at consensus-building?]
  - Teachers were given 3 handouts: A P21 Teamwork rubric, and Inspire teamwork rubric and a discussion rubric.
- Using Technology Tools to Improve Instruction- Marc Prensky
  - Handout- Article- Prensky, Marc (2005). Shaping tech for the classroom. Downloaded from http://www.edutopia.org/adopt-and-adapt on Nov. 11, 2009. This article listed 4 stages of tech implementation: a) Dabbling to see what tech can do b) Doing old things in old ways-such as using a white board as a black board c) Doing old things in new ways- such as doing a podcast instead of a journal entry, and d) Doing new things in new ways such as using clickers to assess understanding as you teach.
- Reflection Activity

    - Teachers were asked to think of a lesson that they have taught, identify what stage it was at, and brainstorm how it could be adapted to take it up a stage? What would it look like at each of the stages?
- Digital Shares and Feedback
- Cross-District Planning Time

December:

- Digital Shares and Feedback
    - As each person presented, teachers were asked to think about Marc Prensky's four stages. They were asked to post their feedback (specific to these four stages) for the individual who presented and to respond to those that commented on their share.
- Wiki Dig
    - Teachers were asked to work in pairs to search for two sites that would promote deeper, richer learning experiences for students. They were then asked to post the links onto the district's Wiki Dig Challenge page. (Some example were Amazon News and News Cast.)
- Activity Types
    - Teachers split into their subject area groups. Each group then watched a four minute video that was posted on the district wiki which emphasized varying instructional strategies in order to better differentiate the curriculum and illuminate connections. Teachers were then asked to read the following handout for their subject area.
    - Handout-Young, C.A., Hofer, M. & Harris, J. (2009*). Secondary English language arts learning activity types*. Retrieved from the College of Mary, School of Education, Learning Activity Types Wiki http://activitytypes.wmwikis.net/file/view/SecEngLangArtsLearningATs-Feb09.pdf
    - Handout-Hofer, M. & Harris, J. (2009). *Social studies learning activity types*. Retrieved from the College of Mary, School of Education, Learning Activity Types Wiki http://activitytypes.wmwikis.net/file/view/SocialStudiesLearningATs-Feb09.pdf
    - Teachers were asked to use these activity types to develop a lesson that they could take back to their classrooms. They were asked to start with their objectives and to link their lesson to specific GLCS and 21st century learning goals. Teachers were asked to try to include how student learning will be assessed.

- Round Robin Lesson Share
    - Teachers presented their lesson and on-line resources to the larger group.
- Cross-District Planning Time

January:

- Housekeeping
    - Teachers had an opportunity to talk about some of the technical problems they had encountered and share ideas for how to solve them.
- Digital Shares and Feedback
    - After the presentations, teachers were asked to read someone else's and comment on it. They were also asked to reply to those that commented on theirs.
- New Year's Resolutions on Moodle
    - Goal setting for the New Year. Teachers were asked to reflect, develop, and post two or three personal goals for what they would like to do with their classes and how they might be able to contribute to the district community.
- Podcasting
    - Teachers were given a list of podcasts. They were given time to listen to them individually.
    - Teachers shared which ones they liked and why? They then discussed what made for a good podcast and what elements could detract from one.
    - Handout- Rubric for Podcasts. (source unknown) The categories given were introduction, content, delivery, technical production, and partner or group teamwork.
    - Teachers were then asked to create their own podcast to demonstrate for their students what makes for a good podcast.
    - Large group discussion regarding the positive and negative aspects of what they found out about podcasting and whether the rubric needed any modification.
- Audacity Tutorial
    - Handout-Article: Yancey, Kathleen Blake (2009*). Writing in the 21st century: A report from NTCE*. Retrieved in February from http://www,ntce.org. This article talks about the new age of literacy using technology to compose, network and organize.
    - Handout- List of questions for each pair of teachers to explore: How new models for composing could be integrated into the curriculum and the classroom? How the process for _digital' writing compared to that for writing? How particular

tools enable particular genres of writing? What norms need to be established, practiced and discussed for these tools to be effective teaching tools?
    - Discussion- Teachers worked in pairs to discuss these questions.
    - Teachers then recorded their answers as a short podcast using Audacity and posted it to the district wiki.
    - Whole group share followed by a group discussion.
    - Handout- Article- Reeves, J & Dixon, C. Developed for the Greece Arcadia Public School Library in Rochester, NY. Downloaded from Claudine.Dixon@greece.k12.ny.us
- 21st Century Learning Logo
    - The district wished to find a way to communicate to parents and potential homeowners in the area what 21st century learning means to the district and to educators. Teachers were asked to try to design a logo or graphic to give their input on what they felt should be included.
    - People then shared their ideas for the logo.
- Cross-District Planning Time

February:

- Digital Shares and Feedback
    - Speed sharing-Teachers were asked to share three activities or lessons that they have done. One person shared, the other picked the one they wanted to learn more about. Then the other person in the pair shared. Then one side of the table shifted one space and the process was repeated. The intent was to enable teachers to be able to know who to go to if they wanted to know more or to try what they had done.
    - Whole group discussion. Each teacher had a turn to state which idea they really liked, who had done it, and to give positive feedback.
- Using Technology Tools to Improve Instruction-TPACK Framework for Technology Integration
    - Developed by Dr Punya Mishra and Dr. Matthew Koehler at Michigan State University. This model proposes that thoughtful pedagogical uses of technology require the development of a complex, situated form of knowledge that involves the interplay of three main components of the learning environment: technology, pedagogy and content.
    - Handout- Teachers were given a sheet which was to be used for taking notes on the definitions and examples of technology knowledge (T), pedagogical

knowledge (P), content knowledge (CK), and the combination of these three (TPACK)
    - Harris video clip on the TPACK framework. Teachers used this sheet to take notes on the information from the video.
    - Handout- TPACK Webquest Worksheet. This handout listed five online lessons and provided spaces for teachers to comment on its strengths, weaknesses, overall quality and how they would improve each.
    - Teachers divided into three groups and explored five lessons. Each group took one of three possible roles (technology expert, pedagogy expert, or content expert) and ranked them according to their expert point of view.
    - Teachers then met in heterogeneous groups of three (one of each expert) to decide which lesson was best according to the TPACK framework. The stated goal was to put aside our own views and come to a consensus using the TPACK framework.
- Cross-District Planning Time

March:

- Digital Shares and Feedback
    - Teachers were asked to look at three digital shares posted for March and to find at least 3 lessons/activities on the March Digital Share page and to add comments and/or questions under the discussion tab that will help that teacher to enhance their lesson.
- TPACK Take 2
    - On a card, teachers wrote down one lesson that they were thinking of doing in their classrooms in the upcoming month. Copies of both Activity Types handouts (from December's training session) were handed out for reference.
    - Teachers then met in groups of three. Each person was asked to take one of three possible roles (technology expert, pedagogy expert, or content expert) and to analyze each lesson according to their role. Each person was then to suggest ways to enhance, deepen, strengthen, differentiate, expand, and enrich each lesson.
    - Teachers were then asked to post their collective thoughts on each lesson under the discussion tab on the district wiki.
    - Each teacher then had time to go back to their lesson and read the collective comments that were made. Teachers were asked to reflect on the ideas presented and to decide how they wished to modify their lesson. Teachers were then asked to post their lesson on the district's curriculum page.

- Cross-District Planning

April:

- Revisiting New Year's Resolutions
  - Teachers were asked to reflect on their resolutions, see where they had made progress and add more detail to the steps that they would need to make the others happen.
- Survey
  - With only two months left, teachers feedback was solicited so that their needs could be better addressed and they could get support where they felt they needed it.
  - The survey indicated that teachers wanted more training on using formative assessment and giving students tasks that were authentic and/or global.
- Digital Shares and Feedback
- Using Technology Tools to Improve Instruction - The SAMR Model for Transforming Instruction
  - Handout- Puentedura, R. (2009). TPACK and SAMR: The four stages of the SAMR model. Downloaded from http://hippasus.com/resources/actem2009/TechnologyChangeProcess.pdf
  - The four stages are: a) Substitution-technology is a tool substitute. There is no functional change b) Augmentation-Technology acts as a tool substitute with functional improvement c) Modification- Technology allows for significant task redesign and d) Redefinition- Technology allows for the creation of new tasks previously inconceivable. These were compared to Marc Prensky's four stages (See November).
  - Teachers received an index card on which to write down 2-3 lessons they had recently done with their classes. In groups, they read the handouts, discussed the levels and then applied them to the lessons they had written down to see what stage they represented. Lastly, teachers were asked to consider what they could do to redefine and transform the lessons they had taught.
- Citation Workshop
  - Conducted by the media student teacher, this tutorial was aimed at helping teachers and students handle writing citations properly in situations when the original author and/or date for a citation is not clear. This workshop was also recorded and posted as a podcast on the district wiki.
- Cross-District Planning Time

- Interactive White Boards and Promethean Boards Information Session
    - This talk was given by the Superintendent for Technology so as to demonstrate both tools. Included was a demonstration on using a clicker response system for formative assessment. Teachers were allowed to ask questions and were then asked to give their thoughts and preferences for the board to consider before purchasing any system or equipment.

May:

- Digital Shares and Feedback
    - Handout- Directions for how to use Poll Everywhere. After each digital share, teachers voted on the three strengths of the lesson using Poll Everywhere. Voting options were: communication, collaboration, student centered, critical thinking, problem-solving, multimodal, inquiry based, creative, and interdependent.
- Formative Assessment in the Differentiated Classroom
    - Video Clip by Rick Wormeli. Downloaded from http://www.youtube.com/watch?v=rJxFXjfB_B4 The video argues that teachers spend most time designing summative ones but that the formative ones give the most information and improve learning the most. It describes good formative assessments as those involving descriptive feedback that helps kids know the goal, what they did in relation to it and what needs to be done to close that gap. Ideally, kids should then be allowed to edit their work and be assessed anew so that there are many checks for learning.
    - Teachers were given a handout with a variety of sites that lent themselves to formative assessment. They were given time to look at several sites. For example, they looked at Moodle Chat which allowed kids to post questions during a lesson so that the teacher could look at them and then come over to clarify concepts and/or answer questions. They were also shown where resources and links were posted on the district wiki.
- Global Audiences
    - Handout-Jigsaw: Global Connection (no source)
    - Teachers were shown several sites which could be useful for giving students global, authentic audiences. Some examples were Cityquest, Voicethread, ePals and GlobalSchoolNet.
- Cross-District Planning Time

June:

- Attendance was optional. The goal for this session was to help teachers clear the year's accounts and set up their class wikis and Moodles for the coming year.

APPENDIX G
Coding Scheme for Transcripts and Interviews

Defining Inspire:

Factors	Characteristics	Dimensions
How understood by the district	Four C's	Collaboration Communication Critical thinking Creativity
	Integration of multiple technologies to improve teaching and learning	Teaching, not technology Multimodal/differentiated Authentic tasks Global Learning is student-driven Formative assessments
How understood by the Inspire teachers	Four C's	Collaboration Communication Critical thinking Creativity
	Integration of multiple technologies to improve teaching and learning	Teaching, not technology Multimodal/differentiated Authentic tasks Global Learning is student-driven Formative assessments
Consistency of messaging	District website, district wiki, administrator PD, teacher PD, research and readings, Alan November Conference, Board meetings	Collaboration Communication Critical thinking Creativity

		Teaching, not technology Multimodal/differentiated Authentic tasks Global Learning is student-driven Formative assessments

Professional Development:

Factors	Characteristics	Dimensions
Defining Inspire	Instilling a common understanding of the goals and values of the initiative	Explicit mention of goals and values Explicit linking of digital shares to these goals and values Modeling instructional practices that achieve these goals Presentation of supporting research
	Instilling a core set of values and expectations.	Habits of Mind-the soft skills necessary to continued adult learning Learn by doing, take risks, be reflective, collaborate, desire to challenge the status quo, practice is not a private matter, desire to teach every student
	Alan November Conference	Defining of 21st century learning and showing what this looks like in the context of business. Inspiring teachers: examples of what others are doing

		Engendering teacher buy-in: showing how businesses need/benefit from hiring individuals with these skills Consistency of message with that of the district
Building capacity- technology skills	Core technologies and programs-	Machines: laptops, Promethean Boards, clickers, iPods, HD flip cameras Programs: The district Wiki, Audacity, Inspiration, Moodle, Photostory, Easybib, Enotes Practical Knowledge (some examples): What best suited to How to tag How to save and upload How to do citations How to trouble shooting problems Safety issues (legal, moral, ethical)
Building capacity- instructional strategies	Pedagogy	Differentiation Assigning group work Modeling/coaching Encourage student-inquiry critical thinking Facilitating discussion and providing meaningful feedback How to develop units and lessons/sequence activities designed to enhance mastery How to modify/improve

		lesson objectives and previous lessons Constructing and using formative assessment Managing the classroom learning environment Teaching the Habits of Mind (soft skills necessary for learning) Addressing implementation concerns and issues Classroom management strategies
Perceived Utility of PD	Building confidence Improving professional capacities	With technology-machines, programs and practical knowledge for usage With ability to meet Inspire and district goals and expectations for practice Differentiation Assigning group work Modeling/coaching Student-directed learning How to modify/improve previous lessons Formative Assessment

		Habits of Mind Managing the learning environment
	Forming new ideas	New lesson ideas that others shared Opportunities to develop new lessons Obtaining rubrics ready for use Obtaining templates ready for use Knowledge of research on good instructional practice
	Over-all perceptions of the PD	Pace If met their needs The amount of time out of class What liked best/least

<u>Participating Teachers</u>:

Factors	Characteristics	Dimensions
Teacher Traits	Experience	Education, Number of years teaching experience Number of years teaching at the middle school level Number of years teaching that

		subject
	If wanted to participate in Inspire	Yes I wanted to but may not have done it this year No I didn‘t know much about it/I didn‘t have any preference I don‘t think I needed it
	Self-expressed comfort level	Technology Change Taking risks Sharing individual classroom practices with the group
Teacher Buy-In/Commitment	Perceptions of the initiative-perceptions of	Reasons for initiative Longevity District pressure to alter instructional practices and whether this is viewed positively or negatively Of personal need for learning new instructional practices Of Inspire in their classroom and in the district five years from now
	Perception of the role of	If perceive pressure to alter instructional practices If see this as positive or negative

	teacher and student as either traditional or non-traditional	Traditional- Students do most of their learning in a classroom. Teachers have knowledge that they impart to students. Teachers check for understanding with tests and quizzes. Lessons rely on textbooks. Learning begins with drill of basic concepts before progressing to more advanced and applied skills. The students are responsible for leaning/studying what the teacher has presented etc. Non-traditional-see Inspire goals
Classroom Practices	Technologies being used Lessons taught Tasks assigned	Core technologies Core programs Degree of differentiation Degree of student initiative for learning Utilization of group work Utilization of textbooks If teaching Habits of Mind Classroom management strategies (noise, norms for behavior, where students work, teaching how to use the program/save/post, teaching students how to give constructive feedback etc.) Degree of student choice Requirement for critical thinking

	Assessing learning	Requirement for creativity If connect students and/or experts in different locations/global Audience-If the task is for the teacher or for the students If the task addresses real-world problems If Inspire is added on as a final project Summative- students submit a paper, or complete a quiz or test (paper/ on-line/verbal) Formative-students have rubrics, get constructive feedback along the way, modify work based on that feedback. This is done for final projects Formative-on-line and on-going-Students are on Moodle Chat or a blog or a site like Poll Everywhere so that there are regular checks for learning build into most lessons.
	Student engagement	Students more engaged No difference, but the weaker students are more engaged No difference Students engaged but have less ability to sit for/attend to traditional lessons

		Students becoming bored with doing the same programs/activities in every class
Teacher Learning Community- Collaboration, Sharing of Ideas and Joint Problem-Solving	Joint planning time	Full day PD Half day per month Effect on collaboration within the group
	Training sessions and digital shares	Seeing what others are doing Getting ideas/learning Getting inspired Forces modifying one lesson/month Forces others to do one thing/month
	District online resources/wiki	Looking online for ideas/lessons Trying others ideas/lessons Downloaded rubrics and/or templates Time required to search online resources
	Team teaching	With members of the group With others on staff If helping others on staff alter instructional practices aligned with Inspire

School Leadership:

Factors	Characteristics	Dimensions
Administrator training and PD	Administrative courses	Masters of Administration Administration Preparatory Programs
	Experience	Number of years in administration
	Mentorship	If have one If appointed or individually found/sought Mentorship by district personnel
	District PD for administrators	In-service programs Conferences Courses
Understanding of Inspire	Their understanding of the district's goals	The Four C's Integration of multiple technologies to improve teaching and learning
	Perception of district expectations	If feel under pressure to support Inspire Degree to which the district and schools incorporate Inspire into formalized school plans Ensuring teachers attend

		training sessions. Getting all teachers on board Increased test scores
Role of Administration in Supporting Inspire	Setting of performance expectations for Inspire and for the whole school	Utilization of the language of Inspire Utilization of staff meetings to develop teacher capacity linked to Inspire‘s goals Utilization of PLCs to develop the kinds of curriculum required to meet these goals Linking Inspire to other initiatives school Challenging the status quo
	Targeted problem-solving/Removal of implementation barriers	Acquisition of additional resources Tech support Helping to resolve ethical, legal, moral issues which may arise Recognition of efforts of both teachers and students
	Informal conversations with teachers	Listening to teachers Encouraging teachers Giving constructive feedback explicitly linked to Inspire
	Formal communication with parents	Communicating the goals and

	Performance of formal teacher evaluations School culture - supporting the development of a learning community	benefits of the initiative: Curriculum night, monthly meetings with parents, PTO meetings, family tours, meetings with individual parents Supporting/defending teachers as they attempt change or attend PD during school time: meetings with individual parents, responding to emails, phone calls etc. What administrators evaluate Formal conversations/feedback linked specifically to Inspire Goal setting specifically linked to Inspire Making time for teachers to meet, plan and work together Joint problem-solving and decision-making Collaboration/sharing ideas with other teachers If have teaching partners Utilization of staff meetings, PLCs Find time for groups to meet/plan Leadership style-authoritarian consensus-building/team building activities

		For experimentation, taking risks
Teacher Perceptions of Administrative Support for Inspire	Utilization of staff meetings and PLCs Formal and informal conversations	Utilization of the language of Inspire Communicating the goals and benefits of the initiative Developing teacher capacities linked to Inspire‘s goals Linking Inspire to other initiatives school Challenging the status quo Acquisition of additional resources Tech support and maintenance Helping to resolve ethical, legal, moral issues which may arise Recognition of efforts of both teachers and students Allowing teachers time to share what they have tried Giving constructive feedback explicitly linked to Inspire Listening to/encouraging teachers Teacher evaluation feedback linked specifically to Inspire and their classroom instructional practices

	On a personal level as they attempt to implement Inspire	Communicating the goals and benefits of the initiative Linking Inspire to other initiatives school Challenging the status quo Helping to resolve ethical, legal, moral issues which may arise Recognition of efforts of both teachers and students Allowing teachers time to share what they have tried Giving constructive feedback explicitly linked to Inspire Listening to/encouraging teachers Acquisition of resources for their classroom Targeted problem-solving/Removal of barriers Tech support/trouble shooting/maintenance Trust that they have their back Permission to do something (attend a conference, opt out for a while, do a specific project) Encourage struggling students Recommended me for…

Additional District Support Structures:

Factors	Characteristics	Dimensions
Utilization of the Inspire Facilitators	Modeling	Demonstration lessons
	Coaching	Lesson planning Classroom management strategies
	Trouble-shooting	Had her come to the classroom to resolve issues/problems
		Asked her for instructions and suggestions on-line online
		Asked her for instructions and suggestions on-line over the phone
	Other	
		Encouragement, sharing of successes
		Pointing out progress made over the course of the year
		Coping with frustrations
Inspire Across the District	Provision of necessary technologies and materials	Acquisition of equipment and site licenses
		Acquisition of support materials such as cords, wifi, laptop carts, tables, charging stations etc.
		Provision for the adequate maintenance of equipment
		Teacher and student accounts

	Accountability measures	and passwords Digital shares Instructional walks
	Linking Inspire to curriculum, textbook purchases to Inspire goals and training	SALT Committees Atlas Rubicon Common Assessments Alignment of GLCS to Inspire goals
	Communication and decision-making across the district	Board meetings Administrator meetings at the district Inclusion of schools and teachers in decision-making
	Provision of incentives for teachers to continue individual professional development	KALPA hour credits College credits

APPENDIX H
Coding Scheme for Surveys

Teacher Comfort with/Confidence in their Abilities with:

Using technology	TK2, TK3, TK4, TK5, TK6, TK7
Pedagogical knowledge to teach effectively	PK1, PK2, PK3, PK4, PK5, PK6, PK7, PCK1,
Pedagogical knowledge to teach effectively with technology	TCK1, TPK1, TPK2, TPK3, TPK4, TPACK2, TPACK3, TPACK4, TPACK5

Teacher Perceptions of the Value Added by Using Technology:

Can enhance students‘ interest and motivation to learn	13, 35
Can enhance students‘ creativity and imagination	34
Can enhance student collaboration	35
Can enhance students‘ problem-solving skills	36
Can enhance teachers‘ ability to differentiate work	32
Can enhance teachers ability to make learning more student-centered	33
Can enhance students‘ ability to express themselves	37
Allows students to write less	38

Teacher Perceptions of What Makes for an Effective Teacher:

Teacher as an authority figure and imparter of knowledge	3, 10, 18, 19, 22, 23
Teachers‘ content knowledge	12, 15, 20
Teacher modeling metacognition	11, 39
Helping students make connections	40, 41, 42, 43
Using technology	45
Knowing your students and having a rapport with them	1, 4, 7, 16, 21
Having high expectations for all students	5, 41, 42
Holding students accountable for their work/learning	25

Believe that all students can learn	8, 14, 17, 19
Also address students‘ social and emotional needs	9

Teacher Perceptions of Students:

Capability of all students to learn	2, 8, 14, 17
Behavior management	19
Class environment to enhance learning	7, 9
Work habits	25, 37, 38

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