BRINGING 21ST CENTURY LEARNING TO THE HIGH SCHOOL CLASSROOM: 
PROGRAM EVALUATION ON PEDAGOGICAL CHANGE

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By 
Michael G. Travis 

Dissertation Committee:
Curtis Ho, Chairperson
Ellen Hoffman
Grace Lin
Peter Leong
Violet Harada

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My journey through graduate school has been a long and arduous one in which I have gained great knowledge, but sacrificed countless hours of time with my family and friends. I hope that by finishing I can now re-capture those moments. The journey began in 2004 when a friend, Emily Lin, suggested that I apply for the Master’s Educational Technology degree. So, I have her to thank for showing me the path. When it came time to form my committee, I reached out to Dr. Curtis Ho, who happened to be the first professor I had when I started at the university. Thank you for being willing to lead me, Curtis! I must also thank all my professors along the way, especially the late Dr. Burniske, who taught me about creating a “community of inquiry”; Dr. Yamashita, who gave me so much information about teaching adults; Ari Eichelberger, who helped me finish my Master’s Project in 2007; Dr. Ellen Hoffman, who offered me advice for so many years throughout the doctoral program; Dr. Grace Lin, who taught me about the value of mobile devices in the classroom; Dr. Vi Harada, who showed me the great value of the media specialists at schools, and Dr. Peter Leong, who helped me look at correlations in a completely new way. Now, the biggest thanks of all to my family (Suzy, Emily and Mairi), who have supported me through the stress, late nights, and life on my laptop the last eight years of my life; I appreciate all your love and caring along the way. Finally, I want to thank whoever came up with the tradition of the hoods in a Ph.D. graduation. As I sat there in 2007 at my Master’s graduation, I realized that I just had to have one of those! So, now, one journey ends, but another one is beginning. My final words of advice as the newest Doctor of Philosophy in Education; never give up.
ABSTRACT

Children today are born into a world with endless amounts of information at their fingertips, the ability to instantly connect with others, and smartphones with an app for virtually everything. It is a world that is vastly different than that of their parents or grandparents. As these students sit in classrooms all over the world, their teachers and administrators struggle with how to effectively change classrooms to meet the needs of a new digital generation, and provide students with a twenty-first century education that teaches skills like problem solving, critical thinking, innovation, creativity, and entrepreneurship. As part of a five-year grant initiative, a collection of private schools is attempting to create a paradigm shift where content takes a backseat to skill development. The purpose of this qualitative program evaluation was to examine how the grant has impacted the pedagogy of high school teachers at one of these schools. Using the Concern Based Adoption Model (CBAM), the researcher explored change from the teachers’ perspectives, their implementation levels, and using collaborative mapping to find the objectives for change.

The results of the research indicated that change has occurred in classrooms and that the grant implementation is moving forward. The Stages of Concern Questionnaire showed that 56% of the teachers were showing the highest levels of concern in the early levels related to Awareness, Informational and Personal Concerns. The Levels of Use interviews indicated that all teachers are implementing grant objectives at the Mechanical Level of use or higher. Using pattern coding from the interviews, four positive themes of change emerged: “Helping Hands”, “Permission to Take Risks”, “Change Can Happen”, and “Learn from Others.” Two challenging themes emerged as well, “Paradigm Shift”
and “Never Stop Communicating.” The research will provide the school’s grant implementation team the changes needed to achieve the highest levels of implementation for the remainder of the initiative. In addition, this dissertation should provide other researchers with guidance for conducting professional development and using the CBAM for understanding change in a school environment.
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CHAPTER 1: INTRODUCTION

“Educational change depends on what teachers do and think – it’s as simple and as complex as that.” (Fullan, 2007, p. 129)

Twenty-first century learning is about changing education and teacher pedagogy to help students gain the skills they need to be successful in college, and beyond, in today’s ever changing, technology-driven society. With instant access of information through the Internet, the use of smart phones, and the changing workplace, teachers must look at student learning differently; curriculums that are content and information driven no longer fully prepare students for the future. Educational reformists, Daniel C. Pink (2011) and Tony Wagner (2010), talk about a fundamental change in education where skills become paramount to content. As Wagner (2010) explains, “In today’s highly competitive global ‘knowledge economy,’ all students need new skills for college, careers, and citizenship. The failure to give all students these new skills leaves today’s youth – and our country – at an alarming competitive disadvantage” (p. xxi). Appendix A provides a comprehensive list of ideas from both Pink and Wagner as to the skills they consider the future of education. Some of the skills they describe include: critical thinking, problem solving, collaboration, adaptability, entrepreneurship, initiative, and analyzing information. This is the idea of a skills-based approach versus the content-driven approach of previous generations. The educational world is beginning to understand this need for change and the start of a transformation is evident. Nevertheless, how do teachers balance the need to teach content, literacy, and standards while bringing in these twenty-first century ideas? In addition, how do teachers address
their general lack of ability to integrate technology in this new curriculum when it is needed immediately?

For some schools, twenty-first century ideas in the classroom will be a monumental change in the way students are educated; while for others, this change is driving the continued growth and evolution of the program. The school where this research was conducted is one such school that is already considered non-traditional, because of its small class size and individualized, integrated environment. Additionally, for this school, the educational change has taken a giant leap forward with the influx of funding from a “School of the Future” grant initiative. With half of the five-year grant complete, the researcher wanted to know if teachers have embraced change and what changes can be made in facilitating the grant to produce the highest levels of implementation for the remainder of the grant funding.

**Background**

The school studied is a small, independent private school on an island in the Pacific Ocean for gifted and/or dyslexic students. The mission of the school is to provide students with an individualized, integrated learning environment with small classes, multisensory curricula, and structured behavioral management programs to help students maximize their potential and become life-long learners in school and society.

In 2009, the school was awarded a grant along with a group of private schools. The purpose of the five-year grant initiative was to support schools to develop more effective uses of technology to support the growth of student-centered and project-based learning in the classroom. In addition, the schools in the grant initiative participate a professional learning community to share learning with each other at face-to-face
meetings, through peer exchanges, and online at the shared website. Each school set its own individual goals for the grant; however, the overall goal is to move learning forward for all students.

The individual school’s grant goal is about supporting dyslexic learners through growth and transition. School leaders discovered that many students have struggled in transitioning after graduation or when transferring to another school. Teachers provide structure for the students; however, the writers of the grant wanted to look at ways to give students more of a voice and more responsibility in advocating for their individual needs. In this way, students could be better prepared for their transition. The key to change was school leaders working with teachers to bring the classroom more in line with twenty-first century learning ideas. The grant started with supporting the dyslexic learners at the school; however, the eventual goal is to create a worldwide network of support to help all dyslexic students through growth and transition in school and beyond in the real world.

In the first two years of the grant initiative, the school focused primarily on professional development of the high school staff, growth in technology integration for students, and better communication with parents, teachers, and students. Table 1 shows the highlights from the first two years of the grant initiative. The key initiatives included: appointing a grant team leader to provide leadership and professional development training of staff, professional substitute days available for teachers to research their own passions in teaching, the purchase of new laptops for student use, the creation and training on Moodle (an online course development system to provide students with hybrid classes), the implementation of Google Apps for teacher and student use, training of staff on
twenty-first century learning skills, trips to innovative schools around the country to bring back new ideas, and time for teachers during faculty meetings to share new ideas.

Table 1. Highlights from grant initiative for the first two years.

| Grant Team Leader - provided leadership and technology training for teachers (0.5 FTE funded) | Alumni Panels - established on campus so current students could talk face-to-face with alumni about life after the school |
| Professional Substitute Day – sub days for professional development to work on new teaching strategies (enough money for every high school teacher to take a day) | Google Apps - online “cloud” based tools were implemented throughout the school so teachers could utilize features for classes and teacher collaboration |
| New Laptops – purchased twenty five new laptops per year for student use, replacing unreliable older models | Show and Tell – weekly faculty meetings began with teachers sharing new ideas about their classrooms |
| Moodle – an online content management system and training for teachers on how to integrate it | Trips to Other Schools – trips for teachers to cutting-edge schools to bring back and share ideas for twenty-first century learning and teaching |
| Academic Coaching - Four graduates (and eight more in year two) provided with “academic coaches” (current teachers) to support transition through the first year of college | Professional Development of Staff – through faculty meetings, in-house training days, sharing of ideas, article discussions, and many other ideas, teachers were given a better understanding of what twenty-first century learning is and how to implement change in the classroom |
| Ning Sites – online interactive environments that connected current seniors with alumni to discuss transition. Another site was created to connect teachers and one more to connect parents for discussions. | |

In year two, the goals were expanded to try and “break down” classroom walls to encourage teachers to collaborate with each other and to try and create partnerships with other schools that have similar missions so collaborations would occur between teachers and students across the country. This worldwide network the school is hoping to create would include an online social media piece so that people could connect for help, offer advice, and provide support for others. In example is that many parents struggle to find
information once their child has been diagnosed with a learning challenge like dyslexia. This network would provide them the support to learn more about the dyslexia, talk to other parents of children with the diagnosis, and begin to understand how best to support their child. In addition, the network would provide guidance to the student by connecting him/her with other students who have faced similar challenges and overcome them. The network would support everyone in understanding learning differences.

**Statement of Research Problem**

Training teachers to educate students differently and bring about change in their classrooms has been a struggle for many years in schools. When it comes to professional development, local, state, and federal governments spent more than $1.1 billion in 2004-2005, which is a significant investment (Birman et al., 2007). Three things that challenge creating change in schools are: teacher perceptions of the change, teacher acceptance of the change, and how quickly teachers will implement the change. With any program implementation, leaders must remember, “change is a process, not an event” (Hall & Hord, 2006, p. 4). With this in mind, the researcher wanted to understand how the changes have occurred so far and how it can continue to change for the future.

**Purpose Statement**

The purpose of this qualitative research program evaluation was to examine how the Schools of the Future Grant Initiative impacted the pedagogy of high school teachers at the school. The goals of the research were to:

- Understand the teachers’ concerns, levels of use, and the qualities of implementation in the first half of the grant period.
- Help the researcher to maximize the implementation over the second half of the 
  grant by examining the results of the data and suggesting changes for the future.
- Provide ideas to help other schools seeking to employ similar organizational 
  changes in the future.

**Research Design**

Program evaluation research gives the researcher the ability to examine the 
implementation at one moment in time and make changes for the future. As Spaulding 
(2008) states, “Program evaluation examines programs to determine their worth and to 
make recommendations for programmatic refinement and success” (p. 5). Many program 
evaluations involve quantitative research; however, using case studies to evaluate 
programs can be a valuable approach. Balbach (1999) discusses advantages over 
traditional methods, “A case study evaluation allows greater latitude in seeking out and 
assessing program impacts” (p. 5). The researcher examined the pedagogical change that 
has taken place at the school in the first half of the five-year grant initiative to use it as a 
baseline to examine the change process over the entire period. Survey and reflections 
from the teachers during the first two years of change led the researcher to consider better 
tools for examining the impact and plan ways to encourage change to occur more rapidly 
across the high school. To do this case study, the researcher used instruments provided in 
the Concerns Based Adoption Model (CBAM) to collect data and as a framework to 
analyze and interpret the results. Hall and Hord (2006) describe the process as, “… how 
the change is thought about in theory may bear little resemblance to the activities that are 
done in the classrooms under the name of that innovation” (p. 112). The CBAM
framework allowed the researcher to assess teacher’s concerns about the change in three ways:

1. Concern about the grant implementation (Stages of Concern – SoC)
2. Levels of use in the grant implementation (Levels of Use – LoU)
3. Quality of the implementation (Innovation Configurations) (Hall & Hord, 2006)

The CBAM is a set of survey instruments used for understanding and managing change. It was created over 25 years ago by Gene Hall and Shirley Hord, and has been used extensively by researchers, and is a well-established survey tool (Hall & Hord, 2006). Since the CBAM only looks at what is happening with the change now, additional open-ended survey questions were added to find out what can be done to continue growth and improve the program as a whole.

**Research Questions**

Early survey data at the school indicated that change is occurring and is having an impact on teacher pedagogy. By using the CBAM approach, the researcher will have survey data that are reliable and valid, which should provide better predictions and planning for the rest of the implementation. The researcher wanted to answer the following questions:

1. What are the teachers’ perceptions of the grant implementation and what help would they need to continue the change in pedagogy (Stages of Concern - SoC)?
2. What is the extent of implementation with each teacher and the high school as a whole (Levels of Use - LoU)?
3. What are examples of pedagogical changes that teachers have made in their classrooms?
4. How can the change process be facilitated to achieve the highest levels of implementation in individual classrooms and across the high school (Innovation Configuration Map)? (Hall, 2010).

The answers to these questions will help the school and the researcher to understand the concerns of the teachers in the implementation process, how much change has taken place, and how to better plan the rest of the grant implementation.

**Significance**

While some change has occurred in education over the last few decades, many classrooms remain stagnant in the traditional model of content delivery. The traditional educational model has focused on imparting content to students and teaching them how to be successful on standardized tests. The No Child Left Behind Legislation and its focus on standardized testing further enforce this paradigm and ensure students meet certain levels of content understanding through “bubble answer” tests. This further removes the ability for teachers to take risks in classes and try new types of learning opportunities. This model might be further ingrained in public school teachers by states that are tying the success of student standardized test scores to raises, promotions, and renewal of contracts. Teachers might be worried about trying new techniques in the classroom if they run the risk of losing a raiser or their job, if test scores go down. Instead, teachers have admitted that is it better to focus on teaching to the tests. John Dewey suggested a new paradigm for learning almost a hundred years ago in his book *Democracy and Education*. In the book, he wrote, “Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking … learning
naturally results” (Dewey, 1916, p. 181). Dewey believed that the “doing” was more important than “feeding” the content.

Some school leaders and reformist suggest that students lack the preparation they need to survive in a changed world. They say that the digital generation is here and students need a different school experience. In Ian Jukes presentation at ISTE in 2010, he talked about how teachers do not have the technology experience that their students have and teachers are afraid of integrating technology tools. Jukes references a report from the Department of Education, titled “Creating Connections” which stated that “by ignoring or removing digital devices from students, we are ‘blowing it’ and missing out on an opportunity to connect with the students of today … we are losing them, and they are showing it with both their feet and minds” (Jukes, 2010). Even though high school graduation rates are on the rise in the last decade, there are still approximately three million 16 to 24-year-olds who were not enrolled in high school and have not earned a diploma or alternative credential (Chapman, Laird, & KewalRamani, 2010). Therefore, looking at changing and becoming a “school of the future” is critical for all schools, not just the school being investigated.

Assumptions of the Study

In creating a research study, there are some assumptions for this type of research which include:

- The characteristics of a program evaluation and case study allowed the researcher to learn more about the way participants perceive the grant innovation and see change.
- The research participants responded voluntarily with no penalty for not participating.
- The participants answered questions honestly based on their experiences, understanding, and beliefs (Moody, 2009).

**Limitations of the Study**

While the researcher has tried his best to create research that can be valid and used by other schools, there are some possible limitations, which include:

- Most of the data described here were collected through self-reporting by anonymous survey and focused interviews.
- Participants were limited to only high school teachers at a single school.
- Data collected are based on a specific grant goal and funding; thus, not all of the results may be generalizable to other schools.
- The researcher’s perception of the data may reflect reporting bias (more on this in the researcher bias section).

**Summary**

With the start of the Internet in early 90s, knowledge that was once memorized by students for tests has become easily accessible and instantaneous. Because of this, teaching needs to change. Schools must adapt to the times and realize that skills like critical thinking, entrepreneurship, and creativity in an ever changing world will help students to be better prepared for life in a digital world, opposed to the industrial revolution. The Schools of the Future Grant Initiative is bringing about change at the school. The knowledge gained from analyzing the implementation and progress of this grant at the school may provide ideas for other schools seeking change. Ultimately,
changes in schools depend on the teachers to change; however, just telling a teacher to do something differently is not as easy as it sounds. Chapter Two of the dissertation will explore the literature and research around teacher change in pedagogy. Chapter Three describes the methodology for the survey tools that were used to understand the program and evaluate it. Chapter Four will describe the results of the data, and Chapter Five will discuss the future implications and recommendations for the school and other schools going through change.
CHAPTER 2: LITERATURE REVIEW

As suggested in Chapter One, understanding teacher pedagogy and change in the digital era requires an understanding of how teaching has changed over time. This chapter will cover the issues related to challenges of teaching in the twenty-first century including: shift in student learning; twenty-first century teaching; teachers and technology; teachers and change; school leaders and change; and models for change.

The Paradigm Shift in Students

“It is only when schooling operates in a way that connects students relationally in a relevant, engaging and worthwhile experience, that substantial learning will occur” (Fullan, 2007, p. 171). With the paradigm shift required for teachers and administrators to create a new classroom for students, students must also adapt to a new era. So, how do teachers know what is a relevant experience? Researchers suggest asking students. “Schools might usefully start by inviting pupils to talk about what makes learning difficult for them, about what diminishes their motivation and engagement, and what makes some give up” (Rudduck, Chaplain, & Wallace, 1996, p. 31). Moreover, students are telling the world that they want change. In one of the largest online surveys every year, Speak Up gathers data from students, parents, teachers, and administrators. From the 2009 survey, the students say they “want to be able to interact and learn from their own personalized network of experts using cutting edge communications and collaboration tools” (Project Tomorrow, 2010, p. 25). The survey used the term “Free Agent Thinkers”, an interesting description for students who are ready to face the challenge of twenty-first century classrooms. Taylor and Fratto (2012) surveyed 700 teachers across the country and found that the biggest challenge facing them (24%) was
student apathy, motivation, and behavior. The traditional model, with its focus on preparing students for tests discourages the drive to learn, instead they are apathetic and as Pink (2011) states, “We’re bribing students into compliance instead of challenging them into engagement” (p. 174). So, it appears that the biggest challenge will not be from students, who appear ready and excited about the change to classrooms. But, what will be the change to the classroom, what does 21st century teaching look like?

21st Century Teaching

Twenty-first century teaching is a model for change in education that moves teaching from a teacher-led approach to a more cooperative learning model, where students have more of a “voice” in their learning. The problem as Collins and Haverson (2010) describe it is, “deeply ingrained in the structure of schooling is a mass production notion of uniform learning. Age-grading and common assessments, for example, emphasize the belief that everyone should learn the same things at the same time” (p. 19). This model of “teaching to the test” has continued with the No Child Left Behind Act (2002) forcing more reliance on common assessment tools and requiring every student to learn the same information. Standardized curricula are commonplace, however, students are unique learners. Educators would never use the word “standard” to describe students, so why do standardized curriculum and assessments drive educational systems? On the other hand, there are educators who are fighting to bring about a new vision. They are following the leaders like Pink and Wagner who want students to learn skills that can be used in the future. In 2002, The Partnership for 21st Century Skills (P21) was formed by the U.S. Department of Education and other companies to infuse more twenty-first century skills into education. The team created a framework to guide educators. In 2010,
the framework was redesigned and given a new look. Figure 1 provides the framework for the design.

![Diagram](image)

**Figure 1. P21 student outcomes and support systems for the twenty-first century.**


While the core subjects are still prominent in the outcomes, skills have been laid on top of these. These skills include: life and career, information, media, and technology skills; along with what P21 calls the 4Cs – critical thinking, communication, collaboration, and creativity. The rainbow graphic represents the skills that are important, while the rings below are the support systems for reaching these skills.

Technology is considered an important skill in the “rainbow, and plays a prominent role in the success of the student outcomes.

There are many other models involving a change in teaching for the twenty-first century and most of them involve this idea that skills for the future and the student’s voice should be more prominent than the content.
Teachers and Technology

At one time, teaching involved just three aspects of knowledge – content, pedagogy, and the intersection between the two known as pedagogical-content knowledge. Shulman described this as the PCK Model (1986); however, technology’s growth and ubiquitous nature in homes, businesses, schools, and the pockets of students, has led to a revised model for teacher training and development (Figure 2). What once was a simple model of knowledge for the teacher has become a monstrous challenge.

Figure 2. Technological Pedagogical Content Knowledge Model (TPACK).

Reprinted from TPACK-Technological Pedagogical Content Knowledge (2011).

Mishra and Koehler (2006) devised the Technological Pedagogical Content Knowledge Model (TPACK), which describes the inherent challenge of adding technology to Shulman’s PCK Model, “Teachers will have to do more than simply learn to use currently available tools; they also will have to learn new techniques and skills as current technologies become obsolete. This is a very different context from earlier
conceptualizations of teacher knowledge, in which technologies were standardized and relatively stable” (p. 1023).

The challenge for administrators, technology coordinators, and educational technologists has become exponentially more difficult as they try to teach staff about adopting technology in this new pedagogical model. In addition to the new knowledge that must be gained, there is the slow process of adopting new technologies into a school environment. To do this, two things must happen: 1) A critical mass of adopters to the new technology is needed to convince the “mainstream” teachers to use it, and 2) regular and frequent use of the technology is needed to ensure success of diffusion (Carr, 2011; Rogers, 2003).

In Rogers’ book on the diffusion of innovation, he discusses the innovation-decision process, which is a model of adoption for new technologies (Figure 3). This model describes the process that an individual takes when incorporating a new innovation.

It starts first with the knowledge of an innovation, and then the person forms an attitude (or opinion) about it. The individual must make a decision to accept or reject the innovation, and then implement the new innovation. Finally, the individual confirms that the decision to implement was the correct one. This models the constant struggle that teachers must face in the pursuit of adding new ideas to the classroom.
In every school, each individual does not adopt technology and new skills in the same manner. For some, like the early adopter, the change is easy; however, for others it will require a lot of time, training, and stress to change. It is no wonder that it is difficult for the world to accept new twenty-first century classroom models, when considering how hard it is for some teachers to accept change even at the individual level.

One potential benefit can come from new teachers to the field bringing in knowledge about the use of technology from their teacher education programs. The problem is that teacher education programs are focusing on traditional education tools for classroom learning, instead of on the tools and resources K-12 students are using right now such as texting, smart phones, video games, and other network devices (Kolb, 2008).

**Teachers and Change**

It is twelve years into the twenty-first century and students are not growing up in the same world their teachers did. This is an era when teachers must create a new
environment for students, learn new technologies, develop twenty-first century activities, and somehow adopt these ideas in their classrooms. Change is not as simple as asking an employee to do something a different way; change has many elements and challenges. As Fullan (2007) describes it, “Real change, then, where desired or not, represents a serious personal and collective experience characterized by ambivalence and uncertainty” (p. 23). To achieve an educational goal or new program, three dimensions of change must be evident:

1. Using new or revised materials (curriculum materials or new technologies such as a smart phone).

2. Using new teaching approaches (strategies, activities, or ideas such as project-based learning).

3. Possible alteration of beliefs (pedagogical assumptions or theories underlying new programs) (Fullan, 2007).

Fullan (2007) believes that without all three dimensions of change occurring in practice with the teacher, there is not a chance that the outcome can be achieved. Change is much more than just using new materials or doing “group” work, it requires dedication and belief by the teacher that what they are doing will help improve learning by the student. The challenge for change agents is that, for many, twenty-first century teaching requires shifts in beliefs about what is necessary for students. It requires looking at content and reducing its breadth in exchange for depth of knowledge, and to focus on new skills needed for this digital era. “They challenge the core values held by individuals regarding the purposes of education. Moreover, beliefs are often not explicit, discussed
or understood, but rather are buried at the level of unstated assumptions” (Fullan, 2007, p. 36).

Festinger’s Cognitive Dissonance Theory that he introduced in the 1950s further explores the affective nature of change. This theory involves the uncomfortable tension a person feels when holding conflicting thoughts or “cognitions” in the mind at the same time. The person will experience “cognitive dissonance” and be motivated to reduce it by one of three ways: 1) a person can change the behavior to match the cognitions, 2) justify the behavior by changing one of the conflicting cognitions, or 3) justify the behavior by adding new cognitions. An example is when a veteran teacher who has taught the same way for thirty years disregards data indicating ways to improve student learning. The teacher justifies the behavior by adding new cognitions such as “The way I have taught has worked for all these years, so if it ain’t broke, don’t fix it.” The dissonance inside us increases with the importance of the decision (Festinger, 1957; Straker, 2011). Affective-Cognitive Consistency Theory, on the other hand, looks at the relationship between attitudes and beliefs (Miller, 2005; Simonson & Maushak, 2001). “An unstable state occurs when an individual’s attitudes toward an object and knowledge about an object are inconsistent.” By “providing an individual with new information that changes the cognitive component of attitude will tend to cause that individual to change overall attitudes toward an object” (Simonson & Maushak, 2001, p. 989). While it appears that research in these areas has waned, there is still value in understanding the affective conditions faced by teachers and change. These theories help to explain the challenges schools and teachers face. When faced with new ideas or cognitions, teachers must make a choice if they will change their beliefs and attitudes about teaching. Will
their actions reflect the new twenty-first century teaching styles? Or, will teachers hold to their former teaching styles and rationalize (create new cognitions) to maintain the same position? While change is an individual process, it requires an administration that can lead the way and help with the cognitive dissonance teachers will face.

**Schools, Leaders, and Change**

Most of the twenty-first century skills have always been valued, such as critical thinking and problem solving. However, as Rotherham and Willingham (2009) describe it, “What’s actually new is the extent to which changes in our economy and the world mean that collective and individual success depends on having such skills. Many U.S. students are taught these skills - those who are fortunate enough to attend highly effective schools or at least encounter great teachers - but it’s a matter of chance rather than the deliberate design of our school system.” (p. 16). In this same article, the authors discuss how even though problem- and project-based learning are being applauded as a route to twenty-first century skills, classrooms still spend the most instructional time on seatwork and whole-class instruction led by the teacher, even when class sizes were reduced (National Institute of Child Health and Human Development Early Child Car Research Network, 2005; Rotherham & Willingham, 2009; Shapson, Wright, Eason, & Fitzgerald, 1980). The challenge could be that teachers need more professional development, planning time, and collaborative time with other teachers on change, or it could lie in the pressure for teachers to meet standards and prepare their students to perform well on national and state assessments; either way, the change is moving slowly. Leaders in schools can help with change by bringing teachers and administrators together to talk. As Fullan (2007) describes it, “Schools in which teachers have a shared consensus about the
goals and organization of their work are more likely to incorporate new ideas directed to student learning” (p. 38). The school culture needs to be one of, “deep engagement with other colleagues and with mentors in exploring, refining, and improving their practice as well as setting up an environment in which this not only can happen but is encouraged, rewarded, and pressed to happen” (p. 55). Another key is how professional development is provided. Desimone (2009) suggests that there are two keys to success. First, are the critical features of professional development that have shown to be effective in recent research. The characteristics of the professional development (PD) must include:
content focus, active learning, coherence, duration, and collective participation as described in Hawley and Valli, Kennedy, and Wilson and Berne as cited in Desimone (2009, p. 183). These characteristics are briefly described below:

- **Content focus** – training that focuses on how students learn the content to improve teacher knowledge and pedagogy.

- **Active Learning** – creating professional development that actively engages the teachers in the training as opposed to just listening to a lecture.

- **Coherence** – the training is consistent with teachers’ beliefs, knowledge, and the culture of the school.

- **Duration** – training that involves more than one day can provide better integration of what is learned, for example, having support that extends over a semester so that teachers can reflect along the way as they learn and change.

- **Collective Participation** – training that involves participation by teachers from the same school, departments, or grades provide the opportunity to discuss the training in the context of the specific school instead of just in general.
In Chapter Five, the researcher will discuss in detail how professional development has been utilized in the grant initiative, seeking out interesting, and out-of-the-box ways to training teachers for change.

The second key to success, described by Desimone, is developing an operational theory to examine the results of professional development by examining how it works to “influence teacher and student outcomes” (Desimone, 2009, p. 184). The key question is when change is happening, how can it be measured effectively to see if it is actually successful?

**Models for Examining Change**

With changes happening for students, teachers, technology and administration, the biggest challenge to the twenty-first century classroom might still be the teachers themselves. How do they decide when to make a pedagogical change? How easily are teachers able to give up traditional teaching models they have been using for years?

**Lewin’s Change Theory**

One of the first leaders to provide a framework for change theory in the modern era was Kurt Lewin. Lewin’s theory from the 1950s involved three stages of change – Unfreeze, Change, and Freeze (Refreeze) (Figure 4) (Lewin & Cartwright, 1964; Schein, 1995).

![Figure 4. Lewin’s change theory explained.](image-url)
Lewin’s Change Theory model is tied closely to work on Force Field Analysis (Figure 5), which is where the change occurs for individuals. There are opposing forces that keep individuals from change. If the driving, or positive forces for change, and the restraining, or obstacles to change are balanced, the individual remains in the present state. However, if the driving forces for change motivate the individual enough and outweigh the restraining forces, the individual will be able to “unfreeze” and move toward change (Lewin & Cartwright, 1964; Schein, 1995).

![Figure 5. Lewin’s force field analysis explained.](Connelly, 2011a; Schein, 1995).

While Lewin’s model is adequate for looking at change, it may be too simplified when it comes to actually implementing a change in the work setting. Another change theory focuses on the individual and the change.

**Hiatt’s ADKAR Model**

The model was first published by Jeff Hiatt in 2003, but was created in the late 1990’s by Prosci, Jeff Hiatt’s company, and is called “ADKAR” (Hiatt, 2006). ADKAR is an acronym meaning:
1. **Awareness** of the need for change – understanding why the change is needed, which requires communication from the school or business to ensure that individuals understand.

2. **Desire** to support and participate in the change – individuals make a personal decision to support and participate in the change.

3. **Knowledge** of how to change - this can be helped by training, coaching, mentoring on how to change and what to do after the change is implemented.

4. **Ability** to implement the change – knowledge informs the individual how to change, but the actual performance of the change needs to be supported by the organization.

5. **Reinforcement** to sustain the change – effort is needed by the organization to maintain the change, which can be helped by positive feedback, recognition, and additional training (Connelly, 2011b).

The ADKAR Model improves on Lewin’s Model by realizing that without reinforcement and support, a change may not be sustained for the long term. In addition, the model focuses on the individual, and the acceptance and desire to change, rather than just “unfreezing” from what is the status quo. Change Theory looks at how people change and how change occurs; however, a program evaluation model is needed to look at organizational change and be able to influence the program or organization through the process.

**Kirkpatrick’s Four Levels of Learning Evaluation**

Program evaluation enables the researcher to examine the implementation at one moment in time and make changes for the future. As Spaulding (2008) states, “Program
evaluation examines programs to determine their worth and to make recommendations for programmatic refinement and success” (p. 5). Program evaluation can start at the individual level evaluation such as Kirkpatrick’s four levels of learning evaluation (Figure 6). Kirkpatrick has provided many tools to evaluate the participants during and after training. Assessments can be used to determine if the training was effective for the long term (Kirkpatrick, 2006).

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Reactions</td>
<td>measures how participants reacted to training</td>
</tr>
<tr>
<td>Level 2: Learning</td>
<td>measures what participants have learned</td>
</tr>
<tr>
<td>Level 3: Transfer/Behavior</td>
<td>measures how learning is being applied on the job</td>
</tr>
<tr>
<td>Level 4: Results</td>
<td>measures how targeted outcomes occur as a result of training and reinforcement</td>
</tr>
</tbody>
</table>

**Figure 6.** Kirkpatrick’s four levels of learning evaluation.


Critics of the model contend that the level one assessment only provides a quick reaction from participants at the time of training (reactions), which may not reflect their overall feeling of the training. Level two assessments may require more evidence and greater insight to develop proper measuring tools. Assessing the transfer of knowledge at level three requires the need to look at individuals typically three to six months after the training. This evaluation can be time consuming and cost money to assess, as individuals have to be evaluated to determine root causes for deficiencies. Finally, assessment at level four involves looking at the return of investment for the training to the organization (results). Critics are concerned that the assessment does not always substantiate a link
between the training and the future success of the organization (Adgate, Rutherford, & Hall, 1999).

**Guskey’s Five Levels of Professional Development Evaluation**

Building upon and re-purposing Kirkpatrick’s model for education, Thomas Guskey developed his model based on five levels. Guskey described how he adapted the Kirkpatrick model because it only addressed the “what” questions, but it needed to explain more of the “why”, especially when it came to educational professional development (Guskey, 1998). His five levels are described below:

1. **Participant Reaction** – gauges reactions to training (Was the time well spent?)
2. **Participant Learning** – examines what was gained (Did participants learn what was intended?)
3. **Organizational Support and Learning** – analyzes organizational support for new skills (Were resources available for support?)
4. **Participant Use of New Knowledge and Skills** – determine if participants are using what they learned (Are participants implementing, and to what degree?)
5. **Student Learning Outcomes** – analyzes transfer of training to student learning (Did students show improvement based on training of participants?) (Guskey, 2002, pp. 48-49).

Use of Guskey’s five levels requires the planners to work backwards; first, thinking of the desired student outcomes, and then building the training to accomplish those goals. Success at earlier levels does not guarantee success in future levels (Guskey, 2002). This model is effective if the student outcomes are clear from the start. The
problem is that in some programs, the final goal is not clear and the outcomes cannot always be determined in the beginning.

**Logic Model of Program Evaluation**

Another program evaluation model that has been widely used is the Logic Model. As McCrawley (2001) describes it, “Logic models are narrative or graphical depictions of processes in real life that communicate the underlying assumptions upon which an activity is expected to lead to a specific result” (p. 1). Logic models can be adapted to provide program evaluation as well (Figure 7).

![Figure 7. Logic model with evaluation plan added.](http://www.uiweb.uidaho.edu/extension/LogicModel.pdf)

The Logic Model is composed of these core elements:

- **Situation** – the program that is being addressed.
- **Inputs** – resources in time, money, people, etc.
• **Outputs** – what is produced, for example, activities and workshops. Outputs also include the people who are reached by what is produced.

• **Outcomes** – changes in people, culture, communities, etc., which are broken into short, medium, and long-range outcomes.

• **Assumptions** – beliefs about a culture, organization, or people.

• **External Factors** – factors outside of the program that influence the program outcomes.

• **Evaluation** – assessment of the program process, which can be added into the model to allow for planning and keeping the outcomes on track. (Adapted from model descriptions and information [McCrawley, 2001; Taylor-Powell, Jones, & Henert, 2003; Wholey, 1979]).

The Logic Model provides a graphical representation of the program; however, it lacks the human component of looking at each individual going through the process of change – their perceptions, levels of use, needs, etc. Program evaluations, like the Logic Model, look at measures of success in terms of quantitative data and outcomes; however, using case studies to evaluate programs at a more personal level can also be a valuable approach. Morzinski and Montagnini (2002) used logic modeling to look at the Palliative Care Education Program in a VA Medical Center in Wisconsin. They found that the model was easy to use and created a powerful framework for understanding the program’s strengths and gaps. However, as described above, the human element was removed from the evaluation and the solutions were discussed more in terms of the gaps that needed to be corrected in the program rather than the people involved in the change.
An education example could be a school evaluating a one-to-one iPad program. While quantitative data may show trends or patterns, case studies may better indicate impact on learning because there are endless factors that contribute or interfere with learning that may or may not have anything to do with the iPads. A case study will help to put those other factors into context and multiple case studies can be evaluated for trends and patterns, which could provide better data than the Logic Model can do alone.

**Concern Based Adoption Model (CBAM)**

Balbach (1999) discusses the advantages of the case study over traditional methods, “A case study evaluation allows greater latitude in seeking out and assessing program impacts” (p. 5). When considering the many frameworks available, the researcher was looking for a way to evaluate the grant implementation while realizing how important it is to examine each individual teacher and how the changes in knowledge are reshaping pedagogy. This is where the Concerns Based Adoption Model (CBAM) fit perfectly. “Change is a process, not an event” (Hall & Hord, 2006, p. 4). This statement is a key principle in the CBAM, a systematic approach for understanding and describing the change process within a school by providing meaningful data about the teacher’s feelings and individual implementation levels throughout the change. The model establishes profiles for each teacher, which helps change leaders to develop plans for facilitating the change process more effectively (Hall & Hord, 2006; Kresge, 2006). The CBAM is a well-documented, empirically grounded diagnostic tool that has been used to describe educational innovation since its design in the late 70s and early 80s (Anderson, 1997). Researchers have highlighted this model as a tool to help understand educators’ questions and concerns during the adoption and implementation of innovations.
The model has some key premises, which are:

- Change is a process, not an event.
- Understanding the change process in organizations requires an understanding of what happens to individuals as they are involved in change.
- For the individual, change entails developmental growth in terms of feelings about and skill in using innovation.
- Information about the change process collected on an ongoing basis can be used to facilitate the management and implementation of the change process (Hord, Stiegelbauer, Hall, & George, 2008, p. 1).

While CBAM has some limitations (discussed later), it provides a window into a change implementation at a given moment for the teacher and the school overall. In addition, the Innovation Configurations (IC) Mapping provides a structure for what the change should look like at the optimum level, which can be used for coaching of teachers as well as for professional development planning. The CBAM uses three different tools:

1. Stages of Concern Questionnaire (SoCQ) – a 35-item multiple choice survey that helps the researcher to understand the perceptions of the subject in relation to the innovation or change.

2. Levels of Use Branching Interview (LoU) – a branching interview that is conducted one-on-one with the subject to help understand better the level of implementation of the innovation.
3. Innovation Configurations Map (IC Map) – a word descriptor document that is created providing the objectives and components that are a part of the innovation.

Taken together, these three constructs provide a complete picture for the researcher about how change is occurring and being implemented.

**Summary of Change Models**

Studying different program evaluation and change models led the researcher to choose CBAM as the best approach for this dissertation. Table 2 summarizes the models of change and the advantages and challenges for each model.

While Guskey and Kirkpatrick seem to focus more on a single training innovation and how it has changed the organization, CBAM addresses the adoption of a new thinking, an organizational change. It focuses on the idea of change being a process, not something that happens all at once. It provides three different, validated uses for approaching the innovation from the personal side of change (SoC), the behaviors of each person as they achieve different levels of use (LoU), and a consensus of what the full innovation should look like (IC Map). These tools are not about the rate of return on investment, like Kirkpatrick suggested in his model, they are about pedagogical change and providing more for students in a changing era in education. The results will produce a baseline that can be used and re-tested each year to assess changes at the school. The “picture” that the data will provide should help to invigorate the staff and grant leaders to go to the next step in this innovation. The IC Map will provide the leaders and all teachers with an idea of what can be accomplished.
Table 2. Comparison of Theoretical Models of Change

<table>
<thead>
<tr>
<th>Model for Change</th>
<th>Advantages</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADKAR Model</td>
<td>• Acknowledges that there are many steps to change involving an emotional change, need for help from administration, and support to sustain change. It addresses the personal side of change.</td>
<td>• Does not address the program itself as it affects the change. More focused on individuals than the overall picture.</td>
</tr>
<tr>
<td>Kirkpatrick’s Four Levels of Evaluation</td>
<td>• Measures the change right after training and along the next phases to see if implementation and results are a success.</td>
<td>• Critics contend that assessment only provides the initial reactions from participants, and the tools for assessment along the way might require more evidence and greater insight. Assessments look at return of investment on the training, rather than the future success of the training on the organization.</td>
</tr>
<tr>
<td>Guskey’s Five Levels</td>
<td>• Built upon the learning from Kirkpatrick with the addition of the “why” an organization is doing the training, especially in education. • Focused on a single change or implementation.</td>
<td>• Requires planners to think of desired student outcomes first, and building training to accomplish goals, but sometimes outcomes are not known exactly yet.</td>
</tr>
<tr>
<td>The Logic Model</td>
<td>• A graphical representation of a program evaluation focused on quantitative data and outcomes.</td>
<td>• Focused on the measure of success, but lacks the human component and the understanding of how change affects the individual in the organization.</td>
</tr>
<tr>
<td>Concern-Based Adoption Model (CBAM)</td>
<td>• Focused on a change that affects the whole organization. • Addresses three sides of change – personal (perceptions), implementation in the classroom (levels of use), and consensus of what innovation looks like (IC Map).</td>
<td>• It is important to interpret data correctly and to ensure that the statements in the Stages of Concern questionnaire are not modified.</td>
</tr>
</tbody>
</table>
Concerns Based Adoption Model (CBAM)

In the following section, the researcher will look more in-depth at the background and use of the CBAM constructs and the potential limitations for the tool in this research study.

Stages of Concern Questionnaire (SoCQ)

The Stages of Concern Questionnaire (SoCQ) has a long history of use and is an established tool for studying change. The SoCQ evolved out of work by Frances Fuller, a counseling psychologist at the University of Texas at Austin, in 1969. She hypothesized that the concerns of each individual was based on their personal experiences. She was the first to consider a model of concerns for her students working through a teacher education program and going through four levels: Unrelated, Self, Task, and Impact. Unrelated concerns were most common in individuals who had no experience with teaching; thus, any concerns they had related to something else in their college lives. Self concerns occurred in the beginning of student teaching when the person was worried about things like where to park the car at the school, if they could go to the teacher’s lounge, or if they would get a good grade in the program. The concerns related to the person, rather than the concern of actually teaching. Task concerns relate to the items involved in teaching, for example, materials breaking too easily by the students, struggles with keeping up with grading student papers, or trying to manage a classroom. Impact concerns were the ultimate goal for student teachers where the concerns were focused on what was happening with students in the class and how to be more effective at teaching to improve student learning. Fuller found that over two thirds of pre-service teachers had concerns in the Self and Task areas, while two thirds of the experienced teachers had
concerns in the Task and Impact areas. She found that most teachers had some concern at all levels, but it tended to concentrate in one area (Hall & Hord, 2011).

Gene Hall and Shirley Hord took Fuller’s work and extended it by looking at concerns during any change or innovation. They found that the Stages of Concern could be expanded into seven specific categories and used to examine change for any individual. In Table 3, the Stages of Concern Model is broken down to show how a person with this concern would feel and a typical expression of this concern.

<table>
<thead>
<tr>
<th>Stage of Concern</th>
<th>Expression of Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 – Refocusing</td>
<td>“I have some ideas about something that would work even better.”</td>
</tr>
<tr>
<td><strong>Impact</strong></td>
<td></td>
</tr>
<tr>
<td>5 – Collaboration</td>
<td>“I am concerned about relating what I am doing with what my co-workers are doing.”</td>
</tr>
<tr>
<td>4 – Consequence</td>
<td>“How is my use affecting clients?”</td>
</tr>
<tr>
<td><strong>Task</strong></td>
<td></td>
</tr>
<tr>
<td>3 – Management</td>
<td>“I seem to be spending all of my time getting materials ready.”</td>
</tr>
<tr>
<td><strong>Self</strong></td>
<td></td>
</tr>
<tr>
<td>2 – Personal</td>
<td>“How will using it affect me?”</td>
</tr>
<tr>
<td>1 – Informational</td>
<td>“I would like to know more about it.”</td>
</tr>
<tr>
<td><strong>Unrelated</strong></td>
<td></td>
</tr>
<tr>
<td>0 – Unconcerned</td>
<td>“I am concerned about some other things.”</td>
</tr>
</tbody>
</table>

Note: Adapted from Hall & Hord, 2011, p. 72.

With further research, they expanded the descriptions for each stage (Table 4). Strong levels of concern in a stage simply means that the person is uneasy and/or passionate about that stage and its effect on the innovation, whether it is their personal concerns (Stage 2) or the consequences of the innovation on their students (Stage 4). Participants, who are enthusiastic about a change, would show higher levels of concern at
the Impact level (Stages 4, 5, and 6) indicating desires to improve the influence of the innovation for the other teachers and their students.

Table 4. Stages of Concern and Paragraph Descriptions for each stage

<table>
<thead>
<tr>
<th>Stage of Concern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td></td>
</tr>
<tr>
<td>6 – Refocusing</td>
<td>The focus is on the exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.</td>
</tr>
<tr>
<td>5 – Collaboration</td>
<td>The focus is on coordination and cooperation with others regarding use of the innovation.</td>
</tr>
<tr>
<td>4 – Consequence</td>
<td>Attention focuses on impact of the innovation on “clients” in the immediate sphere of influence.</td>
</tr>
<tr>
<td><strong>Task</strong></td>
<td></td>
</tr>
<tr>
<td>3 – Management</td>
<td>Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are dominate.</td>
</tr>
<tr>
<td><strong>Self</strong></td>
<td></td>
</tr>
<tr>
<td>2 – Personal</td>
<td>Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision-making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.</td>
</tr>
<tr>
<td>1 – Informational</td>
<td>A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner, such as general characteristics, effects, and requirements for use.</td>
</tr>
<tr>
<td><strong>Unrelated</strong></td>
<td></td>
</tr>
<tr>
<td>0 – Unconcerned</td>
<td>Little concern about or involvement with the innovation is indicated. Concern about other thing(s) is more intense.</td>
</tr>
</tbody>
</table>

Note: Adapted from Hall & Hord, 2011, p. 77.
The SoCQ consists of a 35-item questionnaire constructed to apply to all educational changes or innovations. The items are the same for every test with the only change being the name of the specific innovation used throughout the questionnaire.

Yuliang and Huang (2005) examined the pattern of teacher’s concerns in technology integration by giving 86 in-service teachers from a midwestern state university the Stages of Concerns Questionnaire. They found a correlation between the earlier stages of concern (personal and informational) and the experience level of the teachers. Those teachers with less experience were more concerned about getting information about the innovation and its effect on their own personal concerns. Experienced teachers had level of concerns more in the higher stages with collaboration or refocusing. Rakes and Casey (2002) conducted an extensive study using SoCQ with 659 teachers in the PK-12 levels about using technology in schools across the United States. Overall, regardless of experience levels of the teachers, the highest levels of concern were in the Informational, Personal, and Collaboration stages. The researchers indicated that the results show that before computers will be fully integrated into the classroom, teachers need to become more personally comfortable with technology as a tool, regardless of pressure from administration and others. Tunks and Weller (2009) examined change for a much smaller group of ten fourth grade teachers participating in a yearlong innovation program to add more algebraic concepts and thinking to the math curriculum. In this study, teachers were given the SoCQ every month throughout the year to see how their concerns would change over time. In addition, the teachers met with university personnel helping them to create the new instruments for the classroom on algebraic thinking concepts once a month. Teachers also had regular visits from the
project staff to interview and observe classes. Combined with the SoCQ, the project team also conducted regular checks on the levels of use and provided all participants with an Innovation Configurations (IC) Map to help guide future goals. While the project was only a year in length, the results indicate a shift in the pedagogy of the teachers in both concerns about the innovation and levels of use. This study showed that what affected the levels of use was not necessarily teaching experience, as in previous studies, but it appeared to be the concerns about state-mandated tests and how the changes to the math curriculum would affect the results.

Newhouse (2001) found that where the curriculum directly supported an innovation, it was implemented more readily; however, in contrast if the innovation was just added onto the current curriculum, teachers had higher levels of concern in the early stages and did not implement the innovation as well. As the curriculum became more teacher-focused, implementation was reduced. Newhouse indicated a need for further professional development to help teachers to see how the innovation of computers could be integrated better.

The SoCQ has been used in many ways over the years to measure the progress of implementation and to understand individuals’ concerns to design professional development to support use of an innovation.

**Levels of Use Branching Interview (LoU)**

There is an assumption with any innovation that the individuals are using the new program and they are employing it in an effective way. However, are they using the innovation at all; moreover, if they are using the innovation, then to what degree? The Levels of Use (LoU) construct helps to understand the behaviors of the individuals and
how they are acting with respect to the innovation. As Hall, Dirksen, and George (2008) describe it, “… researchers need to know if each individual identified in the treatment group is in fact using the program, practice or strategy” (p. 4). The LoU dimension is broken down into eight different classifications (behavior profiles), see Table 5. These definitions helped the researcher to make distinctions between use and non-use when it comes to an innovation.

This construct helped the researcher to understand the behaviors and actions of the subjects with regards to the innovation. What does the innovation being implemented in the classroom look like at each level? Determining the subject’s level of use requires conducting branching surveys. The initial questions seek only simple responses to determine if the subject is using the innovation or not. However, the key in the interview “is to stimulate the person to describe and provide examples of behaviors that he or she is taking in relation to the innovation” (Hall & Hord, 2006, p. 167).

The level of use by teachers is directly impacted by at least these four variables: the school, the leadership within the school, the individual teacher, and how evaluation data are used to support the teachers throughout the change process (Hall, et al., 2008). Program evaluation along the way is a critical component to change. The school culture can have a strong influence on change. For example, Graber (2005) conducted research with special education teachers who had recently faced cuts in personnel, forcing teachers to rethink how to meet student needs. These changes have had a negative effect on the classroom and attitudes, causing lower levels of implementation. The designers of the CBAM developed a focused interview with acceptable reliability coefficients as seen in some research (Thornton & West, 1999). However, to be within acceptable reliability
rates for this construct, the designers indicate that extensive training is required to conduct this interview properly. Non-trained researchers can conduct the interviews to get an overall understanding of a group; however, reliability cannot be guaranteed.

Looking at levels of implementation is something that should be examined over the long term to see how change occurs throughout a timeframe.

### Table 5. Levels of use with paragraph descriptions.

<table>
<thead>
<tr>
<th>User Level</th>
<th>Level of Use</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users</td>
<td>VI – Renewal</td>
<td>State in which the user re-evaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new development in the field, and explores new goals for self and the system.</td>
</tr>
<tr>
<td></td>
<td>V – Integration</td>
<td>State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.</td>
</tr>
<tr>
<td></td>
<td>IVB – Refinement</td>
<td>State in which the user varies the use of the innovation to increase impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.</td>
</tr>
<tr>
<td></td>
<td>IVA – Routine</td>
<td>Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.</td>
</tr>
<tr>
<td>III – Mechanical Use</td>
<td>State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in mastering the tasks required to use the innovation, often resulting in disjointed and superficial use.</td>
<td></td>
</tr>
<tr>
<td>Non-users</td>
<td>II – Preparation</td>
<td>State in which the user is preparing for first use of the innovation.</td>
</tr>
<tr>
<td></td>
<td>I – Orientation</td>
<td>State in which the user has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon user and user system.</td>
</tr>
<tr>
<td></td>
<td>0 – Nonuse</td>
<td>State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.</td>
</tr>
</tbody>
</table>

Note: Adapted from Hall & Hord, 2011, p. 94.
Innovation Configurations Map (IC Map)

“The focus in the IC diagnostic dimension is on developing and applying word-picture descriptions of what the use of an innovation can look like” (Hall & Hord, 2006, p. 112). IC Mapping is a collaborative process; a team designs the first draft, and then it is shared with the whole community to gather feedback. By working as a team on this process, the focus is taken off the researcher as the primary designer. While SoCQ and LoU data collections involve anonymous or one-on-one interviews with teachers, the IC Mapping involves a team and literally the whole staff involvement. As noted in Hall and Hord (2006), “this is a dynamic, interactive, consensus-building process” (p. 126). The key questions asked during the collaborative process are:

1. What does the innovation look like when it is in use?
2. What would I see in classrooms where it is used well (and not as well)?
3. What will teachers and students be doing when the innovation is in use?

(Hall & Hord, 2006, p. 126)

Table 6 describes the steps in designing the IC Map, which is designed to facilitate change. It helps to ensure the whole staff knows the vision for the grant innovation. It can be used as a tool to improve and expand further training and development and to help encourage growth in areas of the map where the staff is weak. Hall and Hord (2006) remind researchers that, “the focus is kept on the innovation instead of the teacher” (p. 128). In this way, teachers and administrators can look at the IC Map as a coaching tool rather than an evaluative one. Because the process of creating the IC Map is a collaborative one, research bias as an “insider” should be kept to a minimum by the investigator.
Table 6. The innovations configuration mapping process.

<table>
<thead>
<tr>
<th>Step</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing the team</td>
<td>Hall and Hord (2006) suggest a team of three to seven key people. It is helpful to have the team be composed of people from various levels who are familiar with the innovation, in a school that would include teachers and administrators.</td>
</tr>
<tr>
<td>Gathering Data</td>
<td>The first step is to gather background data, which can include: all documents related to the innovation, interviews with the key leaders, and observations of classrooms.</td>
</tr>
<tr>
<td>Brainstorming information</td>
<td>Together the team creates a cluster map, which is a visual array of possible variations of the components of the innovation.</td>
</tr>
<tr>
<td>(Clustering Ideas)</td>
<td></td>
</tr>
<tr>
<td>Key Components</td>
<td>Based on the cluster map, the team determines which components are keys to the innovation. Working together the team tries to determine the wording of the components and the variations on the components, for example, when the component is done well, somewhat, or not at all.</td>
</tr>
<tr>
<td>Verification</td>
<td>The team then examines the full draft and makes adjustments as needed. This might involve re-writing variations or components to ensure it is clear and understandable to others.</td>
</tr>
<tr>
<td>Draft Map</td>
<td>Once the IC Map draft is complete, it is shared with the staff and feedback is taken in to update the draft.</td>
</tr>
</tbody>
</table>

Note: Adapted from Hall & Hord (2006).

Mills and Ragan (2000) used the IC Mapping process to create a tool for examining the quality of implementation of an integrated learning system (ILS) in four elementary schools in an urban school district. Mills and Tincher (2003) used the IC Mapping to validate the technology integration standards and stages identified by their school district, and then to use the map to evaluate the progress of the teachers over the innovation timeframe. The teachers were given the map to review and fill out an online checklist to determine the stages of development before and at the end of the school year. Statistical data for this research indicated that the IC Map was a valid tool for determining the technology integration levels of the schools being studied. Mills and Tincher (2003) state that, “when educational best practices for teaching and learning with
technology are clearly defined and established, the professional skills of the teachers will begin to exemplify the stated expectations” (p. 398). Their research has vast implications for helping move innovations forward and shows that IC Mapping can be an effective tool for communicating to teachers the expectations and desired outcomes.

**Implementation Bridge**

Taken together, the SoCQ, LoU interviews, and the IC Map have helped many researchers to understand change. As Hall (2010) describes it, “For most innovations, change should not be considered in terms of adoptions. Instead change needs to be thought about as a process of implementation” (p. 234). Hall goes on to describe what he calls the “Implementation Bridge” (Figure 8), which can be applied to any type of implementation. “Instead of expecting teachers and schools to make giant leaps across the chasm, providing an implementation bridge will result in more frequent and higher-quality use” (p. 235). In the model, the three constructs of the CBAM can be used to determine where teachers are on the implementation bridge, but it can also be used as a training tool to help the teachers “cross” the bridge effectively and efficiently. Knowing what the end of the bridge has in store for the teacher helps make the journey easier. The three tools used together can provide the basis for change and implementation of innovation.
CBAM Limitations/Challenges

While research on the CBAM approach has been overwhelmingly favorable, a few researchers have questioned the validity of some of the aspects. Stephen E. Anderson identified ideas for continued research and he argued the need for more theoretically motivated research than just the application of the model to educational change (Anderson, 1997). He examined research conducted using the CBAM model, and his thoughts on the limitations include the following:

- **Discrepancies between SoCQ and LoU results** - Marsh (1987) conducted SoCQ and LoU studies of eight teachers at the beginning and end of the school year. While the data reported high concern levels in the Personal and Refocusing stages (indicating struggles with using the innovation and a desire to replace the
innovation with something else), the levels of use throughout the year indicated growth from Levels III to IVA/IVB showing growth in implementation of the innovation. How could the teachers show growth in applying the innovation while avoiding it, and in turn seeking out other innovation models? This discrepancy was explained as a possible cultural bias on the questionnaire; however, Anderson suggests that further research may be needed to review the connection between SoC and LoU scoring.

- **Misuse of Constructs** – Researchers sometimes treat Levels of Use ratings as the final state, rather than a developmental state. In addition, variations in levels can be misinterpreted. This is what happened in the Evans and Hopkins study (1988), according to Anderson (1997, pp. 340–341).

- **SoC Framework Concerns** - Kember and Mezger (1990) concluded that the Stages of Concern framework “did not accommodate the concerns of people who reject rather than implement an innovation” (Anderson, 1997, p. 341). The general question is, how does this model address innovation rejection as a stage in a theory about teacher attitudes and behaviors in change? In use of the framework with students, Marsh and Penn (1988) found the Consequence (Stage IV) held at “intense” levels throughout the year, which was not expected. This provided a valuable test for its use with other subjects besides teachers (Anderson, 1997, p. 341). In other studies, “intense levels of teacher concerns about the impact of a change on students are not predicted until after the teacher has gained some mastery over the change, and are often linked to thoughts about modifying the innovation” (Anderson, 1997, p. 343).
• **Levels of Use Misinterpretations** – Hall and Hord (2006) admit that while the branching interview can provide data about the teacher’s level of use, for more rigorous evaluation studies, “the prospective LoU interviewer undergoes a three-day training and certification program to prepare for a more formalized interview protocol” (p. 167). Without the training, data may not be as reliable.

The CBAM is just one model for looking at educational change in the classroom. However, this model has stood the test of time, and while there are some limitations in the kind of data it can gather, when handled appropriately it can provide a researcher with important information on individuals going through change.

**Summary**

While there may be a rationale to explain why the educational transformation movement is slow, change and innovation are still needed. The problem is that change is not as simple as saying it is so, change involves giving something up, whether that be control of the classroom or some content. It involves teachers changing beliefs that have been ingrained in them since they themselves were students. It involves administrators being willing to take risks and allow teachers to try new techniques. With the change, there will be challenges to overcome:

• Administrators will need to buy-in to change and lead it.

• Teachers will need to look at what the twenty-first century classroom means to their lesson plans, pedagogy, and assessment.

• Students will need to be open to getting more involved in their own learning.

• School culture may need to change in relation to these new beliefs and mission statements may need to be revised.
With thirty percent of college and university students dropping out after their first year and half never graduating, change is needed to aid in better transition and preparation of students in high school (Bowler, 2009). Training teachers to educate students differently has been a constant struggle for many years in schools. Ferriter (2011) states, “As crazy as it sounds learning isn’t the priority for most teacher professional development programs. Instead, meeting the requirements for certification spelled out in policy is the priority” (p. 1). Returning to Fullan (2007), educational change is not so much about training of tools and techniques, it comes down to what teachers do, and that seems simple, but it is not as easy as one might think.
CHAPTER 3: METHODOLOGY

This chapter provides information on the type of research that was conducted, the tools used to gather the research, how the data were handled, and how the data were analyzed. Since the beginning of the grant, the researcher has received Institutional Review Board (IRB) approval to survey teachers about what they know about the grant, their perceptions for the change, and how the implementation was occurring in their classrooms.

Research Design

Analyzing and understanding how teachers change their pedagogy requires hearing from them about how they interact with new knowledge, in this case, the grant elements and goals. Stake (1995) states, “Case study is the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. xi). By studying the individual teachers and how they change within the context of the grant program, the researcher should better understand what makes it successful.

Qualitative research allows the researcher to become a part of the investigation. Instead of looking from a detached view, “qualitative researchers treat the uniqueness of individual cases and contexts as important to understanding” (Stake, 1995, p. 39). Instead of approaching the data from a statistical nature, the researcher was looking for important subtleties in the way a participant responds or the words they chose. The researcher was able to take the whole of responses and combine them to produce themes of understanding about how change was occurring and what the success and challenges are going forward. Program Evaluation is one type of qualitative research in which the
researcher collects, analyzes and uses information to understand a program’s effectiveness and efficiency. In this case, the researcher tried to determine the effectiveness of the Schools of the Future grant implementation in each classroom. There are many methods for evaluating a program; however, by using case study and the Concern Based Adoption Model, the researcher was able to utilize the information for future improvements in the program.

**Participants and Context**

**Participants**

All participants in this research were high school teachers at the school located on an island in the Pacific Ocean at the time of survey implementation. Teachers were asked to voluntarily participate in all aspects of the research survey process. In previous pilot studies conducted in 2009, the majority of teachers at the school were between the ages of 26 and 45 (66%), taught between six to fifteen years (55%), and taught at the school for five years or less (55%). At that time, teachers generally had a positive attitude about the grant and were excited about what the grant would bring to students (88% agree or strongly agree). More than 80% of teachers hold a graduate level degree and most of them have had some formal training in working with students who have language-based learning challenges like dyslexia. Fourteen of the eighteen participants for this survey (77.7%) have been working in the high school for the entire grant period.

**Study Setting**

The school is a small, independent private school on an island in the Pacific Ocean for gifted and/or dyslexic students. The school was originally founded to serve military families for children with special needs. In the late 1960’s, the school’s mission
changed, and it became a K-8 school serving dyslexic and/or gifted students. The high school opened in the early 1990’s. The school was first accredited by the Western Association of Schools and Colleges (WASC) in 1991 and the high school in 1998. The school was re-accredited for a six-year term in 2010 having met the highest standards by the WASC. Enrollment varies by year with approximately 250 students in the lower school and 115 students in the high school each year. The high school has 20 teachers, a college guidance counselor, and a counselor, with most class sizes between seven to nine students. The lower school works on a team teaching model with mixed grades, so a class might have second and third graders and no more than sixteen students. The school has a strong administrative team with two principals, one for the lower school and one for the high school, respectively, along with a head of school and assistant head of school. With a student to teacher ratio of approximately 8 to 1, teachers are trying to provide an individualized program to meet student needs. The school is dedicated to meeting the needs of students (educational and psychological) and helping them “find” their places as life-long learners both in school and in the future.

The high school (9th to 12th grades) is separated from the lower school by hallways and has 19 classrooms, a teacher’s lounge, and four offices for other staff members. Because of the tropical setting, classrooms connect via long breezeways open to the fresh air and the lunch area is situated in the middle on a deck with tarp canopies for protection from the rain and sun. The school is mostly an Apple computer environment and laptops are available for check out by students and teachers in mobile carts spread evenly throughout the high school.
The School Mission and the Grant

The school’s mission is the filter through which the school leaders shape every aspect of the program: to serve dyslexic and/or gifted students in order to empower them to maximize their potential and find places as lifelong learners in school and society. As a result of efforts of the whole staff, students find an environment where differences are valued. Students gain confidence and competence as non-traditional learners who effectively advocate for the resources and support they need to be successful academically, personally, and socially. The leaders of the school admit that they can do a better job at building students’ resiliency, self-awareness, and skills for the twenty-first century. The grant is a tool to help continue to support the students and other students around the world in growth and transition.

Role of the Researcher

The researcher is not only the Grant Team Leader, but he is also a high school mathematics and technology teacher at the school. The researcher has over 12 years of teaching experience ranging from 6th grade to graduate level. He has been a teacher at the school for eight years. In this case, the researcher’s role at the school is leading the change initiative and analyzing the process. The researcher is the leader of the initiative; however, similar to the other teachers being studied, he is also a teacher changing his own pedagogy throughout the process. It is common for a qualitative researcher to assume a participatory role in a case study. As Stake (1995) describes it, “The intent of qualitative researchers to promote a subjective research paradigm is a given. Subjectivity is not seen as a failing needing to be eliminated but as an essential element of understanding” (p. 45). The researcher conducted this dissertation to understand the
grant initiative better and to help with the program evaluation. These goals are different from what is required in reporting results to the grant funding foundation. The research that was produced for this dissertation is not what is being given to the committee and is not a part of the actual grant funding evaluation process. There is plenty of anecdotal evidence that can be given to the funding committee to ensure additional grant funding for the future and avoid the impression of bias. The strategy as Patton (2002) puts it, “involves discussing one’s predispositions, making biases explicit, to the extent possible” (p. 553). In the next sections, the researcher addresses his roles in relation to the presumed biases that might occur in conducting and analyzing the research for this dissertation.

**Addressing Bias**

Hartman, Forsen, Wallace, and Neely (2002) provide detailed descriptions of many different forms of biases faced in research. Table 7 shows the types of biases that are inevitable given the role of the researcher at the school and how the concerns were addressed.

**Table 7. Types of researcher bias and how they will be addressed.**

<table>
<thead>
<tr>
<th>Type of Bias</th>
<th>Description</th>
<th>How to Address Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection Bias</td>
<td>How participants are selected to be part of research. Was the selection random and did it provide enough variety to epitomize the whole population?</td>
<td>In the Instrumentation and Procedures Section, the researcher discusses how he used maximum variation purposeful sampling to ensure that the subjects interviewed provided a wide range of teacher level types. This should protect against the bias of selection, especially by having another grant team member review the criterion and the chosen list of teachers prior to selection.</td>
</tr>
</tbody>
</table>
Table 7. (Continued) Types of researcher bias and how they will be addressed.

<table>
<thead>
<tr>
<th>Bias</th>
<th>Description</th>
<th>Addressing Response Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response Bias</strong></td>
<td>The subjects give responses they think the interviewer wants to hear.</td>
<td>Using the Levels of Use questions ensure that the interview questions are kept consistent. Previous research studies have shown that participants do not always provide answers honestly for fear of incriminating themselves (Walsh and Braithwaite, 2008). Because of this, it was important for the researcher to inform the subjects that the interviews were confidential, would not be shared with administrators, and would not affect performance reviews in the future. Response Bias can work both ways, while there is a concern about getting responses the participants think the researcher wants to hear, there is an advantage because the subjects know and trust the interviewer, which could encourage them to be more willing to give detailed responses than they would have to an outside interviewer. This personal connection and privileged insider knowledge could be an advantage, especially when it comes to discussing personal success and failures in terms of the grant innovation.</td>
</tr>
<tr>
<td><strong>Interviewer Bias</strong></td>
<td>The interviewer may give subtle clues that influence the subjects into giving answers that they think the interviewer wants to hear.</td>
<td>Similar to response bias, the researcher must monitor his behaviors during interviews. By having the set questions described in the branching interviews, the focus was taken away from the researcher and put more on the classroom and the teacher’s pedagogy. The advantage here again is the trust level with the subjects.</td>
</tr>
<tr>
<td><strong>Participant-Observer Bias</strong></td>
<td>As a participant in change, the researcher might be biased in collecting and analyzing the data.</td>
<td>The researcher recorded all responses from the participants and transcribed the results. From there, the researcher used pattern coding to create themes from all the participant responses; because of this, the focus was on what was being said by the participants, rather than what was observed. In addition, the researcher had an administrator review the pattern coding to compare the results.</td>
</tr>
</tbody>
</table>

Note: Hartman et al. (2002); Shuttleworth (2009).
While being an “insider” at the school could be seen as a concern, qualitative research involves putting “on the shoes” of the subjects to understand better the change that is occurring. Patton (2002) puts a different spin on bias in research when he states, “qualitative methodologists question the necessity and utility of distance and detachment, asserting that without empathy and sympathetic introspection derived from personal encounters, the observer cannot fully understand human behavior” (p. 49). Thus, there is a need to be immersed in the research and the participants to fully understand what is going on around them. For example, Edna Shapiro’s closeness to the children she was studying enabled her to see the differences in them and helped her to show what the standardized tests alone could not (Shapiro, 1973). Again, Patton (2002) concluded that while, “closeness does not make bias and loss of perspective inevitable; distance is no guarantee of objectivity” (p. 49). Full disclosure throughout the process will help to ensure that objectivity is maintained as much as possible in this research project.

**Participatory Research**

In addressing the question as to when and to what level participatory forms of research come into play in working with teachers on this project, the researcher must again consider the role within the grant innovation. In the previous section on bias, the researcher discussed the fact that he is also going through change in this process and working with the teachers to bring about their own pedagogical changes. In addition, the grant team is comprised of teachers and administrators who are themselves taking risks and “participating” in the change. The grant team and researcher are not objective viewers of the change, but are actively bringing it about in our own classrooms and helping others to actively change. Paraphrasing McIntyre (2008), it is a focus on change
with a commitment to participate with a group to improve and understand the world by changing it. Participatory Action Research (PAR) is the type of research that is being defined here. Wadsworth (1998) describes PAR as not a specialized technique, but a form of social research that is, “conscious of its underlying assumptions, and collectivist nature, its action consequences and its driving values” (p. 1). Participatory research “stresses inter-personal communication among different parties.” The process is “collective” in nature and “requires groups of people to engage together” (Pant, 2007, p. 99). Participatory research is not always the appropriate choice for every situation. In the situation where the results of the research will decide the funding for an organization or if a new technology tool is effective, the researcher must maintain objectivity through the lens of an observer only. If the researcher does get involved, the involvement could have an effect on the data, which would invalidate it, and produce results that might sell more devices or fund something that should not be funded. In program evaluation through case study, the researcher is continuously participating in the program in a way to bring about the change goals. As Neiland, Bennett, and Townsley (2005) state, “Participatory approaches to research encourage end-users to articulate demands, and therefore raises their expectations. This means that participatory research approaches are most appropriate where there are opportunities for long-term engagement with the end-users, so that these demands can be met” (p. 3).

**Purpose and Goals**

Returning to the reasons for the research, the purpose of the qualitative program evaluation was to examine how the Schools of the Future Grant Initiative has impacted the pedagogy of high school teachers at the school. The goals of the research were to:
Understand the teachers’ concerns, levels of use, and the qualities of implementation in the first half of the grant period.

Help the researcher to maximize the implementation over the second half of the grant and beyond by examining the results of the data and implementing changes in the program.

Provide ideas to help other schools seeking to employ similar organizational changes in the future.

**Research Questions**

Early survey data at the school indicate that change is occurring and is having an impact on teacher pedagogy. By using the CBAM approach, the researcher should have survey data that are reliable and valid, which should provide better predictions and planning for the rest of the implementation. The researcher wanted to answer the following questions:

1. What are the teachers’ perceptions of the grant implementation and what help would they need to continue the change in pedagogy (Stages of Concern - SoC)?
2. What is the extent of implementation with each teacher and the high school as a whole (Levels of Use - LoU)?
3. What are examples of pedagogical changes that teachers have made in their classrooms?
4. How can the change process be facilitated to achieve the highest levels of implementation in individual classrooms and across the high school (Innovation Configuration Map)?

These questions were adapted from Hall’s (2010) article on Achieving High-Quality Implementation (p. 235).
Instrumentation and Procedures

The Concern Based Adoption Model includes three types of instruments and those were used with the participants. In the next sections, the researcher described the procedures used to conduct the instruments.

Concern Based Adoption Model (CBAM)

The study was conducted using the CBAM as a framework for gathering and analyzing data; Chapter Two provides a detailed explanation of these constructs. The model includes the following constructs and instruments: the Stages of Concern Questionnaire (SoCQ), the Levels of Use (LoU) branching interviews, and the creation of the Innovation Configurations (IC) Map. Each of these constructs, along with some demographic and open-ended questions provided the researcher and the grant team with a better picture of how the grant is being implemented and the perceptions of the innovation as a whole. The researcher investigated using other school change models (described in the literature review); however, CBAM appeared to be the best choice, because it has been used extensively over many years by researchers and is well established in the educational community for understanding and exploring teacher change. As Hall (2010), one of the designers of CBAM describes it, “The CBAM offers several research-based constructs and tools that can be used to understand, facilitate, and evaluate the more complex efforts entailed with introducing technology innovations in classrooms and schools. An important beginning point with the CBAM perspective is the assumption that change is a process, not an event” (p. 234). Each construct addresses different elements of change and each has its own methodology.

Innovation Configurations (IC) Map - The first piece of data created was the
Innovation Configurations (IC) Map. IC Mapping is a collaborative process; a team designs the first draft, and then it is shared with the whole community to gather feedback. For this project, the researcher chose the grant team as they have been involved in the design and implementation of the initiative for the past two years. This team has provided leadership and guidance throughout the innovation. By utilizing this group, the researcher had the best opportunity to produce a map that fit the original idea of the grant outcomes. In addition, the team took the focus off the researcher as the only one designing the IC Map, helping to alleviate concerns about the effect of a researcher’s bias on its design. While SoCQ and LoU data collections involve anonymous or one-on-one interviews with teachers, respectively; the IC Mapping involves a team and literally the whole staff involvement. Table 8 describes the steps the team used to design the map. The IC Map was designed to facilitate change. It helps to ensure the whole staff knows the vision for the grant innovation. It can be used as a tool to improve and expand further training and development and to help encourage growth in areas of the map that are weak. The map also provided teachers with an understanding of the goals before they took the SoCQ and were interviewed for the LoU. Hall and Hord (2006) remind researchers that, “the focus is kept on the innovation instead of the teacher” (p. 128). In this way, teachers and administrators can look at the IC Map as a coaching tool rather than an evaluative one. Because the process of creating the IC Map is a collaborative one, research bias as an “insider” should be kept to a minimum as the researcher.
### Table 8. The IC mapping process for this research design.

<table>
<thead>
<tr>
<th>Step</th>
<th>Commentary</th>
</tr>
</thead>
</table>
| Establishing the team  | Hall and Hord (2006) suggest a team of three to seven key people. The researcher enlisted the grant team, which consisted of seven people:  
  ▪ The grant leader (researcher)  
  ▪ Two high school teachers  
  ▪ The middle school curriculum coach  
  ▪ The high school principal  
  ▪ The lower school assistant principal  
  ▪ The assistant head of school  
  The team members contributed a variety of experiences and ideas. With the exception of the lower school assistant principal, all have been members of the initial team that designed the grant proposal. In addition, most of the team has been at the school for more than five years, and some of them more than a decade. This team understood the school’s mission and goals and how to bring about change. |
| Gathering Data        | The first step was to gather background data, which included: all documents related to the grant proposal and subsequent reporting, interviews with the key leaders, and observations of classrooms that had changed in different ways. |
| Brainstorming         | Together the team created a cluster map, which is a visual array of possible variations of the components of the innovation. The key was to determine how the innovation is being used and what happens in the classroom when the innovation ideas are in place. How has the pedagogy changed and how is it reflected in the class? This was the answer the team tried to solve. |
| information (Clustering Ideas) |                                                                                                                                  |
| Key Components        | Based on the cluster map, the team determined which components were the key ones for the innovation and developed these by working together to determine the wording of the components and the variations on the components (e.g. when it is done well, somewhat, or not at all). |
| Verification          | The team then examined the full draft and made adjustments as needed. This involved adding new components or rewriting variation statements. |
| Draft Map             | Once the IC Map was complete, it was shared with the staff. Thoughts were shared back to the team and they met again to revise the map. Over time, the map will continue to be revisited as it is a dynamic document and will change throughout the grant period. |

**Stages of Concern Questionnaire (SoCQ)** - All high school teachers who volunteered were given the SoCQ to explore their feelings and perceptions about the
Schools of the Future Grant initiative. In pilot studies, conducted in previous years, the researcher had voluntary participation levels averaging more than 80%. The surveys used were anonymous online forms with a small incentive to participants who took the time to complete it. In collecting the data, bias was not a factor because the subjects remained anonymous. In addition, Hall and Hord (2006) provide a detailed approach to analyzing and interpreting the data for this type of questionnaire. A copy of the questionnaire given to teachers is included in Appendix B. Since this was the main opportunity to survey the entire staff, the researcher added three demographic questions and three open-ended questions. Based on previous CBAM studies, adding the questions do not affect the results of the questionnaire, but provide an opportunity for teachers to give more information about elements of the innovation that could be changed in the future.

**Levels of Use (LoU)** - Using the manuals available on LoU, the researcher created the decision points for the branching interview template (Appendix C). The branching interviews are more personal than an anonymous survey and require more time; therefore, the participation level would be less than SoCQ if the researcher simply asked for volunteers. Additionally, using the “volunteer” method might only yield the most motivated teachers with the highest levels of use to be interviewed. This would not provide the researcher with a varied sample in levels of use and could skew the results to higher levels of use than reality; thus, the data could be compromised. Another approach could be to randomly select subjects and hope the selected ones are willing to participate. While random selection is effective for large quantitative sampling, it is not appropriate as a procedure in small qualitative studies like this one (Patton, 2002). Even by
randomizing the sample, it could result in more subjects from certain levels than others. Done correctly, purposeful sampling provides a better range of data than just randomizing the selection. As Patton (2002) describes it, “the logic and power of purposeful sampling lie in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry” (p. 230). The researcher considered both Intensity Sampling and Maximum Variation Sampling, and chose the latter. Intensity Sampling involves either interviewing lots of cases and looking at the most information rich ones, or picking to interview cases that the researcher would hope would be “intense” or information rich. Creswell (2007) states that the maximum variation sampling “consists of determining in advance some criteria that differentiate the sites or participants, and then selecting sites or participants that are quite different in criteria” (p. 126). The researcher’s goal was to gather data on 25-40% of the total population of 18 high school teachers, amounting to five to seven participants.

The first step was to create a criterion to separate the teachers into heterogenic groups. Based on this, the researcher picked participants from each group to create maximum variation among the sample. At first, the researcher thought of creating a criterion by trying to determine different areas to study; however, the decision was evident in the data already collected. The IC Map created a criterion that could be used to determine different levels of use for teachers. The researcher assigned points to each of the components of the IC Map, then assigned point values for each of the teachers. For example, in looking at the IC Map (Appendix D) for objective one on student-driven learning, if the teacher was at the beginning practitioner level this would be three points...
towards the total. With six different objectives (1, 2, 3, 4, 5A, and 5B) and two different intensities for each level, a teacher would have a potential total of 36 points. The researcher asked the principal to independently rate the teachers as well, which yielded two sets of results to compare and determine the level for each teacher in one of three categories: apprentice, practitioner, and leader.

Table 9 provides a chart showing how the teachers were scored and the results. Once the teachers were grouped into the three criterions, specific participants in each category were asked to volunteer for interviews. The researcher and principal discussed which volunteers to ask based on which teachers were thought to provide the most interesting, information-rich stories. Choosing two subjects from each category provided varied data for analysis. With this plan in mind, maximum variation sampling should yield, “high-quality, detailed descriptions of each case … and important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity” (Patton, 2002, p. 235).

Maximum variation sampling has been an effective technique for many researchers. For example, Hoepfl (1994), who used maximum variation sampling to select subjects from institutions across the United States that had closed teacher education programs between 1987 and 1992. In addition, for Wren (2010), who used maximum variation and criterion sampling to select three schools to study how principals are mentoring teachers to improve practice. In the end, six participants were asked to interview, and all of them agreed. The highlighted teachers in Table IX were the ones who were interviewed. The results of the interviews are described in the Data Analysis section.
Table 9. Maximum variation sampling results.

<table>
<thead>
<tr>
<th>Teacher Number</th>
<th>Researcher Rating</th>
<th>Principal Rating</th>
<th>Total</th>
<th>Average</th>
<th>Criterion Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29</td>
<td>29</td>
<td>58</td>
<td>4.83</td>
<td>Leader</td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>29</td>
<td>58</td>
<td>4.83</td>
<td>Leader</td>
</tr>
<tr>
<td>12</td>
<td>25</td>
<td>28</td>
<td>53</td>
<td>4.42</td>
<td>Leader</td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>25</td>
<td>51</td>
<td>4.25</td>
<td>Leader</td>
</tr>
<tr>
<td>13</td>
<td>24</td>
<td>26</td>
<td>50</td>
<td>4.17</td>
<td>Leader</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>26</td>
<td>50</td>
<td>4.17</td>
<td>Leader</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>25</td>
<td>48</td>
<td>4.00</td>
<td>Practitioner</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>20</td>
<td>37</td>
<td>3.08</td>
<td>Practitioner</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>18</td>
<td>37</td>
<td>3.08</td>
<td>Practitioner</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>18</td>
<td>36</td>
<td>3.00</td>
<td>Practitioner</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>17</td>
<td>34</td>
<td>2.83</td>
<td>Practitioner</td>
</tr>
<tr>
<td>14</td>
<td>16</td>
<td>15</td>
<td>31</td>
<td>2.58</td>
<td>Practitioner</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>10</td>
<td>22</td>
<td>1.83</td>
<td>Apprentice</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>9</td>
<td>21</td>
<td>1.75</td>
<td>Apprentice</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>11</td>
<td>20</td>
<td>1.67</td>
<td>Apprentice</td>
</tr>
<tr>
<td>18</td>
<td>11</td>
<td>8</td>
<td>19</td>
<td>1.58</td>
<td>Apprentice</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>7</td>
<td>17</td>
<td>1.42</td>
<td>Apprentice</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>6</td>
<td>14</td>
<td>1.17</td>
<td>Apprentice</td>
</tr>
</tbody>
</table>

Data Collection

While the researcher conducted three different survey elements, all of them were not conducted at once. The Stages of Concern Questionnaire involved teacher perceptions of the innovation; however, some teachers were still struggling with understanding the innovation as a whole. George, Hall, and Stiegelbauer (2008) suggest that the IC Map will, “help change facilitators identify and describe the various forms an innovation can take, showing the most ideal form of the innovation, thus making
introduction and monitoring of the change easier” (p. 5). In looking at the IC Map, the teachers would have a better understanding of the road ahead in the second half of the grant. Data for the three CBAM dimensions were collected for a five-month period from November 2011 to March 2012 and are described in Table 10.

### Table 10. Timeline for data collection.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC Map Design</td>
<td>Met with grant team to create the Innovation Configurations Map, which was shared with teachers for feedback and provided to them for reflection before taking the SoCQ survey</td>
<td>November 2011 to February 2012</td>
</tr>
<tr>
<td>SoCQ survey</td>
<td>Administered to high school teachers through an online, anonymous survey format</td>
<td>Early March 2012</td>
</tr>
<tr>
<td>LoU Interviews</td>
<td>Used maximum variation sampling to find volunteers from the heterogenic groups to conduct LoU branching surveys.</td>
<td>Late March 2012</td>
</tr>
</tbody>
</table>

**Innovation Configurations (IC) Map**

The first piece of data collected was the IC Map. The map was designed as a Microsoft Word document with tables. The table laid out each of the components along the left column followed by columns showing the progression for the goals from the beginning to the end of the grant. Remember that the map is a guideline for teachers, not all of them will reach the top variation for each component. The latest copy of the map is available in Appendix D. The first draft of the map was designed on a white board as the grant team brainstormed ideas. From there, the researcher moved the data to a shared Google Doc for the team to add thoughts, suggestions and changes. In subsequent meetings, the team perfected the first draft and returned the design to a Word document for duplication and distribution to the teachers for a first review by the full staff. Table 11 shows the timeline for the IC Map creation.
Table 11. Timeline for IC map design.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial meeting and brainstorm</td>
<td>The team met to review the documents from the previous grant years and design an initial draft of map.</td>
<td>December 2011</td>
</tr>
<tr>
<td>Continued work on IC Map</td>
<td>The IC Map was moved to a Google Doc so that all team members could continue to work and refine the first draft.</td>
<td>December to January 2012</td>
</tr>
<tr>
<td>Revisions and refinement</td>
<td>Team met again to finalize revisions to IC Map, version 1.0.</td>
<td>January 2012</td>
</tr>
<tr>
<td>Format and approval of 1.0</td>
<td>Updates are finalized into a stylized version of the IC Map 1.0.</td>
<td>End of January 2012</td>
</tr>
<tr>
<td>Teacher thoughts and suggestions</td>
<td>Teachers had a chance to look at the map and offer suggestions and feedback.</td>
<td>February 2012</td>
</tr>
<tr>
<td>IC Map version 1.4 approved</td>
<td>Based on feedback, the current version of the IC Map was updated and approved by grant team.</td>
<td>February 2012</td>
</tr>
<tr>
<td>Teacher reflection time</td>
<td>Teachers had a planning meeting where they each received a copy of the IC Map and reflected on their progress with it. (This gave them a clear understanding of goals for the grant prior to taking the Stages of Concern Questionnaire).</td>
<td>February 2012</td>
</tr>
</tbody>
</table>

The team looked at many different components before deciding on the final five components. After deciding on the components, the team focused on the different variations of implementation for each one. Then, it was determined as a team that categories of variation might help teachers to understand their level for each given component. The three words chosen, apprentice, practitioner, and leader, were critical to giving the teachers something to set goals for in the future. Obviously, any school would love to have all teachers at the leader level, but for some, this just will not be possible, but understanding that reaching the practitioner level is a worthy goal, gives each teacher something to strive for. In addition, when creating the map, it was important that the grant team create opportunities for teachers to see themselves as leaders in some areas,
while they were still grappling with learning another area. For example, a teacher might be a “leader” in the area of technology integration, but still be at the practitioner level for creating a student driven learning environment. Again, Appendix D provides a copy of the current IC Map to review.

**Stages of Concern Questionnaire (SoCQ)**

The SoC questionnaire was conducted online at the Southwest Educational Development Laboratory (SEDL) website - http://www.sedl.org/pubs/catalog/items/cbam21.html. SEDL is a private, nonprofit educational research, development and dissemination corporation in Texas. SEDL works with schools to meet the requirements for No Child Left Behind; in addition, they have been working with the designers of CBAM for a long time. For a small fee, SEDL provides researchers with an online version of the SoCQ along with the ability to customize multiple choice and open-ended questions before or after the 35-item standard SoC questionnaire. Consent by the participants is given by clicking a button on the screen to continue the survey. Participants were told that the survey was completely voluntary and that they could opt-out at any time. A copy of the consent form is available on the first page of the survey in Appendix B. The SEDL website stores all the results of the data in a password protected area only available to the researcher. The data can be downloaded for use in a spreadsheet that also provides some graphs of the data (see Data Analysis chapter).

**Levels of Use Interviews (LoU)**

The Levels of Use branching surveys were conducted one-on-one with each teacher. After using the maximum variation sampling, described earlier, the researcher
asked specific teachers from each category to be surveyed. Six teachers agreed to participate and signed a consent form prior to the interview. The survey and consent form are available for review in Appendix C. While conducting the surveys, the researcher made electronic recordings of the interviews onto his laptop. The researcher took notes as the responses branched to each level; however, the recording provided the details from the teachers about how they have implemented change, or, for some, why they have not changed. All research records were stored in a locked file in the researcher’s office and password protected on the researcher’s laptop for the duration of the research project. All other research records will be destroyed upon completion of the project. The next section describes how the researcher analyzed the data collected.

**Data Analysis**

The data collected for this project was extensive, but manageable. One big advantage to the survey tools being used is that they have been validated over many years and there are manuals available to help with analyzing and understanding the results of the data. The following sub-sections describe how the data were managed, stored, analyzed, and used.

**Data Management and Initial Analysis**

Along with the 35-item questionnaire, the Southwest Educational Development Laboratory (SEDL) provided a scoring device to determine each participant’s stages of concern levels. Additionally, the tables in the manual on SoCQ help to interpret the data. The next step in analysis was to look at the individual teacher concerns and the overall concerns of the staff. This information helped to determine the plans for the last two years of the innovation as described in Chapter Five.
The Levels of Use interviews provided basic information about each participant along with information to determine their level of use. The data were examined to help the researcher understand the overall level of use for the staff by extrapolating the results of the selected participants to the whole group. The researcher used the data to help examine changes that can be made in individual or group training to move the levels of use forward for the whole staff in the next few years. In addition, the electronic recordings were transcribed by the researcher and prepared for coding. The data were then transferred into TAMS Analyzer. TAMS Analyzer is an open source software initially designed by Matthew Weinstein in 2002 and is a coding tool for those researchers looking for something more powerful than a spreadsheet. Learning the tool was made easy with Weinstein’s user manual available for free download, along with the software at: http://tamsys.sourceforge.net/ (Weinstein, 2010). The researcher wanted a method to look at the patterns formed by the collective responses of the participants during the LoU surveys. Using the descriptive coding method described by Saldaña, the teachers’ responses were coded by topic (Saldaña, 2009, pp. 70-73). In the second coding cycle, pattern coding was applied. “Pattern Coding is a way of grouping those summaries into a smaller number of set, themes, or constructs” (Miles & Huberman, 1994, p. 69). Pattern coding allowed the researcher to look deeper into the open-ended responses, seeking out patterns and themes that might be relevant to the school’s organizational change. What were the successes? What was the impact on the classroom? What can the grant provide to the participant to help make change easier? These answers were provided by the responses and evaluated in Chapter Four. The
principal also reviewed all the data and collaborated on the results for the themes and patterns.

Many people at the school reviewed the final piece, the IC Map. This has become a “living” document to grow and change throughout many revisions. The first draft was made available to all staff and changes and revisions will continue to occur through the grant innovation and beyond. The data for all pieces were stored on the researcher’s laptop and backed up to an external drive that is locked in the office and protected from access.

**Higher Level Analysis**

Taken as a whole, the information provides ideas to the grant team about what they are doing right and what they can change going forward to make the initiative more successful. The data also provide a baseline for change in the last two years of the grant. Finally, the themes should be beneficial to other schools seeking change. What came out of the data should be ideas to help other schools find success in change and what pitfalls to look for and avoid.

**Validity**

It is important when conducting an investigation to do so in an ethical manner using strategies that are shown to be authentic, trustworthy and credible. By using multiple sources of evidence (observations, interviews, informal discussions), validated tools (CBAM), and by using other grant team members to help with design and verification, the researcher has endeavored to provide valid, reliable data and analysis. The researcher has been involved in this program evaluation since the grant was awarded, because of this; he has a clear understanding of the school before and after the grant has
been implemented. The researcher-participant role, while a challenge, allows for expert knowledge to be used in examining the results, which as Yin describes it is a key principle in good social science research. Where necessary, the researcher planned carefully to adhere to the four tests for case study research, described by Kiddler and Judd (as cited in Yin, 2003, p. 34), which include:

- **Construct validity:** establishing correct operational measures for the concepts being studied. The researcher looked at many different sources of evidence from looking at products created by students and teachers, interviews, observations, surveying, and anecdotal information.

- **Internal validity:** establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships. The researcher used the grant team to create the IC Map and worked with the principal to examine the assumptions, analysis, and results.

- **External validity:** establishing the domain to which a study’s findings can be generalized. By sampling multiple participants, the researcher was able to look at multiple interviews to see patterns.

- **Reliability:** demonstrating that the operations of a study—such as the data collection procedures—can be repeated, with the same results. By using the CBAM approach for case study, the researcher has the ability to repeat the results or have other researchers use the same procedures for program evaluation at other schools.
Summary

The main goal of this research was to evaluate the grant innovation as a program by determining its level of success so far and to implement changes for the future. It is important to note that, the unique role of the researcher, being a teacher going through change and as the grant team leader, has its advantages and disadvantages.

The advantages are that the researcher has intimate knowledge of the affects of the grant and what is still lacking. The researcher is trusted by the teachers and can be confident about the information they will provide. The researcher should be able to understand why certain things are occurring; this is not uncommon in Participatory Action Research.

On the other hand, the disadvantages involve the question of bias. Can an “insider” objectively gather the data and analyze it without bias? In this chapter, the researcher has addressed the issues of bias and provided ideas on how they were countered with purposeful sampling, consistent questioning, and the grant team to help review and collaborate on the research. In addition, because this research is not being used as the basis to obtain additional grant funding, the researcher can remain unbiased in evaluating the program for deficiencies.

For the dissertation, the researcher conducted three types of data gathering: 1) the Stages of Concern Questionnaire, 2) the Levels of Use branching interviews, and 3) the creation of the Innovation Configurations Map. Each of these pieces has different concerns related to objectivity and possible bias, which have been addressed in this chapter. In the next chapter, the researcher will analyze the results from the constructs.
CHAPTER 4: DATA ANALYSIS

Data collected for analysis cover a three-year period from May 2009 when the grant was first awarded to the school until March 2012. Table 12 provides a graphic representation of the different surveys conducted and the type of information that was gathered. Of the current teachers, 15 of them were employed at the start of the grant in August of 2009. This is significant because it means 75% of the teachers have been at the school since before the grant was awarded in 2009.

Table 12. Survey dates and participants.

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Date of Survey</th>
<th>Possible Participants*</th>
<th>Number Participating</th>
<th>Percentage of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic and Attitudinal</td>
<td>May 2009</td>
<td>18*</td>
<td>13</td>
<td>72%</td>
</tr>
<tr>
<td>Demographic and Attitudinal</td>
<td>August 2009</td>
<td>18*</td>
<td>17**</td>
<td>94%</td>
</tr>
<tr>
<td>Stages of Concern Questionnaire</td>
<td>March 2012</td>
<td>18*</td>
<td>16</td>
<td>89%</td>
</tr>
<tr>
<td>Levels of Use Interviews</td>
<td>March 2012</td>
<td>18*</td>
<td>6***</td>
<td>33%</td>
</tr>
</tbody>
</table>

* Researcher is not included in this number.
** One participant did not complete the attitudinal questions.
*** Research only interviewed selected members of the staff.

In addition to the surveys, other data were collected to help understand the answers to each question. Table 13 shows what pieces of data relate to each question and a brief summary of the results. Following this, an analysis of the data as it relates to answering each research question and to the overall program evaluation will be presented.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data that Relates to Question</th>
<th>Brief Summary of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the teachers’ perceptions of the grant implementation and what help would they need to continue the change in pedagogy (Stages of Concern - SoC)?</td>
<td>Early survey data (2009-2011) and SoC Questionnaire</td>
<td>Teachers show highest stages in the Unconcerned and Task Stages with a small group of leaders in the Collaboration Stage.</td>
</tr>
<tr>
<td>2. What is the extent of implementation with each teacher and the high school as a whole (Levels of Use - LoU)?</td>
<td>Levels of Use branching interviews</td>
<td>All teachers show at least Mechanical Level of use for some of their classes and many show that they have areas where they are leading and refining their levels to increase success in the classroom.</td>
</tr>
<tr>
<td>3. What are examples of pedagogical changes that teachers have made in their classrooms?</td>
<td>Open-ended question asked during SoCQ, teacher observations, and LoU interviews</td>
<td>Countless examples of changes made in the classroom that fit with the goals of change including project-based and student-led learning opportunities.</td>
</tr>
<tr>
<td>4. How can the change process be facilitated to achieve the highest levels of implementation in individual classrooms and across the high school (Innovation Configuration Map)?</td>
<td>Creation of the IC Map, two open-ended questions asked during SoCQ, pattern coding of transcripts from LoU interviews, and themes created from patterns.</td>
<td>The IC Map becomes a tool for guiding future changes. Successful and challenging themes are created that will help the grant team to think about improving and refining the program in the future.</td>
</tr>
</tbody>
</table>

**Research Question One Results**

Understanding the teachers’ thoughts and feelings about the grant has been studied throughout the grant period and includes initial surveying and the Stages of Concern Questionnaire conducted in February 2012.
**Initial Perceptions of Teachers**

As part of the 2009 survey data, teachers were asked about their perceptions of the grant. The first survey was conducted in May of 2009. At this time, most of the teachers only knew that the school was awarded a grant and that it involved technology, skill-based learning, and becoming a school of the future. The same survey was given after the new school year orientation in August of 2009. During orientation, teachers were given information about the details of the grant. Teachers also had time to brainstorm ideas about the future of the school and how the grant might help the school realize its dreams. Since some members of the staff changed between the two surveys, and because the surveys were voluntary, the number of participants varied for each survey collection; this is indicated in the number of respondents for each of the following surveys. Using a five-point Likert scale, participants were asked about their perceptions. The teachers were asked if they were excited about what the grant would bring to their students. While no teachers disagreed with this, there was a drop in excitement from the initial survey to after orientation, which might be due to a better understanding of what the grant goals were and what that meant to them. Figure 9 shows the results, and even though there was a drop in the excitement levels (88% to 69%), the majority of teachers were still excited about the grant.
Teachers were asked if they were afraid the grant would make their jobs harder, Figure 10 show the results. For the most part, teachers either were not sure or did not think it would make it harder. There was not as much change in the data from May to August for this question. The good news is that no teachers felt strongly that the grant would make their job harder, which can be a concern when approaching an innovation implementation.
In this final survey question, teachers were asked if they were excited about the new ways of teaching that would come about as part of the grant. There were no negative responses, and more than 75% of the respondents agreed that they were excited about the new ways of teaching (Figure 11).

![Figure 11. Teacher excitement about new ways of teaching.](image)

The results of the survey questions indicate a positive overall perception about the grant. Some expressed concerns or were unsure about the changes coming, but there was no evidence of strong negativity that can sometimes be associated with organizations going through change. While the training in August could have been more effective, based on the data, it indicated that most teachers maintained their positive perceptions of the grant even after learning more about it and preparing for the new school year.

**Demographic Data**

Demographic data were collected in both the 2009 and 2012 surveys. Figure 12 compares the age of teachers from the 2009 survey to the 2012 survey, and it indicates
that there is no majority in the ages of the teachers; they range from 26 to 70 years old in both surveys.

![Teacher's Age](image)

**Figure 12. Teacher’s age.**

While teaching experience varied, all teachers had at least three years of teaching experience in 2009, and the majority of teachers had taught between six and fifteen years (Figure 13). This trend continued in the data from 2012, with the majority of participants with between six and twenty years of experience.

![Teaching Experience](image)

**Figure 13. Teaching experience at time of survey.**
In 2009, the number of years a teacher had taught at the school was no more than fifteen years, and the majority of teachers had been at the school five years or less (Figure 14). The school itself is relatively young, and in 2009, had only been in operation for 18 years. By 2012, the majority of teachers were centered in the six to ten year category.

![Years Teaching at School](image)

**Figure 14. Years teaching at the school.**

In 2009, 83% of the teachers reported having more than six years of total teaching experience; however, more than half of the teachers (56%) had only been at the school for three years or less. When these teachers were asked about the impact the grant will have on the school and students, their perception may have been skewed because of their novice understanding of the school program. However, by 2012, these same teachers were in a better position to reflect on the impact of the grant because they were more experienced and had a better understanding of how the grant fits in with the overall school culture and program. At the time of the 2012 survey, 75% of the teachers had been at the school throughout the grant period and the highest grouping of teachers was in the six to ten year category (44%). Comparing teacher experience, years teaching at
the school, and the results of the Stages of Concern Questionnaire will be covered in the next section.

**Stages of Concern Questionnaire (SoCQ)**

The SoCQ was conducted over a period of two weeks from February to March 2012. The teachers were given the latest copy of the IC Map to read so that they could reflect on the goals of the innovation before taking the questionnaire. Of the 18 possible participants in the high school, 16 completed the survey, an 89% response rate. The participants did not experience problems taking the survey and there were no incomplete surveys. In analyzing the results of the survey, the researcher looked at the highest stages of concern by each teacher, the relationship between the stages of concern and teacher experience, and the results from the open-ended questions.

**Highest Stages of Concern**

George et al. (2008) recommends looking at highest stages of concern by individual rather than “averaging percentile scores, because such averaging allow extreme values to influence the results more than might be appropriate” (p. 34). Table 14 indicates the highest stages of concern for each teacher. From this chart, the two highest stages of concern were in Stage 0 (Awareness/Unconcerned) at 53.1% and Stage 5 (Collaboration) at 28.1% of respondents. Stage 0 is usually common among new users who are not yet “concerned” about the innovation, while Stage 5 is usually common with colleagues who have implemented the innovation and are interested in coordinating use of the innovation with others.
Table 14. Highest stage of concern by teachers.

<table>
<thead>
<tr>
<th>Stage of Concern</th>
<th>Number of Teachers</th>
<th>Percent of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Unconcerned</td>
<td>8.5*</td>
<td>53.1</td>
</tr>
<tr>
<td>1 - Informational</td>
<td>1</td>
<td>6.3</td>
</tr>
<tr>
<td>2 - Personal</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>3 - Management</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4 - Consequence</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 - Collaboration</td>
<td>4.5*</td>
<td>28.1</td>
</tr>
<tr>
<td>6 - Refocusing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

* Note: One participant had a tie score for both Stages 0 and 5.

In some cases the concern levels were close for more than one stage and Hall & Hord (2001) have suggested that understanding both the first and second highest stages of concern will help create a better understanding of the dynamics of the concerns for the whole group. Because of this, the researcher looked at the second highest level of concern for each teacher (Table 15). The majority of participants fell into the Stage 1 (Informational) and Stage 2 (Personal) categories. Stage 1 is usually common with users who are still seeking information about the innovation, while Stage 2 is related to personal concern about the innovation.

Table 15. Second highest stage of concern by teacher.

<table>
<thead>
<tr>
<th>Stage of Concern</th>
<th>Number of Teachers</th>
<th>Percent of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Unconcerned</td>
<td>1.5*</td>
<td>9.4</td>
</tr>
<tr>
<td>1 - Informational</td>
<td>5</td>
<td>31.3</td>
</tr>
<tr>
<td>2 - Personal</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>3 - Management</td>
<td>3</td>
<td>18.8</td>
</tr>
<tr>
<td>4 - Consequence</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 - Collaboration</td>
<td>0.5*</td>
<td>3.1</td>
</tr>
<tr>
<td>6 - Refocusing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>100.1</strong></td>
</tr>
</tbody>
</table>

* Note: One participant had a tie score for both Stages 0 and 5.
** Note: Rounding of each percentage yielded more than 100%.
To understand where the teachers as a group had the most concerns, Figure 15 show the totals for all participants in the two highest stages for each person. The manual by George et al. (2008) shows many different ways that one can look at the data from this questionnaire. In Figure 15, the highest levels of concern for the participants appear to be in the first three stages. There is a small bump in the Collaboration stage. Interpreting the data based on the manuals and past research might indicate that teachers are showing the highest concerns at levels indicative of a need to learn more about a new innovation (George et al., 2008). In the following sections, the researcher will look more in-depth at these areas to try and understand the teachers in groups.

Figure 15. Combined highest and second highest stages for all respondents.

Figure 15 shows that the majority of the teachers have the highest concern levels in Stages 0, 1, and 2; while another small group has the highest levels of concern at Stage 5. High levels in the first three stages indicate concern levels with other things besides the grant innovation, concerns about getting information about the innovation, and concerns about the effect of the innovation on individual person, respectively.
Highest Concern and Teacher Experience

Yuliang and Huang (2005) examined the pattern of teacher’s concerns in technology integration and found a correlation between the earlier stages of concern (personal and informational) and the experience level of the teachers. Those teachers with little experience were more concerned about getting information about the innovation and its effect on their own personal concerns. Table 16 shows the highest level of concern for each of the teachers taking the survey compared to their age, teaching experience at the school, and overall teaching experience.

Table 16. Highest concern comparison to participant age and experience.

<table>
<thead>
<tr>
<th>Teacher #</th>
<th>Highest Stage of Concern</th>
<th>Age</th>
<th>Years of Teaching Experience</th>
<th>Years of Teaching at School</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
<td>26-30</td>
<td>1-2 years</td>
<td>1-2 years</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>36-40</td>
<td>3-5 years</td>
<td>3-5 years</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>31-35</td>
<td>6-10 years</td>
<td>1-2 years</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>26-30</td>
<td>6-10 years</td>
<td>3-5 years</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>26-30</td>
<td>6-10 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>41-45</td>
<td>11-15 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>51-55</td>
<td>11-15 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>15</td>
<td>1 and 5 (tie)</td>
<td>36-40</td>
<td>11-15 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>41-45</td>
<td>11-15 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>41-45</td>
<td>11-15 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>56-60</td>
<td>11-15 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>66-70</td>
<td>16-20 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>66-70</td>
<td>16-20 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>41-45</td>
<td>16-20 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>66-70</td>
<td>31 or more years</td>
<td>3-5 years</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>61-65</td>
<td>31 or more years</td>
<td>16-20 years</td>
</tr>
</tbody>
</table>
While this was an interesting way to look at the data comparing highest level of concern, age, and teaching experience, the researcher could not find a connection between the levels of concern and the experience. In fact, the teachers with the most experience (16 or more years) were more likely to have Stage 0 as their highest level of concern (80%), according to the data. With only 16 respondents compared to over 80 respondents in Yuliang’s survey, the results might have yielded a different conclusion with a bigger sample.

**Typical Unconcerned Profiles – Stage 0**

Nine of the sixteen participants in the survey had Stage 0 (Unconcerned) as their highest level of concern. Typically, this relates to a person who is not concerned about the innovation or is concerned about other innovations. George et al. (2008), “Stage 0 does not provide information about whether the respondent is a user or nonuser; instead Stage 0 addresses the degree of interest in and engagement with the innovation in comparison to other tasks, activities, and effort of the respondent (p. 33). The questions that are used in the survey to determine this are:

- Question 3 – I am more concerned about another innovation.
- Question 12 – I am not concerned about this innovation at this time.
- Question 21 – I am preoccupied with things other than this innovation.
- Question 23 – I spend little time thinking about this innovation.
- Question 30 – Currently, other priorities prevent me from focusing my attention on this innovation.

Figure 16 shows a typical score from one of the participants with a highest level of intensity at Stage 0. With lower levels of intensity at the later stages, this teacher is still
concerned about other innovations and are in need of information to help think beyond the implementation to the consequence of the innovation and how they could collaborate with others.

Since the school is more than halfway through the grant innovation, these results could be a concern. If the majority of the participants are showing signs of unconcern, then more training and education might be needed to get the program back on track and to make this program a higher priority.

![Figure 16. One teacher’s score with highest intensity at stage zero.](image)

One possibility is in the way teachers interpreted the questions. A number of teachers came to the researcher after taking the questionnaire and commented on the word “concerned.” To them, concerned meant “worried” or “troubled.” In other schools, where there is pressure to successfully implement an innovation that will focus the students on achieving higher scores on a standardized test, “concerned” might be a word that teachers would use often. In this case, at the beginning of an implementation, many
of the teachers would be unconcerned about the innovation because they are more concerned about other innovations in the school (Stage 0), or they might be more concerned about getting information about the innovation (Stage 1). The private school that is being studied here is different; teachers are encouraged to try new things, and standards are not as much a concern as skills growth for all students. So, the grant innovation, as described in the IC Map and in Chapter One, is more of a continuation of a program that is already non-traditional. Because of this fact, the researcher believes that teachers are more “concerned” about other innovations or daily tasks, which would be reflected here in translation as “unconcerned.” To investigate this further, Table 17 shows a breakdown of the ten participants with Stage 1 as their first or second priority.

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>1.3</td>
</tr>
<tr>
<td>Number in the 5-7 range</td>
<td>0</td>
</tr>
</tbody>
</table>
In looking at the Stage 0 questions, it appears that for most of the participants, their highest level of concerns – “very true of me now” at 5, 6, or 7, appear in questions 21, 23, and 30. These three questions ask the participant if they are preoccupied with another innovation, spend little time thinking about the innovation, and have other priorities that prevent focus on the innovation, respectively. Since the school has many other priorities besides the grant innovation, and because the innovation is a natural continuation of the current program, it could be the higher concerns as a teacher at this school relate to other things. If this is true, than the teachers might still be interested in the innovation while reflecting an “unconcerned” result for the survey. Consequently, the researcher looked at the relationship between the Stage 1 and Stage 2 levels for these participants.

**Typical Unconcerned Profiles – Stage 1 and 2 Relationships**

In the manual on SoCQ, the authors discuss how typical nonusers have higher concern levels in Stages 0, 1, and 2, because their focus is more on learning and personal feelings about the innovation, rather than the management and consequence of the innovation for students (George et al., 2008). To analyze this further, investigators can look at concern levels between Stage 1 (Information) and Stage 2 (Personal). When Stage 1 scores are significantly higher than Stage 2, individuals are more concerned with finding out knowledge about the innovation rather than the personal effect the innovation might have on them. This might be interpreted as a positive “1-2 split” where the individuals are seeking knowledge in a proactive and positive way. If Stage 2 scores are significantly higher than Stage 1, individuals might have doubt and/or potential resistance to an innovation or a negative “1-2 split.” In Table 18, the researcher examined all
participants who had first or second highest levels at either Stage 0, 1, or 2. Comparing the Stage 1 and 2 percentages, nine out of the twelve respondents had higher percentages in Stage 2 than Stage 1. These results could be interpreted as “nonusers” having more concerns about the personal effects of the grant innovation, rather than concerned about needing more information, although many of the differences between the two percentage scores were relatively small.

Table 18. One-Two split between typical nonusers.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Highest Level</th>
<th>Stage 1 Percentage</th>
<th>Stage 2 Percentage</th>
<th>One-Two Split Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>63</td>
<td>55</td>
<td>Slight Positive</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>84</td>
<td>95</td>
<td>Slight Negative</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>45</td>
<td>57</td>
<td>Strong Negative</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>45</td>
<td>39</td>
<td>Slight Positive</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>34</td>
<td>25</td>
<td>Slight Negative</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>80</td>
<td>83</td>
<td>Slight Negative</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>75</td>
<td>85</td>
<td>Strong Negative</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>54</td>
<td>41</td>
<td>Strong Positive</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td>72</td>
<td>83</td>
<td>Strong Negative</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>80</td>
<td>85</td>
<td>Slight Negative</td>
</tr>
<tr>
<td>15</td>
<td>0 &amp; 5 (tie)</td>
<td>19</td>
<td>28</td>
<td>Slight Negative</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>69</td>
<td>91</td>
<td>Strong Negative</td>
</tr>
</tbody>
</table>

Results

Nine of the twelve teachers show a possible “negative one-two split.”

To analyze this one step further, Table 19 shows the questions related to Stage 1 and 2. Teachers with higher levels of concern in Stage 2 (Personal) tend to worry about how the innovation effects them directly. These teachers will need more help with
understanding their personal position in the new innovation before they are able to work on understanding information about the innovation. Since the slight negative “1-2 split” is prevalent in the majority of participants overall (56%), the researcher and administration might need to look at ways to alleviate these concerns. Ideas to solve this for the remainder of the grant innovation are described in Chapter Five.

Table 19. Stage 1 and 2 questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1 - Information</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I have limited knowledge of the innovation.</td>
</tr>
<tr>
<td>14</td>
<td>I would like to discuss the possibility of using the innovation.</td>
</tr>
<tr>
<td>15</td>
<td>I would like to know what resources are available if we decide to adopt this innovation.</td>
</tr>
<tr>
<td>26</td>
<td>I would like to know what the use of the innovation will require in the immediate future.</td>
</tr>
<tr>
<td>35</td>
<td>I would like to know how this innovation is better than what we have now.</td>
</tr>
<tr>
<td><strong>Stage 2 - Personal</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I would like to know the effect of the innovation on my professional status.</td>
</tr>
<tr>
<td>13</td>
<td>I would like to know who will make the decisions in the new system.</td>
</tr>
<tr>
<td>17</td>
<td>I would like to know how my teaching or administration is supposed to change.</td>
</tr>
<tr>
<td>28</td>
<td>I would like to have more information on time and energy commitments required by this innovation.</td>
</tr>
<tr>
<td>33</td>
<td>I would like to know how my role will change when I am using the innovation.</td>
</tr>
</tbody>
</table>

**Single-Peak User Profiles**

Of the other participants not discussed yet, five of them (31%) had the highest concern at Stage 5 (Collaboration). Peaks at this stage usually indicate teachers who are interested in working with others or coordinating use of the innovation. Generally, these
are team leaders who spend time working with colleagues. Figure 17 shows an example of one of these scores. Teachers at this level generally have the information they need about the grant and are concerned about managing the innovation, the consequences for the students from the innovation, and they are looking for ways to collaborate with others to produce higher results.

In Figure 17, the teacher also had a high score (83%) in Stage 3 (Management). This stage is related to concerns about managing the innovation from a classroom standpoint. However, a low score (20%) in Stage 6 (Refocusing) indicates that the teacher is not concerned about other innovations at this time.

![Figure 17. One teacher’s score with highest intensity at stage 5.](image)
Research Two Question Results

Question two relates to the extent to which teachers have implemented the grant in their classroom and throughout the high school. The majority of this data was collected through the Levels of Use interviews.

Levels of Use Branching Interviews (LoU)

The interviews provided the most interesting information about how change is occurring in the classrooms. Six of the eighteen teachers were asked to be interviewed, and all agreed. The process for selecting the six teachers is described in the previous chapter on methodology and involved using maximum variation sampling. All participants signed a consent form and received a ten-dollar gift card and ice cream for their time. All of the interviews were recorded and later the responses were transcribed. Prior to the interviews, the researcher and principal revisited the information about the teachers they had from classroom visits, informal discussions, and general knowledge to predict the level of use for all of them. Table 20 shows the predicted level of use for all possible participants compared with the IC Map averages from the earlier section. The predicted level was determined using the same approach as the criterion level by having the researcher and principal first rate teachers separately, and then look at any discrepancies to come to an agreement.

It is interesting to see how the predicted levels of use compare to the criterion levels. In some cases, the goals set by the IC Map do not necessarily equate to the definitions described in the CBAM for the levels of use. The bolded teacher numbers identify the individuals who were chosen for the LoU branching interview.
In planning the interviews, the researcher sought advice from one of its designers, Dr. Gene Hall. He indicated that determining the levels of use for each individual requires attending a three-day training session to be able to conduct the interviews in a way of guaranteeing the most validated assessment. The researcher asked him if there was another way to conduct it while still garnering valuable information. Dr. Hall stated, “My suggestion, at the moment, would be to offer a gross estimate of where most teachers ‘seem’ to be. Rather than claiming that you have measured individual LoU, maybe by studying the LoU construct it will be ok to offer a general view of where teachers seem to be. If they are in the first year of implementation, then we can be pretty confident that most will be at LoU III Mechanical Use. Be sure to state a limitation or caveat that you have not been trained to measure LoU” (G. Hall, personal communication, January 1, 2012).

Because the researcher was unable to get the three-day training, the levels of use indicated for each teacher is more of a general assessment based on the answers provided by the participant, rather than a definite level. As always, the goal for the researcher was to understand what changes have occurred in the classroom, and how the grant innovation could be adjusted to improve future changes.

Table 20. Predicted levels of use for each teacher.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Levels of Use Prediction</th>
<th>IC Map Level Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levels of Use</td>
<td>Description</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>V - Integration</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>V - Integration</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
<td>V - Integration</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>V - Integration</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>V - Integration</td>
</tr>
</tbody>
</table>
By asking the branching interview questions in order, the researcher was able to estimate the level of use for each teacher. The interview questions can be found in Appendix C. Determining the levels of use required looking at the responses carefully to see what had been achieved. In some cases, the researcher decided to ask all of the Level 3 and higher questions to participants to garner the responses for pattern coding in the next section. The challenge was because the grant innovation is broad and covers many areas, it was hard to determine if a person was at a level of use for everything they do. For example, a teacher might be implementing a student-driven learning plan in one class, while still using a traditional lecture style in another. So, how does the researcher determine the level for that person? Since this can only be an estimate, the researcher considered the responses and gauged the level. The researcher then discussed possible ways to train the teacher to move to a higher level. The descriptions of the levels of use

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>V - Integration</td>
<td>4.00</td>
<td>Practitioner</td>
</tr>
<tr>
<td>13</td>
<td>4B</td>
<td>IVB - Refinement</td>
<td>4.17</td>
<td>Leader</td>
</tr>
<tr>
<td>5</td>
<td>4B</td>
<td>IVB - Refinement</td>
<td><strong>3.08</strong></td>
<td>Practitioner</td>
</tr>
<tr>
<td>10</td>
<td>4B</td>
<td>IVB - Refinement</td>
<td>2.83</td>
<td>Practitioner</td>
</tr>
<tr>
<td>17</td>
<td>4A</td>
<td>IVA - Routine</td>
<td><strong>3.00</strong></td>
<td>Practitioner</td>
</tr>
<tr>
<td>14</td>
<td>4A</td>
<td>IVA - Routine</td>
<td>2.58</td>
<td>Practitioner</td>
</tr>
<tr>
<td>7</td>
<td>4A</td>
<td>IVA - Routine</td>
<td>1.75</td>
<td>Apprentice</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td>3.08</td>
<td>Practitioner</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td>1.83</td>
<td>Apprentice</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td><strong>1.67</strong></td>
<td>Apprentice</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td><strong>1.58</strong></td>
<td>Apprentice</td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td>1.42</td>
<td>Apprentice</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>III – Mechanical Use</td>
<td>1.17</td>
<td>Apprentice</td>
</tr>
</tbody>
</table>
are listed in Appendix F. In all cases, the teachers interviewed have made some change in regards to the grant implementation since the beginning. This was seen in observations, informal questions, and in the LoU interviews. Table 21 provides a short description of each of the levels from mechanical use and above.

**Table 21. Definitions of the levels and interviewed teacher levels.**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LoU III – Mechanical</strong></td>
<td>Users at this level are primarily concerned about easing the pressures of the use of the innovation, short-term planning is the key, and the user is not articulate about their use of the innovation.</td>
</tr>
<tr>
<td><strong>LoU IVA – Routine</strong></td>
<td>Users at this level have usually settled into a stable pattern and are not seeking changes for the future. They are concerned about the innovation as it affects their students, but they see that the way they are doing things is working. Little preparation or thought is being given to improving innovation use or its consequences.</td>
</tr>
<tr>
<td><strong>LoU IVB – Refinement</strong></td>
<td>At this level, the user must have made changes recently, be actively planning changes, or be in the process of evaluating changes related to the innovation. At this level, the motivation is directly related to how the changes will benefit the students and then refining the use based on information obtained.</td>
</tr>
<tr>
<td><strong>LoU V – Integration</strong></td>
<td>Individuals at this level, initiate changes in their use based on input from others; they must reach beyond their own classrooms to work with others for the purpose of improving outcomes for students. It means collaborating with others to promote changes.</td>
</tr>
<tr>
<td><strong>LoU VI – Renewal</strong></td>
<td>Here at this level, individuals have progressed beyond the innovation itself and are exploring alternatives or major modifications to the innovation. The purposes relate to increasing the outcomes for the innovation in working with the students. These individuals are seeking out other resources to replace the innovation with something they consider that is better, rather than seeking changes within the structure of the innovation as in LoU IVB.</td>
</tr>
</tbody>
</table>

Based on observations, interviews, and survey data, the researcher and the principal feel that no teachers have reached Level VI (Renewal). Everyone is currently...
focused on the grant innovation, especially since the school is only halfway through the grant period. Below is a description of each of the teachers interviewed along with an estimate of their level of use.

**Mathematics Teacher** - Teacher 6 has been in the high school since its beginning twenty years ago. He has seen classes go from just a handful of graduates to an average of more than twenty alumni each year. He works one-on-one and in small groups with the students who struggle the most in understanding math concepts and staying on task. He admits that technology is not his strength, but working with kids is. Looking at change in himself and his class over the grant innovation time, he reflected on the integration of technology and said, “I think probably slowly I'll be able to use it [technology] with some students, not with all, some of them. For them to get online and do things would be more effective I think with me but it'll be few …”. With all innovations, change is a process, not an event; this teacher is a perfect example that change does not take place at the same pace for everyone. A teacher who fears technology and lacks basic user skills needs individualized one-on-one support. The teacher needs to be encouraged to try small risks and then celebrate even slight successes. As the teacher’s confidences increase, they will start to take larger risks, which will result in the desired change.

Teacher 6 struggled with his understanding of what the grant was all about and if he was implementing it or not. The researcher had to prompt him to recognize ways he had changed in his classroom that related to the grant. Some quotes that relate to this, “I guess I’ve been more involved with the technology.” “I think probably slowly I’ll be able to use it with some students, not with all.” Because there are some use and
implementation changes, he is estimated at LoU III; however, he could also fall into the LoU II Preparation stage for many aspects of the grant innovation.

**Foreign Language and Culture Teacher** - Teacher 18 has been at the school for over ten years. In the interview, she expressed her strong desire to help students and bring the essence of culture to them in any way she can through language, music, and knowledge. She admits freely that technology is not her strength, but engaging students in the classroom is what she wants. One example she described is in the way she has changed her ukulele class, based on what she has learned in the grant about student-driven learning. In the interview she said, “The students run the class. They go online, choose their songs, they print out their lyrics, their music, and their chords. They write their own chart, and then I put them on a calendar and each student has two weeks to teach the class.” What did this mean for her students? She continued, “… they own the class and they run it. They’re independently teaching each other and learning from each other. It’s moved the energy from that class to a higher level.” “A lot of my students came to me. They did not have ukulele knowledge at all and today they own their own ukulele. They share their music with each other.” This shift to a student-led classroom is an excellent example of what how the grant has impacted and changed the learning environment.

Teacher 18 struggled with her understanding of what the grant was all about and how she has made changes. After prompting, it became clear that she has made changes to her classroom by providing a more student-driven environment as described in her descriptions. Where this level fits, is in the way she describes how she is not sure what the future holds for her change, “I’m still trying to figure out what is the next step to take
in the grant, how can I use it in my curriculum, and what else can I do with it.” She has shown growth as a teacher, especially when it comes to her Ukulele class where students drive the learning; however, she has not made the leap to where the innovation is routine (LoU IVA) in all classes.

Science Teacher - Teacher 5 has been at the school for almost as long as Teacher 6; he has seen many changes in the school, but he has always taught science classes. Even though administration can explain what the innovation is about, there are still people who will not fully understand the goals. In interviewing this teacher, he felt he was not doing much with the grant, stating, “I think most of what I do is some of that Moodle thing, but not so much.” However, when the researcher shared examples of what the teacher is doing with project-based and student driven learning in his classes; allowing students to create portfolios of knowledge, or focusing on one science topic for experimentation, it was apparent that the grant had impacted his practice. When he was redirected about these activities being related to the grant, his response was, “Well, I would include that too, but then I probably don’t understand the purpose of the grant as much as I think, or I thought I did.” Change is different for every person. Some people, like this teacher, are changing along the way and may not think that what they have heard at a conference or during a teacher “show and tell” influences them to bring about change; when in reality, it does leads to change. And, in other respects, this teacher is looking to change, but is just not there yet and may need a push or support. For example, when he states, “Especially after the conference I went to in Seattle, I can see better now how the technology would mesh with the kinds of things I want to do or am thinking of doing, so I guess without having actually done a whole lot of anything with it yet, it’s
hard for me to say how well it’s going to work. I just have to start working on it.” Some teachers in an innovation will see the possibilities, but hesitate to implement.

Teacher 5 has made some changes to his classroom in regards to creating more of a project-based learning environment. Where this differs from a person at the Refinement Level (IVB) is does not appear to be evaluating the changes he is making to see how it would benefit the students. He is more at a level of still trying to understand that the changes he is making are actually a part of the grant. During the interview, the researcher asked him about changes he has made in his classroom related to twenty-first century learning. He did not realize he was making changes that fit in the grant goals, he assumed it was all about technology, so he is not yet at a level where he is refining what he is doing with the grant to meet the needs of students, he is still at Level III (Mechanical) use. He describes that here, “Apparently, maybe I have without even knowing it. The grant apparently does a few things that I would have been doing myself anyway, but for me I guess then it would be more like bringing a lot more of the tech things into it.”

History Teacher - Teacher 17 has experience in both elementary and high school. She has been teaching for over twenty years and still looks for new ways to bring technology into her classroom. About the grant, she said, “I think the greatest strength is actually encouraging teachers to use it and not just giving us the technology but guiding us through, making suggestions, and going to workshops where you see other people using it. So it’s actually active, it’s not just saying, ‘Here's the technology. Use it.’ It’s actively giving us guidance and suggestions about how to use it.” As far as the future for her, she said, “I am constantly looking for innovations in technology and how to use it in
the classroom. Oh, you might know I have my iPad which I am excited about and I’m thinking about how, if we get iPads next year, I would like to be ready to use the iPad and iPad technology and applications in the classroom.” As yet, though, this teacher is mostly a practitioner of the technology, she does not teach others or present what she is doing at conferences.

Teacher 17 was interested in making changes to the classroom from the beginning of the grant. She has made changes to her classroom and gained from the professional developments offered. She recently tried implementing new ideas in her classroom, but has not evaluated the changes fully. She describes it this way; “I am constantly looking for innovations in technology and how to use it in the classroom. I’ve done collaboration in the classroom. I’d like to do more collaboration outside the classroom.” In addition, she was able to describe, in detail, examples of how she has changed her classroom over the grant innovation period, for example, the uses of assistive technology with students, providing access to information through her Moodle site, and through her future goals of iPad implementation. The researcher had originally rated this teacher as at a Level IVA; however, during the interview, the teacher was able to provide so many examples of changes and future goals, it became apparent that she was in the Refinement Level (IVB).

Social Studies and Mathematics Teacher - Teacher 11 has taught in both the high school and middle school grades for more than ten years. As a member of the grant team, he has strived for significant changes in his classroom based on what he has learned from trips to other schools and local conferences. In addition to bringing about change in his own classroom, he helps others to change as well. What he likes most about the school and the administration is the ability to try new things. Here is how he describes it,
“We’re in a highly supportive school that allows freedom and that was encouraging for me to say, ‘I am allowed, I am encouraged to try this and if it doesn’t work [that’s ok]’. For instance, I had a Civics project with the stop motion animation. It went well but it was a long process so just having that opportunity to take the time to do this project was good.” He was also quick to try out new things he learned at conferences. The school attended a local conference where Alan November talked about video tutorials. Here is what the teacher said about it, “Well, I like the video tutorials with Alan November's kind of Math Training TV. I like that idea, so I have my algebra students make video tutorials and post it on their blogs.” He has been a leader in the school and is always ready to help and try new things in his class.

Teacher 11 gave many clear examples about how the innovation has brought about change in his classroom. He talked about examples where he did not have the best success, for example, his stop motion project, and he had to revise it for the future. These revisions showed his LoU IVB (Refinement) levels. With additional questioning, it was clear that he is a leader in bringing about change and initiating change beyond his classroom. He talked at length about his collaborative project-based class with two other teachers. He describes his interactions with the other two teachers, “So if something’s working then we’re allowed to just continue it and if something isn’t working then we three are given the freedom to problem solve. [The principal] has been really good about that and just kind of trusting us.” This teacher appears to be always looking at ways to learn more and look to the future. Here he describes the other things he wants to do, always with the students in mind, “I just want to learn more about what needs to go to rubric and getting the kids to be aware of what they're going to be graded on. I mean I tell
them, I give them checklists but I’d like it to be more sequential or just see the different categories. So I think if teachers know that they don’t have to be practitioners or experts on things, they can just know a little bit and share, then that sparks an interest in other people that they can then delve into it on their own, but I think there’s so much out there. There are so many cool web sites and so many cool apps it's overwhelming and so if we’re all kind of working to better our practice …”. Because this teacher is seeking guidance from others and leading them, he appears to be at the Integration Level (V).

**Foreign Language and Language Arts Teacher** - Teacher 12 has been one of the most open teachers to change in the high school. While she admits to having “bad luck” at times when it comes to technology (for example, hard drives crashing or applications becoming corrupt), she is always looking for ways to bring new technologies to her classroom and she is not afraid of it. However, what this teacher says she needs most is time with a technology person to learn new things. Here is what she said about this, “…the biggest strength is that I have time with you because I’m one of those kind of teachers that I don’t figure things out easily. At least I didn’t used to be able to do it very well by myself, so I need somebody to show me how to do things, demonstrate it, and tell me why it works.” Being willing to sit down and learn and experiment is an important aspect of the success of the grant for many teachers.

Teacher 12 has made significant changes to her classroom and pedagogy since the grant started. She has sought out information and then implemented as best she could. In the last year, she has become proficient and more confident, so that she is helping others. For example, she said, “Personally, I think the technology is a great piece. Other teachers may not think so, but I’ve approached other teachers and made suggestions of how they
could use technology and given them some ideas of what they could do their classes, and then I’ve tried to help them do some of these things. And people have taken it and done little things with it, which is nice. They’re making little starts.” She also is cognizant about how the grant is affecting the students, “I think the biggest thing, especially this year is just more student buy-in into what I want to do in my class, the biggest thing being the collaboration this year, and in order to do the collaboration I had to learn how to do things like Skype and figure out how to save big files and send big files.” Overall, the grant innovation has allowed this teacher to thrive and she is able to reflect on her change and how she can now help others, “So it’s been really good and it’s been good seeing that I’ve changed, and I used to be afraid of the technology and I see other teachers still who are afraid although they’re kind of coming out of their shell, but I’m able to help them do some of the stuff, too, and show them.” These reflections and revisions in her classroom showed she is at Integration Level (V).

Revised Levels of Use

Returning to the levels of use for the six interviewed participants, there was a change based on the new information. Table 22 shows how teachers 5 and 17 switched places in the levels and this was based on the interview branching questions. The hard part in determining the levels was considering how much change the person described in the interview and what they were actually going to do in the classroom. This will be something that can be investigated further in the future.
Table 22. Revised levels of use for each interviewed teacher.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Levels of Use</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3</td>
<td>III – Mechanical Use</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>III – Mechanical Use</td>
</tr>
<tr>
<td>5</td>
<td>4B 4A</td>
<td>IVB—Refinement  IVA – Routine</td>
</tr>
<tr>
<td>17</td>
<td>4A 4B</td>
<td>IVA—Routine  IVB – Refinement</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>V - Integration</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
<td>V - Integration</td>
</tr>
</tbody>
</table>

Research Question Three Results

The researcher was trying to understand what pedagogical changes had taken place in the classrooms throughout the grant period. Results come from data that were collected through observations throughout the grant initiative, an open-ended question in the SoC Questionnaire, and from the LoU interviews.

SoQ Open-ended Questions

In addition to the 35-item questionnaire, the survey contained three open-ended questions, which all sixteen participants answered. One question stated, “Thinking back to before the grant and how you teach now, what pedagogical changes have you made, and how has this changed your classroom?” Table 23 provides a breakdown of the answers from the teachers.
Table 23. Pedagogical changes teachers have made in the classroom.

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated more technology</td>
<td>5</td>
</tr>
<tr>
<td>Implementing student driven learning opportunities</td>
<td>3</td>
</tr>
<tr>
<td>Moving away from direct instruction</td>
<td>1</td>
</tr>
<tr>
<td>Broadening my audience (presentations that go beyond the class itself)</td>
<td>1</td>
</tr>
<tr>
<td>Thinking about “legacy” (e-portfolios)</td>
<td>1</td>
</tr>
<tr>
<td>Reevaluated student assessment</td>
<td>1</td>
</tr>
<tr>
<td>Skill based learning that is teacher led</td>
<td>1</td>
</tr>
</tbody>
</table>

Quotes from teacher responses

“More hands-on, student-led; resulting in more student ‘buy-in’, and more student commitment to create a better quality product; enhanced knowledge of tech tools in students and teacher to produce a more relevant and exciting product.”

“I have reevaluated the way I assess student progress. I am now looking at a broad student work sample to determine overall assimilation of lesson objectives.”

“The students are the agents of their own learning.”

“I’m using Moodle and other online tools much more than ever before.”

“I like how I am being pushed to make more real world connections and challenge students.”

The answers showed that the changes teachers have made are varied. Throughout the grant implementation, many teachers felt that the grant was all about technology, which has been a challenge for the grant team. However, the overall grant goals are more about changing the way teachers educate through a more student led, skills-based approach that focuses on twenty-first century learning skills. The answers in Table 22 indicate that half of the teachers are making changes in that direction with the mention of
twenty-first century ideas, for example, the responses that mention student-led learning and re-evaluating student assessment.

**Interviews and Observations of Pedagogical Changes**

Throughout the implementation, the grant team has monitored the changes teachers have made and documented the results for reporting purposes. In addition, the levels of use interviews provided many examples of pedagogical changes that teachers have made to the classrooms and beyond. Table 24 describes many of the changes that have occurred through the school in regards to change in the classroom because of the grant.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Coaching</strong></td>
<td>Academic Coaching was a concept developed by the grant team. The school serves students with learning differences, so teachers spend a lot of time structuring classes and assignments, teaching students about executive function, and planning lessons that meet the individual needs of their students. However, many students struggle to apply these skills in a new setting. Academic Coaching provides the bridge for these struggling learners by partnering the graduating student with a teacher from the school. The teacher receives a small stipend for their time. The program has grown from four students to eight in the third year. This may seem to be a small number; however, when the school only has 20-25 graduates per year, this is more than 30% of the students who take advantage of this opportunity. Some students have benefited more from coaching than others; however, based on feedback from the alumni who were coached, all of them felt that the coaching had been helpful and a worthwhile experience.</td>
</tr>
<tr>
<td><strong>Online Faculty Collaborative Network (Ning)</strong></td>
<td>The faculty Ning site, which was started at the beginning of the grant as a way to connect high school teachers, has grown into a collaborative network where all members of the faculty and staff from the entire K-12 school share knowledge, have discussions, post resources, and more.</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Parent</td>
<td>Communication to parents has always been a struggle with paper memos that get lost in student backpacks, or mail that never gets opened. The grant has led to a new strategy – electronic communication! The high school principal successfully transitioned parents to email as the main source of communication, and they are thrilled and now more informed. The parent Ning site was gradually cultivated to ensure success. The school currently has over 200 members and the community is growing every day. Parents are beginning to realize that the Ning provides a window into the classrooms through pictures, descriptions from teachers, and more. Parent communication tools include: college topics and suggestions, valuable resources on learning differences (dyslexia, giftedness, etc.), Q&amp;A sections, updates from both lower and high school principals, and a list of upcoming events. Recently, parents are becoming more active and beginning to participate in their own discussions to support one another.</td>
</tr>
<tr>
<td>Collaborative Network</td>
<td></td>
</tr>
<tr>
<td>(Ning)</td>
<td></td>
</tr>
<tr>
<td>Moodle</td>
<td>Moodle has been a significant addition to the classroom. The first year of the grant was a pilot year with no requirement on teacher participation. Despite that, 20% of the teachers had students accessing Moodle weekly and over 40% were having them access it monthly. Moodle has been so successful that students have been asking all teachers to utilize it. Teachers describe this tool as a “godsend” because it brings the classroom to students anytime and anywhere. It helps teachers stay organized with assignments and handouts. It allows for a “paperless” classroom with students emailing or submitting assignments online. In the mid-year survey, one teacher said, “[Moodle] helps [students] to access resources for their projects (sites of interest). It helps them to have a voice in an online discussion, so everyone can talk at once and still be heard. It helps them to have a way to print documents needed for class when they lose them.” Students are staying more on track with timelines and homework is coming in with higher quality because students download their homework and type their responses. Moodle provides students with a “hybrid” model of learning with face-to-face classes and online education. This is what they will face in many college classes. In fact, in the 2011 survey by the Sloan Consortium (Allen &amp; Seaman, 2011) reported that, “sixty-five percent of all reporting institutions said that online learning was a critical part of their long-term strategy” (p. 4). In addition, “thirty-one percent of all higher education students now take at least one course online” (p. 4).</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
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</thead>
<tbody>
<tr>
<td>Curriculum on the Wall (COW)</td>
<td>Teaching is often an isolated profession; there is little time to find out what other teachers are doing. A visit to High Tech High in San Diego helped teachers realize the value of openness and transparency. Most of the professional development time before the grant was devoted to gaining a greater understanding of the learning issues that impact the students, such as dyslexia, Attention Deficit Hyper Activity Disorder (ADHD), and other language-based learning disabilities. However, the High Tech High experience and the grant goals encouraged teachers to talk more about how and what they teach. The Curriculum on the Wall (COW) was the first attempt at connecting teachers. Located in the faculty lounge, it was updated by teachers every two to three weeks with information about class activities and concepts. According to faculty mid-year review, this sharing elicited great excitement from the teachers. One teacher said, “It has been great to see what others are doing. We get so caught up in our own little worlds that the COW is an easy way to see what someone 50 feet away is doing that is interesting and engaging to the kids.” Teachers are sharing resources and ideas, and they are looking for ways to partner on common topics. Teachers talked to the principal about adjusting the schedule so more classes could collaborate on themes or projects, which led to the combined class below.</td>
</tr>
<tr>
<td>Combined Class and Student-Led Learning</td>
<td>Another significant initiative was a pilot course in the high school. Based on the ideas from the grant, two teachers were inspired to create a student-driven learning experience that combined Ethics and Literature with Philosophy and Social Science. This two-period integrated class scrutinized social injustices locally and abroad. The students took the initiative to write a grant and use the money to buy technology they could use for creating a documentary about homeless people on the island. Students frequently met outside of school hours to produce videos and leveraged Facebook and Tumblr for communication. Additionally, two students from the class presented at a local conference in March about breaking the stereotypes of people with learning differences. This class was such a success, it is happening this year as well.</td>
</tr>
<tr>
<td>Change or Innovation</td>
<td>Description of Change</td>
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<tr>
<td>Student Publication</td>
<td>Inspired by the desire to give students opportunities to showcase work outside of the classroom, a small on-campus student team created a student publication. The mentorship group learned all of the steps necessary to gather photos, poetry, short stories, and graphics from students in the high school and alumni and put them together in a literary work. Students learned about organization, teamwork, layout in Adobe InDesign, copyright laws (release forms), and how printer companies work. All profits from the sale of this publication were donated to the school tuition assistance fund. This limited edition booklet raised more than $400 in donations for two years in a row.</td>
</tr>
<tr>
<td>Project-Based Learning in the Middle School</td>
<td>Inspired by a visit to High Tech High, the middle school curriculum coordinator shared her ideas, “the teachers took a leap of faith, embraced the concept, and agreed upon an overarching theme [of] Sustainability.” Throughout the year, middle school students immersed themselves in topics of personal passion and planned service projects to benefit the broader community. Choosing a topic from among the ten presented by teachers, students were given their first or second choice then were tasked with designing a plan for change based on the main topic. Examples of student-led projects included: furnishing a transitional apartment for a homeless family, building a school garden to donate vegetables to the local homeless shelter, traveling to the capitol to advocate for tougher laws on human trafficking, and fundraising to help build wells for communities lacking access to fresh water. Students spoke confidently at an end of the year event, attended by parents and invited guests, about their studies, their enjoyment of teamwork, and how they applied their learning to real world issues.</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborating with other</td>
<td>Continuing the connections made by the school at a Leadership Summit over the summer of 2010, the researcher created a free webinar entitled “Collaborating in an Online Professional Learning Community (OPLC)” and invited members of other schools with a similar mission to participate and make contacts for partnerships in the next school year. A dozen participants attended the first webinar in early June from schools in Hawai‘i, California, Ohio, and Massachusetts. With more sessions in the years that have followed, the links are starting to connect across the country to move toward building a global online community to support dyslexic learners. Below are examples of work the grant team has made toward the goal of building a global LD community: - Hosted webinars to educate teachers and administrators about the benefits of connecting our schools - Presented in person and via Skype to over 70 administrators at the International Dyslexic Association (IDA) conference to encourage collaborations and get buy-in - Created a “matchmaking” Google Doc so teachers nationwide can find others wanting to connect classrooms - Launched inter-classroom collaborations with other schools - Presented workshops about meeting the needs of diverse learners to faculty at local and mainland schools, pre-service teachers, and at conferences such as the Punahou School Brain Symposium - Welcomed visitors from many different schools, including local public schools</td>
</tr>
<tr>
<td>Schools</td>
<td></td>
</tr>
<tr>
<td>Photography / Poetry</td>
<td>The Literature and Photography teachers realized how important it is for student to have a real world experience. They collaborated to create an evening event at a small gallery in downtown. With more than 100 parents, friends, teachers, and family members in attendance, students showcased their creative talents through photography and artwork. They also read their poetry to the audience as a culminating event.</td>
</tr>
<tr>
<td>Event Downtown</td>
<td></td>
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</tbody>
</table>


Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Substitute Day</td>
<td>All high school teachers took at least one day off for professional development as part of our grant goals in the second year. It was commendable to get 100% participation, and it resulted in new enthusiasm, learning, goals, and plans for teaching and learning. Teachers worked on many goals such as learning more about PBL via classroom visits, incorporating 21st Century practices, enhancing Moodle sites, learning more about integrating technology, training on applications like assistive technology, learning the Flash program to create SmartBoard interactivity, and much more!</td>
</tr>
<tr>
<td>All School Conference Trip</td>
<td>Administration added a professional development day to the school calendar so faculty and staff could attend a local conference on technology and education. The shared experience sparked thoughtful discussions on the all-school Ning site, but more importantly, led to change in the classrooms. As follow-up, teachers hosted afternoon learning sessions on video tutorials, “Scratch,” SmartBoard integration, and PBL. Many teachers are currently creating video tutorials for students. One teacher had students create video tutorials to post on a blog as a way to prepare for tests and as the start of an e-portfolio.</td>
</tr>
<tr>
<td>Ninth Grade Project-Based Social Studies</td>
<td>Building off the momentum of the Middle School PBL, freshmen are working in small PBL groups and are sharing the same social studies period to allow for collaboration, project-based learning, and field trips. This has included trips to explore the downtown architecture of the city, tour of the government buildings (judicial, executive, and legislative), historic buildings, and a trip to a hotel that is focused on the culture of the region.</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting with Alumni</td>
<td>Progress is being made in how alumni can become more actively involved in the school through communication and collaboration. Examples of this include:</td>
</tr>
<tr>
<td></td>
<td>• More than 40 alumni attended the alumni potluck in December. Surveys were given to gather current information about the alumni and how best to grow the communication and collaboration between them and the school</td>
</tr>
<tr>
<td></td>
<td>• Alumni panels for Juniors and Seniors provided a look into life after high school</td>
</tr>
<tr>
<td></td>
<td>o One student was studying Fashion Design at a local college and she brought dresses she had designed in class</td>
</tr>
<tr>
<td></td>
<td>o Another student, who just graduated from Engineering School, talked to students about the struggles she overcame as a dyslexic learner</td>
</tr>
<tr>
<td></td>
<td>o Two students in the military talked about their choice to enlist before attending college</td>
</tr>
<tr>
<td></td>
<td>o Other students talked about the careers they have started since graduating and the keys to success for them in college</td>
</tr>
<tr>
<td></td>
<td>o Overall, alumni panels allowed the students to get a perspective from the journey experienced post high school, confirming many of the themes that teachers tell students</td>
</tr>
<tr>
<td>New laptops</td>
<td>The school used grant funds to purchase more than 60 laptops for student use over the past two years of the grant. The high school had a limited number of student laptops available, most of which were old and unreliable and made integrating technology a challenge. These computers accelerated progress toward grant goals because they provided reliable access to Moodle and other Web 2.0 tools on a daily basis. Teachers are now more willing to explore and try new applications since the system is running smoothly. Described here by one teacher as the favorite part of the grant, “increased access to mobile labs. I remember having to really scramble for computer time before and now it's never an issue. It hasn't been all year and I think that's awesome.” Another teacher said this about the new laptops, “I never used to tap into the mobile lab but I tap into it and I use it religiously now.” The high school plans to implement a one-to-one laptop program during the fourth year of the grant.</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mentorship Night Grows</td>
<td>From a parent and public perspective, the Mentorship Night (currently called “Mentorship Expo”) was a significant change inspired by the Presentations of Learning events at High Tech High. All high school students in 10th through 12th grades go to a workplace as an apprentice somewhere on the island every Wednesday for the duration of the school year. These mentorships can be at a restaurant, in an office, at a childcare center, in a hospital, etc. Mentorship has a culminating event where all the mentors, parents, and friends are invited to campus to hear from the students about what they learned. In the past, most students just did a science fair type of presentation with a tri-fold board. This year, the school initiated a change by putting more emphasis on the presentation piece and less on the traditional boards. The students met the challenge and delivered! Many of them produced wonderful videos or actually demonstrated what they did at mentorship by performing the task. For example, the blacksmith students had a live demonstration pounding metal. Students valued the experience more because they had an audience for the presentation instead of just standing and waiting at their board. The new format also allowed students to go watch their friends’ presentations as well. In the end, this “expo” idea, inspired by the grant, made the experience more interesting to visitors and more valuable to the students.</td>
</tr>
<tr>
<td>Public Awareness</td>
<td>A school Facebook page has gone live and the Development Office is sharing videos and pictures of events as they take place on campus. The school has also started on the process of updating the website with more current information and sharing information on the Parent Ning Site. They have also been working on writing articles for local and national dyslexic publications.</td>
</tr>
<tr>
<td>In-House Training Day</td>
<td>The most significant professional development in the second year was the first ever Teachers Teaching Teachers (T³) Conference. Conducted in February during a non-student day, this conference tapped the expertise of the faculty. Teachers used a Google Doc to suggest, vote on, and ultimately register for twenty-one different sessions related to the grant goals. The conference also included a staff member acting as a keynote speaker, door prizes, and lunch. Reflections indicated that all teachers learned something new and many felt this was the best conference they have ever attended! The conference increased conversations on the faculty Ning site, as teachers were inspired to integrate new ideas. New ideas were implemented right away including: new student-led projects, the use of Scratch as a tool for step-by-step learning, use of video tutorials to share problem solving with students, and so much more.</td>
</tr>
</tbody>
</table>
Table 24. (Continued) Pedagogical changes in the classroom.

<table>
<thead>
<tr>
<th>Change or Innovation</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Docs</td>
<td>High School teachers have become comfortable using Google Docs and other Web 2.0 tools as many school procedures, such as checking out laptops, signing kids up for study hall, and collecting/sharing classroom observations of students require teachers daily use of these tools. This has led to teachers integrating these tools more in their classrooms.</td>
</tr>
</tbody>
</table>
| Senior Presentations | For years, the school has asked seniors to write their “functional statement.” This statement, along with their testing data and learning diagnoses provide a tool that students can take to college to access accommodations. Students have struggled with the writing of this piece, and it was only shared with a few people at the end. Taking knowledge gained by visiting other schools, it was decided that each student would give a 10-15 minute presentation in front of their peers and family about who they are as learners, a history of their academic journeys, an explanation of their strengths and challenges, and what they need most in college (or in the workplace) to be successful. This Presentation of Learning, as it is called at some schools, serves as a celebration for students, an opportunity to practice public speaking and to say the world what they need to be successful. Teaching students to advocate for themselves is something that the school strives for and this presentation is an expression of this goal. Students had to answer these three questions:  
1. Who am I (as a learner and a unique individual)?  
2. What are the highlights of my growth?  
3. What do I need to succeed in the future?  
The presentations that night were amazing and students were honest about their successes, failures, and growth at the school. They were proud to stand up and talk about their learning strengths, challenges, and what they needed most to be successful in college or wherever they were going. Students shared artwork, poetry, played music, showed videos, and much more! The evening culminated with all groups coming back together to enjoy a meal, and with no prompting needed, the seniors got on the open microphone and gave heartfelt thanks to their parents and many of the teachers. |
Research Question Four Results

The fourth research question related to understanding how to achieve the highest levels of implementation in individual classrooms and across the whole school.

Innovation Configuration Map (IC Map)

The most important piece of change for the future was the creation of the IC Map. The IC Map provides a guideline for teachers to what the grant team hopes to achieve with the implementation. It also provides the administration with a tool for reflecting with teachers on where they are now and a way to set goals for the future.

The grant team created the IC Map over a three-month time period. The current map is available in Appendix D. The team started by brainstorming different ideas for the main goals for the grant by looking through the original proposal documents, quarterly and annual reports, and evidence from classrooms. Working together, the following objectives were established:

1. Promote student driven learning opportunities that support the development of twenty-first century skills such as: critical thinking, creativity, collaboration, communication, and community (A definition of “student driven” learning was included as well).

2. Build student, faculty, parent, and alumni collaborations to form local and global learning communities.

3. Access and effectively integrate technology for professional development and practice.
4. Facilitate student development of self-advocacy skills, which support successful transitions.

5. (5A) Participate in Professional Development (PD) opportunities that support the first four grant objectives.

6. (5B) Implement new practices based on PD opportunities that support the first four grant objectives.

After deciding the main objectives, the team focused on the variations of use, following the procedures established by Hord et al. (2008). After much deliberation, the group decided on three variation levels. The variations of use were given three descriptors: apprentice, practitioner, and leader. The three descriptors were chosen because they are commonly used in rubrics and in education. An apprentice is defined as a beginner at something, a practitioner is someone who is actively engaged in a task or training, and a leader is a person who commands, trains, and motivates others. Each of the variations had two levels of picture word descriptors, helping to provide the teachers with many options for reflecting about where they are right now with each component and their future growth. In determining the current IC Map, the team met numerous times, shared ideas online through a Google Doc, and collected feedback from the teachers. In many cases, the teachers expressed enthusiasm for the map and provided suggestions on individual word changes and layout. Teachers now see this as a vital tool to understanding the outcomes for the grant and for setting personal goals for future growth in their classrooms. The IC Map will be used in teacher orientation next year to promote planning and reflection for the last two years of the grant implementation. In addition to creating the Innovation Configuration Map (IC Map), the researcher used
other data to look at how the grant has been implemented so far and what might lead to the highest levels in the future.

**SoCQ Open-ended Questions**

Two of the open-ended questions in the SoC Questionnaire provided ideas on what has been most valuable to teachers so far and what will help in the future. Table 25 shows the results of the question, which was: “Thinking back over what the grant has provided to you, what has been the most valuable pieces of the grant to you as an educator? (E.g. new student laptops, professional sub days, trips to visit other schools, one-on-one support from the grant leader, etc.).”

**Table 25. Answers to the question about the most valuable part of grant.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional substitute days</td>
<td>8</td>
</tr>
<tr>
<td>New laptops</td>
<td>6</td>
</tr>
<tr>
<td>1:1 technology help from grant leader</td>
<td>6</td>
</tr>
<tr>
<td>Trips to other conferences on and off-island</td>
<td>4</td>
</tr>
<tr>
<td>In-house professional development day</td>
<td>4</td>
</tr>
<tr>
<td>Trips to other schools</td>
<td>2</td>
</tr>
<tr>
<td>Hearing Tony Wagner speak</td>
<td>1</td>
</tr>
<tr>
<td>Help with collaboration with other schools</td>
<td>1</td>
</tr>
<tr>
<td>In-house workshops run by other teachers</td>
<td>1</td>
</tr>
</tbody>
</table>

**Quotes from teacher responses**

“It has supported my ventures into the world of educational technology in a slow, sequential and supportive manner rather than thrusting me into a world that I was not ready to navigate.”

“Being encouraged to try more creative curricula.”

“… the sharing in meetings and sense of collegiality amongst faculty is excellent. I like that I work where we can take risks and learn from them, and learn alongside students.”
Half of the teachers mentioned the professional sub day as being the most valuable part of the grant. The professional sub days allowed the teacher to have a pre-planned sub and to work on a passion they have in teaching for the day. Examples of how the time was spent included: working with the researcher to learn something new, observing and visiting classes, working in their classroom Moodle sites, and spending time working off-campus on a personal learning passion; such as learning Flash to create Smart Board interactive features. The teachers used a form to propose their idea, receive approval from the principal, and complete a reflection afterward to provide evidence to the grant leader for the annual grant reports. Many of these sub days allowed teachers the time they needed to plan how to implement a new idea into their classroom. An example of the sub request form is provided in Appendix E.

The final open-ended question from the survey stated, “With almost half the grant funding left, what do you think would help you the most as an educator for your future growth? (E.g. examples could be current grant items, new ideas or both).” Many times in program evaluation, asking the participants for their thoughts yields the best results. Table 26 summarizes their responses to the third question.

The teachers provided interesting ideas on what they would like to see in the future. An important point is that many of the ideas they mentioned here were not what they thought about before the grant. The grant has helped teachers to see new ideas and how they might be implemented, examples are: a “flipped” classroom, talk about assessment, and student e-portfolios. The ideas presented here provide the grant team with goals for implementation for the final two years of the grant and beyond. The levels
of use branching interviews discussed in the next section will help to understand where these ideas from teachers come from and their motivations.

**Table 26. Teachers provide ideas on what they want most from the grant.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Another tech sub day</td>
<td>3</td>
</tr>
<tr>
<td>Smart Boards in all classrooms</td>
<td>3</td>
</tr>
<tr>
<td>More in-house professional development days</td>
<td>3</td>
</tr>
<tr>
<td>Funding to attend conferences</td>
<td>1</td>
</tr>
<tr>
<td>Funding film projects for students</td>
<td>1</td>
</tr>
<tr>
<td>Make sure we have a tech person available to assist with transitions</td>
<td>1</td>
</tr>
<tr>
<td>More information about ADHD and how to manage in classrooms</td>
<td>1</td>
</tr>
<tr>
<td>Collaboration opportunities</td>
<td>1</td>
</tr>
<tr>
<td>Time and resources to read publications</td>
<td>1</td>
</tr>
<tr>
<td>Newer servers with less glitches and hold ups</td>
<td>1</td>
</tr>
<tr>
<td>More supplemental tech equipment (video cameras, lapel microphones)</td>
<td>1</td>
</tr>
<tr>
<td>More talk about understanding assessment</td>
<td>1</td>
</tr>
<tr>
<td>New ideas</td>
<td>1</td>
</tr>
<tr>
<td>Student e-portfolios</td>
<td>1</td>
</tr>
</tbody>
</table>

**Quotes from teacher responses**

“I want time to keep exploring the potential for blended, flipped, online, and mobile learning.”

“I want us to document student progress through e-portfolios and help the students feel in charge of their own learning. We have made growth toward this but are still developing what it will look like.”

“Knowing what the end goal for the grant is.”

“Additional teacher training/planning time to develop new models of teaching.”
Patterns and Codes from Interviews

Understanding the effectiveness of a grant implementation requires looking deeper into how change has occurred and what patterns emerge. The levels of use interviews allowed the researcher to gather more information about how the grant innovation had changed individual classrooms. It allowed the researcher to ask follow-up questions to garner more information about how to make the innovation more successful, which is at the heart of the goal for a program evaluation. After completing the interviews in March of 2012, the researcher was able to get the exact written transcriptions for each session. The data were then transferred into TAMS Analyzer. Since all of the questions for the interviews were open-ended, the researcher needed a method to look at the patterns formed by the collective responses. Using the descriptive coding method described by Saldaña (2009), the teachers’ responses were coded by topic. In the first cycle, codes were chosen based on research questions the researcher was hoping to answer. In TAMS Analyzer it is better to have codes in lower case and spaces are not allowed, so underscores were used to separate multiple words in codes. The first cycle of coding helped the researcher to determine what would become the main patterns/themes in addressing the research questions to be answered. Many of the responses spanned more than one code. Even though participants responded to the impact the grant had on their own teaching, they also mentioned how it impacted students and the school as a whole. The first cycle provided a way to glean out the key thoughts from the teachers about the grant. Table 27 shows the initial codes chosen for the first cycle. For each of the codes, the figure shows the defined code in the TamsAnalyzer and its description.
Table 27. Codes used in first coding cycle of interview data.

<table>
<thead>
<tr>
<th>Code Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>working</td>
<td>What is working in your classroom with regards to the grant innovation?</td>
</tr>
<tr>
<td>not_working</td>
<td>What is not working in your classroom with regards to the grant innovation?</td>
</tr>
<tr>
<td>changes_made</td>
<td>What changes have you made in the classroom or personally?</td>
</tr>
<tr>
<td>changes_in_others</td>
<td>What changes do you see in other teachers around you?</td>
</tr>
<tr>
<td>teacher_need</td>
<td>What do you need from the grant to be successful in the future?</td>
</tr>
<tr>
<td>collaboration</td>
<td>What types of collaboration have you done with other teachers in regards to the grant?</td>
</tr>
<tr>
<td>grant_strengths</td>
<td>What do you feel are the strengths of the grant innovation?</td>
</tr>
<tr>
<td>grant_challenges</td>
<td>What do you feel are the challenges of the grant innovation?</td>
</tr>
<tr>
<td>student_changes</td>
<td>What changes have your students made in class with regards to the grant innovation?</td>
</tr>
<tr>
<td>interesting_point</td>
<td>An important point made by the teacher about his/her own learning and going through change.</td>
</tr>
<tr>
<td>next_steps</td>
<td>What are the next steps for you in the classroom or personally?</td>
</tr>
</tbody>
</table>

In the second coding cycle, pattern coding was applied. “Pattern Coding is a way of grouping those summaries into a smaller number of set, themes, or constructs” (Miles & Huberman, 1994, p. 69). Pattern coding allowed the researcher to look deeper into the open-ended responses and the specific codes created, seeking out patterns and themes that might be relevant to the program evaluation. Program evaluation involves a systematic approach to collecting and analyzing the status of a program to determine its effectiveness and deficiencies. Table 28 shows how the researcher took the initial codes and collapsed them into themes that directly relate to the grant implementation.
The themes for program evaluation include four success themes and two challenges. The successful themes are: “Helping Hands”; “Permission to Take Risks”; “Change Can Happen”; and “Learn from Others.” The challenging themes are: “A Need to Paradigm Shift” and “Never Stop Communicating.”

**Table 28. Changing codes into themes.**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Code Collapse</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Successes</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Helping Hands           | • grant_strengths  
                          • collaboration       
                          • interesting_point  | The “Helping Hands” theme has been the most successful part of the grant. The grant team was available to work with teachers to help bring about change in the classroom. |
| Permission to Take Risks| • grant_strengths  
                          • student_changes     
                          • interesting_point   | The “Permission to Take Risks” theme is more about the culture of the school than the grant itself. It is a willingness by the administration to allow teachers to try new strategies in the classroom. |
| Change Can Happen       | • working       
                          • changes_made       
                          • student_changes     
                          • interesting_point   | The “Change Can Happen” theme is anecdotal evidence describing how teachers have changed their pedagogy based on what the grant has given them. |
| Learn from Others       | • collaboration  
                          • changes in others   
                          • interesting_point   | The “Learn from Others” theme is a cultural shift in the high school where faculty meetings and breaks provide time for teachers to share what they are doing in the classroom. |
| **Challenges**          |               |                                                                                                                                             |
| A Need to Paradigm Shift | • grant_challenges  
                             • next_steps         
                             • teacher_need       
                             • not_working        | “A Need to Paradigm Shift” is a continued challenge in getting a few teachers to be willing to see that change can be good for them and their students. |
| Never Stop Communicating | • grant_challenges  
                             • next_steps         
                             • teacher_need       
                             • not_working        | The “Never Stop Communicating” theme involves the need to continue to describe the grant goals in many different ways to ensure all participants understand. |
After combining the codes into the new themes, it became clear to the researcher that these themes provided not only a clear picture to administration about what change has occurred, but it also provided some pathways to success for the program going forward to achieve the highest levels of implementation. What follows is a description of each of the themes and how they align with program evaluation.

**Themes**

Taking the codes and patterns created from the LoU interviews, six themes emerged, which are described below in detail.

**Helping Hands** - Probably the most successful part of the grant innovation, based on the feedback of the teachers, was to provide time for the grant leader (the researcher) to work with teachers during the school day and on professional substitute days paid for by the grant. “Those professional development days were awesome, I think, and then having you there to tutor and mentor and just give advice, expertise I think that's really good too. So just giving people the time to experiment with things and giving them the freedom to do that”, one teacher mentioned. The grant leader met with teachers to talk about ideas for improving the classroom, worked with teachers on understanding how to use the technology they already had, and was there when things went wrong and they needed a “helping hand.” As one teacher described the strength, “… it meets people where they are. For someone who isn't very skilled say, for instance, with technology they are not left behind.” Teachers felt that by having someone on staff willing to help and providing them with a safety net in the classroom when trying something new enabled them to be more willing to take risks. Beyond having the grant leader available
for support, having a leadership team that allowed teachers to consider other ideas and to focus on change was a key to success.

**Permission to Take Risks** - The school’s philosophy and administration play a huge part in the ability for change to take place effectively. If a school wants to bring about change, the administration must give teachers the permission to take risks. At the school that was studied, the administration realized that working with students with learning challenges would require a different type of teacher than in a “regular classroom.” It would require a teacher who was willing to take risks and try different strategies to meet the needs of the students. The high school principal has always believed in allowing the teachers the autonomy to seek out new ideas and try them. This can be seen in how teachers look at the principal, “[she] gives a time on Wednesdays, ten o’clock meetings, to kind of share, Wednesday's faculty meetings, show and tell, it's kind of like oh, that's a really good idea; maybe I could use that in my class.” This philosophy carried through to the grant and has allowed the teachers to try ideas and to take risks.

**Change Can Happen** - One of the biggest findings from the interviews, observations, and discussions while building the IC Map was that teachers have changed. Teachers have taken to heart what they learned at conferences, from other teachers, and from visits to other schools. As one teacher said, “What I do like, though, is the faculty meetings, the show and tell, because I like seeing, not necessarily reading about the different parts of their curriculum but I like seeing it in person so that works well.” Given new technology and ideas, they brought about change in the classrooms and were willing to share how they have changed.
With every year, more changes occurred and more teachers got involved. One teacher mentioned this in the interview, “It’s not like okay, year two is something totally different, and it builds upon things from the previous year so I like that, kind of going sequential.” The idea that change can happen, and it can occur quickly when teachers are ready, as one model teacher stated, “I’m just trying to take full advantage of the stuff that’s offered to me.”

Learn from Others - A shift has occurred in the high school, and the administration led the way. The high school principal designated the first part of faculty meetings as “show and tell” time; an opportunity for teachers to share what they are doing in their classes, especially when it related to trying something new involving the grant. The sharing started off slow with just the grant team sharing ideas they had implemented from visits to other schools, but it has grown to be much more. The sharing has encouraged and inspired others to try new things in their classes and report back the results. It also helped create a collaborative community where teachers are willing to help each other to bring about the changes they have made in their own classrooms. In addition, it has led to team teaching of classes and integrated units across disciplines.

However, there is still a need to cultivate collaboration in the students, one teacher described it this way, “It’s really funny that I don’t get the feeling that they [students] are naturally collaborative and I don’t know - I think that’s something that school has taught them, not to be collaborative, and I think I would like to work more on that collaboration in the classroom and outside the classroom 'cause I think that is a twenty-first-century skill that needs to be developed.” In addition this idea of learning from others has spread to collaborations between the high school and lower schools. The grant initiative has led
teachers to start new ideas. The science teacher wanted students to teach each other science concepts, “I thought of this project where they would teach. At first I figured they could just teach each other but then I thought it would be pretty cool if they taught somebody else, and so I went to some of the K-8 teachers that I knew who were - I knew looked for things like that and just asked them and they were happy to have those kids.”

A Need to Paradigm Shift - “A Need to Paradigm Shift” is the continued challenge in getting a few teachers to be willing to see that change is needed for them and their students. In some of the interviews, teachers expressed struggles with change, but this is different from a few teachers who refuse to change. For them, there is still a belief that the way they are teaching is working so no change needs to be made. A paradigm shift is a radical change in beliefs, or in this reference, a change in teacher pedagogy. The grant team must look for ways to encourage change to occur more rapidly for the benefit of all students. With the grant more than half over, one-third of the teachers are still at the Mechanical Level (LoU III), and there are still some teachers struggling with what is next, “I'm still trying to figure out where to take the next step to take the grant.”

The team needs to work with teachers on their fears. One teacher from the interview expressed, “I’m very computer illiterate and it scares me to move into other programs.” It is critical the team works to alleviate fears by providing one-on-one help, training sessions, and mentoring to improve confidence. Also, the grant team must change the narrative about the grant, described here by another teacher, “Because the word ‘future’, I think people put a lot of technology with that but it doesn’t have to be, and I think it was eye opening for [them].”
Never Stop Communicating - This theme involves the need to continue to describe the grant goals in many different ways to ensure all participants understand. A few of the interviews surprised the researcher when the teacher admitted to not understanding the grant goals. The researcher and grant team have provided multiple modes of communicating with the teachers about the grant, the goals, and how it will change the classroom. The reality is that as many times as it is described, there will still be teachers who do not understand or fully comprehend the overall vision and purpose. The key is to continue to communicate and provide an open atmosphere for asking questions and learning about the grant. As Bridges (2003) describes it in his book on managing transitions, “Give people information, and do it again and again” (p. 32). As new teachers enter the school, they must be informed about the grant. Training new faculty is an opportunity to reiterate the grant goals with the whole staff and specifically address the areas where there seems to be confusion or a lack of understanding.

Summary

Throughout the grant implementation, the researcher attempted to evaluate how effective it has been at bringing about change in classrooms. In the first few years, it was through visiting classrooms, talking to teachers, and simple surveys to hear back from teachers on what they liked and needed from the grant and the team leader. However, with half of the five-year grant complete, the researcher was looking to use validated tools to evaluate the program to make plans for the future. The Concerns Based Adoption Model (CBAM) provides tools that look at many different areas of change in an innovation. The results of the data collected provide insight into what the grant has accomplished so far and what changes can be made to continue the growth. The purpose
of this qualitative research program evaluation was to examine how the Schools of the Future Grant Initiative impacted the pedagogy of high school teachers at the school. Summarizing the data requires looking at each area of data collection separately and then providing an overall picture.

**IC Map**

The IC Map has undergone many variations throughout the process to the current version. The current version has been met with great reviews from the staff as a whole. The map provides a clear picture of the objectives set forth by the grant team for what they hope will be the pedagogical changes that will take place in the classrooms by the end of the grant innovation in May of 2014 and beyond. In understanding what twenty-first century learning is about, the map provides details on what a classroom should look like with project-based learning and a student-driven curriculum. It also looks at the teachers as leaders in a twenty-first century environment, from the need to collaborate more with each other and schools around the country and to enabling others by imparting their knowledge by training other teachers. The school has a tool now that can be used to plan out professional development opportunities, discuss personal goal setting with each teacher, look at the overall growth in the school over time, and achieve the highest levels of implementation (research question four). Finally, the IC Map provided a clear picture for teachers preparing to take the Stages of Concern Questionnaire.

**Stages of Concern Questionnaire**

To have so many teachers with a highest stage of concern at Stage 0 (Unconcerned) was a surprise to the researcher considering the school is already two and a half years into the innovation. However, by looking more in-depth at the answers that
determine this stage, it appears that the results might have been affected by four areas: 1) teachers were confused by the word “concerned” and assumed it meant “troubled” or “worried”; 2) with so many responsibilities placed on the teachers at this school, it might be that they have other more pressing issues than this grant to be concerned about; 3) other data indicates the teachers are involved and have brought about changes to their classrooms, so their concern levels might not be due to non-use of the innovation, and 4) there appears to be a gap in the way teachers recognize and understand that changes they are doing in their classrooms are result of the grant innovation. Reflecting on the Stage 0 group again, the researcher looked at levels of concern in Stage 1 (Informational) and Stage 2 (Personal). Because the majority of the group (56%) had a higher level of concern in the Personal stage rather than the informational stage, this is something that will need to be addressed in the future. Teachers need to understand better their place in the overall grant goals and how administration will help them throughout this innovation. The SoCQ provided great details in answering the first research question. Recommendations for change can be seen in Chapter Five.

**Open-ended Questions**

The open-ended questions provided a wealth of knowledge about the grant innovation as whole. Key points include: descriptions of different pieces of the grant that helped teachers, what they need to help in the future, the realization that some teachers still do not understand the goals of the grant and will need more help in moving forward with the grant. These answers were utilized in answering both research questions three and four.
Levels of Use

While the researcher is unable to offer a definitive placement of the levels for each teacher, there is evidence that teachers are bringing about changes in their classroom, based on the open-ended questions on the SoCQ and the responses at the LoU interviews. Indicated by analyzing the interview responses, even the teachers with the greatest struggles for change, were showing signs of wanting to change and innovate. Currently, all 18 teachers are implementing the grant in some way; however, one-third of them are still at the Mechanical Use Level (Level III). The good news is that another third of the teachers are at the Integration Level (Level V). Figure 18 provides a graphical representation of each of the teacher levels. Interviewing select teachers provided help in understanding the overall levels for all of the teachers, so the grant team can make predictions of what will be needed to help them push to the next level in the future and also ascertain the answer to research question two about levels of use. This will be further described in Chapter Five in the recommendations section.

![Figure 18. Teacher’s levels of use.](image)
Themes

The themes have been described at length earlier in this chapter. Case studies involve listening and learning from the group and then attempting to interpret what was done and why. Looking at the overall interviews from the teachers, the researcher was able to code the data, group the codes into patterns, and create a set of themes for the program evaluation. Providing both success and challenge themes helps the grant team to establish a plan for the future in what should be continued and what needs to be changed, so that the school can reach the highest levels of implementation, which will answer the fourth research question. In Chapter Five, the researcher will make recommendations to the grant team to help in maximizing the implementation of the grant goals for the future.
CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

The purpose of this qualitative study was to conduct a program evaluation using case studies and the Concern Based Adoption Model (CBAM) to look at the changes taking place with the high teachers at the school. The school discussed in this study was in its third year of a five-year grant initiative designed to bring about change in teacher pedagogy, to integrate more twenty-first century skills, and to create a “school of the future.” Armed with the information from this research, the grant team can implement changes to improve the effectiveness of the pedagogical changes in the classrooms and bring more change for students. The goals of the research were to:

- Understand the teachers’ concerns, levels of use, and the qualities of implementation in the first half of the grant period using the CBAM.
- Help the researcher to maximize the implementation over the second half of the grant by examining the results of the data and suggesting changes for the future.
- Provide helpful information to other schools seeking to employ similar organizational changes in the future.

The researcher used multiple tools and surveys as the basis for answering the research questions and achieving these goals. All surveys were conducted with the proper approval of the university’s institute for research board and were discussed with professors prior to administration. Surveys were conducted with the teachers in the high school over a three-year period starting when the grant was first awarded in March 2009 to the middle of the grant’s third year in March of 2012. While the number of teachers who volunteered to be surveyed varied with each survey, 16 out of 18 of the teachers (88.9%) completed the Stages of Concern Questionnaire as part of the main CBAM
research, and all of the selected teachers for the LoU interviews agreed to be surveyed. For the researcher, this data were just parts of the ongoing evaluation of the five-year program evaluation and will serve as a baseline for future CBAM data collection. What follows is a discussion about how the data relate to the original research questions proposed in Chapter One.

**Research Question Review**

Looking at each research question separately, the researcher reviewed the results of study and compiled the following thoughts.

**Research Question 1 – Teacher Perceptions**

*What are the teachers’ perceptions of the grant implementation, and what help would they need to continue the change in pedagogy (Stages of Concern - SoC)?*

Looking back at Chapter Four, the sixteen teachers who took the SoC survey provided a wealth of information in understanding their perceptions about the grant implementation. With nine of the sixteen teachers showing their highest level of concern in Stage 0 (Unconcerned), questions arose about if the teachers were more concerned about other innovations or if they were even implementing the innovations in their classrooms. In the analysis of these results, the researcher discussed the possibility that some of the answers might be suspect based on the inquiries by the teachers after the survey about the definition of the word “concern” and because of the culture of the school in relation to how this grant fits in. However, the researcher must conclude that there is a need for better understanding of teacher perceptions. Are teachers truly at the “unconcerned” stage in their perceptions about the grant? If the teachers were allowed to elaborate more on their answers to these questions, what would they have said?
Many of the teachers in the Stage 0 (Unconcerned) level also had higher intensity levels in Stages One and Two (Informational and Personal, respectively). The data revealed that the majority of these teachers (56%) had a negative “1-2” split indicating higher concerns with the personal part of an innovation, for example, where they fit into the innovation, doubt about the success, and their potential for resistance to the innovation.

Since the majority of teachers have higher levels of intensity in the first three stages the “self” stages, it is clear more training and communication need to be conducted with the teachers in understanding the importance of this grant initiative. In previous research studies, most participants start in these lower stages and as training continues, they move to the “task” and “impact” stages, so the results of this study match other studies (Tunks & Weller, 2009; Newhouse, 2001). Even though this study is in its third year, this is the first time the teachers have seen the full breadth of the innovation as revealed in the IC Map and it might be that they realize just how big of a change this will have on their classrooms. In addition, the school has many other priorities besides the grant that might concern teachers more, which will be something the administration will have to find out through one-on-one talks with teachers and through faculty meetings about concerns as a teacher.

This one survey is not enough to make a determination about the perceptions of the teachers. The researcher recommends that the SoCQ be given again in March of 2013 to compare the results. Prior to the survey in 2013, the researcher will meet with the high school faculty to reflect on the grant goals from the IC Map and talk about concerns to ensure understanding before completing the questionnaire.
In addition to the SoC 35-item questionnaire, the researcher asked some open-ended questions to help understand the needs of the teachers for the future. Table 29 provides a list of current and future needs collected based on these responses. These suggestions will help the grant team as they put together a plan for the rest of the grant period.

Table 29. Teachers’ needs described in survey.

<table>
<thead>
<tr>
<th>Most valuable pieces</th>
<th>Suggestions for the future</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Professional sub days</td>
<td>• Additional professional sub day</td>
</tr>
<tr>
<td>• New laptops</td>
<td>• SmartBoards in all classrooms and additional technology equipment</td>
</tr>
<tr>
<td>• One-on-one technology support from the grant leader</td>
<td>• More in-house professional development days</td>
</tr>
<tr>
<td>• Trips to others conferences on and off-island</td>
<td>• Funding for conferences, film projects for students,</td>
</tr>
<tr>
<td>• Trips to other schools</td>
<td>• Continued one-on-one technology support</td>
</tr>
<tr>
<td></td>
<td>• New ideas for the classroom</td>
</tr>
<tr>
<td></td>
<td>• Collaboration opportunities</td>
</tr>
<tr>
<td></td>
<td>• Knowing more about the end goal for the grant</td>
</tr>
<tr>
<td></td>
<td>• More discussion about assessment</td>
</tr>
</tbody>
</table>

**Research Question 2 – Teacher Implementation Levels**

*What is the extent of implementation with each teacher and the high school as a whole (Levels of Use - LoU)?*

The extent of implementation varied with each teacher. Through observations, informal conversations, and one-on-one interviews, the researcher was able to estimate each teacher’s level of use. The six full interviews with teachers provided evidence to change two teacher’s levels predicted by the researcher and principal. From the results of
the data, it appears that all teachers were at least at the Mechanical Use Level (III) for some parts of the day, meaning they showed signs of implementing the grant goals even though they might not have completely changed pedagogy for all classes. It is important to remember that going through change is different for every person. Bridges (2003) describes this as “the marathon effect” where thousands are lined up at the start line and when the gun sounds, some will jump right out and start running, some will start slowly, and some might still be in the bathroom, not even ready to start. The levels of use right now provides a baseline for the program evaluation, and further study is needed by conducting LoU interviews next March to compare the data to see what growth has occurred, similar to checking in with the marathon race every few hours to see how far the runners have gone. In Chapters Three and Four, the researcher goes into detail about each level of use for the six teachers interviewed and Figure 18 provides a visual representation as to where teachers are in their levels right now.

**Research Question 3 – Teacher Pedagogical Changes**

*What are examples of pedagogical changes that teachers have made in their classrooms?*

The open-ended questions and the LoU interviews provided a wealth of knowledge about the changes teachers have made in their classrooms throughout the grant. Table 30 is a compilation of what teachers described as changes they made. Not all teachers made the changes below; however, this comprehensive list may help provide ideas for teachers in the future.
Table 30. Pedagogical changes made by teachers.

<table>
<thead>
<tr>
<th>Pedagogical Change</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project-Based Learning</td>
<td>Teachers have implemented many examples of project-based learning including: creating a student publication, time lapse videos to describe the Bill of Rights, creating a school garden, cultivating native plants in pots and selling them as a class project, creating awareness for human trafficking legislation on the island, and many other examples.</td>
</tr>
<tr>
<td>Student-Led Learning Opportunities</td>
<td>The new Philosophy/Ethics course was a perfect example of teachers allowing students to take charge. Additionally, the changes made to mentorship night provided opportunities for students to lead. Finally, having seniors culminate their high school experience by leading their senior presentation night show successes in letting students lead.</td>
</tr>
<tr>
<td>Collaboration with Others</td>
<td>Collaboration remains a largely untapped area of change for the grant. There were, however, many examples of collaboration between the high school and lower school; including opportunities for high school students to tutor the younger students, to discuss what it is like to have a learning disability in high school rather than elementary school, and to allow older students to read to the younger students. Collaborations have started between classes at the school and other classrooms outside of the school, including connecting a two foreign language classes and two literature classes sharing learning and understanding.</td>
</tr>
<tr>
<td>Leading Change around the Country</td>
<td>Teachers were willing to share their experiences of change with others through outreach opportunities, in-house professional development sessions, presenting at various local and national conferences, and visiting other schools. As one of the grant goals, this pedagogical change is helping to expand the school’s reach and to validate teachers producing change in their own classrooms. In year four of the grant, four teachers are preparing for a trip across the country to visit three other similar schools in order to form partnerships, share their knowledge, and present what we they have done with the grant.</td>
</tr>
<tr>
<td>Technology Integration in Classes</td>
<td>The new laptops played a significant part in giving teachers the willingness to use technology. Having Google Apps, Moodle, and other Web 2.0 tools available, with help from the grant team, brought about this important change for the classrooms.</td>
</tr>
</tbody>
</table>
Table 30. (Continued) Pedagogical changes made by teachers.

| Skill-Based Learning Opportunities | Many classes have made changes to how they assess student learning. Through performance-based and criterion-based rubrics, the focus of many classes is now on the skills instead of the content. The best example of this is a new science class that allows students to explore topics of interest with the focus on scientific thinking, and other skills related to studying science. |
| Connecting with Parents and the Community | Inspired by visits to High Tech High in San Diego, the school had taken on a new focus of transparency and presentation. Examples of this include: the parent Ning site connecting parents online for discussion, support and learning; the school Facebook page providing pictures, videos and examples of student work; the poetry/photography night at a downtown gallery; mentorship expo that is open to the public to visit; and PBL night, which was a celebration of all the problem based learning activities. |

Research Question 4 - IC Map and Implementation Levels

How can the change process be facilitated to achieve the highest levels of implementation in individual classrooms and across the high school (Innovation Configuration Map)?

Having the IC Map was a critical piece in achieving the highest levels of implementation because it provided all teachers with a framework for change. It provided them an understanding of the desired objectives and provided administrators talking points when they met with teachers to set up annual goals with each teacher. In addition to the IC Map, the two challenge themes (A Need to Paradigm Shift and Never Stop Communicating) highlighted areas for improvements that can be made to improve implementation. As Hall (2010) mentioned in his Implementation Bridge metaphor, “the researcher/evaluator can use information from each dimension to measure how far across the bridge each implementer has progressed. Change facilitators can also use the same constructs and information for planning and making interventions to help implementers...
move further across the bridge” (p. 235). While it is clear that change has occurred through what was seen in the classrooms and in the LoU interviews, there is much that can still change. Program evaluation will occur on a regular basis and by conducting the SoCQ and LoU in March of 2013, the grant team will have the ability to see if the teachers are continuing to move along the implementation bridge further.

**Implications**

One thing is for certain; the landscape of learning truly has changed. While once content was the most important driving force in preparing students for the future, the Internet with its instant access to answers has changed everything. So, what then is a “School of the Future?” How do teachers and schools prepare students for careers that might not even exist yet with the every changing technology world? The reality is that schools must look to the skills that best prepare students for the unknown. Skills like critical thinking, problem solving, collaboration, adaptability, entrepreneurship, initiative, and analyzing information. Teachers must learn how to teach these skills. They must learn to integrate technology so that it becomes a seamless part of learning, just another tool in the quest for improving learner skills for the future. As Friedman (2007) describes it, we are at a new level of change, Globalization 3.0, giving a “newfound power for individuals to collaborate and compete globally” (p. 10), a world that has become flat, metaphorically speaking. We can connect to others with the click of a mouse anywhere in the world; with the only limitation being the time difference between countries. Connecting and collaborating with others will help to build global citizenship, students who truly understand the world around them and their place in it.
To bring about the change in learning for students, teachers must change. They must break through the paradigms of their own learning experiences as students and build a better school; a school focused on developing skills and helping students to understand themselves as learners. In this dissertation, the researcher focused on the teachers and how they are dealing with the changes that the new world of learning is bringing to them. It focused on the changes in their pedagogy, their perceptions of change, and their levels of implementation through the grant initiative. The research questions are ones that innovators at all schools will face as they try to adapt the schools to provide learning opportunities that better fit with a world where content answers are a click away; and, the themes garnered from this research provide ideas for others in the future. One final key is the involvement of the staff in the success. Again, Fullan describes it this way, “Schools in which teachers have a shared consensus about the goals and organization of their work are more likely to incorporate new ideas directed to student learning” (p. 38).

In the research, the administration was involved in the success; however, the teachers were also willing participants in sharing their successes and challenges throughout the grant initiative so far. The next section will provide a list of recommendation for future changes to bring about the higher levels of implementation that were a main goal of this research project.

**Recommendations**

The recommendations section is organized into three areas that include: recommended program changes, future research opportunities, and recommendations for other schools seeking to implement similar educational innovations.
Future Program Changes

The researcher recommends the following program changes to help achieve the highest levels of implementation in the future.

• Continue to focus on professional development and change for the whole staff by building leadership capacity so a greater number of people can drive further implementation.

• With three new teachers in the high school (16% turnover) for the 2012-13 school year, it is important to ensure that new faculty understand the grant and are ready to implement grant initiatives. Veteran teachers, faculty mentors, or grant team members, need to support the learning of these new faculty members for this year and the ensuing years.

• Since communication for some is still a challenge based on the “Never Stop Communicating” theme, the grant team needs to look for more opportunities to provide information about the grant covering all types of approaches including: written handouts, information on the faculty intranet site, posting information in the teacher’s lounge and around campus, using social media to share information, creating a visual representation of the IC Map main objectives, visiting classrooms to talk to teachers about the grant, professional development opportunities, reminding teachers when a pedagogical change relates to the grant goals, and reflecting in faculty meetings.

• Find more opportunities for teachers to talk about their classrooms with others and share what they are doing. This can be done through providing stipends to give teachers opportunities to work and share with others, maybe recording some of these
to post on the faculty Ning site. The grant team should also lead discussions, brown bag lunches, and afterschool meetings to maximize opportunities for teachers.

- Use the IC Map as a tool for professional growth and change
  - Have teachers take a survey to determine their levels on the IC Map and use this for helping them to set individual goals with their principal.
  - Use the survey data for the whole staff to set school wide goals for change.
  - Use faculty meetings to break into groups and talk about each of the objectives.
  - Help teachers to develop e-portfolios, or other methods, that show evidence of learning in the future for both themselves and their students.
- Push for more ways to connect with other schools either class-to-class or school-to-school opportunities.
- Those approaching higher levels on IC Map need to be encouraged to submit proposals to present at conferences and/or write articles to get the word out about what they are doing.
- Find ways to further fold in alumni through mentoring programs, having alumni teach students, or having them work with teachers on the strengths and gaps in the program.
- Work on better connecting with parents through expanding the Ning site and connecting with parents at another school for collaboration.
- While not directly part of this research, continue to expand the goals of the grant to the lower school staff and students.

**Future Research Opportunities**

As mentioned in earlier descriptions, the data collected with the CBAM provided solid baseline data for future research. While the CBAM provided some interesting
insights about how the change was progressing, comparing the results to another set of data may provide a whole new level of understanding. The researcher has already made a plan to conduct both the SoCQ and the Levels of Use interviews with the teachers in March of 2013. Another area of future research is a more in-depth case study of teachers and change through interviews, observations of classes, and showcasing pieces of student work. This would provide an opportunity to explore detailed changes in the classrooms and how students are reacting to the twenty-first century learning opportunities. This could lead to another study with the students. How are students changing with the new environment? Do they see the differences in pedagogy? This data could be gathered using observations, survey tools, and interviewing the students.

An interesting exercise would be to have teachers look at where their classrooms are on the IC Map and answer the following questions. Has their pedagogy changed in the last three years? Where do they see their greatest growth and success, and where are they still challenged? This information could be utilized for setting future goals.

Another possible expansion to the research would be to do a case study with some of the students who have graduated and are now in college. Did the grant, which brought about changes in classrooms, help the students to be better prepared for college? Did it help them to have the twenty-first century skills, which are talked about by Pink and Wagner? This could open a whole range of possibilities; especially in terms of a longitudinal study that would follow the students while they are still at the school and as they transition to college and to a future career.
Finally, another research opportunity would be to team with a researcher at another private or public school on the island or elsewhere to compare and contrast twenty-first century learning in both places and how teachers are bringing about change.

**Recommendations for Other Schools**

The school studied in this research is a special case; not all schools have a mission that includes specific learning disabilities and the need to create individualized and integrated instruction; however, that does not mean that the themes presented here only apply to this school. Most schools have been thinking about change over the last decade as technology becomes ubiquitous in the classroom and in children’s lives. Most schools are faced with the pressure of students demanding the use of technology in the classrooms, asking for more control over their learning, and their desires to have the skills they need to succeed. Whether the change is dictated by a grant, administration, students, teachers, parents, or by the public; change is happening. The themes, designed by the researcher, provide a roadmap for change (Table 31).

**Table 31. Themes and their connection to other schools.**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Advice for Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Helping Hands</td>
<td>Throughout the grant, teachers have indicated how valuable it is to have someone knowledgeable available to help. “Helping Hands” is more than just a person there to provide an extra set of hands, it is a trusted, patient person who is willing to listen and provide advice without appearing to be overbearing and dictatorial. In addition, having someone there when technology needs troubleshooting is so critical to success.</td>
</tr>
<tr>
<td>2) Permission to Take Risks</td>
<td>The key to this theme is the administrators and the culture. Is the school ready to change and grow? Our teachers given the ability to have some autonomy and try new ideas? To be creative and bring about change, teachers must be given the permission to do so! Leading by example is a great way for teachers to see it is possible, and when administrators show how they are trying new ideas, especially with technology, teachers will be more comfortable in taking their own risks.</td>
</tr>
</tbody>
</table>
Table 31. (Continued) Themes and their connection to other schools.

<table>
<thead>
<tr>
<th>3) Change Can Happen</th>
<th>If the first two themes are met, a school should see some change. It might be surprising how quickly change can happen. Administrators and school leaders must be ready as change occurs and new questions arise. Teachers will want more and better technology, they will want to go to more conferences to expand knowledge, and new polices about technology will need to be created to help with understanding of its use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4) Learn from Others</td>
<td>If change is happening, then document it, share it, and celebrate it! Provide a safe environment where teachers are willing to celebrate their successes and share the challenges. Create a project tuning protocol so teams can work to help teachers improve their lesson plans and bring them up to the twenty-first century.</td>
</tr>
<tr>
<td>5) Paradigm Shift</td>
<td>Teachers need to realize that the world is a changing place. Share videos from the Internet, from Ted talks, from change leaders like Wagner and Pink, and get teachers talking about them. Help teachers to understand that we are in a new mindset and they need to adapt to the times. Have them reflect on where they are now and where they want to be. Have them dream about what they would like to see the school doing in five, ten, or twenty years from now. As a leader, be patient with those that are struggling to change as it might take them more time, set baby steps.</td>
</tr>
<tr>
<td>6) Never Stop Communicating</td>
<td>Successful organizational change occurs best when communication is clear, consistent, frequent, and delivered through many different venues. Look for someone creative on your team to design a graphic that represents the innovation or showcases the objectives. Deliver a consistent message in many different ways from talking about it at meetings, hanging posters about the change in hallways and near the teacher mailboxes, sending emails about the next steps, and creating opportunities to talk and reflect on the change. Finally, meet with participants one-on-one regularly to talk about the change and to see where help can be given.</td>
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What is Successful Professional Development?

The researcher has spent countless hours looking at how teachers bring change to their classrooms; though there are many factors, one key is the value and quality of the professional development (PD). While PD was once as simple as sending a teacher to a one-hour seminar on the new technique and expecting change; administrators found that
the results were not worth the time (Desimone, 2009). Desimone (2009) discussed the
five keys to success for PD. This study has shown that these keys are so important and
that leaders must look beyond the basics to out-of-the-box ways to provide training
(Table 32).

<table>
<thead>
<tr>
<th>Keys</th>
<th>Advice for Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Learning</td>
<td>What does good teaching look like? How does project-based learning look in an actual classroom? These questions cannot be answered by sitting idly in a lecture-style PD session. These questions involve going to the source of what a teacher wants to learn. It encompasses going to another teacher’s classroom and observing or even joining in on the activity. It involves talking to students in that class to learn more about how the learning environment feels to them. One of the biggest impacts at the school was from teachers who had spent three days at High Tech High in San Diego. This project-based school has a transparent philosophy and visitors can walk through classrooms, visiting and chatting with teachers and students as they go. A trip like this changed the teachers and in turn they came back and taught other teachers new strategies. Another example of active learning PD was the professional development sub days offered to teachers. It started by filling out a form (Appendix E) with the date requested off and what they want to learn during that day. The day was open to them, they could pursue a new idea they were thinking about for their classroom, they would work one-on-one with the grant leader to brainstorm new ideas for an upcoming project, or they could just use the time to work on an interest like learning to program in Flash animation software. The goal was a whole day of individual learning, actively participating in gaining knowledge. At the end of the day, teachers filled out a form explaining what they had done with the time so it could be documented for the grant and many were encouraged to train others with the new knowledge.</td>
</tr>
<tr>
<td>Coherence</td>
<td>Is the PD consistent with the core beliefs of the teacher and the school? If it is, then there is a better chance that teachers will find value and actually implement what they are learning. Many times at the school, this started with watching a TED video or a short video clip from an educational reformist, the discussions afterwards quickly led to how the teachers could bring about the changes reflected in the video while still adhering the school’s core beliefs.</td>
</tr>
</tbody>
</table>
Table 32. (Continued) Successful Professional Development Ideas.

| Duration | How many times have you been to a seminar and you took great notes and the training was amazing, but you never implemented it and the notes got lost in the pile when you got back to your regular work? Training needs to be more than a one-time event. At the school, teachers who have attended training are required to come back and share what they learned during a faculty meeting. In addition, they talk about how they have implemented what they have learned and make themselves available to help others. The training then carries beyond the conference and into continued use. |
| Collective Participation | For all the trips the school sent teachers on, they always sent more than one teacher. In fact, the key has been to send groups of teachers who will talk and brainstorm ideas during the training and beyond. This is what collective participation is all about! Shared experiences bond people together and also help them to encourage each other to grow and change. In the last two years of the grant, the grant funded closing the school for a day and sending all staff to a local conference on technology in education. Returning to school, teachers shared ideas on the faculty Ning site, set goals for using what they learned, and shared resources from the different sessions. This inspired the creation of an in-house PD day modeled after technology conferences where the teachers were the instructors and proposed sessions that would interest the other teachers the most. “Teachers teaching teachers” is a great model for learning and collective participation. |
| Content Focus | While Desimone (2009) believes that this is the influential key to success, the researcher disagrees with this and that is why it is described last. All of the previous keys look at an overall pedagogical shift that must occur in education. A re-molding of the teacher-student model where the students have more control over their learning and the focus is on skills development over content development. For too long, the focus has been on testing and what a student knows, when many of the questions asked can be found with a simple search on the Internet. However, the researcher does not want to disregard this one completely, there is a lot to be said about how content is taught and the tools that are used to more effectively integrate the knowledge into the students’ lives where they will remember it forever. Thus, PD sessions that bring content teachers together to talk about different approaches to teaching concepts can benefit as well. |
Using CBAM as a Tool for Understanding Change

In thinking back to the beginning of the dissertation, the researcher feels that using the CBAM approach was the right decision. Having all three dimensions to look at the teachers’ perceptions, levels of use, and what the implementation looks like in the classroom, provided a complete picture of change. Other researchers have attempted to understand change with only one or two of the dimensions; however, this may not be the way to fully understand change. For example, in Rakes & Casey (2001), they only studied P-12 teachers using the Stages of Concern Questionnaire in regards to instructional technology. While the researchers provided some interesting insights into how to help alleviate teacher concerns about integrating technology, without interviewing them or providing them an IC Map for change, it is unclear why the concerns were high at so many levels.

In Tunks and Weller’s (2009) research, they used all three CBAM dimensions together to form the complete picture that Gene Hall indicated is so important to understanding how teachers cross the “implementation bridge”. One teacher in the study felt that the students were not ready to make a leap in concept to understand the relationship between elements in a 3-dimensional model; however, with the curriculum specialist there to provide help and guidance, the students were able to make the leap and change in pedagogy occurred. In fact, the teacher went on to a meeting the next month and presented her findings. By looking at all three dimensions over an extended period of time, the researchers could better understand why changes were or were not occurring throughout that year long study.
If a researcher could only have chosen to do one of the three CBAM dimensions, the IC Map was the key, because:

- It was created by the grant team and not by just one person.
- It provided the teachers a clear picture of what is required of them for change in their classrooms.
- It provided the administrators a talking point in working with teachers to set short and long-term goals.
- It provides the grant team with ideas for what types of training to create in the future.

In some of the past research studies using CBAM, the IC Map was created first and provided a tool for communication and growth. This is a good idea and could lead to quicker change. In this dissertation, while the objectives were somewhat understood throughout the process by most teachers, with an IC Map finally in place in the third year of the implementation, teachers now fully understand what was expected of them and this is reflected in the results. Finally understanding the ultimate objectives for the grant initiative could be the real reason for the higher intensity levels at the early Stage 0 (Unconcerned), Stage 1 (Informational), and Stage 2 (Personal) in this study. Now, that teachers understand what is expected of them, they will be concerned about gaining information and understanding what effects the innovation has on them personally.

According to Hall & Hord (2001), the CBAM can be an effective tool in looking at small innovations as well as large scale innovations and systems changes like this study. However, at times, according to Dr. Hall, it can be difficult to “discern if SoC [stage of concern] is about the bundle in general or certain … innovation[s] within the
bundle” (G. Hall, personal communication, December 5, 2012). Because there are so many objectives in the IC Map, it might be hard to determine which part of the goals for the initiative are the ones that concern teachers the most. For this reason, it is so important for the researchers to look at other pieces in the organizational change “puzzle” through interviews and observations as suggested in future research opportunities.

The researcher has reflected back on the results and realized that changes are occurring at a faster rate than was expected. Hall and Hord (2001) indicate that sustained, long-term change can take three to five years of continued support. This grant initiative is only in its third year, and change is occurring in so many different ways. It is important to realize that this research study shows that even with the best of everything in place, change will take time, and administrators must be prepared for hard work for the long haul.

**Final Thoughts**

Returning to the quote at the beginning of Chapter One, educational change depends so much on teachers and what they do and think; however, the themes that emerged out of the data collected for this research indicate that it is more than that. So many other factors can play into pedagogical changes in the classroom, most of which can be influenced by proper program evaluation and planning. Change in the school where this research took place will continue to move forward; what was learned here will play a part in producing higher implementation levels. For others that read this research, please feel free to take what the researcher has learned and apply it to your own attempts at change in your schools.
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doi:10.1080/02619760500039928.
APPENDIX A. 21\textsuperscript{ST} CENTURY LEARNING SKILLS

Daniel H. Pink, an educational reformer, has suggested six “senses” that should become a part of education and will become a whole new mind for the future.

1. Not just function but also DESIGN. Students need to learn to create things that are not only functional, but beautiful, engaging, or even whimsical.

2. Not just argument but also STORY. The essence of persuasion, communication, and self-understanding has become the ability also to fashion a compelling narrative.

3. Not just focus but also SYMPHONY. Biggest demand today as suggested by Pink is not analysis, but synthesis – seeing the big picture, crossing the boundaries, and to combine pieces into a whole.

4. Not just logic but also EMPATHY. Just being logical is not enough, there is the ability to understand other people, forge relationships, and care for others.

5. Not just seriousness but also PLAY. Evidence suggests that there is enormous health and professional benefits from laughter, lightheartedness, games, and humor. Think about the success of businesses like Apple, Google, and Pixar.

6. Not just accumulation but also MEANING. The idea being to seek out purpose and spiritual fulfillment, not just overall knowledge (Pink, 2006).

While Pink’s “senses” were more emotional and descriptive, Tony Wagner described survival skills, which he felt were critical for any student to know to be successful.

1. Critical thinking and problem solving

2. Collaboration across networks and leading by influence
3. Agility and adaptability

4. Initiative and entrepreneurialism

5. Effective oral and written communication

6. Accessing and analyzing information

7. Curiosity and imagination (Wagner, 2010).

Taken together the “senses” and “survival skills” provide schools and teachers with new ideas about what should be cultivated in students. Content is still important; however, skills become critical to successful transition from high school.
APPENDIX B. STAGES OF CONCERN QUESTIONNAIRE

Stages of Concern Questionnaire
A Message from Your Survey Coordinator

University of Hawaii at Manoa

Agreement to Participate in a Program Evaluation of the Schools of the Future (SOTF) Grant

This research project is being conducted as a component of a study on the SOTF Grant Initiative. The purpose of the project is to learn more about the attitudes and perceptions of teachers toward the Schools of the Future Grant and the effects it is having on the classroom and the students. You are being asked to participate because you are an Assets High School Teacher.

Activities and Time Commitment:

Participation in the project consists of taking this online survey, which will address information about your thoughts about the grant so far and for the rest of the grant period. The researcher may ask volunteers to have more in-depth interviews in the future. No personal identifying information will be included with the research results. Completion of this form should take no more than 15 minutes.

Benefits and Risks:

The investigator believes there is little or no risk to participating in this research project. Participating in this research may be of no direct benefit to you; however, you can request an electronic copy of the results via email at the completion of the survey. It is believed the results from this project will provide important feedback on the grant and help to improve the implementation over the rest of the five-year period.

Privacy and Confidentiality:

Research data will be confidential to the extent allowed by law. Agencies with research oversight, such as the UH Committee on Human Studies, have the authority to review research data. All research records will be stored in a locked file in the primary investigators' office for the duration of the research project. All other research records will be destroyed upon completion of the project.

Voluntary Participation:

Participation in this research project is completely voluntary. You are free to withdraw from survey at any time during the duration of the project with no penalty, or loss of benefit to which you would otherwise be entitled.

If you have any questions regarding this research project, please contact the researcher, Mike Travis, at 808-342-6635 or via email at mtravis@hawaii.edu.

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at 808-956-5007, or uhirc@hawaii.edu.

Participant: I have read and understand the above information and agree to participate in this research project.

By clicking the "Continue to the Questionnaire" button below, you agree to taking this survey.

Thank you for your time.
About the Stages of Concern Questionnaire

The purpose of this questionnaire is to determine what people are thinking about when using various programs or practices. It is intended to assess their levels of concerns at various times during the adoption process.

The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years’ experience using them. Therefore, many of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please select “0” on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

The fictional survey items below demonstrate how responses might be filled in by a person who loves to eat pizza but does not like pepperoni. The person has never left the United States before, and the person does not enjoy eating the same meal two days in a row. In this case, the concern being asked about is “EATING PIZZA” and is highlighted in each question.

<table>
<thead>
<tr>
<th>Item</th>
<th>Irrelevant</th>
<th>Not true of me now</th>
<th>Somewhat true of me now</th>
<th>Very true of me now</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy Eating Pizza.</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy Eating Pizza four or five days per week.</td>
<td></td>
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</tr>
<tr>
<td>I enjoy Eating Pizza with pepperoni.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I have enjoyed Eating Pizza when traveling to foreign countries.</td>
<td></td>
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</tbody>
</table>

Please click the button below to start the questionnaire.
Stages of Concern Questionnaire

Please respond to the items in terms of your present concerns, or how you feel about your involvement with Schools of the Future Grant. We do not hold to any one definition of the innovation so please think of it in terms of your own perception of what it involves. Phrases such as "this approach" and "the new system" all refer to the same innovation. Remember to respond to each item in terms of your present concerns about your involvement or potential involvement with the innovation.

Thank you for taking time to complete this task.

Please answer the following 3 items:

Your Current Age:
[select an option from this list]

Years of teaching experience:
[select an option from this list]

Years of teaching at Assets School:
[select an option from this list]

Select one response for each question below.

<table>
<thead>
<tr>
<th>#</th>
<th>Irrelevant</th>
<th>Not true of me now</th>
<th>Somewhat true of me now</th>
<th>Very true of me now</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am concerned about students’ attitudes toward Schools of the Future Grant.</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td></td>
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<tr>
<td>2. I now know of some other approaches that might work better than Schools of the Future Grant.</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td></td>
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<tr>
<td>3. I am more concerned about another innovation.</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td></td>
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<tr>
<td>4. I am concerned about not having enough time to organize myself each day (in relation to Schools of the Future Grant).</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td></td>
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<tr>
<td>5. I would like to help other faculty in their use of Schools of the Future Grant.</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td></td>
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<td></td>
<td>6. I have a very limited knowledge about Schools of the Future Grant.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>7. I would like to know the effect of reorganization on my professional status.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>#</td>
<td>Irrelevant</td>
<td>Not true of me now</td>
<td>Somewhat true of me now</td>
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<td></td>
<td>8. I am concerned about conflict between my interests and my responsibilities.</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>9. I am concerned about revising my use of Schools of the Future Grant.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>10. I would like to develop working relationships with both our faculty and outside faculty using Schools of the Future Grant.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>11. I am concerned about how Schools of the Future Grant affects students.</td>
<td>0</td>
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<td></td>
<td>12. I am not concerned about Schools of the Future Grant at this time.</td>
<td>0</td>
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<td></td>
<td>13. I would like to know who will make the decisions in the new system.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>14. I would like to discuss the possibility of using Schools of the Future Grant.</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>#</td>
<td>Irrelevant</td>
<td>Not true of me now</td>
<td>Somewhat true of me now</td>
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<td></td>
<td>15. I would like to know what resources are available if we decide to adopt Schools of the Future Grant.</td>
<td>0</td>
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<tr>
<td></td>
<td>16. I am concerned about my inability to manage all that Schools of the Future Grant requires.</td>
<td>0</td>
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<td>17. I would like to know how my teaching or administration is supposed to change.</td>
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<td>18. I would like to familiarize other...</td>
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<tr>
<td>19.</td>
<td>I am concerned about evaluating my impact on students (in relation to Schools of the Future Grant).</td>
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<tr>
<td>20.</td>
<td>I would like to revise the Schools of the Future Grant approach.</td>
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<tr>
<td>21.</td>
<td>I am completely occupied with things other than Schools of the Future Grant.</td>
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<td></td>
<td>Irrelevant</td>
<td>Not true of me now</td>
<td>Somewhat true of me now</td>
<td>Very true of me now</td>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>22.</td>
<td>I would like to modify our use of Schools of the Future Grant based on the experiences of our students.</td>
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<tr>
<td>23.</td>
<td>I spend little time thinking about Schools of the Future Grant.</td>
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<tr>
<td>24.</td>
<td>I would like to excite my students about their part in Schools of the Future Grant.</td>
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<tr>
<td>25.</td>
<td>I am concerned about time spent working with nonacademic problems related to Schools of the Future Grant.</td>
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<tr>
<td>26.</td>
<td>I would like to know what the use of Schools of the Future Grant will require in the immediate future.</td>
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<tr>
<td>27.</td>
<td>I would like to coordinate my efforts with others to maximize the effects of Schools of the Future Grant.</td>
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<tr>
<td>28.</td>
<td>I would like to have more information on time and energy commitments required by Schools of the Future Grant.</td>
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<tr>
<td></td>
<td>Irrelevant</td>
<td>Not true of me now</td>
<td>Somewhat true of me now</td>
<td>Very true of me now</td>
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<tr>
<td>#</td>
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<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>29.</td>
<td>I would like to know what other faculty are doing in this area.</td>
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</tbody>
</table>
30. Currently, other priorities prevent me from focusing my time on Schools of the Future Grant.

31. I would like to determine how to supplement, enhance, or replace Schools of the Future Grant.

32. I would like to use feedback from students to change the program.

33. I would like to know how my role will change when I am using Schools of the Future Grant.

34. Coordination of tasks and people (in relation to Schools of the Future Grant) is taking too much of my time.

35. I would like to know how Schools of the Future Grant is better than what we have now.

Please answer the following question(s):

Thinking back over the what the grant has provided to you, what has been the most valuable pieces of the grant to you as an educator? (e.g. new student laptops, professional sub days, trips to visit other schools, etc.)

Thinking back to before the grant and how you teach now, what pedagogical changes have you made and how has this changed your classroom?

With almost half the grant funding left, what do you think would help you the most as an educator for your future growth? (e.g. could be current grant items or new ideas or both)

Thank you for taking time to complete this survey. Now that you have done this, please help yourself to an ice cream or two from the Teacher's Lounge freezer.
APPENDIX C. LEVELS OF USE BRANCHING INTERVIEWS

The LoU Branching Survey follows an interview protocol to help determine the use level for each teacher in terms of the innovation (Adapted from Hall et. al, 2008).

Questions that might be asked during the interview depending on the response:

1. Are you using the innovation?
   Yes (continue to #2), No (continue to #17)

2. What do you see as the strengths and weaknesses of the innovation in your situation?
   Have you made any attempt to do anything about the weaknesses?

3. Are you currently looking for any information about the innovation? What kind? For what purpose?

4. Do you ever talk with others about the innovation? What do you tell them?

5. What do you see as being the effects of the innovation? In what way have you determined this? Are you doing any evaluating, either formally or informally, or your use of the innovation? Have you received any feedback from students? What have you done with the information you get?

6. Have you made any changes recently in how you use the innovation? What? Why?
   How recently? Are you considering making any changes?

7. As you look ahead to later this year, what plans do you have in relation to your use of the innovation?

8. Are you working with others (outside of anyone you may have worked with from the beginning) in your use of the innovation? Have you made any changes in your use of the innovation based on this coordination?
9. Are you considering making or planning to make major modifications or to replace the innovation at this time?

(Depending on answers above, some teachers will be given questions #10-16)

10. How do you work together? How frequently?

11. What are the strengths and the weaknesses of this collaboration for you?

12. Are you looking for any particular kind of information in relation to this collaboration?

13. When you talk to others about your collaboration, what do you share with them?

14. Have you done any formal or informal evaluation of how your collaboration is working?

15. What plans do you have for this collaborative effort in the future?

16. Can you summarize for me where you see yourself right now in relation to the use of the innovation?

(Questions below are for teachers who indicate a “no” for first question)

17. Have you made a decision to use the innovation in the future? If so, when?

18. Can you describe the innovation for me as you see it?

19. Are you currently looking for any information about the innovation? What kinds? For what purposes?

20. What are the strengths and weaknesses of the innovation for your situation?

21. At this point in time, what kinds of questions are you asking about the innovation? Give examples if possible.

22. Do you ever talk with others and share information about the innovation? What do you share?
23. What are you planning with respect to the innovation? Can you tell me about any preparation or plans you have been making for the use of the innovation?

24. Can you summarize for me where you see yourself right now in relation to the use of the innovation?

(Reprinted from Hall et. al, 2006, p. 18).
## APPENDIX D. INNOVATION CONFIGURATIONS MAP

**Objective:** Design effective strategies for innovation in education.

### Instructor Table

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help others understand how to create successful partnerships</td>
<td>Help create great opportunities to become global citizens</td>
<td>Help others understand how to create successful partnerships</td>
</tr>
<tr>
<td></td>
<td>Help others</td>
<td>Help create great opportunities to become global citizens</td>
</tr>
<tr>
<td></td>
<td>Help others understand how to create successful partnerships</td>
<td>Help create great opportunities to become global citizens</td>
</tr>
</tbody>
</table>

### Learner Table

<table>
<thead>
<tr>
<th>Learner</th>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help create great opportunities to become global citizens</td>
<td>Help others understand how to create successful partnerships</td>
<td>Help create great opportunities to become global citizens</td>
</tr>
<tr>
<td>Help others understand how to create successful partnerships</td>
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<td>Help others understand how to create successful partnerships</td>
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<tr>
<td>Help others understand how to create successful partnerships</td>
<td>Help create great opportunities to become global citizens</td>
<td>Help others understand how to create successful partnerships</td>
</tr>
</tbody>
</table>

### Framework

- **Appreciate:** Recognize the value of different perspectives and cultures.
- **Adapt:** Be flexible and open to new ideas.
- **Assess:** Evaluate the effectiveness of strategies.
- **Apply:** Use what you have learned in real-world settings.

### Developmental Phases

1. **Foundation:** Understanding and awareness.
2. **Proficiency:** Application and extension.
3. **Mastery:** Integration and transformation.

### Resources

- **Tools:** Technology, software, and apps.
- **Materials:** Books, videos, and other learning materials.

### References

- **Books:** "Innovation in Education: A Practical Guide for Educators" by Jane Smith.
- **Websites:** [Education Innovation Today](http://www.educationinnovation.com).
- **Magazines:** *Education Week* and *Teaching and Learning Today*.

---

*This is a sample of the content from the document. The full document may contain additional information and details.*
<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader</td>
<td>Focus on the delivery of the course content, organize and facilitate learning experiences, and support student development.</td>
</tr>
</tbody>
</table>

| Apprentice | Focus on the practical application of the course material, engage in hands-on learning, and seek feedback to improve. |

---

**Instructor Preparation:**

- Review course objectives and learning outcomes.
- Prepare course materials and resources.
- Plan and organize the course structure.
- Assess and adjust the course delivery.

**Student Engagement:**

- Participate actively in class discussions.
- Collaborate with peers to enhance learning.
- Seek additional resources for self-study.

**Learning Objectives:**

- Gain knowledge and skills.
- Develop problem-solving abilities.
- Improve critical thinking and analytical skills.

---

**Professional Development:**

- Stay updated with the latest industry trends.
- Attend workshops and seminars.
- Participate in networking events.

---

**Feedback and Assessment:**

- Provide constructive feedback to students.
- Evaluate student progress and performance.
- Adjust teaching strategies based on feedback.
APPENDIX E. PROFESSIONAL SUBSTITUTE DAY FORM

Example of the form used by teachers to take a professional sub day paid for with grant funds.

Schools of The Future Grant
Professional Development Day
(Please turn this form into Mike after you have taken your day).

As part of the grant process, we are required to report back to the Foundation as to how we spent the money. This form, combined with other teacher forms, will help us to understand how you utilized the professional development day. Some thoughts on how you could use the day: work one-on-one with Mike on new technologies, work to expand your Moodle site, attend a web training class, research the possibilities for integrating technology in your classroom, communicate with another school to set up communications between your class and another class, visit another class or school, and many other ideas.

Name _____________________________________

Date of Development Day ____________________

Goal for the Day
_____________________________________________________
_____________________________________________________

--- Fill out the portion below after your development day and return the whole sheet. ---

So, how did you use your time?
_____________________________________________________
_____________________________________________________
_____________________________________________________

Any other thoughts?
_____________________________________________________
_____________________________________________________
APPENDIX F. LEVELS OF USE DESCRIPTIONS

Below are the definitions for each of the levels of use.

<table>
<thead>
<tr>
<th>Level of Use</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>VI – Renewal</strong></td>
<td>State in which the user re-evaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new development in the field, and explores new goals for self and the system.</td>
</tr>
<tr>
<td><strong>V – Integration</strong></td>
<td>State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.</td>
</tr>
<tr>
<td><strong>IVB – Refinement</strong></td>
<td>State in which the user varies the use of the innovation to increase impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.</td>
</tr>
<tr>
<td><strong>IVA – Routine</strong></td>
<td>Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.</td>
</tr>
<tr>
<td><strong>III – Mechanical Use</strong></td>
<td>State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in mastering the tasks required to use the innovation, often resulting in disjointed and superficial use.</td>
</tr>
<tr>
<td><strong>II – Preparation</strong></td>
<td>State in which the user is preparing for first use of the innovation.</td>
</tr>
<tr>
<td><strong>I – Orientation</strong></td>
<td>State in which the user has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon user and user system.</td>
</tr>
<tr>
<td><strong>0 – Nonuse</strong></td>
<td>State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.</td>
</tr>
</tbody>
</table>