Change is learning: Metacognition to resolve concerns during the third year of the implementation of a technological innovation

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CHANGE IS LEARNING: METACOGNITION TO RESOLVE CONCERNS DURING THE THIRD YEAR OF THE IMPLEMENTATION OF A TECHNOLOGICAL INNOVATION

by

Nola Allen-Raffail

A dissertation submitted in partial fulfillment of the requirements for the

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ABSTRACT

CHANGE IS LEARNING: METACOGNITION TO RESOLVE CONCERNS DURING THE THIRD YEAR OF THE IMPLEMENTATION OF A TECHNOLOGICAL INNOVATION

by

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Dr. Edith Rusch, Committee Chair
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“We are living in a time of change. Rather than viewing change as a painful course of action, let’s develop an understanding of how it works, how to facilitate the process, and how to learn from our experiences”

(Hall & Hord, 2011, p. 18).

This study used a snapshot of a private Kindergarten-12th grade school during the third year of the implementation of a technological innovation (RenWeb) to investigate teacher concerns during the process of change and gain insights into individuals’ use of metacognition to resolve those concerns. Two primary research instruments were used, the Stages of Concern Questionnaire (George, Hall, & Stiegelbauer, 2006) and the Learning Combination Inventory (Johnston, 1996). Although both instruments have been used extensively for research studies, they have not been used together in the same study.

The researcher used Johnston’s (2010) description of “metacognition [which] is the internal talk that goes on in your mind among your team of Learning Processes” (p. 60). The interaction of these four Learning Processes; Sequence, Precision, Technical Reasoning, and Confluence combine to create an individual’s learning combination.
Research data were collected through the self-administered Web-based Stages of Concern Questionnaire (SoCQ) and Learning Combination Inventory (LCI). After grouping SoCQ profiles based on their relative distance across the Implementation Bridge (Hall & Hord, 2011), and the LCI reports based on similarity of patterns, 11 randomly selected interviewees were chosen to provide more in-depth data.

One part of the research provided teachers with information about their learning patterns by completing the LCI online, which included a personal report and a website to obtain more information. The researcher thought this would stimulate conversations about how people learn, however that was not the case. The data revealed in this research suggest that people need more time and support to use knowledge of their learning patterns in order to increase communication about learning. Even though teachers did not engage in any further research about Let Me Learn© or participate in conversations about the process many people thought knowledge of learning patterns might influence the way they approach learning about RenWeb in the future.

The second part of the research explored the SoCQ and LCI groups in a variety of ways to search for a relationship between an individual’s Stages of Concern profile and learning pattern. Although the data comparing individuals’ Stages of Concern and approach to learning provided a rich description of both research instruments, there was no clear relationship between them. However, there were some similarities between them in the larger SoCQ and LCI groups. Based on the data, using the SoCQ along with knowledge of learning patterns and how they interact (metacognition) may provide a change facilitator with adequate information to address the concerns of participants with
appropriate support and training to increase the effectiveness of implementing an innovation.

Finally, Friedman (2005) challenges “being adaptable in a flat world, knowing how to ‘learn how to learn’, will be one of the most important assets any worker can have, because job churn will come faster, because innovation will happen faster” (p. 239). Johnston (2010) believes metacognition answers the challenge because “the mind remains the most vital technology for communication with others and … navigating the world of the 21st century requires high-speed learning and communicating” (p.134).

Keywords: change, adult learning, Stages of Concern Questionnaire, Learning Combination Inventory, metacognition
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I would also like to thank Dr. Gene Hall for his time and assistance in understanding and interpreting the Stages of Concern Questionnaire and profiles.
DEDICATION

This is dedicated to …

My parents, Clarence L. Nicodemus, D.O., Ph.D. and Reverend W. Grace Nicodemus, for setting the example of lifelong learning by completing advanced degrees in their 60s.

My husband, Lance, for his constant love, support, and encouragement and for doing all the extra things that made my life easier while I completed this journey. And especially for providing comical relief and a break from writing when I needed it most.

My children, Dani, Audrey (husband Andy), and Blake who shared their growing, changing, and learning through the years and always helped me remember to take time for the important things in life…even in the middle of writing a dissertation.

My grandchildren, Aiden and Addyson, who were born in the middle of it all and will experience changing and learning that is beyond my imagination.

And to all those who change and learn with me……

Instruct the wise and they will be wiser still;

teach the righteous and they will add to their learning.

Proverbs 9:9
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CHAPTER ONE

INTRODUCTION

Background

Changes in technology - a modern example.

Technology changes the way we live. That thought occurred while I shopped with my husband. We pushed a cart through the large, air-conditioned building with rows and rows of hundreds of types of food – canned, boxed, bottled, bagged, frozen, refrigerated, and fresh – then used our debit card at the self-check-out stand to buy the groceries. What a difference from the small general stores that began in the 1600s (Fleming, 2002, p. 50) and provided everything from “spelling books, arithmetics, and slate pencils, … codfish and molasses, and … calico and thread” ("From the Great Industries of the United States," 1872, p. 349) and were purchased on a “credit-and-delivery basis…the place where) customers presented their orders to clerks, and the clerks filled them…and finally accounts were periodically tallied and bills prepared” (MacFadyen, 1985, p. 25).

For 300 years the general store remained largely unchanged. Then, Clarence Saunders opened the first true grocery store in 1916. People laughed at the idea until they experienced shopping by entering through a turnstile, walking up and down aisles with a hand basket, and picking out their own groceries, before handing money to a clerk. As many as 185 people could be served in an hour by three clerks ("A Piggly Wiggly idea develops into a $60,000,000 business," 1921). Within 15 years, the advent of the automobile made the first true supermarket possible ("King Kullen Grocery Co., Inc.," 1996). Large quantities of items were available for purchase and utilized the shopping cart, invented in 1937 from a basket and a folding chair, to help customers buy more
items easier. At first, people refused to accept this new contraption. Men thought they were strong enough to carry their own groceries and women pushed baby strollers all day and resisted pushing anything else. To overcome this resistance, Sylvan Goldman hired models to shop with carts while a cute girl handed carts to people and said, “Look, everybody’s using them --- why not you?” (MacFadyen, 1985, p. 24).

The invention of computers, barcodes, and scanners greatly increased efficiency of grocery shopping. People can even order groceries on-line and have it delivered to their home ("The Supermarket," 2002).

After thinking about the effects of technological innovations on something as commonplace as purchasing groceries, I wondered how technology affected education in general, as well as how it affected me, specifically, in my experience as a teacher.

**Technology in our lives.**

Technology not only changed our grocery-buying experience from a tediously long and laborious process to scanning items in the self-checkout lane before paying with a debit card; it has dramatically modified other aspects of our lives. One major example is the changes in military operations. In China 2,500 years ago, spies were used to gather information about the enemy by foot or by horse. They were considered “a most important element in a war, because upon them depends an army’s ability to move” (Clavell, 1983, p. 82). Now network-centric warfare “facilitates the creation and sustaining of shared awareness at all command levels…[that] supports speed of command – the conversion of a superior information position to action” (Cebrowski, 2003, p. 16). This allows armies spread across the globe to synchronize offenses in real time instead of waiting days or weeks to obtain information needed to coordinate actions.
Similar technological changes have occurred in the education profession. During high school, I experienced academic problems. So, when I began teaching I wanted students and parents to have constant feedback on classroom performance. In the early 1980s, I created a computerized spreadsheet that allowed me to enter grades, calculate percentages instantly, and print out individual progress reports to be signed by parents. In addition, the spreadsheet-calculated grades made it easy to fill out computerized Scantrons for the large school district computer to create professional report cards. By the mid-1990s several commercial companies had developed grade book programs that were much easier to use and more powerful than the old spreadsheets I created. Research soon showed that student grades improved with use of electronic grade books (McGhee, 2000).

A job change put me in a school where teachers still kept paper grade books, averaged grades by calculator, and filled out report cards by hand. In contrast, I continued using a computerized grade book to calculate grades, but still had to fill out report cards by hand. After a couple of years, I finally convinced the middle school teachers to adopt the more efficient computerized method.

As school enrollment increased, middle school teachers adopted the uniform use of computerized grade books that created data for similarly computerized report cards. It was a cumbersome process that required several steps to create professional-looking report cards, but the results were worth it. The largest challenge was to get all teachers to use the grade book program. Reactions to the change varied. Several teachers were excited to use the new program and accepted it easily; others used it because they had to; and still others adamantly refused to enter grades through computers. This last group of teachers often found someone else to do the work for them--either a teacher aide or the
computer teacher. Even after 3-years, many refused to embrace this change. I wondered why some people accepted change so readily, while others refused.

In addition to grade books and report cards, a variety of computer programs were used to maintain staff and student records, communicate with staff and parents, create lesson plans, and track financial data. After researching several programs to create, organize, and maintain all of the school’s information in a manner that could be shared with everyone, the school administration selected RenWeb (a web-based, integrated student information system). When I discussed the program with several middle school teachers, they asked for a live web demonstration for the entire school.

During the demonstration, I was surprised by the reactions of several teachers. They made comments about the program, including; “This is not appropriate for elementary grades”; “I won’t use this”; “I don’t want parents to see my grades”; “This seating chart has desks. I wish we had desks. How can I use this when it doesn’t even look like my room”; “Elementary is NOT like middle school. We can’t use this”; “I have to teach all day (not like middle school teachers), I don’t have time to learn this stuff”; “I won’t email parents and I sure don’t want them to email me. Who has time to check that? I see my parents all the time.” I was encouraged when a few teachers told me privately after the demonstration that they thought RenWeb would be easier to use and were looking forward to learning something new. Again, I wondered why there were such a variety of reactions to the program. Especially since the people responsible for maintaining and distributing the school’s information were excited to consolidate the various programs into one unified system.
Several weeks after the demonstration a letter sent to all teachers notified them of the adoption of RenWeb. Again, teachers’ responses were varied. One of the very outspoken teachers against RenWeb during the demonstration wrote on the top of that paper “Where were the teachers in this (adoption)? The users?” She expressed her strong resistance to implementing the program and several others agreed with her. Although, some teachers and staff were excited to learn more about RenWeb and looked forward to the entire school using the same system, many others said they would use it, but were worried about making mistakes or having trouble learning a new technology. Why did teachers react so differently to something that seemed so simple and beneficial to the entire school? How might their concerns affect the implementation of this project? Since change is constant, how did the educational field adapt to new technologies that we take for granted today?

**Instructional technology.**

Throughout the history of education, innovations have improved teaching, learning, and teacher productivity. Many new technologies, taken for granted today, took years for teachers to accept and use regularly. For example, blackboards were invented in the late 1700s (Levi, 1858) and used in schools a few years later, in addition to the previously accepted oral delivery ("Education: A sketch of the origin and progress of the Adelphi school, in the Northen Liberties.," 1813; Historicus, 1866; "School: The Story of American Public Education," 2001). Within in a few decades, educational literature deemed blackboards necessary for teachers to present and students to demonstrate the attainment of specific knowledge ("Improvement in public instruction," 1841). Even though by the 1850s they became one of the "articles [believed to be] indispensable in
schools of every grade" ("Apparatus," 1851, p. 152), common use in schools did not occur until the late 1860s (Historicus, 1866). Even so, some teachers still refused to use blackboards and slates, as inferred by Bateman’s (1861) comment, “no one is fit to be a primary teacher who is unwilling or unable to use them” (p. 183).

Even in 1935, a survey of 100 elementary school teachers found only three-fourths of the teachers used the blackboard regularly for announcements, to present important facts, give directions for assignments, and observe student practice; and rarely to explain concepts or draw diagrams (Fildes, 1935). However, by 1940, blackboards were considered so “well known and widely used as to require little comment” in an article about acquiring audio-visual equipment (Shane, 1940, p. 425). This first major educational innovation took 140 years to fully integrate into schools. In contrast, overhead projectors came on the educational scene in the late 1940s (Thomas, 1952) and by the early 1970s some teachers thought they were the best way to present information to students (Graves, 1972, p. 698). This innovation took a strong hold in education in less than 30 years.

**Administrative technology.**

The classroom was not the only part of the school that utilized changes in technology. “By the mid 1920s, over 85 percent of 522 secondary school administrators surveyed were regularly utilizing cumulative records, desk calendars, filing cabinets, mimeograph machines, program clocks, surveys, telephones, tests, and typewriters” (Petrina, 2002). Within several years, school buildings were creating “more adequate office facilities tending toward a general office suite” (Lee & Chenault, 1935, p. 396). This change provided the necessary room to track the increasing amount of student
information generated at the school; “the cumulative record, a permanent record of the child's school performance from his first day of school, contains such items as home addresses, schools attended, marks and test scores earned, teachers' comments, absenteeism, and tardiness” (Mitzel, 1966, p. 105). As the use of data banks increased in businesses, schools noticed the advantages and began to utilize this new technology. By the mid-1960s the legal community expressed concern about the abundance of personal information available in “the electronic data bank, where a complete dossier for every one of us is literally at the fingertips of the console operator” (Karst, 1966, p. 343).

Starting in the early 1970s some schools used computerized administrative systems to keep track of the overwhelming amount of student data; grades, transcripts, and attendance (Jackson & Deal, 1985). The first systems were large costly mainframes run by programmers. Not until the mid-1980s, with the advent of microcomputers, were large school districts able to work with their own data. In the mid-1990s schools began using more computers in the classrooms, and a few years later over 500,000 computers were used by school districts for administrative tasks (Darby & Hughes, 2005).

With the increase in school Internet use, the Telecommunications Act of 1996 mandated telecommunication companies to provide services at reduced rates for libraries and schools ("Telecommunications Act of 1996," 1996). In addition, the need for student information created by the No Child Left Behind Act (NCLB) of 2001 (Elhers, 2001; Golden, 2005) had schools looking for more advanced, flexible and user-friendly ways to manage student information. Public schools are also now required to create more opportunities for parental involvement in accordance with NCLB, Section 1118 Parental Involvement ("No Child Left Behind Act of 2001," 2001). For these reasons, and since
almost half of parents with school aged children want to be more involved in their child’s education (Goral, 2000), it is up to schools to gather, maintain, and share student information as they promote a better home/school relationship.

As the need for accountability, increased communication with parents, and availability of real-time student information increases, administrators search for programs that make their job easier. The problem arises when the administrator’s need for this information is dependent upon teachers and other staff members to maintain accurate and timely data. Since change is difficult for many people, I believe the administrator needs to facilitate the implementation of these programs with minimum staff dissension and maximum effectiveness.

As a teacher responsible for maintaining classroom grades I eagerly used current technology to provide students and parents with timely information about student performance. When my school implemented new computerized grade book program, I was shocked that many teachers openly refused to use the program. I believed I could influence those teachers with my enthusiasm as I worked with them individually and in small groups to teach the technical skills needed to use the program. Since this was a new technology, I agreed with Hargreaves’ (2001) “technical perspective … that everyone shares a common interest in advancing the innovation … all that remains is how best to implement it” (p. 53). Heifetz (1994) describes this technical perspective as a Type I change and I assumed that all I had to do was provide the technical expertise in order ensure total integration of the program into daily use. Surprisingly, this was not the case. Many teachers finally used the program daily, but several others still refused and found a way to get around it by having a teacher aide or the computer teacher enter grades.
Later, when a newer, comprehensive student information management system (RenWeb) was about to be implemented, I decided to apply my emerging knowledge of the principles of change to these technologies. I thought this situation seemed ideally suited to the Diffusion perspective. Hall and Hord (2006) describe this perspective as primarily a process of communication where information about the change is discussed with a few people who then share their enthusiasm with others. So, during a staff meeting I prepared everyone for the upcoming change by discussing the possibility of adopting a new student information management system. Since the middle school teachers usually embraced new ideas before other teachers, I had a lengthy discussion about the benefits of the program. Most of those teachers were supportive and wanted to share more information with the rest of the staff. I just knew everyone would be as excited as we were. Well, I was wrong again. The less-than-enthusiastic comments during the school-wide live web-demonstration of RenWeb proved I needed to try something else.

My next step was to apply another perspective on change based on the concerns teachers discussed during the demonstration. The Concerns Based Adoption Model states “if change-facilitating interventions are appropriate, timely, and address the client’s particular concerns, the process (of change) can be successful for all” (Hall & Hord, 2006, p. 258). In order to determine the concerns of each teacher before RenWeb finally adopted, I administered the Stages of Concern Questionnaire (George, Hall, & Stiegelbauer, 2006). Even after addressing individual concerns, privately and in small groups, several teachers still resisted using RenWeb and criticized the program continually. I felt like I was missing an important piece of knowledge that would help people adapt to change and so began this research.
First, I discovered that implementing RenWeb was about more than learning the technical skills to use the program. It involved an adaptive change. Heifetz (1994) describes this as a “change in people’s values, attitudes, or habits of behavior” (p. 87). At the beginning of the RenWeb implementation, many teachers had information concerns; they needed to know more about what they were going to do with this technology. As they learned more about the program, their concerns changed from technical (how do I do it) to adaptive (when do I have time to do it and why do I have to) and addressing those concerns were not always enough to promote increased implementation. Using Heifetz’s description of adaptive change, it is understandable that the teachers had difficulty fully implementing RenWeb into their daily routine.

**Statement of the Problem**

The dilemmas described above are common responses when educators are faced with adaptive changes. So, if administrators want to facilitate the implementation of new complex technologies, they need a deeper understanding of how to engage individuals in ways that alleviate concerns. Researchers suggest, “although personalized interventions can facilitate change, in the end, individuals determine for themselves whether or not change will occur” (George, Hall, & Stiegelbauer, 2006, p. 9). The researchers also noted that it is not the administrator’s role to manipulate teachers into accepting change; their studies found “how effective it can be to recognize the inevitable presence of concerns within individuals and to extend a helping hand to assist in coping with and resolving those concerns” (p. 9). Therefore, this research used a snapshot of a school during the third year of the implementation of a technological innovation to investigate teacher concerns during the process of change and search for the missing piece(s) that
encouraged individuals to address those concerns. This exploratory research study examined the following questions:

1. How does individual and group knowledge of learning patterns foster increased communication about concerns related to organizational change during the third year of implementation of a technological innovation?
2. In what ways do Stages of Concern in the third year of the implementation of a technological innovation relate to an individual’s approach to learning?
3. In what ways does individual knowledge of one's personal approach to learning support resolution of concerns during the third year of the implementation of a technological innovation?

**Summary of Methodology**

A single site case study, using qualitative methods and multiple data sources, provided the framework to gain insights into individuals’ metacognitive resolutions of personal concerns related to change during the third year of implementation of a technological innovation. Sources included demographic data, surveys, interviews, and research instruments with established validity and reliability to collect data related to concerns about change and individual approaches to learning. A qualitative approach was appropriate because the study took “place in the natural world … [used] multiple methods that … [were] interactive and humanistic, … [focused] on context, … [was] emergent rather than tightly prefigured, and …[was] fundamentally interpretive.” (Marshall and Rossman, 2006, p. 3). In addition, the research fit Stake’s (1995) definition of a case study “in which the researcher explores in depth a program, an event, an activity, a process, or one or more individuals. The case(s) are bounded by time and
activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time” (cited in Creswell, 2003, p. 15). Finally, Stake (2000) explains that a “case study is not a methodological choice but a choice of what is to be studied” (cited in Glesne, 2006, p. 13). This research was suited to an explorative qualitative single site case study based on the limited population, in-depth focus on a single process within a limited context, and the emergent nature of data collection and analysis.

**Significance of the Study**

This study added knowledge about the relationship between teachers’ Stages of Concern and learning patterns and the perceived effectiveness of various types of professional development/support throughout the implementation of a student information management program. It also provided innovation facilitators with a roadmap of effective implementation strategies based on Stages of Concern and learning patterns. The use of two relatively simple questionnaires may provide a change facilitator with adequate information to address the concerns of participants with appropriate support and training to increase the effectiveness of implementing an innovation.

**Definitions**

**Metacognition** – commonly defined as “thinking about thinking” (Hacker, 1998, p. 3).

**Concerns-Based Adoption Model (CBAM)** – first proposed in 1973 by Hall, Wallace, and Dossett, is a “conceptual framework that describes, explains, and predicts probable behaviors throughout the change process” (George, Hall, & Stiegelbauer, 2006, p. 5).
Adaptive changes – or second-order changes “are systemic in nature and aim to modify the very way an organization is put together, altering its assumptions, goals, structures, roles and norms” (Watzlawick, Weakland, and Fisch, 1974, pp. 10-11 as cited in Evans, 1996, p. 5). This also requires individuals within the organizations to “change their beliefs and perceptions” (p. 5).

Transformational learning – “refers to the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action” (Mezirow, 2000a, pp. 7-8).

Diffusion – “the process in which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas” (Rogers, 2003, p. 5)

Interactive Learning Model – “how we process information (cognition), perform learning tasks (conation), and develop a sense of self when engaged in learning tasks that do not always come naturally (affectation). Moreover, everyone approaches learning tasks with varying degrees of sequence, precision, technical reasoning, and confluence” (Johnston, 1997, p. 78).

Innovation – “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12).

Implementation – “takes place when an individual puts an innovation into use” (Rogers, 2003, p. 20)
Organization of the Study

The introduction described how technology has changed our lives, especially in everyday experiences, such as grocery shopping and throughout history in education. The next chapter presents a review of literature that will define change and explore how individuals and organizations experience change. It will also include theories and research that provide insight into the way school personnel and schools learn to change as they address the problem of collecting, maintaining, and sharing student information using modern technology. Finally, a discussion of organizational communication and sustaining change will complete the literature review. Chapter three describes the research design and methodology to collect and analyze data from a school during the third year of implementation of a technological innovation. Chapter four reveals, describes, and analyzes the data collected. Finally, chapter five concludes the research and provides suggestions for future research.
CHAPTER TWO

LITERATURE REVIEW

“Today, computer technology touches every aspect of our lives, affecting the way we learn, work, shop, and share information” (Perkins-Gough, Snyder, & Licciardi, 2003, p. 94). Revisiting the grocery-shopping example, it is evident computers and technology largely changed the way people shop. Stores determine staffing needs by data provided by registers, cameras and traffic counters installed at all doors. Inventory is automatically tracked when scanners read product barcodes as customers buy items. This ensures that re-orders are completed accurately and easily (MacFadyen, 1985). Many grocery stores even use just-in-time inventory to fill orders. Customers place orders by a certain time and the store purchases only what is needed to fill the day’s orders from vendors. As soon as merchandise arrives, it is immediately placed into individual customer boxes and delivered to homes later that day ("The Supermarket," 2002). These same communication and information sharing systems that are used in businesses have been implemented in the military and schools.

As technology changes, people are forced to change and learn these new systems or innovations. Some innovations, like the blackboard, took over 150 years to become the standard and easily used by most teachers. Today, technological changes occur so quickly that people must constantly learn new information, skills, and ways of interacting with technology and each other. The following literature review defines change, describes how individuals and organizations experience change, explores the concept that change is learning, and finally identifies problems sustaining change.
What is Change?

Hall and Hord (2006) state, “change is everywhere” (p. 3). Although change is a commonly used word, there is not one accepted definition. Senge (1999) traces the meaning back to the “old French word changer [meaning] ‘bend’ or ‘turn’ like a tree or vine searching for the sun” (pp. 14-15). He believes the idea that “the only constant is change” (p. 14) and this idea has been around since Heracleitus’ time (circa 500 B.C.) or before. Dictionary.com (2010) has almost 40 different meanings for the word change. Meanings range from a verb “to make the form, nature, content, future course, etc., of (something) different from what it is or from what it would be if left alone” to a noun, “a transformation or modification; alteration; a variation or deviation: a change in the daily routine.” It can even be used as an idiom, such as “change front…to shift a military force in another direction.”

Many well-known authors discussing change bypass a concrete definition and proceed to describe a change, explain the process of change, and/or teach leaders to understand change and help people accept and thrive during a change (Hargreaves, 2001; Evans, 1996; Fullan, 2008; Hall & Hord, 2006; Heifetz, 1994). The definition is therefore implied through the application of principles or guidelines to understand and promote change.

Researchers must also deal with the numerous definitions of change. Senge (1999) describes change as it applies to external business environmental changes, internal changes in practices or strategies, reorganizations, or transformations (often describing large organizational changes) (pp. 14-15). Many times these definitions can have contradictory or unclear meanings to the people involved in the change. Evans (1996)
believes that “change means different things to different people” (p. 21). Often, the people mandating the change have an understanding of change that is different than the people actually implementing the change. This can cause misunderstandings, emotional reactions, and resistance to the change. Researchers must, therefore, explain their definition of change. Senge (1999) prefers to use the term “‘profound change’ to describe organizational change that combines inner shifts in people’s values, aspirations, and behaviors with ‘outer’ shifts in processes, strategies, practices, and systems” (p. 15). The important concept of profound change is that “there is learning” and the organization “builds capacity for ongoing change” (p. 15).

Experience of Change

Hall and Hord (2011) state, “We are living in a time of change. Rather than viewing change as a painful course of action, let’s develop an understanding of how it works, how to facilitate the process, and how to learn from our experiences” (p. 18). This section explores the literature related to individuals and organizations in the midst of change.

Individuals and change.

The manner in which people perceive change affects the way they adapt to the change. Evans (1996) believes people react to change in different ways based upon several factors, including “individual characteristics (personality, history), the kind of organization [people] work in, the nature of the change, and the way it is presented” (p. 28). Researchers of the change process describe four perspectives on change that help explain why the experience of change (especially in education) can be so challenging. The first three perspectives, technical, cultural, and political, are based on “House’s
(1981) classical treatment of educational innovation and on Haberman’s (1972) discussion of different dimensions of human action...and add a fourth of [their] own: the postmodern perspective” (Hargreaves, Earl, Moore, & Manning, 2001, p. 51). Although each perspective is described individually, in a real situation, different people will have combinations of perspectives throughout the process of change.

The technical perspective described by Hargreaves (2001) “draws attention to the technical difficulties of changing knowledge, skill, and behavior, whether in teaching or other occupations” (p. 116). In the grocery store example, using the self-check lane for the first time required learning a new set of skills and behaviors to purchase groceries by watching people to see how they used the touch screen and bar scanner. The “expert cashier” easily solved additional problems that arose. Heifetz (1994) describes this as a Type I situation, which is “somewhat mechanical: [since] one can actually go to somebody and ‘get it fixed’” (p. 74). According to the technical perspective, the success of implementing new innovations is usually determined by assuming that everyone involved supports the innovation and just needs a plan implement it. During most implementations, teachers are given some type of in-service training to provide information about the innovation and then left on their own. Although teachers learn new practices best when they have “opportunities to experience observation, modeling, training, one-to-one coaching, practice, and feedback” (Hargreaves et al., 2001, p. 117), implementations based on these types of opportunities are rare.

On a more individual level, the cultural perspective “is concerned with the meanings and interpretations teachers assign to change, how changes affect and even confront teachers’ beliefs as well as their practices, how teachers (alone or together)
understand the changes that face them, and the impact of change on teachers’ ideas, beliefs, emotions, experiences, and lives” (Hargreaves et al., 2001, p. 117). The researchers believed that participants were better able to make sense of the change if they collaborated during the implementation process. Hargreaves (2001) focused on the feelings and personal beliefs during change as he discussed Nias’ 10-year study of a large-scale legislative forced implementation of education reform in England and Wales. “Nias (1991) reported that many primary (elementary) teachers expressed senses of loss, bereavement, and demoralization or loss of purpose when they were required to implement” (p. 128) a new curriculum with strict guidelines and assessment. People grieved for the security of sameness and predictability. Evans (1996) agrees that many people feel a sense of loss when faced with changes, noting “a major part of our world stops making sense; continuity is disrupted; our connections can no longer be counted on” (p. 29). When concerns about an innovation are expressed at work, these “feelings of loss are often denied or attributed to other causes” (Bolman & Deal, 2003, p. 380). In contrast, when these feelings occur in our personal lives, “every culture outlines a sequence for transition rituals following significant loss: always a collective experience in which pain is expressed, felt, and juxtaposed against humor and hope” (Bolman & Deal, 2003, p. 381).

Concerns are often mitigated by a political perspective, which “is concerned with how power is exercised over others or developed with them, the ways that groups and their interests influence the innovation and reform process, and how the ends of education address, comply with, or challenge the existing distributions of power in society” (Hargreaves et al., 2001, pp. 120-121). The political perspective also looks at who is
actually in control of the change and whom it really benefits. Often, when the change is mandated, there is more resistance from those required to implement the innovation. “A common administrative and legislative delusion and conceit is that reform can be imposed, even forced, on teachers, without any regard for their values or inclusion of their voice” (Hargreaves et al., 2001, p. 128).

Therefore, one could conclude that in order to create and maintain a successful change, teachers need to intellectually believe that the change is personally meaningful and relevant. In addition, they need emotional support, encouragement, and time to reflect on the progress of the change and their concerns about the change. Heifetz (1994) explains that situations that require more than technical knowledge become adaptive changes. He also argues that, unlike technical changes, adaptive changes do not occur when people are dependent on authoritative leaders. This is especially important as teachers tackle the often-difficult task of moving from the comfortable status quo to full implementation of an innovation. Many times teachers that have difficulty accepting change are labeled as “laggards” (Rogers, 2003). Even if a teacher embraces the change and is motivated to learn the necessary technical skills and behaviors, setbacks or challenges can cause concerns, which can be draining if not addressed personally or with emotional support from leaders or peers.

Finally, Hargreaves (2001) describes a postmodern perspective that takes into account our modern society filled with “chaos, uncertainty, complexity, and ongoing change” (p. 122). Some of the factors that contribute to this perspective are the increased speed of communication and knowledge base, overabundance of innovations, and involvement of diverse interest groups in the process of change. Although some teachers
believe that “new experiences provide chances for learning, development, and improvement” (Hargreaves, 2001, p. 123), constant change can be overwhelming and exhausting. “By examining emotions and change from a different perspective, we not only gain insights about the dynamics of change, but we also find new understandings of how to make change work more constructively” (Fullan, 1997, p. 216).

These perspectives of change provide an understanding of the ways people approach change and feel about change as they go through the process of change. In fact, Hall and Hord (2006) point out that “change is a process through which people and organizations move as they gradually come to understand and become skilled and competent in the use of new ways” (p. 4).

One effort that focused on how educators approach change led to the development of the Concerns-Based Adoption Model (CBAM) that emphasizes the “importance of understanding and addressing the personal side of change” (Hall & Hord, 2011, p. 265). CBAM, first proposed in 1973 by Hall, Wallace, and Dossett, is a “conceptual framework that describes, explains, and predicts probable behaviors throughout the change process” (George, Hall, & Stiegelbauer, 2006, p. 5). A major component of the CBAM is the Stages of Concern, a “quasi-developmental path to the concerns as a change process unfolds” (Hall & Hord, 2011, p. 74). When implementing an innovation in a perfect situation, the people involved move through seven Stages of Concern in a predictable manner. At the beginning of a change, people are unconcerned (low Stage 0 Unconcerned) about the change. They have other things on their mind and are not interested in learning about the change. As implementation begins, most people (and groups) have high self-concerns (Stage 1 Informational and Stage 2 Personal). They want
to know more information about the innovation being implemented and how it will personally affect them. As time passes, the self-concerns decrease as people move into the task (Stage 3 Management) concerns stage. At this point “attention is focused on the processes and tasks of using the innovation and the best use of information and resources … issues [are] related to efficiency, organizing, managing, scheduling and time demands” (p. 73). Usually by three to five years after the initial implementation, the impact concerns (Stage 4 Consequence, Stage 5 Collaboration, and Stage 6 Refocusing) are higher. At this point, people are more interested in how the innovation is impacting others, and working with others to make the innovation better. Of course, this sequential development only occurs “if the innovation is appropriate, if the leaders are initiating, and if the change process is carefully facilitated” (p. 74). Otherwise, according to Hall and Hord (2006), “concerns do not progress from self to task to impact. Instead, progress is arrested, with Stage 3 Management concerns continuing to be intense” (p. 141).

Recognizing and resolving personal concerns “requires time as well as timely intervention for both cognitive and affective factors… merely acquiring more knowledge about or experience with an innovation does not guarantee that an individual will resolve earlier concerns and have later concerns emerge” (George, Hall, & Stiegelbauer, 2006, p. 9). People need time and instruction to learn the technical aspects of change as well as time to grieve the loss of the status quo.

Godfrey (2005) experienced this type of arrested progress during the third year of the implementation of a technological innovation. Two years after a new grading program and one year after the web-based Blackboard 5.5 was implemented, 15% of teachers that attended a mandatory training were not using the programs as required (p.,
50). She also stated “since implementation had been ongoing for two years at MVHS; the expected profile of the teachers would be that of the inexperienced user, but the data revealed concerns of the nonuser” (p. 79). Godfrey attributed this to a lack of “strategies for implementation and identification of teacher concerns…before the implementation of technology” (p. 79). Research verifies that teacher adoption of a technological innovation to the desired level of implementation is a problem for many.

Not only do individuals experience change, but organizations as a whole also go through the change process. Even though Hall and Hord (2011) state “an entire organization does not change until each member has changed” (p. 9), it is important to understand how organizations as a whole react to change.

**Organizations and change.**

Although researchers often have different definitions of organizational change, Senge (1999) believes that most people responsible for implementing changes “are trying to respond quickly to external changes and think more imaginatively about the future. They want better relationships, … [with] more trust and openness…[and] to unleash employees’ natural talents and enthusiasm” (pp. 4-5). Bolman and Deal (2003) state this is “a multiframe undertaking” (p. 370). In order to change, people need to be retrained, but “it never works to retrain people without revising roles, or revamp roles without retraining” (p. 370). Leaders who realize that new roles require new skills and those skills also create new roles are more likely to succeed. “Change also alters power relationships and undermines existing agreements and pacts [as] it intrudes upon deeply rooted symbolic forms, traditional ways, and ritual behavior” (p. 370). In addition, “the
organization’s social tapestry begins to unravel, threatening both time-honored traditions and prevailing cultural values and practices” (p. 370).

One reason change in schools is particularly difficult is the relationship and expectations between society and schools that has lead to what institutional theorists call “the grammar of schooling” Rowan and Miskel (1999, p. 368). According to Rusch (2005) “The grammar of schooling is particularly significant for understanding organizational learning. Historically, the grammar has been shaped by norms of conformity that lead to remarkably homogenous schools and systems throughout the United States” (p. 89). The commonly accepted rules, behaviors, and beliefs that influence the expectations of the roles people have within a school make it exceedingly difficult for the people within the organization to change. Rusch (2005) concluded that there was an acute need to understand how educational organizations learn and the role of communication in that process.

**Communication in organizational change.**

Communication is defined as the “process in which participants create and share information with one another in order to reach a mutual understanding” (Rogers, 2003, p. 5). Rogers (2003) further describes the integral role communication has in implementing an innovation as diffusion: “the process in which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas” (p. 5).

In an effort to describe how communication was used within the structure of the military to implement new information technologies, the term network centric warfare was coined in the late 1990s ("The Network-Centric Craze," 2006, p. 38). Cebrowski
(2003) states “network centric warfare is a concept … it cannot have a definition, because concepts and definitions are enemies … [it] is a tool, a means to empower strategies to accomplish objectives, or ends” (p. 16). Even though it is difficult to define, this new conceptual framework “is based upon the experiences of organizations that have successfully adapted to the changing nature of their competitive spaces in the Information Age” (Alberts, et.al.2000, p. 87). Admiral Alberts, considered to be the godfather of network centric warfare ("The Network-Centric Craze," 2006, p. 38), explains that network centric warfare is more than a network of computers that push information from one place to another. Although network centric warfare originates from a military perspective, if the “war talk” is removed, all that remains is another organization dealing with changing technology and the adaptations in communication required for implementation.

Alberts (2001) stresses that sharing information is not enough, it may be more important “for individuals to be able to interact with each other in increasingly sophisticated ways, making it easier for individuals and organizations to share information, to collaborate on tasks, and to synchronize actions or effects” (p. 45). So, more important than sharing information, is using the shared information to make real-time decisions with groups of people that are in different geographical areas and create new shared power structures within the organization. This self-synchronization allows commanders in areas geographically removed from the physical battle to empower subordinates to make decisions based on real-time information from a variety of sources.

In all organizations communication, according to researchers, “is a central process in planning and implementing change” (Jones, Watson, Gardner, & Gallois, 2004, p.
The identified challenge is to “understand the communication of organizational change” (p. 735). The researchers found that “effective organizational communication by supervisors and managers reduces uncertainty about change and is linked to higher levels of employee adjustment and more positive organizational outcomes…conversely, communication problems are viewed as among the most serious by implementers” (p. 736). In organizations like schools that include stakeholders beyond the formal organizational boundaries, the communication challenge is complicated by the new technologies, namely email and communication through websites. Rapidly changing technologies means more information can be shared with a dispersed group of people in a timely manner. The military is an example of an organization that uses websites and satellite data to simultaneously share information between geographically disperse locations, which enables enhanced decision-making opportunities. Other organizations, like schools, can email information to stakeholders outside of the formal organization, or post information on a website that can be accessed by the general public or password protected for the intended audience. Despite the advances in technology, the institutional structure of schools can inhibit the implementation and broad use of these advanced forms of communication. In fact, Jones et.al. (2004) found that organizational structures do not necessarily change with the addition of new technology.

Communication about change related to schools and schooling requires attention to the institution of school. Lammers & Barbour (2006) propose “an institutional theory of organizational communication” (p. 356) that explains the unique communication practices in institutions, such as schools. After much research on the definition of institutions, “for analytical purposes, [the authors] view institutions as constellations of
established practices guided by formalized, rational beliefs that transcend particular organizations and situations” (p. 364). In order to further explain the foundations of this theory, Lammers & Barbour (2006) offer five propositions that “employ the fundamental components of institutions (behaviors, actors, and beliefs) as well as derived elements, including formal knowledge and established practices” (p. 364).

The first two propositions provide an understanding of communication related to schools. The first proposition, “communication sustains institutions,” maintains that institutions are sustained by individuals as they “identify with established beliefs and practices, its day-to-day practices enacted, endorsed, routinized, and recorded…largely through organizing” (Lammers & Barbour, 2006, p. 364). In schools, this is evidenced daily through the repetition of routines, following written and unwritten rules and procedures, and using special words or actions to create structure. Individuals (possibly parents) that are not accustomed to these practices may need assistance in understanding the dynamics of the institution’s rules and procedures. This is accomplished through the second proposition that states, “communication aligns organizing with institutions” (p. 365). In other words, people that belong to an institution and accept the rules and procedures, “tend to reproduce those rules in their communication…[which includes] internal and external as well as tacit and explicit aspects” (Lammers & Barbour, 2006, p. 365). Many of these rules cut across organizational boundaries through communication.

In a recent study on an educational network made up of administrators from various school districts and professors from different universities, Rusch (2005) found that some network members “appeared to exhibit more allegiance to the network than to their formal [school] system” (p. 96). This could be explained in part by the concept that
“a network learning relationship can result in the development of new language, new ideology, new communication strategies, new group skills, and different power relationships” (p. 88); much like institutions. However, when individuals within the network share new ideas about organizing “they frequently expose unexamined assumptions and tacit understandings that sustain ineffective structures in the district … [so] it stands to reason that efforts to modify the grammar of schooling or to evolve deeply institutionalized practices could prove difficult” (p. 89). This resistance of education to new technologies has been demonstrated repeatedly from the introduction of the blackboard in the early 1800s through the use of computers today. “Most of the components of learning environments reflect extremely stable forces or systems, and this is a major reason the evolution of learning environments is typically so slow” (Jackson & Deal, 1985, p. 112). Owens (2001) agrees by stating “schools have a genetic predisposition to maintain their identity and core characteristics over time” (p. 184).

**Change is Learning**

The word “learning” is often used interchangeably with “training.” Senge (1999), however, distinguishes between the two by pointing out that “the word ‘training’ originally meant ‘directing the course of a plant’: to be trained is to be controlled” (p. 24). In the business world, learning is often just “a frill with no link to business results… at worst [it] means ‘taking in information’…with no relevance to the future you are creating” (p. 24). In reality, “the word ‘learning’ derives from the Indo-European *leis*, a noun meaning ‘track’ or ‘furrow’…to enhance capacity through experience gained by following a track or discipline…[that] always occurs over time and in ‘real life’ contexts”
(p. 24). Senge (1999) sums up learning as the “enhanced capacity for effective action in settings that matter to the learner” (p. 24).

According to Hall and Hord (2011) “professional learning is a critical component embedded in the change process. Research focused on change process and on professional development reveals parallel findings, both of which identify the imperative of learning in order to use improved programs, processes, and practices” (pp. 7-8). Hall and Hord believe that learning is so important in the process of change that from 2006 to 2011, they moved their “Change Principle 1: Change Is a Process, Not an Event” (2006, p. 4) to the second principle and created a new “Change Principle 1: Change is Learning – It’s as Simple and Complicated as That” (2011, p. 6). In fact, Hall and Hord stress the importance of learning in a figure in their most recent book that depicts a spiral staircase with the phrase “To achieve improvement we must change unsuccessful practices which require learning” (2011, p. 7).

**Organizational learning.**

In the past, researchers and academics debated whether organizations could learn or whether it only occurred within individuals. Bolman and Deal (2003) point out that the debate over organizational learning “died out as scholars and practitioners discovered instances where individuals learned and organizations didn’t, or vice versa” (p. 28). According to Senge (1999) “all organizations learn – in the sense of adapting as the world around them changes. But some organizations are faster and more effective learners. The key is to see learning as inseparable from everyday work” (p. 24). Senge (2006) states that “the core learning dilemma that confronts organizations [is]: we learn best from experience but we never directly experience the consequences of many of our
most important decisions” (p. 23). The effects of changes made today may not be apparent for a long time, or may be removed from those implementing a change, making it difficult to make adjustments throughout the change process.

In order to lead organizations through the change process, it is important to understand how organizations and individuals learn to change. Irene and Carol (2000) believe implementing a new technology innovation in any organization requires a leader to have “specific skills-beyond those generically associated with effective leadership... selecting the right team for innovation to occur, selecting the right facilitator for innovation to occur, promoting the gathering, sorting, and disseminating of ideas generated, and providing the right tools” (p. 289). Hall and Hord (2006) describe three types of change facilitators: initiators who have a vision and motivate others, managers who focus on the tasks in an organization, and responders who deal with events as they occur. The initiating facilitator described by Hall and Hord can be further defined by Irene and Carol (2000) as four main innovative styles that work well together in a team-the “Idea Creator” who generates new ideas, the “Idea Embellisher” who recognizes benefits and develops ways to promote them, the “Idea Perfecter” who points out flaws and eliminates anything that might impede implementation, and the “Innovation Implementer” who puts together a detailed implementation plan. In addition to having a team of people to facilitate change, Smith (2007) found that a “godfather” or a respected person to “use their influence to subtly guide innovation projects through the organisational (sic) hurdles that stand in their way” (p. 101) was necessary for the innovation to be successful.
Communication is necessary to create change in any organization. Senge (1999) believes a “shared commitment to change develops only with collective capability to build shared aspirations [which occurs as] people start discussing ‘undiscussable’ (sic) subjects [after] they develop the reflection and inquiry skills that enable them to talk openly about complex, conflictive issues without invoking defensiveness” (p. 9). Opening communication within an organization is the key to reflecting upon the change and Cranton (1996) states, "it is generally agreed in the literature (Brookfield 1987; Boud and Walker, 1991; Tennant and Pogson, 1995) that critical reflection is the key to the learning experience" (p. 2).

**Individual learning.**

There are a variety of reasons why adults continue to learn, ranging from learning a new sport or activity to obtaining an advanced college degree. Many adult learners “choose to become involved in either informal or formal learning activities as a result of a desire to grow, change or develop, or as a response to a professional or practical need” (Cranton, 1994, p. 5). It is helpful to understand that although many adults choose to learn something new, they may not necessarily be self-motivated or able to be self-directed.

Mezirow’s (1997) theory of transformative learning, “the process of effecting change in a frame of reference” (p. 5), provides a lens for examining how adults engage in adaptive learning, particularly when it involves complex innovations like technology. Mezirow states that these frames of references are made up of a person’s “associations, concepts, values, feelings, [and] conditioned responses … that define their life world” (p. 5). That means that a frame of reference encompasses all that a person knows about
their world as created through personal experience, and social and cultural inputs. An important aspect of transformative learning theory is that all learning passes through this “frame of reference [which] encompasses cognitive, conative, and emotional components, and it is composed of two dimensions: habits of mind and a point of view” (p. 5).

The cognitive component describes the thinking part of the learning experience. As a person is exposed to something new, the cognitive part of the brain works to make sense of the new information. Weick (2005) explains that this need for sensemaking occurs when the world one encounters is different than one expects. During this process of sensemaking a person tries to organize this new information through filters of previous experiences, learning, or norms shaped by culture, society or upbringing. “It is not about truth and getting it right. Instead, it is about continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism” (Weick et al., 2005, p. 415). Much of the “redrafting” occurs through self-reflection or communication with others.

Another component of a frame of reference is emotion, “our most direct reaction to our perception of ourselves and the world around us” (Manning, 2002, p. 89). So, emotions color the way people make sense of their world. Johnston (1996) states emotion plays an important role in learning since it provides motivations as well as self-perceptions (p 23).

Finally, the conative component is described by Johnston (1996) as “natural skills, pace, autonomy” or “the performing self” (p. 22-23). This is the part of learning that translates the thinking and emotion into actions and behaviors.
As people learn new concepts, the individual’s frame of reference provides the filter they use to view their world. This “is composed of two dimensions, a habit of mind and resulting points of view” (Mezirow, 2000b, p. 17). The habits of mind are explained as the usual way a person thinks, feels, and acts. These responses to situations and events are largely determined by “assumptions that constitute codes … [which] may be cultural, social, educational, economic, political, or psychological” (Mezirow, 1997, p. 6). The habits of mind are expressed through a point of view, the “belief, value judgment, attitude, and feeling that shapes a particular interpretation” (p. 6) of an event or situation. These points of view can change or shift as individuals make sense of new or different situations or information and “reflect either on the content or process by which we solve problems and identify the need to modify assumptions” (p. 6). Mezirow explains that “learning occurs in one of four ways: by elaborating existing frames of reference, by learning new frames of reference, by transforming points of view, or by transforming habits of mind” (Mezirow, 2000b, p. 19). This is extremely difficult when learning new concepts and skills.

The transformative learning theory (Mezirow, 1997) describes the way adults make sense of the world around them and incorporate new learning into their existing knowledge base.

… the goal of adult education is implied by the nature of adult learning and communication: to help the individual become a more autonomous thinker by learning to negotiate his or her own values, meanings, and purposes rather than to uncritically act on those of others. This goal cannot be taken for granted; educational interventions are necessary to ensure that the learner acquires the
understandings, skills, and dispositions essential for transformative learning.

Critical reflection, awareness of frames of reference, and participation in discourse become significant elements in defining learning needs, setting educational objectives, designing materials and methods (p. 11).

Mezirow stresses the importance of critical reflection and communication, both self-discourse and with other individuals, is an essential component to learning and change.

Johnston (2010) expands on the notion of critical reflection and self-discourse and describes this as “metacognition [which] is the internal talk that goes on in your mind among your team of Learning Processes” (p. 60). These Learning Processes (also called Learning Patterns) are the “convergence of the three brain activities (cognition, conation, and affectation) [which] form four stable patterns of learning” (Johnston, 1998, p. 24) that are “present at birth and developed over time” (p.40). The interaction of these four Learning Patterns; Sequence, Precision, Technical Reasoning, and Confluence combine to create an individual’s learning combination. Johnston (2010) describes each Learning Pattern below –

Sequence … needs to organize, plan, and complete work assignments without interruption, using clear instructions as well as a time frame that allows for checking work (p. 166).

Precision … seeks information and details, asks and answers questions, and researches and documents facts (p. 166).

Technical Reasoning … describes the way we seek relevant real-world experiences and practical answers. This is the Pattern of the fewest words.
It emphasizes the ability to problem solve using independent, private thinking and hands-on interaction (p. 167-168)

Confluence … describes the way we use our imagination, take initiative and risks, and brainstorm ways of approaching things in a unique manner.

Confluence allows the learner to link disparate pieces of information into the big picture (p. 161).

Each of these Learning Processes or Patterns provides the learner with a path to learning. The key to harnessing this power is to “understand how the pieces [Patterns] communicate with one another, and recognize the expertise each brings to a given situation” (Johnston, 2010, p. 63). Every time a learner is confronted with a new situation, these patterns begin an internal “chatter” to process the situation and decide how to think, act, and feel. This “chatter” can be difficult to hear because of the sensory overload of everyday life. Individuals need to tune into the “chatter”. Johnston (2010) emphasizes the importance of “true listening [which] yields attentiveness and allows you to weigh in the balance the various perspectives you are hearing so you can then act” (p. 64). She contends that metacognition is an active process that is described by “action verbs to represent each phase of metacognition: Mull, Connect, Rehearse, Express, Assess, Reflect, and Revisit” (p. 65). The phases, explained below, may be used in the order listed or another order.

Mull – Am I up to this? What is the “this”? What am I expected to do?

Connect – Have I done this before? Seen it done before? Take the first step.

Rehearse – Let me see if I can do this. Practice in private.

Express – Go public! Submit the work. Make the presentation.

Reflect – What did I accomplish? What did I contribute? What did I fail to do?

Revisit – If I could start over, what would I do differently? Where would I make a strategic alteration in my plan?

Learn – What have I learned about myself? What have I learned from doing the task? (Johnston, 2010, p. 67)

As the learner enters each phase, the related questions or statements stimulate the Patterns to “chatter” and interact to create a direction or path. “The more frequently we tune into it, the more clearly we can identify the direction we are being given” (Johnston, 2010, p. 72). Thinking about how we learn, metacognition, “is the single determiner of how much you retain, how well you retain it, and how well you implement what is presented to you as professional development or professional training” (Johnston, 2010, pp. 142-143).

**Sustaining Change**

Sustainability, the process of sustaining change, is defined by Rogers (2003) as “the degree to which a program of change is continued after the initial resources provided by a change agency are ended” (p. 376). According to Senge (1999) “Most change initiatives fail” (p. 5). He believes this occurs over and over “despite substantial resources committed to the change effort, talented and committed people ‘driving the change’, and high stakes” (p. 6) because leaders need to better understand the process of change and they “fail to recognize the importance of learning capabilities” (p. 9). Sustaining change must be accompanied by continual individual learning within the organization. Hall observes that much of what we know about change comes from studies of
implementation during the first 1-2 years, but we know far less about what actually sustains change (personal communication April 26, 2006). Noting that, “change is an ongoing, but very elusive, process for researchers to capture,” Rusch & Wilbur (2007) concluded that change theories are often developed around only the “visible and dramatic events” (p. 317).

**Summary**

Current research in communication suggests that technological advances in communication have changed the way people communicate with each other, both within organizations and between organizations and people beyond the organizational boundaries. The Network Centric theory explains how the military has adapted to the new technology of this century and the importance of using real-time communication to provide the best environment for global warfare. On a much smaller scale, this same real-time communication in schools can provide a way for teachers, parents, and students to enhance the learning environment. Since it is essential for teachers to use this new technology to benefit the learning process, it is important to understand how adults (teachers) obtain new knowledge. Mezirow (1997) states

> As we move into the next century and more technologically sophisticated industry and service sectors, work becomes more abstract, depending on understanding and manipulating information rather than merely acquiring it. New forms of skill and knowledge are required. There is a growing consensus pertaining to the essential understandings, skills, and dispositions required for an adult learner to become an effective member of the workforce of the future. Economists recognize that resources should be directed toward creating a
workforce that can adapt to changing conditions of employment, exercise critical judgement as it manages technology systems, and flexibly engage in more effective collaborative decision making (p. 8).

Oftentimes these changes in work conditions are difficult for adults (even teachers in the field of education) to embrace.

Mento, Jones and Dimdofer (2002) maintain that none of the common models for the management of change focus on change from the perspective of the employee, the recipient of the change. The success of a change process is contingent on employees' willingness to change. Therefore, a need remains to consider other aspects of the change process, including the employee perspective, which may aid in improving the level of success of these efforts (cited in Parsells, 2006, pp. 1-2).

One way to consider the employee during change utilizes the Stages of Concern Questionnaire (SoCQ) based on the Concerns Based Adoption Model (CBAM) to determine and resolve individual’s concerns during the change process.

Several studies have used learning styles to determine preferred learning strategies or activities (Yeh, 2005), or learning readiness or educational outcomes- but few have provided the learner with a way to communicate about how they learn and create a way for learners to take charge of their own learning. The Let Me Learn Process©, through the use of the Learning Connections Inventory, can provide a way for individuals to “understand, articulate, and communicate their distinctive ways of processing the world” (Silverberg, 2006, p. 50). Individuals can then use this knowledge to improve communication within organizations in order to adapt and grow through the change process. Additionally, Friedman (2005) challenges “being adaptable in a flat
world, knowing how to ‘learn how to learn’, will be one of the most important assets any worker can have, because job churn will come faster, because innovation will happen faster” (p. 239). Johnston (2010) believes metacognition answers the challenge because “the mind remains the most vital technology for communication with others and … navigating the world of the 21st century requires high-speed learning and communicating” (p.134).

The next chapter describes the pilot study, along with methods and data analysis procedures used for this study. The following chapter reveals the findings of the study. Finally, chapter five concludes the research with a discussion of the findings, implications of the study, and possible areas of future research.
CHAPTER THREE

METHODOLOGY

After implementing a student information management system at a private Kindergarten to Eighth grade school, I realized that teachers responded differently to this technological innovation. Even 2-years after implementation, several teachers refused to use RenWeb or found a way to have other people do the work for them. Much research has been conducted on teacher concerns during the first year of the implementation of an innovation. However, less research has focused on teacher concerns related to a change after the first year.

This chapter provides a guideline for the research beginning with the purpose of the study and research questions, then the design of the study, followed by a description of the pilot study. In addition, the chapter details the data collections methods, research instruments, data collection timeline and procedures for the analysis of the data.

Purpose of the Study

The purpose of this exploratory qualitative research study was to gain insights into individuals' metacognition as they resolved personal concerns related to change during the third year of implementation of a technological innovation (RenWeb). Therefore, this study sought to identify the various ways in which a variety of adult learners responded to and addressed those personal concerns when faced with a technological innovation. In addition, the researcher examined the self-reported effectiveness of various interventions in regard to an innovation implementation. The intent was to locate insights that may foster a workplace learning environment that effectively supports change and innovation.
Research Questions

The focus of this exploratory research examined the following questions:

1. How does individual and group knowledge of learning patterns foster increased communication about concerns related to organizational change?
2. In what ways do personal levels of concern about the implementation in the third year of a technological innovation relate to an individual’s approach to learning?
3. In what ways does individual knowledge of one's personal approach to learning support resolution of concerns during the third year of the implementation of a technological innovation?

Design of the Study

A single site case study, using qualitative methods and multiple data sources, provided the framework to gain insights into individuals’ metacognitive resolutions of personal concerns related to change during the third year of the implementation of a technological innovation. Sources included demographic data, surveys, interviews, and research instruments with established validity and reliability to collect data related to concerns about change and individual approaches to learning. A qualitative approach was appropriate because the study took “place in the natural world … [used] multiple methods that … [were] interactive and humanistic, … [focused] on context, … [was] emergent rather than tightly prefigured, and …[was] fundamentally interpretive.” (Marshall and Rossman, 2006, p. 3). In addition, the research fit Stake’s (1995) definition of a case study.
in which the researcher explores in depth a program, an event, an activity, a process, or one or more individuals. The case(s) are bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time (cited in Creswell, 2003, p. 15).

Finally, Stake (2000) explains that a “case study is not a methodological choice but a choice of what is to be studied” (cited in Glesne, 2006, p. 13). This research was suited to an explorative qualitative single site case study based on the limited population, in-depth focus on a single process within a limited context, and the emergent nature of data collection and analysis.

**Pilot Study**

As noted in chapter one, the implementation of RenWeb, a web-based student information system, revealed the extraordinary variety of responses teachers have to changes in technology. After reflecting on events and reviewing literature on change, I realized diffusion was occurring in front of my eyes. Examples of how “an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 5) included middle school teachers asking for a live web demonstration of the program and later sharing information about the new program with other staff members.

In an effort to make this a smooth transition and understand each teacher’s concerns about the change, teachers completed the Stages of Concern Questionnaire (SoCQ) (George, Hall, & Stiegelbauer, 2006) at the beginning of the RenWeb implementation. The profile for the group indicated Stage 1 Informational concerns were
the highest. Further discussion revealed that a majority of teachers were excited about the change, however a small group seemed unwilling to participate.

The following year all activities related to RenWeb were designed with teacher concerns in mind. The follow-up administration of the SoCQ indicated more concerns with “how do I get this to work?” Many teachers were learning how to use RenWeb, sharing ideas with others and asking questions as needed. A few teachers liked to figure out new things on their own and share that information with me and anyone else that would listen. There were also a few teachers who grumbled about having to learn a new program and complained constantly that it wasn’t working for them, no matter how much time I spent working with them. After two years of struggling with reluctant users and outright resisters, I decided to use the Let Me Learn Process© in order to reveal each teacher’s “learning compass” so we all could understand our different approaches to learning a new technology. Three individuals and their approach to learning illustrate how the Let Me Learn Process© addressed the ongoing concerns these teachers had as the implementation went forward.

**Carl’s story.**

Carl (pseudonym), a relatively new teacher, enjoys using the computer and learning new things, especially anything that helps his sixth-eighth grade students learn better. His main concerns about RenWeb were finding ways to make it better and easier to use. In his view “the speed of the software was slow” and “sometimes grades [got] dropped” (comments on SoCQ). He communicated that all of the trainings were helpful and he learned something new each time. Other teachers’ resistance to using the program and their constant complaints puzzled him. In his opinion, if your administrator told you
to do something, you do it to the best of your ability and find ways to make it better. Carl’s patterns on the Learning Combination Inventory (LCI) revealed that he is identified as a strong willed learner with use-first scores in sequence, precision, and technical and a high use-as-needed score in confluence. His dominant technical pattern explained his interest in solving problems, his desire to work things out by himself, and need for a clear purpose (helping students). In addition, his high sequence accounted for his need to be accurate, do things neatly and thoroughly, and know that he is meeting the expectations of those around him.

Mary’s story.

Mary (pseudonym) was initially excited about RenWeb “because it involves the whole school.” Although she was not very proficient at using the computer, she was willing to learn. Her main concern was the availability of on-going training throughout the year. On the SoCQ, she indicated a preference for learning in small groups or one-on-one training with a staff person she knows. Each time she had to do something in RenWeb that she was unsure of, she asked for directions, did the task a few times with the trainer, and then went off to use RenWeb on her own. When she finished the task, she would ask the trainer to check to she if she did everything correctly. She wanted to make sure she did all that she was asked to do and was very proud of herself when she was finally able to do almost everything on her own. Mary did not understand why other people refused to use RenWeb as they were required. She believed the way to make the school better was to have everyone using the same program the same way. Mary’s LCI scores showed a pattern of very high sequence, moderate confluence and precision, and an avoidance of technical. Her need for very clear step-by-step directions, time to do
everything correctly, and desire to meet administration’s expectations were clear indicators of her patterns in action.

**Sara’s story.**

Finally, Sara (pseudonym), an experienced teacher, did not like to use the computer or being told that she had to. Sara had a system that worked for her and did not see any reason to change. On the first SoCQ I wrote the statement “After much research and discussion, the School Council approved the adoption of RenWeb.” Sara underlined the words “research” and “discussion” and wrote “Where were the teachers in this? The users?” During the RenWeb trainings she made several comments that this was not appropriate for elementary grades, she didn’t want parents to see her grade book, and she didn’t have time to do all of that (she was busy teaching all day). On the second SoCQ she wrote several comments about using RenWeb during the previous three months:

- time consuming
- not for grade school
- lesson plan format does not work
- can’t move from column to column
- VERY IMPORTANT –forces class list to be alphabetical rather than according to teacher’s list (not teacher friendly)

For two years I tried to address her concerns about RenWeb and describe the benefits to the entire school by using the same program. She continued along the same path – complaining that RenWeb did not work for her, it was not appropriate for fourth grade (or lower), and it was a waste of time. Finally, after the Let Me Learn© workshop, she said, “I told you I like to do things my way. I won’t take another questionnaire
(SoCQ). Just use my last one, it will be the same.” That is exactly how a person with high confluence feels. They want to do things their way without following the rules and must see a personal advantage to change. Fortunately, she had a teacher’s aide that was able to do all of the work required within RenWeb and I was able to make some changes so her system worked better with RenWeb. Now, after several years of using RenWeb, she has realized some of the benefits and now wants parents to see their child’s grades in her class. That way she does not need to explain it to the parents- it is available to them on RenWeb.

These are just a few of the examples of how teachers processed change while implementing RenWeb at my school. Knowing the teachers’ Stages of Concern helped determine where they were in the change process. The Learning Combination Inventory (LCI) provided teachers (and facilitators) with a common language about learning and change to address those concerns in a way that was beneficial to all. Therefore, this dissertation study focused on exploring a more effective way to address teacher concerns and promote learning through a technological change.

**Research Setting and Participants**

The research setting was a private Christian K-12 school in Las Vegas, Nevada that opened in 1994. According to one of the administrators, the school was using another computerized student information system that was not web-based before deciding to implement RenWeb. At the time of the research, the school was finishing the third year of implementing RenWeb and had a staff of 45 (including administrators, teachers, and support staff). Preliminary research data were obtained during a mandatory staff meeting. Although all staff was required to attend, only 32 people completed the SoCQ and of
those, only 28 completed LCI reports were matched by email address to participate in the remainder of the data analysis. Table 1 lists the demographic data of the 32 staff members that completed the SoCQ.

Table 1. Demographic Data complied from the Stages of Concern Questionnaire demographic questions.

<table>
<thead>
<tr>
<th>Years of teaching</th>
<th>Years in this position</th>
<th>Time using RenWeb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>People</td>
<td>Time</td>
</tr>
<tr>
<td>1-2</td>
<td>2</td>
<td>Less than 1</td>
</tr>
<tr>
<td>3-4</td>
<td>2</td>
<td>1 year</td>
</tr>
<tr>
<td>5-10</td>
<td>12</td>
<td>2 years</td>
</tr>
<tr>
<td>11-20</td>
<td>9</td>
<td>3 years</td>
</tr>
<tr>
<td>21-30</td>
<td>7</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 + years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 + years</td>
</tr>
</tbody>
</table>

Data Collection Methods

In order to explore the process of change and possible effects of metacognition, data were gathered from several sources, research instruments, surveys, and interviews. Several survey questions included in the Stages of Concern Questionnaire (SoCQ) were used to gather personal demographic information (length of time teaching, time in current position, grades/levels taught), information about RenWeb use (length of time using RenWeb, features of RenWeb used, perceived level of expertise), and preliminary learning preferences (types of training used to learn about RenWeb, and trainings believed to be most beneficial). The SoCQ also provided more information about concerns teachers had during the third year of implementing RenWeb by creating a concerns profile for each teacher. An additional research instrument, the Learning Combination Inventory (LCI) was taken online and provided insight into each teacher’s
personal learning patterns and approach to learning. The responses to the general survey, SoCQ and LCI provided the basis for interview questions.

**Data collection timeline.**

In December 2010, the research school was contacted by email and later by phone to explain the proposed research (see Appendix A). After a personal interview with an administrator, the school consented to participate in the research once the study was approved (see Appendix B).

Research data were collected in May 2011 through the self-administered Web-based SoCQ and LCI. An email was sent to each teacher and staff member that used RenWeb with detailed instructions on how to access the websites and complete the surveys (see Appendix C). In addition, the email also stated the process would be explained to teachers and staff during the next mandatory staff meeting and instructions would also be provided in a letter. I was allowed the first 1½ hours of the meeting and participants signed an Informed Consent letter (see Appendix D) from the University of Nevada, Las Vegas that provided a description of the study, participant responsibilities, and efforts to maintain participant confidentiality. While describing the research, I explained that I became interested in helping people learn about RenWeb since some people at my school still needed a lot of help, even after 6-years. One of the principals coughed/laughed and about half of the people there started laughing. It seemed like they had some of the same problems.

Participants completed the survey and questionnaire in the computer lab or on computers in their own classrooms. Once logged in to the school’s computer, participants took The Stages of Concern Questionnaire hosted by Southwest Educational
Development Laboratory (SEDL) at www.sedl.org/concerns. The password was included in the email (and the letter) that directed participants to the homepage of the survey. A few staff members had trouble getting to the correct webpage because they typed the web address into the google search box instead of the address bar. The computer lab was set up with Mac computers and most of the staff were more comfortable with PCs, which caused a few technical problems. Participants completed several demographic questions and the SoCQ at this website. All information was saved at SEDL for the researcher to access for analysis purposes. Participants did not receive a copy of this information.

Next, a link from the SoCQ sent participants to the online version of the Learning Combination Inventory at http://www.LCRinfo.com. They were prompted to enter the group code. Several people had trouble entering the code in the correct spot and/or entered the “logout” button instead of the “submit” button. After they entered the code, they were directed to create a profile and accept the consent page. That took the participant to the welcome page where they clicked the “Take LCI” under the “New Surveys” screen. While the participants were taking the LCI, many asked other people to help them answer the questions. One lady stated she worked with a teaching partner that knew her better than she knew herself. Two or three people answered the LCI then received a “not valid” screen that said they should do it again and use less “sometimes” answers. One lady did it again and everything was fine. One lady did it 3 times and kept getting the same response even though she changed the way she answered. I told her that it was all right and she didn’t have to do it. She started crying and said that she always handled stress that way. I wish I had brought a paper copy that she could have filled out. After answering all questions, participants were provided with their personalized results.
and a website to learn more about the Let Me Learn© process. Several people said that it was interesting and they enjoyed taking the LCI and thanked me. Many people printed the informational pages, while others just signed off and were done with it. A couple of participants said they would like to read more about it. All information was saved on the LCR website for the researcher to access for analysis purposes.

In addition to the SoCQ and LCI, interview questions were created to provide more information about individuals’ perceived level of experience, possible sources of concerns, description of preferred learning situations, and communication and/or further research about the LCI (see Appendix G).

**Research instruments.**

Baseline data were gathered using two survey instruments (SoCQ and LCI), which according to Creswell (2003) “[provide] a quantititative or numeric description of trends, attitudes, or opinions of a population.” (p. 153). Research data were collected through a self-administered Web-based survey, learning inventory, and interviews.

An administrative account was set up through Southwest Educational Development Laboratory (SEDL) to administer the SoCQ online and analyze results. Permission to use the survey and results were granted by SEDL in July 2010. An administrative account was also set up in July 2010 with Learning Connections to administer and analyze the LCI online.

**Stages of Concern Questionnaire.**

The first survey instrument, SoCQ, is a major component of the Concerns Based Adoption Model (Hall & Hord, 2006); a “conceptual framework that describes, explains, and predicts probable behaviors throughout the change process” (George, Hall, &
Stiegelbauer, 2006, p. 5). The 35-item Stages of Concern Questionnaire has “strong reliability estimates (test/retest reliabilities range from .65 to .86) and internal consistency (alpha-coefficients range from .64 to .83)” (Hall & Hord, 2006, p. 147). Each item is ranked on a Likert scale of 0-7 that represents increasing levels of concern about the statement. The levels correspond to the following statements “Irrelevant (0), Not true of me now (1-2), Somewhat true of me now (3-4), and Very true of me now (5-7)” (Hall & Hord, 2006, p. 280). The questions from the SoCQ can be divided into groups of five questions each that represent the seven Stages of Concern (Stage 0 Unconcerned, Stage 1 Informational, Stage 2 Personal, Stage 3 Management, Stage 4 Consequence, 5 Collaboration, and Stage 6 Refocusing). (see Appendix E). Many researchers have used the SoCQ to research teachers’ concerns about a technological innovation to age, gender, years of teaching, teaching field, and/or amount of training provided (Bagby, 2007; Gaither, 2005; Godfrey, 2005; Henrickson, 2007; Hernandez, 2003; Hoskyns-Long, 2009; Tovar, 2009). The majority of these studies only lasted one or two years. However, according to Hall and Hord (2006) “most changes in education take three to five years to be implemented at a high level” (p. 4).

The Stages of Concern Questionnaire is hosted by Southwest Educational Development Laboratory (SEDL) at www.sedl.org/concerns. The password was included in the email (and letter handed out at the meeting) that directed participants to the homepage of the survey. All information was saved at SEDL for the researcher to access for analysis purposes. Participants did not receive a copy of this information. The online software at SEDL scored the questionnaires and created percentile scores for each of the seven Stages of Concern that were plotted on a graph to create a profile. These Stages of
Concern profiles generally fall into certain patterns for the following groups of innovation users: “Nonuser, Inexperienced User, Experienced User, and Renewing User” (Hall & Hord, 2006, p. 143). The profiles were examined as a group, subgroups, and individually.

**Learning Combination Inventory.**

The Learning Combination Inventory (LCI) was “developed using 6 years of pilot studies with U.S. and international students. [Its] strength lies in its ability to identify, accurately and consistently, an individual’s hard-wired learning patterns … [that] are the result of cognitive, conative, and affective brain functions that are present from birth and developed over time” (Johnston, 1998, p. 40). The inventory provides a way for learners to understand their personal learning patterns in order to be fully engaged in the process of learning. The LCI consists of 28 statements of learning behaviors that are answered with the choices of “Never Ever, Almost Never, Sometimes, Almost Always, and Always” and three short answer response questions “1. What made assignments frustrating for me in school was… 2. If I could choose, I would show what I have learned by… 3. My most memorable and enjoyable learning experience involved…” (Johnston, 1998, pp. 42-44). The statements were scored and a numerical value was obtained for each of four learning patterns. The short answers were used to validate the scores by looking for key words and phrases associated with each pattern. Numerical scores for each of the four patterns; Sequential, Precise, Technical, and Confluent; “are divided into ranges (i.e. 7-16 = I avoid this pattern, 17-25 = I use this pattern as needed, and 26-35 = I use this pattern first)” (Johnston, 1998, p. 41). See Appendix F for a chart that divides the Learning Combination Inventory into sections for each pattern along with a brief
description of each pattern [Compiled from (Johnston, 1997, p. 79) and (Johnston, 2010, pp. 124-130)].

Although both instruments have been used extensively for research studies, they have not been used together in the same study. The responses to the demographic questions, SoCQ and LCI were examined qualitatively for common themes that provided the basis for more in-depth personal interview questions.

**Interviews.**

According to Yin (2009) “a major strength of case study data collection is the opportunity to use many different sources of evidence” (51%), therefore this study used personal interviews to support data collected from the SoCQ, LCI and survey questions. The questions were developed to provide more in-depth knowledge regarding RenWeb trainings at the beginning of implementation, the perceived usefulness of those trainings, as well as current methods of learning about RenWeb. In addition, questions explored each individual’s understanding of and/or discussions about their learning patterns, and whether this knowledge might influence their approach to learning more about RenWeb.

Only 28 out of 32 SoCQ profiles could be matched by email address to their LCI report for analysis and to randomly select 12 people for a personal interview. During a meeting with Dr. Edith Rusch, all of the LCI reports for the participants were grouped according to similarities of Learning Patterns in each of the three use levels (Use First, Use as Needed, and Avoid). Table 2 lists and describes the seven LCI groups, based on pattern descriptions provided on the individual LCI reports for each participant. Initially, we decided to exclude the Strong Willed learners and Bridge learners groups since they were able to use several patterns and might not provide an accurate picture of an
individual pattern. During later analysis, it was apparent that those groups made up about a third of the participants that had valid SoCQ profiles matched with LCI pattern reports. Also, it was important to provide an accurate analysis of the actual participants at the school.

Table 2. Learning Combination Inventory (LCI) Groups, Titles, and Descriptions condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSAC</td>
<td>Clear directions</td>
<td>Taking risks is foolish</td>
</tr>
<tr>
<td>Lead Sequence, Avoid Confluence</td>
<td>Step-by-step directions</td>
<td>Rather NOT make mistakes</td>
</tr>
<tr>
<td></td>
<td>Time to do work neatly</td>
<td>Careful and cautious</td>
</tr>
<tr>
<td></td>
<td>Work without interruption</td>
<td>Don’t take social risks</td>
</tr>
<tr>
<td></td>
<td>Want to meet expectations</td>
<td>Avoid improvising</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seek parameters</td>
</tr>
<tr>
<td>LSNA</td>
<td>Clear directions</td>
<td>No Avoid Patterns</td>
</tr>
<tr>
<td>Lead Sequence, no Avoid</td>
<td>Step-by-step directions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time to do work neatly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work without interruption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Want to meet expectations</td>
<td></td>
</tr>
<tr>
<td>LCAS</td>
<td>Don’t like repetitive tasks</td>
<td>Tend not to read directions</td>
</tr>
<tr>
<td>Lead Confluence, Avoid Sequence</td>
<td>See situations differently</td>
<td>Don’t plan or schedule</td>
</tr>
<tr>
<td></td>
<td>Like to do things their own way</td>
<td>Rarely double-check work</td>
</tr>
<tr>
<td></td>
<td>Don’t like following the rules</td>
<td>Following directions confusing or frustrating</td>
</tr>
<tr>
<td></td>
<td>Enjoy taking risks</td>
<td>Ignore table of contents</td>
</tr>
<tr>
<td>LP</td>
<td>Want complete and thorough explanations</td>
<td>With other Patterns</td>
</tr>
<tr>
<td>Lead Precision</td>
<td>Ask a lot of questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like to answer questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Need to be accurate and correct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like test results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seek written documentation of success or failure</td>
<td></td>
</tr>
<tr>
<td>LT</td>
<td>Don’t like to write things down</td>
<td>With other Patterns</td>
</tr>
<tr>
<td>Lead Technical</td>
<td>Need to see the purpose of task</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work independently</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Figure how things work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t like to use a lot of words</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Look for relevance and practicality</td>
<td></td>
</tr>
<tr>
<td>SW</td>
<td>3 or more Use First Patterns</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Strong Willed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3 or more Use as Needed Patterns</td>
<td></td>
</tr>
<tr>
<td>Bridge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Next, with the help of Dr. Gene Hall, the SoCQ profiles were sorted into five groups based on their relative position on the Implementation Bridge. Hall and Hord (2011) describe this bridge as a way for members within an organization to move from the current practices to the newly implemented practices. Although the school was at the end of the third year of implementing RenWeb, not all teachers and staff were at the same place on the bridge.

After creating these two sets of groups, a representative group of participants was needed for the interviews. I created a spreadsheet with each participant’s SoCQ ID number, SoCQ group and LCI group. Choosing 12 random participants for the personal interviews was difficult. Frst, I looked through the SoCQ groups and tried to choose participants that were representative of each of the five groups. This process did not provide a representative sample of the LCI groups. Then I chose participants from each of the LCI groups, but this time the SoCQ groups were not appropriately represented. Since neither of these methods provided a random, balanced sampling of participants to interview, I compared the SoCQ groups in rows and the LCI groups randomly assigned to columns that created a graph representing the number of participants in each of the groups (see Figure 1).
During a discussion with Dr. Rusch and Dr. Hall, we agreed on a pattern that provided 12 randomly selected participants to interview. Starting from the bottom left of Figure 1 diagonally to the upper right, the following participants were chosen.

- **Group 1**: 2 LSAC, 2 LSNA
- **Group 2**: 1 LCAS
- **Group 3**: 2 LP
- **Group 4**: 2 LT
- **Group 5**: 2 SW, 2 B

An email invited 12 individuals to participate in the interview. After the first email, eight people responded and were interviewed at the school, a coffee shop, or by phone. After a second email, one more person responded and was interviewed. At this time the principal offered to help and called the remaining three people. After her call and...
another email, I interviewed two more participants. The last participant did not answer any emails or requests from her principal to contact me. The 11 people that participated in the interview answered questions pertaining to how they learned to use RenWeb, how they learn new things in general, if they discussed their LCI patterns with others, if they thought their LCI scores match how they learn, and to explain their self-reported level of expertise with RenWeb. Every interview was tape recorded and transcribed for analysis purposes.

Data analysis.

“Data analysis involves organizing what you have seen, heard, and read so that you can make sense of what you have learned” (Glesne, 2006, p. 147). In order to make sense of the data that were gathered, each individual SoCQ profile and LCI patterns were printed from the hosting website. The randomly generated ID number on the SoCQ was matched (using email addresses) to the LCI pattern reports so names were protected during analysis.

Once the interviews were complete, I used the analysis and graphing features at SEDL to compare the SoCQ profiles for different subgroups based on the participants’ responses to subgroup and custom questions on the SoCQ questionnaire. It was easy to create profile graphs for years of teaching, years using RenWeb, and self-reported levels of expertise. However, I wanted to explore the SoCQ profiles for each of the SoCQ groups and the LCI groups. After emailing the webmaster at SEDL and explaining the features I wanted, he agreed to add that information which allowed me to analyze the data in greater detail. Another feature that I needed was a graphical output of the responses to the demographic questions on the SoCQ. I was able to create a graph based on the
information, but was not able to print out a list of the responses. Again, after contacting the webmaster, he made that feature available on the website.

**Limitations**

This research was limited to a small private Christian school that was in the third year of implementing RenWeb, a web-based student information system. The school was selected in order to explore a situation similar to the pilot study, both in type of school and innovation. The specific type of innovation, RenWeb, and its technological nature also limited the study. In addition, since this study examined a snapshot of the site at a specific point in time, and was not an intervention study, the type, degree, and effectiveness of trainings during implementation were not known. Any findings are limited to this research site and may not be generalizable to other schools, either private or public.

**Bias and Anonymity**

Although I was never personally affiliated with the research site at the time of this study, several former staff members were employed at my school. In addition, a few of my former students were currently enrolled at the research site. In an effort to protect anonymity, the site of this study was not discussed with either staff or students. I also chose RenWeb as the technological innovation used to study the process of change because of my familiarity with the program and ability to discuss and understand concerns that participants shared during the research.

In order to protect the anonymity of the research site and participants, the school name and participants were not identified in any analysis or findings. In addition, during recorded interviews, participants were only identified by the SoCQ ID numbers. All
cassette tapes, printed transcripts, LCI reports, and SoCQ profiles were secured in a location away from school staff. Online data at [www.sedl.org](http://www.sedl.org) and [www.LCRinfo.com](http://www.LCRinfo.com) were maintained in a password-protected administrator account.

**Accuracy of Findings**

A challenge to the qualitative researcher is to provide accurate findings from gathered data sources. Cresswell (2003) lists eight strategies that may be used to increase the accuracy of research findings: “triangulate”, “member-checking”, “rich, thick description”, “bias”, “negative or discrepant information”, “prolonged time”, “peer debriefing”, and “external auditor” (p. 196). This research explored the possible relationships between personal concerns during the process of change and individual learning patterns. In order to report findings accurately, 4 of the 8 strategies were employed. First, data from the Stages of Concern profiles, Learning Combination Inventory, survey questions on the SoCQ, and personal interviews were used “to build a coherent justification for themes” (Cresswell, 2003, p. 196). Second, many individual quotes throughout the findings provided a rich description and emphasized themes between the data sources. Third, I discussed a personal bias regarding the research site and in-depth knowledge of the technological innovation (RenWeb). Finally, throughout the research process, I consulted experts knowledgeable about the research instruments used. Dr. Gene Hall, one of the creators of the Concerns Based Adoption Model, provided valuable insights into using and interpreting the Stages of Concern Questionnaires and profiles. In addition, Dr. Edith Rusch shared her extensive knowledge as a Let Me Learn Process© facilitator to interpret and explain the Learning Combination Inventory results.
Summary

This research lent itself to an explorative qualitative single site case study based on the limited population, in-depth focus on a single process within a limited context, and the emergent nature of data collection and analysis. Data sources included demographic data, surveys, interviews, and research instruments (SoCQ and LCI) with established validity and reliability to collect data related to concerns about change and individual approaches to learning. The goal was to explore insights into individuals’ metacognitive resolutions of personal concerns related to change during the third year of implementation of a technological innovation.

The next chapter provides findings and analysis of the data followed by a concluding chapter that discusses the findings, critiques and explores implications of the research, and suggests possible areas of future research.
This study investigated the concerns educators experience during the third year of the implementation of a technological innovation, specifically RenWeb, an integrated web-based student information system. An effort was made to find a deeper understanding of how to engage individuals in ways that alleviate concerns. Researchers suggest, “although personalized interventions can facilitate change, in the end individuals determine for themselves whether or not change will occur” (George, Hall, & Stiegelbauer, 2006, p. 9). The researchers also noted that it is not the administrator’s role to manipulate teachers into accepting change; their studies found “how effective it can be to recognize the inevitable presence of concerns within individuals and to extend a helping hand to assist in coping with and resolving those concerns” (p. 9). Therefore, this research used a snapshot of a school during the third year of the implementation of a technological innovation to investigate teacher concerns during the process of change and search for the missing piece(s) that encouraged individuals to address those concerns.

The focus of this exploratory research examined the following questions:

1. How does individual and group knowledge of learning patterns foster increased communication about concerns related to organizational change during the third year of implementation of a technological innovation?

2. In what ways do stages of concern in the third year of the implementation of a technological innovation relate to an individual’s approach to learning?
3. Does individual knowledge of one's personal approach to learning support resolution of concerns in ways that facilitate the implementation of a technological innovation?

In order to explore the process of change and possible effects of metacognition, data were gathered from several sources; research instruments, surveys, and interviews. Several survey questions included in the Stages of Concern Questionnaire (SoCQ) gathered personal demographic information (length of time teaching, time in current position, grades/levels taught), information about RenWeb use (length of time using RenWeb, features of RenWeb used, perceived level of expertise), and preliminary learning preferences (types of training used to learn about RenWeb, and trainings believed to be most beneficial). The SoCQ also provided more information about concerns teachers had during the third year of implementing RenWeb by creating a concerns profile for each teacher. Teachers completed an additional research instrument, the Learning Combination Inventory (LCI) online, providing insight into each teacher’s personal learning patterns and approach to learning. The responses to the general survey, SoCQ and LCI provided the basis for interview questions. The remainder of this chapter explores and analyzes the three research questions.

**Question 1**

Communication is an important component in addressing concerns during the process of change. Hall and Hord (2011) argue that interventions themselves “are key to the success of the change process” (p. 11-12). Interventions are described as “any action or event that influences the individual(s) involved or expected to be involved in the process or the change process itself” (Hall & Hord, 2006, pp.185-187). In the pilot study
described in the previous chapter, all staff members participated two workshop trainings, the most common type of intervention, prior to implementing RenWeb. As the main facilitator, I worked with teachers and staff over the next several years and was often frustrated by teachers that needed repeated help and continued resistance by others. It almost seemed like we were speaking different languages. Finally, after a Let Me Learn© workshop led by Dr. Edith Rusch, teachers felt validated that they finally had the language to explain how they learn and realized that people have different learning patterns. As a facilitator, I used that knowledge to provide teachers with the information they needed without causing further frustration.

How does individual and group knowledge of learning patterns foster increased communication about concerns related to organizational change during the third year of implementation of a technological innovation? Since many educators are busy, I wanted to use a faster, easier way to provide information about learning patterns. So, instead of attending a half-day workshop, participants took the online Learning Combination Inventory and were immediately provided personal results and a website to research more information about learning patterns (www.letmelearn.org). Data that provided insight into this question came from the following interview questions.

1. Have you looked for any more information about your learning patterns from the website provided with your results?

2. Tell me about any conversations you have had with your fellow teachers about the Learning Combination Inventory results.

Analyzing 11 interview transcripts revealed that most of the participants read the personalized Learning Combination Inventory provided after the survey and a few
printed them out. Although several of the interviewees commented that the learning patterns were interesting and the explanation of their learning patterns on the report described the way they learn, none of them looked for more information online. When asked if there were any discussions about the LCI, most of the participants said no. One participant stated, “No, I was really surprised.” Another participant responded that people just asked about each other’s learning patterns, but did not discuss it further.

I thought providing teachers with information about their learning patterns by completing a short, easy inventory online would stimulate conversations, however that was not the case. In fact, one teacher agreed and was “really surprised” when there was very little discussion about learning patterns. One reason may have been the limited amount of time participants had to process the information and the many tasks they needed to finish during the teacher in-service the rest of the day.

In this research, curiosity alone was not enough to create a learning environment. Silverberg (2006) describes the LCI as a “vehicle through which a learner can communicate his or her natural learning process” (p. 51). However, it seems that teacher curiosity and providing basic information from the LCI report was not enough to encourage spontaneous communication or change the patterns of communication within an organization. The data revealed in this research suggest that people need more time and support to use knowledge of their learning patterns to increase communication. Silverberg describes that putting the LCI into action usually begins with a 2-hour workshop on the Let Me Learn Process© followed by more intensive training for interested teachers.
Question 2

The main focus of this question was to determine in what ways an individual’s Stages of Concern in the third year of the implementation of a technological innovation related to their approach to learning. Data for this research question were gathered through the online Stages of Concern Questionnaire (SoCQ) hosted by www.sedl.org, demographic questions on the SoCQ, the online Learning Combination Inventory (LCI) hosted by www.LCRinfo.com, and personal interviews. Results from the SoCQ and the LCI were analyzed in a variety of different combinations. First, a general explanation of the Stages of Concern profiles through the self-reported level of experience, and years using RenWeb provide a foundation for the remaining graphs. Next, the Stages of Concern groups are described in greater detail to provide a foundation to explore the possible relationships between Stages of Concern and learning patterns. Finally, the Stages of Concern profiles are examined through the lens of the LCI groups.

In order to fully understand the following graphs and analysis, it is important to have a conceptual understanding of the Stages of Concern profiles and the Implementation Bridge (Hall & Hord, 2011). George, Hall, and Stiegelbauer (2006) describe the Stages of Concern profiles of users as they move from “nonuser” to “renewing user” as a hypothetical “wave” (p. 36-37) that begins with an individual with higher Stage 0 Awareness (changed to Unconcerned in Hall & Hord, 2011), Stage 1 Informational, and/or Stage 2 Personal concerns. As the individual becomes more familiar with the innovation and earlier concerns are addressed, their Stage 3 Management concerns are higher which is representative of an “inexperienced user.” Finally, as individuals become “experienced users” and “renewing users,” their profiles
peak at Stage 4 Consequence, Stage 5 Collaboration, and/or Stage 6 Refocusing. This demonstrates a wave moving left to right across the Stages of Concern profile.

Figure 2 shows the self-reported level of experience of teachers at the research site. All teachers seemed to be more concerned with other things than using RenWeb as explained by the high Stage 0 Unconcerned scores. As would be expected from the Stages of Concern wave motion, of the three groups, it is the Novice users that had the most intense Stage 3 Management concerns and wondered, “How do I use this and find the time to use it?” Intermediate users still had some Stage 3 Management concerns, while the Old Hands had lower concerns in general. The higher Stage 5 Collaboration concerns usually indicate an individual is a facilitator or trainer for the innovation. After examining the demographic questions from the SoCQ, it was determined that 3 of the 5 people in this group had been using RenWeb for 4 or more years (although the school had only used it for three) that help other teachers on a regular basis; one of these users was an administrator. It is interesting that all three groups have low Stage 4 Consequence concerns, which might imply little concern about the impact of RenWeb on students.
Figure 2. Self-Reported Level of Experience. Stages of Concern average profiles for participants based on their self-reported level of experience with RenWeb.

The average Stages of Concern for participants based on the amount of time they had been using RenWeb is represented in Figure 3. As would be expected of a Novice user, the one person that had used RenWeb for 4-6 months had a high Stage 0 Unconcerned score (more concerned about things other than RenWeb) and high Stage 1 Information and Stage 2 Personal concerns. This individual was looking for more information about RenWeb and stated in the comment section, “I have learned the basics of Renweb through a lot of trial and error … I frequently find myself asking for help from fellow colleagues.”

The first year users had the highest Stage 0 Unconcerned score (again indicating higher concerns with things other than RenWeb) and high Stage 1 Information, Stage 2
Personal, and Stage 3 Management concerns. This pattern is typical of early users as they continue to get more information about using RenWeb and actually begin putting that knowledge into use. Often, during this stage, users are concerned with finding the time to use RenWeb and figuring out exactly how to make it work for them. Several participants in this group expressed concerns about being the system being “slow to load”, or technical problems like “being kicked out of the system and not saving the items I was working on” and “how to recover data” that is lost.

The two 2-year users had more intense Stage 3 Management concerns and were “tailing up” on Stage 6 Refocusing, which suggested some frustration with management of RenWeb. This profile is the characteristic “Big W”, which usually “indicates some ideas are strongly held about what ought to be done differently … that are related to the very high (and unresolved) Stage 3 Management concerns” (Hall & Hord, 2011, pp. 81-82). One user stated

[There are] glitches in the technology. Students are not able to get on at times. There are some inconsistencies in how things have been inputted between the teacher view and the students view. The difference between the PC versions and the MAC (via internet) is annoying and time consuming

The other user in this group stated she felt “a little left behind [because] I was unable to go through all the training offered to teachers when I was first hired.” In addition, “Taking attendance is not as accurate as needed and takes up a great deal of my time that could be better used on teaching and other interaction with students, in my opinion.”
The people in the 3-years user group and 4 or more years user groups were very similar with the exception of Stage 6 Refocusing. The 3-years user group had some ideas about using RenWeb, most of which revolved around the lesson plan feature. One user stated, “Lesson plans for specialists at the elementary level are more time intensive when doing individual classes. Could there be a way to enter lesson plans by class for the year rather than formatting each week, day by day?” Another added, “I would like to have the lesson plans changed so that they can be printed in the order that I teach them. There are too many tabs that are redundant.” Another user expanded on those ideas and suggested “that the set up could be better and more functional for teachers. I would also like to see the ability to quickly and easily shift lessons from one day to another without having to put in a specific day.”

Finally, the people that had used RenWeb 4 or more years had higher Stage 3 Management and Stage 4 Collaboration concerns. One interviewee stated she wanted more information about RenWeb “so I can figure out how to help somebody else if they need [it].”
Figure 3. Time Using RenWeb. Stages of Concern average profiles for length of time using RenWeb.

Another important concept to understand the following graphs is the Implementation Bridge (see Figure 4, used with permission of Dr. Gene Hall). As Figure 4 shows, there is a huge “chasm” between the “Current Practice” and the “Changes in Practice.” Hall and Hord explain, “Each member of the organization has to move across the Implementation Bridge. As they learn to change their practices, there can be changes in outcomes” (2011, p. 10). According to the authors, “if it takes three to five years to implement new practices to a high level, then it is highly unlikely that positive increases in outcomes will occur during the first or second year of implementation” (Hall & Hord,
For that reason, this research focused on a school during the third year of implementation of an innovation.

If individuals are asked to make the “Giant Leap”, “they are being directed to improve outcomes without any support for learning how to change their current practices, and thus improve” (Hall & Hord, p. 10). Many researchers stress that change is a process that takes time and support (Hargreaves, 2001; Evans, 1996; Fullan, 2008; Hall & Hord, 2006; Heifetz, 1994). The Stages of Concern Questionnaire is an assessment tool that can be used to help individuals move across the Implementation Bridge (Hall & Hord, 2011) by exploring and addressing individual’s concerns.

![Giant Leaps](image)

**Figure 4.** Implementation Bridge (used by permission by Dr. Gene Hall).

**Stages of Concern Questionnaire groups.**

The Stages of Concern Questionnaires were analyzed and placed into five groups based on similarities of the profiles and the perceived relative progress across the
Implementation Bridge (Hall & Hord, 2011). The average Stages of Concern profiles for each SoCQ group are shown in Figure 5. Analysis of the individuals within each SoCQ group is discussed in the following sections. Movement across the Implementation Bridge (Hall & Hord, 2011), as well as through the “wave” profile pattern, may be influenced by other factors than time using the innovation and may change over time or seem to regress if other concerns or issues have a higher priority than the implementation of the innovation.

Figure 5. SoCQ Groups. Average Stages of Concern profiles for the SoCQ groups and the number of people in each group.

A brief overview of the SoCQ Groups graph (see Figure 5.) shows that overall, the average Stages of Concern profiles for participants at this school had a higher Stage 0
Unconcerned score (meaning they were more concerned with things other than RenWeb) and very low Stage 4 Consequence concerns. The data suggest that the teachers may not directly relate the use of RenWeb with an impact on students. The “wave” pattern discussed in the previous section can be seen by the relative heights of secondary peaks. Group 1 had higher Stage 2 Personal concerns; Group 2 had higher Stage 3 Management concerns with declining Stage 6 Refocusing concerns; Group 3 had higher Stage 3 Management concerns with an increase in Stage 6 Refocusing concerns; Group 4 had lower intensity concerns overall with a slight increase in Stage 6 Refocusing concerns; and finally Group 5 had higher Stage 5 Collaboration concerns, with some Stage 1 Information concerns and trailing off on Stage 6 Refocusing concerns. Each group is discussed in greater detail below.
SoCQ Group 1.

This group was at the beginning of the Implementation Bridge (Hall & Hord, 2011) and had the profile of a non-user with a negative one/two split (see Figure 6). This means they had higher Stage 2 Personal concerns and somewhat lower Stage 1 Informational concerns. Many times people with this profile have “various degrees of doubt and potential resistance to an innovation” (George, Hall, and Stieglbauer, 2006, p. 40). Even though, Stage 3 Management concerns were not high, during the interviews, several individuals reported specific Stage 3 Management concerns with RenWeb. One
participant was frustrated with being “booted out the system a few times before I was ever able to save anything”. Another user agreed, “it tends to drag or crash when entering grades and all the time spent is lost.” One user summed it up with the comment “it is really a pain when it goes down.”

Some of the participants had ideas to make RenWeb better (the slight “tailing up” on Stage 6 Refocusing concerns). An administrator noted, “I would like to see the different quarters in color so it would be easy for the parents, teachers, students and administration to see the different quarters … also when printing out demerits for each quarter.” Another user expressed her concern about the impact of RenWeb on students, “I would just like to know how to motivate parents to actually use RenWeb (students too!).” The overall theme of discontent about the lesson plan feature was reiterated by a user in this group, “I would change their lesson plan lay out … [to] be better and more functional for teachers.” Of the eight people in this group, two participants had used RenWeb for 1-year or less and the others had used RenWeb for the 3-years the school had been using it.

A profile like the one seen in Group 1 is typically expected for beginning users, but seldom found for users after the third year of implementation of an innovation. A closer look at the answers to the demographic questions as well as the interviews provided some insights about the individuals in this group. The only person who reported her/himself as a novice user had used RebWeb for 6-months, one person reported being an “old hand”, while the rest of the group described themselves as intermediate users. During a personal interview, one participant stated that she had used RenWeb for 3-years, however she worked in the library the first year of the program’s use and did not receive much training. According to her, she and the other librarian “kind of muddled through it
together.” The following year, she moved into the classroom and had to begin learning new features. This would explain her inclusion in this group.

Another participant stated in an interview that she was part of the administrative team and was very busy with all of her duties as well as teaching a class at school. This accounts for her high Stage 2 Personal concerns and inclusion in this group. Another participant that was interviewed had some low intensity Stage 2 Personal and Stage 3 Management concerns. During the interview she explained that she did not have many concerns about RenWeb, and considered herself an “old hand” and stated it was “very, very user-friendly.” She really liked RenWeb, but “would recommend that they make adjustments … [to] the layout of their lesson plans.” The SoCQ is a tool to provide insight into an individual’s concerns, but sometimes it does not provide a complete picture of an individual. Based on some of the responses noted above, it is clear that demographic data and interviews are critical to leaders of change so they can confirm or revise practices based on actual concerns.
SoCQ Group 2.

This group (2) had high Stage 3 Management concerns (see Figure 7). Stage 5 Collaboration concerns were increased in 3 out of 5 participants in this group. Out of the five, two were self-reported novices, two were intermediates and one was an “old hand” (that used RenWeb at another school before joining this school). One teacher, that considered herself a novice with more than 20 years teaching experience and 4-years RenWeb experience, wrote “I hate to tell you I just don’t care about it … my time is completely occupied with teaching, coordinating, testing, writing IEP’s and holding IEP meetings, etc.” This individual’s profile showed a person that was extremely
unconcerned with using RenWeb and very concerned with the management aspects of having to use it. Several people had some Stage 5 Collaboration concerns along with the Stage 3 Management concerns that may suggest that they were working with other teachers to figure out how to best use the features of RenWeb or find the time to do what they needed to do. The one interview from this group expanded on her high Stage 3 Management concerns, “I’ve learned a lot of things, but the technical stuff just throws me.”

SoCQ Group 3.
The six people in Group 3 had high Stage 3 Management concerns and all had various degrees of Stage 6 Refocusing concerns (see Figure 8). Based on the relative height of the Stage 3 Management and Stage 6 Refocusing concerns, this group may have been frustrated and have ideas to change RenWeb. Several people commented on problems they experienced with lesson plans. One wondered, “Lesson plans for specialists at the elementary level are more time intensive when doing [an] individual class. Could there be a way to enter lesson plans by class for the year rather than formatting each week, day by day?” Another agreed, “[This is] not user friendly. Lesson plans are difficult to use in the classroom. Grade book can be difficult to navigate.” Still another expressed, “I do not like how we have to cut and paste lesson plans, it should be simpler. I also do not like how the lesson plans print up; they don’t flow well for me.” Some teachers were not sure what features of RenWeb they had the security rights to use. I would like to be able to copy and paste a whole list of grades from one assignment to another. I’m not sure what I have access to as a regular teacher. Since I teach multiple grade levels and deal with extra curricular activities with students, I’d like to be able to check grades in other subjects. I’m not sure if I’m able to do that.

Another agreed, “I want to be able to check the academic progress on some students in order to make a determination to participate in extracurricular activities.”

One participant in this group stated that she had a concert the day after she took the SoCQ and the LCI and her brain was “just music” until it was over. It is understandable that she had high Stage 3 Management concerns while she was
completing the questionnaires. In order to move from an intermediate user to an “old hand” she stated that she could use more “help with shortcuts as far as lesson plans, entering lesson plans and moving them from one class to another class because a lot of the elementary, do the same stuff, so, it would be a lot easier than having to retype.” Another interviewee from this group really wanted to improve RenWeb by adding a copy feature, either one that copied a set of grades from one class to another or one that “just [copies] and pastes onto a Word document.”

SoCQ Group 4.
This Group 4 (see Figure 9) had overall lower intensity profiles and might not be as frustrated with RenWeb as the individuals in Group 3. They had ideas on how to improve RenWeb, based on the tailing up of Stage 6 Refocusing. One teacher described a technical issue, “There are some inconsistencies in how things have been inputted between teacher view and the student’s view. The difference between the PC versions and the MAC (via internet) is annoying and time consuming.” Another teacher had ideas to improve the lesson plan feature;

I would like to change the way lesson plans are printed. At this time they are only printed in alphabetical order and I would like for them to print out in the order I teach the subject matter. There are too many tabs that are repetitious or that we can’t access. The lessons should automatically archive.

This same idea was expressed by another teacher, “I don’t like the detailed lesson plan portion of the program. One must click on each tab to put in the details. I would like to see it all on one page.” Both of the interviews from this group reflected low intensity concerns except for the “tailing up” on Stage 6 Refocusing. They both had ideas on how to use RenWeb better. One of the teachers had only used RenWeb for 2-years, but felt very comfortable using it. She was very concerned with “making things easier for teachers, I like to help them out in whatever way I can … so that they’re not doing more work than they need to with RenWeb.”
SoCQ Group 5.

Figure 10. SoCQ Group 5 individual profiles identified by the SoCQ identification number and LCI group.

This Group 5 (see Figure 10) was the farthest along the Implementation Bridge (Hall & Hord, 2011) and all had high Stage 5 Collaboration concerns (working with others or coordinating the use of RenWeb with others). Of the four people in this group, three were facilitators in charge of training the teachers and providing technical support to all school staff. The last person in this group used RenWeb for 9-years and stated that she would like “training [about] how I can be useful helping other teachers use RenWeb.” The people in this group had more positive comments than the other groups. That same teacher believed “RenWeb is very easy to use and the help guide explains things well.” An administrator stated, “Online tutorials are helpful and Webinars are great.” Even a
concern was stated more positively. An administrator expressed, “I’d love a cheat sheet that tells me how to do certain things.” The only negative comment by a facilitator was related to creating lesson plans, “The RenWeb help instructions for creating and copying Master Lesson Plans were confusing and did not have enough detail.”

Each of the three interviewed from this group were very involved with helping other people learn about RenWeb and they all thought RenWeb was a great program that was easy to use-- especially for people who liked to figure things out on their own. Their response and viewpoints led me to speculate if these people were more positive about RenWeb because they were farther along the Implementation Bridge (Hall & Hord, 2011) and were comfortable using the features of RenWeb and knew how to get more help if needed. The data indicated that individuals in this group tried to figure things out on their own, or go to the online help areas, or read online manuals. If they still had problems the administrators in the group often contacted RenWeb technical help by phone or email.

Learning Combination Inventory groups.

Data from the Stages of Concern Questionnaires revealed that many individuals thought about changes to RenWeb (as evidenced by the higher Stage 6 Refocusing concerns) or ways to learn about RenWeb. Hall and Hord (2011) stress “to make things better (improved) in the family setting, in the marketplace, and in the classroom, change is introduced and learning makes it possible to make the change” (p. 6). So this research included the use of a learning inventory in an attempt to explore any relation between an individual’s concerns during change and their learning patterns. The Learning Combination Inventory created individual learning patterns that were placed into groups based on the similarities. A brief overview of the four main learning patterns and a
description of each group provide a foundation for understanding the following graphs.

Silverberg, (2006) an educator who has used the LCI extensively, provides these learning pattern definitions:

Sequence - The process of organizing and planning; seeking order and consistency

Precision - The process of using information and words, detail-oriented, seeking confirmation or what is valid, right and/or true

Technical Reasoning - The process of hands-on, active, autonomous problem solving, seeks real-world relevance and the time and space to figure things out

Confluence - The process of generating ideas, reading between the lines, and making connections; comfortable with taking risks, trying and failing and trying again; seeking to do it “my own way” (pp. 50-51)

Silverberg (2006) explains “the four patterns work interactively as a team to form the internal voice of our metacognition” (p. 51). As explained in the previous chapter, the individual LCI reports were examined and placed into groups based on the prominent learning pattern combinations (see Table 2). Figure 11 shows the average Stages of Concern profiles for each of the LCI groups, defined below.

LSAC – lead with Sequence and Avoid Confluence
LSNA – lead with Sequence and no Avoid Patterns
LCAS – lead with Confluence and Avoid Sequence
LP – lead with Precision
LT – lead with Technical
SW – Strong Willed - meaning 3 or more Use First patterns

B – Bridge learners – meaning 3 or more Use as Needed patterns

Figure 11. LCI Groups. Average Stages of Concern profiles for the LCI groups and the number of people in each group.

After each LCI group graph, the individuals represented on the graph are described to provide a “story” about each LCI group and to explain the Stages of Concern profiles through the lens of the learning patterns.
**LCI group LSAC.**

![LCI Group LSAC](image)

**Figure 12.** LCI Group LSAC (Lead Sequence, Avoid Confluence) individual profiles identified by the SoCQ identification number and SoCQ group.

**Table 3.** Learning Combination Inventory LSAC Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Use First)</td>
<td>Clear directions</td>
<td>Taking risks is foolish</td>
</tr>
<tr>
<td>Time-by-step directions</td>
<td>Rather NOT make mistakes</td>
<td></td>
</tr>
<tr>
<td>Work neatly</td>
<td>Careful and cautious</td>
<td></td>
</tr>
<tr>
<td>Want to meet expectations</td>
<td>Don’t take social risks</td>
<td></td>
</tr>
<tr>
<td>Avoid improvising</td>
<td>Avoid improvising</td>
<td></td>
</tr>
<tr>
<td>Seek parameters</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The LSAC group leads with Sequence and avoids Confluence (see Table 3). This learning pattern group (see Figure 12) is often frustrated by collaboration; two group members had relatively higher Stage 2 Personal concerns (SoCQ group 1) and two had
very high Stage 3 Management concerns. People that lead with Sequence want very clear, step-by-step directions and become frustrated if they do not have it. Participant responses to the query about what makes assignments frustrating validated their LCI score. Their comments clearly indicated the importance of information. One noted, “not enough info.” Another said “feeling like I don’t have enough information to complete them.” One teacher was frustrated “when we don’t know all of the directions” an another “when I do not understand the directions or what is expected of me.”

Two of the participants (6450 and 6451) team-teach first grade. As they answered the question on the LCI, one participant kept asking her teaching partner what she should answer because her “partner does all of the thinking in their group.” It is interesting that their LCI and SoCQ groups are the same. People tend to gravitate to and find comfort in working with those who are most like them. Those who have oppositional patterns most often frustrate them.

One participant (6454) was selected to participate in the interview and did not respond to the emails or requests from her principal to participate in the interview. Her answers on the LCI were very short (“not enough info … no … reading … by techniques”) as were her answers on the SoCQ (“n/a, with others, with others, with others”). The low intensity levels for this participant are unusual. She was placed in SoCQ group 1 because of the relatively higher Stage 1 Information, Stage 2 Personal, and Stage 3 Management concerns. The final participant (6430) agreed to a personal interview. The first year the school used RenWeb, she was working part-time in the library and only “gathered information from RenWeb to put into the library program.” She learned what she needed from the other librarian and as noted earlier, she said they
“kind of muddled through it together.” At the beginning of the second year of the school implementing RenWeb, she unexpectedly went into the classroom 2-weeks before school started. The computer teacher had a class for all of the new teachers to help them set up their grade books and input lesson plans. When asked how she learns something new she stated

I give it to God…He gives me peace and I know somehow I will get through it…. My initial reaction is panic, confusion, but then, I just try and look at it, … from God’s perspective and logically – I would just start walking. I just take a first step and then I find out if my steps are right and retrace my steps and take more steps and little by little [I get there].”

The librarian that she worked with once stated “Ah, you’re list-maker” (representative of people that lead with Sequence) and the interviewee responded, “So, I gathered that ah, she’s not.”
LCI group LSNA.

![LCI Group LSNA](image)

Figure 13. LCI Group LSNA (Lead Sequence, No Aviods) individual profiles identified by the SoCQ identification number and SoCQ group.

Table 4. Learning Combination Inventory LSNA Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSNA Lead Sequence, no Avoid</td>
<td>Clear directions</td>
<td>No Avoid Patterns</td>
</tr>
<tr>
<td></td>
<td>Step-by-step directions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time to do work neatly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work without interruption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Want to meet expectations</td>
<td></td>
</tr>
</tbody>
</table>

Group LSNA leads with Sequence and does not have any patterns in the Avoid range (see Table 4). The similarity between the individuals in this group (see Figure 13) and the previous group (LSAC) was the strength of the Sequence process. The difference
between the two groups was that in this group all of their other patterns fall close to or in the Use as Needed category. Individuals in this category have a very high need for order, clear directions, and information. There were no Avoid patterns in this group, meaning if one way of learning something is not working, they can use other patterns to learn, reducing the concerns they have. The participants in this group answered the question: “What makes assignments frustrating to you?” very similarly to the LSAC group. One teacher was frustrated when he/she feels “pressure or not feeling like I have sufficient time to complete the task.” Another teacher noted a “lack of definition” while another teacher described frustration as “not enough clarity or information.” The last teacher concurred that “unclear directions/mixed messages” cause frustration.

A unique observation about this group is the relatively low intensity Stage 0 Unconcerned scores. This usually “indicates an experienced user who is still actively concerned about the innovation [RenWeb]” (George, Hall, and Stiegelbauer, 2006, p. 53). This is partially explained by the amount of time everyone in this group had used RenWeb, at least 3-years. Even though one person (6457) had only been at the school for 2-years, she used RenWeb at another school previously. She did not have many concerns about using RenWeb since she considered herself an “old hand”, so her relatively high Stage 3 Management concerns may be related to finishing her second year at this school. In addition, people that lead with Sequence are very concerned about doing things correctly, which may account for the importance placed on RenWeb as seen in the low Stage 0 Unconcerned scores.

One person in this group (6444) led with Sequence and had Precision right behind it. While taking the SoCQ and LCI, I spent more time with him than any other
participant. He needed step-by-step instructions on how to log onto the computer, get to the website and enter the information to get to the surveys. After I gave him a couple of instructions that he subsequently followed, he asked me to help him get to the next step. After going through the SoCQ, he was automatically sent to the website for the LCI. He did not successfully complete the login process and had to use three different email addresses to finally create a profile and take the LCI. His answers to the demographic questions were very short.

One of the interviewees for this group (6447) seemed to have a profile for a person that was new to using RenWeb (SoCQ group 1). Part of that assumption was due to the relatively high level of Stage 0 Unconcern for RenWeb and relatively low intensity of Stage 1 Information, Stage 2 Personal, and Stage 3 Management and even lower intensity of Stage 4 Consequence, Stage 5 Collaboration and Stage 6 Refocusing. During the interview, she stated that she is “comfortable with [RenWeb], very comfortable, because I’ve been using it … from the beginning.” Sometimes Stages of Concern profiles may be similar and additional information may be needed to accurately assess an individual’s concerns.

The other interviewee for this group (6456) was part of the administrative team that implemented RenWeb and used RenWeb as a teacher and an administrator. When she first started using RenWeb, she called technical support because “you have such easy access to the RenWeb technical support system. And now that I’ve been on it for a while, I sometimes just play with it to see what I can get accomplished.” She considered herself an intermediate user because “I know how to navigate [RenWeb] pretty well myself,” but doesn’t know “every single thing in RenWeb.” She was placed in the SoCQ 1 because of
her relative low Stage 0 Unconcern score and high Stage 2 Personal concerns. During the interview, it was obvious that she was very busy. “There are so many things going on… I’m very, very, busy… I’m constantly trying to document things … constantly putting in demerits … then I’m getting paperwork to the parents and writing letters … yeah, I’m very busy.” She was one of the few people that talked about the consequences of using RenWeb for parents and students. “I liked how information would get to the parents quicker than what we were [using] before. [Renweb provides] more communication with parents, on a day-to-day basis [including] grade input…they would see it right away.”

*LCI group LCAS.*
The LCAS group leads with Confluence and avoids Sequence (see Table 5).

Management is hard for people that lead with Confluence since they don’t like doing the same thing over and over and they don’t want to follow the rules. All three people in this group lead with Confluence (see Figure 14). Participant number 6460 also avoids Sequence and wanted to do things her way. She had a very high Stage 0 Unconcerned score, meaning she was more concerned with other things than with using RenWeb. On the SoCQ, when asked to share any concerns she had about RenWeb, she answered “I hate to tell you I just don’t care about it. I am the intervention teacher. Therefore, my time is completely occupied [with] teaching, coordinating, testing, writing IEP’s and holding IEP meetings, etc.” She had high Stage 3 Management concerns because she was required to use RenWeb, but was busy with other aspects of her job.

Participant number 6464 had used RenWeb for 2-years. She had a Sequence score that was almost in the Avoid range. She had a mid-range score for Stage 0 Unconcerned, which means she was somewhat concerned with learning more about RenWeb, probably since she had not used RenWeb as long as the other teachers. On the SoCQ she stated, “I was unable to go through all the training offered to teachers when I was first hired, and
feel left behind, a little bit.” She also had high Stage 3 Management concerns which is typical for someone that had only used RenWeb for 2-years, but expressed that things could be better. “Taking attendance that is not as accurate as needed takes up a great deal of my time that could be better used in teaching and other interaction with students, in my opinion.” This is a typical response for people that lead with Confluence. They are easily frustrated by repetitive tasks that must be performed in a specific manner.

The last participant in this group (6455) had only been teaching for 3-4 years and had been at this school using RenWeb for 1-year. His Confluence and Precision scores were in the Use First range. Although he had only used RenWeb for a short time, he was in the SoCQ group 4 because of his high Stage 0 Unconcern about using RenWeb and the same level of intensity for Stage 1 Information, Stage 2 Personal, and Stage 3 Management concerns. The only concern he stated about RenWeb was that it was “slow to load.” He preferred to learn one-on-one or using the manual to teach himself. His answers were very short and his SoCQ profile shows that he may have ideas for improvement, but he did not state anything on his SoCQ and was not randomly selected for an interview.
Figure 15. LCI Group LP (Lead Precision) individual profiles identified by the SoCQ identification number and SoCQ group.

Table 6. Learning Combination Inventory LP Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP Lead Precision</td>
<td>Want complete and thorough explanations</td>
<td>Use Other Patterns</td>
</tr>
<tr>
<td></td>
<td>Ask a lot of questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like to answer questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Need to be accurate and correct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like test results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seek written documentation of success or failure</td>
<td></td>
</tr>
</tbody>
</table>

Group LP leads with Precision and uses other patterns as needed (see Table 6).

People in this group like to have a preponderance of information; in fact, individuals with
a high Precision score often spend more time gathering information and then have trouble managing everything. In this group (see Figure 15), two of the teachers had used RenWeb for 3-years and were in the SoCQ Group 3 because of their relatively high Stage 3 Management concerns. Accuracy and a need to be ‘right’ is also a manifestation of Precision, which requires time and effort. These two teachers had ideas to improve how they do things (higher Stage 6 Refocusing). One stated, “lesson plans for the specialists at the elementary level are more time intensive when doing individual classes. Could there be a way to enter lesson plans by class for the year rather than formatting each week, day by day?” The other one wrote “I would like to be able to copy and paste a whole list of grades on one assignment to another. … I’d like to be able to check grades in other subjects. I’m not sure if I’m able to do that.”

The third person in this group was an administrator that had only been at the school for 1-year. She was concerned with collaborating with and teaching others how to use RenWeb (higher Stage 5 Collaborating). In addition, she was more concerned with how RenWeb impacts students than the overall school average. On the SoCQ she wrote, “I’d love a cheat sheet that tells how to do certain things. [For example], I would like to print a report that gives students grades in all classes.”
LCI group LT.

Figure 16. LCI Group LT (Lead Technical) individual profiles identified by the SoCQ identification number and SoCQ group.

Table 7. Learning Combination Inventory LT Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Technical</td>
<td>Don’t like to write things down</td>
<td>With other Patterns</td>
</tr>
<tr>
<td></td>
<td>Need to see the purpose of what they are doing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work independently</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Figure how things work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t like to use a lot of words</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Look for relevance and practicality</td>
<td></td>
</tr>
</tbody>
</table>

The LT group leads with Technical Reasoning and uses other patterns as needed (see Table 7). Of the three people in this group, two had Technical and Sequence as Use
First and Precision and Confluence Use As Needed. The third one had Technical Use
First and the rest Use As Needed. People with this combination of learning patterns work
well one-on-one and have ideas on how to solve problems. When asked what makes
assignments frustrating, individuals in this group’s view of directions were very different
than those participants who have high Sequence. One noted the frustration of
“unnecessary steps” while another answered with, “Being told the assignment can be
done in your own way but having it be redirected to meet what the leader wants.”

There were two interviewees for this group. Both were in the SoCQ group 4 and
had similar profiles (6448 and 6432). Number 6432 was more interested in collaborating
with others (higher Stage 5 Collaboration). In her interview she stated “I try to help
[teachers] so that they’re not doing more work than they need to with RenWeb …making
things easier for teachers, I like to help them out in whatever way I can.” When asked
how she learned to use RenWeb, she explained that she had a training session, “then I just
played around with it to figure things out that I needed to.” She also added, “I don’t like
to read manuals or anything like that, and if there is a picture example then I’ll … follow
that, but if it’s reading, I just don’t like to do it.” Her description of learning something
new is typical of a person that leads with Technical Reasoning, but is not typical of
teacher training.
**LCI group SW.**

![LCI Group SW](image)

Figure 17. LCI Group SW (Strong Willed) individual profiles identified by the SoCQ identification number and SoCQ group.

Table 8. Learning Combination Inventory SW Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW Strong Willed</td>
<td>3 or more Use First Patterns</td>
<td></td>
</tr>
</tbody>
</table>

The definition of a Strong Willed learner is a learner that scores in the Use First range in 3 out of the 4 patterns (see Table 8). Johnston (2010) states this learning pattern combination is “interesting and somewhat rare” (p. 47). People with this combination of
learning patterns also become impatient with other individuals who want detailed 
instructions, or who have trouble mastering the innovation. Since this was the largest 
group (see Figure 17), there were two SoCQ groups that had two or three people in them, 
so the people that were in the same SoCQ and LCI group were analyzed to explore any 
similarities between the smaller groups.

**LCI group SW and SoCQ 2.**

![Figure 18. LCI Group SW (Strong Willed) individual profiles identified by the SoCQ identification number and SoCQ Group 2.](image)

This Strong Willed LCI group and SoCQ group 2 had relatively high Stage 3 
Management and Stage 5 Collaboration concerns (see Figure 18). One person (6439) had 
only used RenWeb for 1-year and only taught for 1 to 2-years. She was self-taught and
stated she hadn’t “really gotten any” types of support in learning to use RenWeb. She thought the training that would be most useful to her would be “an online tutorial that is self-led … and if there already is one, I haven’t been told about it.” She went on to say that “[RenWeb] is user friendly when it’s working. I taught myself how to use it fairly quickly and it is helpful when parents complain about work or due dates for lazy kids and I can say ‘well, it’s been on RenWeb for [a number of] weeks now.’” The other two teachers had taught for over 11 years and had used RenWeb for the 3-years the school had used it. One said she still considered herself to be a novice (6445) and thought “any training would be helpful” but agreed with the last person (6442) that “one-on-one support from other teachers/staff” had been most useful in learning how to use RenWeb. This last teacher considered herself an intermediate user and stated that most of her learning about RenWeb was “done by trial and error” and would like a manual “for tasks done every once in a while.” Strong Willed learners can figure things out in different ways. When they are not able to use one pattern, they can easily switch to another.
Both participants in this group considered themselves an “old hand” at using RenWeb (see Figure 19). One (6433) had used RenWeb for 9-years even though she had only been at this school for 1-year. She had also been teaching for 5 to 10-years and had probably only used RenWeb during that time. In an interview she explained her low Stage 0 Unconcerned, high Stage 1 Information, and high Stage 5 Collaboration concerns: “I think just maybe [to learn about] more shortcuts on how to … set things up … so I can figure out how to help somebody else if they need … questions about something I don’t know how to do.” She stated “I love RenWeb … it’s easy for someone like me who likes to figure out how to do stuff on your own. It’s pretty easy to navigate
through.” The other participant was part of the administrative team that was in charge of implementing RenWeb. She had high Stage 5 Collaboration concerns because she was one of the main trainers when “a new teacher come[s] on board.” When learning something new she also liked to “try to figure it out myself first because that’s how I learn and that’s how I remember. But ... there are some things with RenWeb that you only do annually and so …you have to go back sometimes and reread the manuals ... or go through the tutorials or give [tech support] a call.”

*LCI group SW and SoCQ 1,3,4.*
Although this group of Strong Willed learners does not have a common SoCQ group (see Figure 20), there were some similarities between the Stages of Concern profiles in SoCQ groups 1 and 4. The main difference between the two was the intensity of Stage 6 Refocusing. The individual in the SoCQ group 1 had only used RenWeb for 4 to 6 months and had been in this position at the school for less than a year. She had been teaching for 5 to 10 years. Her Stage 1 Information, Stage 2 Personal, and Stage 3 Management concerns were about the same intensity. She was still looking for more information as stated on the SoCQ:

I feel as though there is probably a lot more I could be doing with the program. I believe with more training I could use RenWeb more effectively. I have learned the basics of RenWeb through a lot of trial and error. I frequently find myself asking for help from fellow colleagues. I would like to receive some training on how exactly I should set up grades. Does it matter if I make an assignment worth 10 points or 100 points?

The SoCQ group 4 individual had been teaching 11-20 years; she had been at the same position at the school for 3-years and had used RenWeb for 4-years. She was not selected for a personal interview, but shared an idea to improve RenWeb on the SoCQ:

I would like to change how lesson plans are printed. At this time they are only printed in alphabetical order and I would like for them to print out in the order I teach the subject matter. There are too many tabs that are [repetitive] or that we can't access. The lessons should automatically archive.

The SoCQ group 3 individual had a classic “Big W” profile that was discussed earlier. He had been teaching 5 to 10 years, five of which were spent at this school, but
had only used RenWeb for 1-year. His high Stage 0 Unconcerned showed that he was concerned with other things more than RenWeb. The high intensity of Stage 3 Management concerns explained that he was still working through the “How do I use it?” stage. Although he was not selected for an interview to provide more information about his high Stage 6 Refocusing concerns, it was obvious that he had ideas about RenWeb—either improving it, changing it, or using something different. He shared the following concerns on his SoCQ: “My main concern ... with RenWeb is being kicked out of the system and not saving the items I was working on ... [or recovering] lost data or saving options.”

*LCI group B.*
Figure 21. LCI Group B (Bridge) individual profiles identified by the SoCQ identification number and SoCQ Group.

Table 9. Learning Combination Inventory B Group, Title, and Description condensed from individual LCI reports.

<table>
<thead>
<tr>
<th>Group Title</th>
<th>Description Lead (Use First)</th>
<th>Avoid or Other Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Bridge</td>
<td>3 or more Use as Needed Patterns</td>
<td></td>
</tr>
</tbody>
</table>

By definition, Bridge learners have three or more use as needed patterns. These three bridge learners have all four patterns in the Use as Needed range. That means that they are able to use each pattern as needed and understand what helps themselves and others learn best. Since these individuals have no Use First processes, they have no strong volition to tackle a task one way or another. They tend to be group facilitators rather than group leaders. Johnston (2010) states “only 3 in 100 persons fall into this mix of Learning Processes” (p. 48). Participant 6438 was the computer teacher that had been in charge of helping teachers with implementing RenWeb since the beginning. During a phone interview she said when she had questions about RenWeb, she went on “their ‘Help’ area, online…[because] they have pretty good detailed instructions.” When she needed to teach others about RenWeb, she stated

I try to show it to them on the Smart Board or whatever first, and then let them play with it, because I find a lot – it depends on the person. A lot of times, they just want to do it. They don’t want to watch me do it first. So, it kind of depends on the person, especially with teachers.

Later in the interview she mentioned that she had teachers that liked to learn other ways. Some liked step-by-step instructions. When asked if she thought learning more about the teachers’ learning combination inventories would be helpful when she taught
the teachers new things, she responded, “Oh definitely, yes.” On her LCI results she stated that she is frustrated by “not understanding directions” and she preferred to “demonstrate or write” something to show what she had learned.

Participant 6446 was a new teacher that had been using RenWeb for 1-year and considered himself an intermediate user. He learned how to use RenWeb “with individual help with school staff and self-taught without a manual.” He preferred to show what he had learned through discussions and would use a “hands-on” method of teaching others something new. His high Stage 2 Personal concerns were most likely related to the amount of time he had been teaching. He was in the SoCQ group 1 along with participant 6452, who had been using RenWeb 3-years, but still had some Stage 1 Information, Stage 2 Personal, and Stage 3 Management concerns. She also learned to use RenWeb with “individual help with school staff, self-taught without a manual” and since she had used RenWeb since the beginning she was in the small group meeting with a RenWeb technician. She was frustrated by “unclear directions and time limits” and preferred to demonstrate what she had learned. When teaching others she showed them and used hands-on methods. The three people in this group had very short answers on the LCI.

This question sought to explore the relationship between individuals’ Stages of Concern and their approach to learning that could be used by individuals themselves and facilitators during the implementation of a technological innovation. During the pilot study, knowledge and application of individual learning patterns after participation in the Let Me Learn© workshop helped both teachers and the facilitator address concerns about implementing RenWeb. George, Hall and Steigelbauer (2006) found in their studies “how
effective it can be to recognize the inevitable presence of concerns within individuals and to extend a helping hand to assist in coping with and resolving those concerns” (p. 9).

The Stages of Concern (SoC) profiles were analyzed in several ways. An overall analysis of the profiles based on self-reported level of use (see Figure 2) and time using RenWeb (see Figure 3) provided some interesting findings. First, as expected, the data gathered from the self-reported level of experience supported the “wave” progression of profiles as described by George, Hall and Steigelbauer (2006, p. 36-37). Second, on both graphs the Stage 0 Unconcerned was very high, usually “indicating that there are a number of other initiatives, tasks, and activities that are of concern to him or her … the innovation is not the only thing the respondent is concerned about” (George, Hall & Steigelbauer, 2006, p. 33). Third, both graphs show a very low Stage 4 Consequence, more noticeable on the self-reported level of use graph (see Figures 2, 3). This stage “focuses on impact of the innovation [RenWeb] on ‘clients’ in the immediate sphere of influence” (Hall and Hord, 2011, p. 73). In this case, the “clients” are the students. It seemed that most of the teachers did not see the impact using RenWeb had on students, or the benefit to them. One teacher, however, was concerned with the impact on students and stated, “I would like to know how to motivate parents to actually use RenWeb (students too!).”

Next, the SoC profiles were analyzed in SoCQ groups based on the relative distance across the Implementation Bridge (Hall & Hord, 2011). Data from the profiles, custom prompts on the SoCQ, and personal interviews revealed several themes. First, many teachers and facilitators responded to the survey question on the SoCQ “Please share any concerns you have about RenWeb at this time” with a concern about the lesson
plan feature. This accounted for many of the higher Stage 3 Management concerns (how do I use this) and several Stage 6 Refocusing concerns (ideas to change it or make it better). Second, the time using RenWeb and the self-reported level of use did not determine the SoCQ group. For example, a teacher (SoCQ group 1) that changed positions after using RenWeb for 2-years needed to learn new features of RenWeb and had a SoC profile expected of a novice user. Another teacher (SoCQ group 4) that had only been using RenWeb 2-years considered herself an intermediate user and was concerned with “making things easier for teachers.” Third, the SoCQ is a tool to provide a snapshot that “represent[s] one way of assessing how far a person is across the Implementation Bridge” (Hall and Hord, 2011, p. 76). Sometimes interviews and answering custom questions on the SoCQ can provide a more complete picture of a person’s concerns. For example, one teacher in SoCQ group one had a profile expected of a beginning user except with lower intensity scores. After an interview, she explained that she was very comfortable using RenWeb and did not fit the description of a novice user. Overall, this analysis of the SoCQ groups provided an explanation of SoC profiles, but not any noticeable patterns with the LCI groups.

“As interesting as it is to see and attempt to analyze a concerns profile, the crucial step is in using it to make concerns-based interventions that will resolve the concern and move the person toward a more advanced use of the innovation” (Hall and Hord, 2011, p. 76). In an effort to explore the possibility of using knowledge of learning patterns as part of that intervention, the SoCQ group profiles were examined through the lens of the LCI groups.
Several themes emerged through the exploration of the LCI group graphs, answers to custom questions on the SoCQ, responses on the LCI, and personal interviews. First, the data suggested that the descriptions of the learning patterns were validated as individuals in each LCI group described the way they preferred to learn about RenWeb as well as concerns they had about RenWeb (from SoCQ custom responses). In addition, many of the interviewees agreed that the LCI report they read after completing the LCI online accurately described the way they learn. Several seemed to have an “aha” moment when they realized how well the LCI report described them.

Second, the data suggested similarities between the two groups that had the same lead with Sequence, even though one avoided Confluence and the other group did not avoid any patterns. For example, teachers that lead with Sequence described their need for clear and adequate directions. The two LCI groups that led with Sequence (see Figures 12 and 13) showed some similarities in Stage 2 Personal and Stage 3 Management concerns, however the intensity of the concerns were generally lower in the LSNA (see Figure 13) group. A possible explanation for this could be that the LSNA group did not have any patterns in the Avoid range. They would be able to use other patterns as needed to address concerns about RenWeb. Another interesting observation about learning patterns is shown in the LCAS group (see Figure 14). People that lead with Confluence like to do things their own way and do not like repetitive tasks. The SoCQ profiles for this group had high Stage 3 Management concerns that could represent their frustration with following the procedures necessary to use RenWeb effectively.

Finally, the strongest example of a relation between the Stages of Concern profiles and learning patterns was suggested by the Strong Willed LCI group. There were
several individuals in this group that were in the same SoCQ group, so each smaller group was examined separately (see Figures 18, 19, and 20). The individual profiles of the LCI group SW and SoCQ group 2 (see Figure 18) was similar, possibly indicating that they were able to use their combination of learning patterns to address their more intense Stage 3 Management and Stage 5 Collaboration concerns. When comparing this graph (see Figure 18) with all of the SoCQ group 2 profiles (see Figure 7), the relative intensity of the Strong Willed learners was a little higher. The teachers in this group liked to figure things out on their own, but two of them thought “one-on-one training with other teachers/staff” had been most useful way to learn about RenWeb. Strong similarities in profiles were also noted between the two individuals in the LCI group SW and SoCQ group 5 (see Figure 19). Both people in this group were very involved with helping others with RenWeb, one as a teacher, the other as an administrator. When this group (see Figure 19) was compared with all the individual profiles in SoCQ group 5 (see Figure 10) only the Stage 5 Collaboration concerns were noticeably higher for both, and the Stage 1 Information concerns for one of them. This would be expected for facilitators and others responsible for helping implement RenWeb.

Although the data comparing individuals’ Stages of Concern and approach to learning provided a rich description of both research instruments, SoCQ and LCI, a relationship between them was only suggested in the larger groups.

**Question 3**

In what ways does individual knowledge of one's personal approach to learning support resolution of concerns during the third year of the implementation of a technological innovation? Data for this question were gathered by the following
interview question – Do you think your understanding of your learning patterns might influence the way you approach learning more about RenWeb? This interview question purposely did not ask if it would help the individual address their concerns about RenWeb since they were not provided any information about their Stages of Concern or the theory behind it. Instead, this question explored the individual’s possible use of their learning patterns to increase their knowledge of RenWeb.

Even though teachers did not engage in any further research about Let Me Learn© or participate in conversations about the process (as discovered in Question 1), people had a variety of thoughts about how knowledge of learning patterns might influence the way they approach learning about RenWeb in the future. Of the 11 people interviewed, four did not say anything related to this question. One interviewee stated, “I think no[t]. I think I’d probably stick to … the way I do things.” A few people responded thoughtfully. One said, “perhaps” another agreed, “probably … I think so.”

The remaining interviewees were more enthusiastic. One exclaimed, “Yes! I think so. Absolutely. Sure.” Another agreed, “Yes, I think it’s helpful, and not just with RenWeb but with other things, too.” The last two included a facilitator and a teacher that often helped other teachers. The facilitator said

Not with this specifically, but we’ve done some other in-service trainings this year where we’ve actually touched on this and … we’ve actually done … some basic learning inventories with our teachers and then touched on, … how would they handle a student [with] their preference of learning [and] how you can adapt your lessons so that you encompass all learners.

Finally, the teacher believed in putting that into practice and stated
I’ve got to make sure I am able to present material on the same problem in different ways to try to catch every student that I possibly can. Because there’s always more than one way to do a problem so there is always more than one way to solve it and that’s more than just math in general. So, I’m like that when I teach teachers.

During the pilot study many teachers used the new knowledge of their learning patterns to ask for help in a way that made sense to them. As a facilitator using the same language, I was able to provide the needed support without the frustrations experienced before the Let Me Learn© workshop. In an effort to provide the research school with a faster, easier way to learn about learning patterns, all participants completely the LCI online and received immediate results. Even though many interviewees agreed that the description of their learning patterns in the LCI report described the way they learn, not everyone agreed that it would help them learn about RenWeb in the future. Of the 11 interviews, four did not respond to the question, one stated knowledge of learning patterns would not be useful, three said very little, and the last three thought it would be very helpful in learning about RenWeb as well as other subjects. Again, as with research question 1, it seems that people need more time and support to make changes. Data for this question is ambiguous and may warrant a deeper look.

Summary

This research analyzed data based on a snapshot of the research school. An attempt was made to determine if knowledge of one’s approach to learning would help resolve concerns during the implementation of an innovation. This chapter revealed the findings and provided analysis of the research through a rich description of data gathered.
by the research instruments, Stages of Concern Questionnaire, Learning Combination Inventory, demographic questions, and personal interviews. The following chapter concludes the research by reviewing the purpose and background of the study, providing a summary and critique of the methodology, discussing the findings of the data, examining the implications of the study, suggesting areas for future research, and revealing my final thoughts as the study ends.
CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

Change is learning - from learning new procedures at the grocery store to learning to adopt new technology in education. Grocery stores remained the same for over 300 years, and learning to use the new stores was not easy. People laughed at the idea until they experienced shopping by entering through a turnstile, walking up and down aisles with a hand basket, and picking out their own groceries, before handing money to a clerk. Even later when the first true supermarkets opened, containing hundreds of items, people refused to the use the newly created shopping cart to make it easier to purchase larger quantities of items. To overcome this resistance and help people learn to use it, Sylvan Goldman hired models to shop with carts while a cute girl handed carts to people and said, “Look, everybody’s using them --- why not you?” (MacFadyen,1985, p. 24).

Recently, my husband and I had a learning experience at the grocery store as we attempted to use the self-check lane for the first time. In order to learn this new set of skills and behaviors we first watched other people use the touch screen and bar scanner. After deciding we could do it, we continually talked to each other and watched other people to make sure we were doing it the right way. Our first attempt was not as successful as we expected and we finally asked the “expert cashier” to solve the problems we experienced.

Early changes in educational technology also took time to be fully accepted, from the blackboard that took over 140 years to the overhead projector that only took 30 years. Today technology is changing at an ever-increasing rate. It is more important than ever for teachers to embrace and teach the ability to adapt to students, the workers of the
future. Friedman (2005) challenges “being adaptable in a flat world, knowing how to ‘learn how to learn’, will be one of the most important assets any worker can have, because job churn will come faster, because innovation will happen faster” (p. 239). As Hargreaves, et.al (2001) note “teachers as learners [italics added] are the center of educational change” (p. 131). Johnston (2010) believes, thinking about how we learn, metacognition, “is the single determiner of how much you retain, how well you retain it, and how well you implement what is presented to you as professional development or professional training” (pp. 142-143). In addition, Hall and Hord (2011) stress, “professional learning is a critical component embedded in the change process” (p. 7). Therefore, it is imperative to provide teachers the knowledge and support to become effective learners.

**Background of the Study**

This study evolved over time as I facilitated the implementation of RenWeb at my small Christian Kindergarten to Eighth grade school, which became the pilot study for this research. Prior to implementing RenWeb, I facilitated a 2-hour live product demonstration for all school staff. Then at the beginning of the first year of implementing RenWeb, all staff participated in a 4-hour training in the computer lab with a representative from RenWeb, where they practiced with their own data and classes. As I worked with teachers and staff over the next several years, I frequently used an intervention called the “one-legged interview” (Hall & Hord, 2011, p. 12), so-named because it is brief and “most people can’t stand on one leg very long” (Hall & Hord, 2011, p. 12). As I passed teachers in the hall, I would ask how things were going with RenWeb. Usually small issues would be addressed quickly; longer issues were often dealt
with through scheduled meetings. I was often frustrated when teachers needed the same information repeatedly or asked for information and did not seem to use it. It was almost like we were speaking different languages. Finally, after using RenWeb for 3-years and still having some teachers resist using it as required, the school participated in a Let Me Learn© workshop led by Dr. Edith Rusch. During the workshop, many teachers felt validated that they finally had the language to explain how they learn and realized that people have different learning patterns. As a facilitator, I used that knowledge to provide teachers with the information they needed without causing further frustration. Even two years after the workshop, I was able to determine how to provide information to teachers based on their learning patterns. The frustrations the staff and I first experienced eventually led me to search for a way to help other facilitators address concerns people experience when faced with a technological change.

**Review of Methodology**

Administrators who want to facilitate the implementation of new complex technologies, need a deeper understanding of how to engage individuals in ways that alleviate concerns. Researchers suggest, “although personalized interventions can facilitate change, in the end, individuals determine for themselves whether or not change will occur” (George, Hall, & Stiegelbauer, 2006, p. 9). The researchers also noted that it is not the administrator’s role to manipulate teachers into accepting change; their studies found “how effective it can be to recognize the inevitable presence of concerns within individuals and to extend a helping hand to assist in coping with and resolving those concerns” (p. 9). Therefore, this research used a snapshot of a school during the third year of the implementation of a technological innovation to investigate teacher concerns.
during the process of change and search for the missing piece(s) that encouraged individuals to address those concerns. The focus of this exploratory research examined the following questions:

1. How does individual and group knowledge of learning patterns foster increased communication about concerns related to organizational change during the third year of implementation of a technological innovation?
2. In what ways do Stages of Concern in the third year of the implementation of a technological innovation relate to an individual’s approach to learning?
3. In what ways does individual knowledge of one's personal approach to learning support resolution of concerns during the third year of the implementation of a technological innovation?

This single site case study used qualitative methods and multiple data sources, to provide the framework to gain insights into individuals’ metacognitive resolutions of personal concerns related to change during the third year of implementation of a technological innovation. Sources included demographic data, surveys, interviews, and research instruments with established validity and reliability to collect data related to concerns about change and individual approaches to learning. This research was suited to an explorative qualitative single site case study based on the limited population, in-depth focus on a single process within a limited context, and the emergent nature of data collection and analysis (Marshall and Rossman, 2006; Stake, 1995, 2000).

Baseline data were gathered using two survey instruments (SoCQ and LCI), which according to Creswell (2003) “[provide] a quantitative or numeric description of trends, attitudes, or opinions of a population” (p. 153). Research data were collected
through a self-administered Web-based survey (Stages of Concern Questionnaire) and inventory (Learning Combination Inventory). An email was sent to each teacher and staff member at the research school that used RenWeb with detailed instructions on how to access the websites and complete the surveys. In addition, a letter was given to all staff during a mandatory staff meeting where I explained the research process and questionnaires. I was available to answer questions and help participants as they completed the Stages of Concern Questionnaire (SoCQ) and Learning Combination Inventory (LCI) in the school computer lab or in their classrooms.

In order to make sense of the data that were gathered, each individual SoCQ profile and LCI patterns report were printed from the hosting websites. The randomly generated ID number on the SoCQ was matched (using email addresses) to the LCI pattern reports so names were protected during data analysis, which “involves organizing what you have seen, heard, and read so that you can make sense of what you have learned” (Glesne, 2006, p. 147). First, the individual LCI reports were placed into groups based on the similarities of the learning patterns (see Table 2). Second, the SoCQ profiles were grouped by similarities based on the relative intensity of the stages of concern (see Figure 5). Individuals were randomly selected to participate in the interview by creating a graph based on the SoCQ groups and the LCI groups (see Figure 1). Initially 12 individuals were selected to participate in the interviews, but after repeated emails from me and phone calls from the principal, 11 people completed an interview. After transcribing the interviews, I used the graphing features at SEDL to compare the SoCQ profiles based on demographic data, SoCQ groups, and LCI groups. Triangulation, “the act of bringing more than one source of data to bear on a single point” (Marshall and
Rossman, 2006, p. 202), included analyzing data from transcribed interviews, custom and demographic questions on the SoCQ, SoCQ profiles, responses on individual LCI reports, and individual LCI reports. These data were used to provide a “rich, thick description to convey the findings” (Creswell, 2003, p. 196) in order to explore the relation between individuals’ stages of concern and approach to learning during the third year of the implementation of a technological innovation.

Discussion of Findings

This study used a snapshot of a school during the third year of the implementation of a technological innovation to investigate teacher concerns during the process of change and search for the missing piece(s) that encouraged individuals to address those concerns. The Stages of Concern Questionnaires, the Learning Combination Inventories, survey questions, personal interviews were analyzed in an effort to find a deeper understanding of how to engage individuals in ways that address concerns.

After analyzing all of the data, I realized this study affirmed the definition used for change in individuals as learning - a mental shift in attitude, value, or behavior that may or may not be externally visible. This definition of change takes into account that the experience of change is different for each individual. Since this study used a snapshot in time, the shift in attitude, value, or behavior was not observed, however responses to survey questions and during interviews provided a glimpse of learning. Participants thought about the types of training they received and what types they thought would be most useful in the future. For example, one participant stated, “most learning was done by trial and error … A manual that could be used for tasks that are done every once in a while [would be useful for future learning about RenWeb].” Another said that in the
beginning of implementation “we had a lot of in-house training through our IT tech”, but now “I learn by trying it on my own.” Most of the comments seemed to confirm how each individual’s learning patterns in action governed their approaches to this change. This study also revealed that the experience of change is different for each individual.

Many teachers who participated in interviews agreed that completing the LCI was interesting and the explanation of their learning patterns on the report described the way they learn. I thought that providing teachers with a quick, easy way to learn about their learning patterns would help create a language for learning to address the concerns about implementing RenWeb. However, I was wrong, it seems that teacher curiosity and providing basic information from the LCI report was not enough to encourage spontaneous communication or change the patterns of communication within an organization. The data revealed in this research suggest that people need more time and support to use knowledge of their learning patterns in order to increase communication. Silverberg (2006) describes that putting the LCI into action usually begins with a 2-hour workshop on the Let Me Learn Process© followed by more intensive training for interested teachers. Therefore, it seems that using metacognition, or learning about learning, is itself an innovation that needs training and support to be applied effectively.

Even though teachers did not engage in any further research about Let Me Learn© or participate in conversations about the process people had a variety of thoughts about how knowledge of learning patterns might influence the way they approach learning about RenWeb in the future. Of the 11 people interviewed, only one responded that they would not use that knowledge. The remaining responses were almost equally
divided between no comment, unexcited “perhaps” responses, and very enthusiastic “Yes!” responses.

The Stages of Concern Questionnaire (SoCQ) is useful for “formal implementation assessment efforts” (Hall and Hord, 2006, p. 148) to provide information about individuals at a point in time during the change process. Analyzing the SoCQ profiles revealed several overall themes. First, even though the research school was in the third year of implementing RenWeb, individuals were at different places on the Implementation Bridge (Hall & Hord, 2011), which was not necessarily related to time using RenWeb. Second, the majority of the school staff had high Stage 0 Unconcerned scores, usually “indicating that there are a number of other initiatives, tasks, and activities that are of concern to him or her … the innovation is not the only thing the respondent is concerned about” (George, Hall & Steigelbauer, 2006, p. 33). Third, most SoCQ profiles showed a very low Stage 4 Consequence score. This stage “focuses on impact of the innovation [RenWeb] on ‘clients’ in the immediate sphere of influence” (Hall and Hord, 2011, p. 73). In this case, the “clients” are the students. Teachers may view using RenWeb as a teacher tool that does not have a direct impact on students.

“As interesting as it is to see and attempt to analyze a concerns profile, the crucial step is in using it to make concerns-based interventions that will resolve the concern and move the person toward a more advanced use of the innovation” (Hall and Hord, 2011, p. 76). In an effort to explore the possibility of using knowledge of learning patterns as part of that intervention, the SoCQ group profiles were examined through the lens of the LCI groups. Silverberg (2006) describes the LCI as a “vehicle through which a learner can communicate his or her natural learning process” (p. 51).
Although the data comparing individuals’ Stages of Concern and approach to learning provided a rich description of both research instruments, SoCQ and LCI, there was no clear relationship between them. However, there were some similarities between them in the larger SoCQ and LCI groups. The Strong Willed LCI group suggested the strongest possibility of a relation between the Stages of Concern profiles and learning patterns. There were several individuals in this group that were in the same SoCQ group, so each smaller group was examined separately (see Figures 18, 19, and 20). The individual profiles of the LCI group SW and SoCQ group 2 (see Figure 18) were similar, possibly indicating that they were able to use their combination of learning patterns to address their more intense Stage 3 Management and Stage 5 Collaboration concerns. Strong similarities in profiles were also noted between the two individuals in the LCI group SW and SoCQ group 5 (see Figure 19). Both people in this group were very involved with helping others with RenWeb, one as a teacher, the other as an administrator. Although there is no conclusive evidence of a relationship between an individual’s Stages of Concern and their learning patterns, the similarities between them may be due to the common concerns represented by placement in the SoCQ group or the combination of Learning Patterns that represented the LCI group.

Another similarity in learning patterns was suggested between the two groups that had the same lead with Sequence, even though one avoided Confluence and the other group did not avoid any patterns. For example, teachers in both groups that lead with Sequence described their need for clear and adequate directions. The two LCI groups that led with Sequence (see Figures 12 and 13) showed some similarities in Stage 2 Personal and Stage 3 Management concerns, however the intensity of the concerns were generally
lower in the LSNA (see Figure 13) group. A possible explanation for this could be that the LSNA group did not have any patterns in the Avoid range. They would be able to use other patterns as needed to address concerns about RenWeb. Again, there was no clear evidence that a relationship exists between the SoCQ and LCI groups.

In addition to the Stages of Concern profiles and the Learning Combination Inventory, data were also gathered from demographic questions on the SoCQ and personal interviews. Many participants, especially those with high Stage 3 Management concerns and/or high Stage 6 Refocusing concerns, commented about the lesson plan feature in RenWeb ranging from how to set them up, to different ways to view and print.

**Critique of Methodology**

This research used a case study methodology to contribute knowledge of individuals in an organization involved in the process of change. Throughout the process of research I discovered several areas that needed clarification or alteration to provide more accurate data for analysis. During the completion of the online research instruments, a few people were not able to complete the LCI online. Even after following directions to answer the questions with fewer “sometimes” responses, one participant was still not able to complete the LCI online. Unfortunately, the individual became upset (sad, not mad) and started crying. She said that was how she always handled stress. Providing a written copy of the LCI to complete could have prevented this problem. A few people experienced technical difficulties entering the websites to take the SoCQ and LCI. Even though I walked those individuals through the process, a printed copy with screen shots may have alleviated some of those frustrations.
During the analytic stage of the case study, “the experienced case study investigator is likely to have great advantages over the novice” (Yin, 2009, 55%). I agreed as I began the process of analyzing the data. Yin (2009) suggests, “a helpful point is to ‘play’ with your data” (56%). So, I started on the www.sedl.org website to analyze the SoCQ profiles through the different subgroups. As I created graphs based on the subgroup responses, I realized some clarifications that would have been helpful in answering the questions and analyzing the data. One demographic question asked participants to respond to “Primary grades taught or school staff” and the participant was able to choose all that apply from the options “Pre-K, 1,2,3,4,5,6,7,8,9,10,11,12, School Staff.” After looking at the responses, people chose every grade they had ever taught. My intention was to know what they were currently teaching. That question needed to be worded more precisely. Two other response options would have helped during analysis, “Administrator, RenWeb trainer.” That might have allowed a better understanding of people that had higher Stage 5 Collaboration concerns. Another demographic question that needed clarification was “How long have you been using RenWeb?” with the following response options, “Never, 0-3 months, 4-6 months, 1 year, 2 years, 3 years, 4 or more years.” It would have made more sense to remove “0-3 months and 4-6 months” and replace it with “less than 1 year.” Another question that needed revision, “In your use of RenWeb, do you consider yourself to be a …non-user, novice, intermediate, old-hand, past user.” Since no one chose “non-user or past user” the following choices would have provided a better understanding of an individual’s self-reported level of use, “novice, inexperienced, experienced, expert.”
Additionally, after creating graphs based on the subgroup questions, I realized I was not able to create graphs based on the SoCQ and LCI groups. The website did not allow me to change or add any data to the questionnaires once they were completed. The webmaster at SEDL was very helpful and personally added the SoCQ group number and LCI group code to a subgroup for each participant, which allowed the creation of graphs based on those groups that used for further analysis.

Interviews, “an essential source of case study evidence because most case studies are about human affairs or behavioral events” (Yin, 2009, 48%), proved to be challenging, while gathering the data and analyzing it. As an inexperienced interviewer, several times I became engrossed with the conversation and lost track of my job as the interviewer. Yin (2009) describes the two jobs an interviewer has as “(a) to follow your own line of inquiry, as reflected by your case study protocol, and (b) to ask your actual (conversational) questions in an unbiased manner that also serves the needs of your line of inquiry” (47%). Since I am the RenWeb facilitator at my school and have knowledge that some of the interviewees were seeking, I answered a few technical questions that they asked. I don’t believe this adversely affected this research since it was not an intervention that was searching for changes in actions or results. In addition, during the interviews, when an interviewee appeared to be distracted or in a hurry to finish, or when I was engrossed in the conversation, I missed opportunities to explore the research questions more fully. This was not apparent until I read the interview transcripts. A more experienced interviewer may have remained unbiased during the interview.

Finally, as Yin (2009) states, “case study analysis is the most difficult stage of doing case studies, and novice investigators are especially likely to have a troublesome
experience” (69%). As a novice researcher, I explored the possible relation between individuals’ Stages of Concern and approach learning based on my previous experience with implementing RenWeb, my emerging knowledge of change, and metacognition. Fortunately, I had assistance from two experts in the field of educational research. Dr. Edith Rusch, an experienced Let Me Learn© facilitator, and Dr. Gene Hall, a creator of the Concerns Based Adoption Model, provided valuable expert assistance throughout the study. However, I still felt that my role in this research was aptly described by Glesne (2006) as “the researcher learner… a curious student who comes to learn from and with research participants” (p. 46).

**Implications**

Hall and Hord (2011) state, “we are living in a time of change” (p. 18). This is especially true in regard to technology in education. In a new book, *The Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*, the authors state, “Digital progress, in fact, is so rapid and relentless that people and organizations are having a hard time keeping up” (Brynjolfsson & McAfee, 2011, 71%). In regard to education, the authors note,

It’s not a coincidence that the educational sector also lags behind as an adopter of information technologies. Basic instructional methods, involving a teacher lecturing to rows of passive students, have changed little in centuries … In many classrooms the main instructional technology is literally a piece of yellowish limestone rock scraped across a larger black slate (Brynjolfsson & McAfee, 2011, 78%).
Therefore, it is important for change facilitators in the educational field to create an environment that embraces change. “Nothing is more important in the twenty-first century than learning to manage change” (Fullan, 2008, p. ix).

One way to manage change is to use the Stages of Concern Questionnaire as a tool for facilitators to reveal concerns individuals have during the process of change. When a facilitator is aware of the concerns individuals have regarding the implementation of an innovation, they have the opportunity to address those concerns through interventions, which Hall and Hord (2011) argue, “are key to the success of the change process” (p. 11-12). They describe interventions as “any action or event that influences the individual(s) involved or expected to be involved in the process or the change process itself” (Hall & Hord, 2006, pp.185-187). The school average Stages of Concern profile (see Figure 22) shows the average of all of the individuals that completed the SoCQ. This data provides a starting point for exploring the overall concerns of a group or organization. This particular profile indicates that most individuals are more concerned about things other than RenWeb, many still have management concerns, and ideas about RenWeb (either making changes to it or changing to something else). Also, teachers have low Stage 4 Consequence concerns that may indicate they do not see the effect of RenWeb on student achievement. It is possible they see RenWeb as a teacher tool with little direct impact on students.
Figure 22. School average Stages of Concern Profile.

Another way to use the SoCQ is to include survey questions designed to provide more information about specific concerns an individual has. This study included fixed response questions about demographic information and types of trainings used to learn about RenWeb. Free response questions allowed individuals to describe how they would prefer to learn about RenWeb and specific concerns they had about using RenWeb. A large number of participants expressed specific concerns about the lesson plan feature of RenWeb. School administrators could address those concerns and provide training for teachers to help alleviate those concerns. Over half of the participants noted that they prefer to learn about RenWeb one-on-one or in small groups with a school staff member. George, Hall and Steigelbauer (2006) found in their studies “how effective it can be to recognize the inevitable presence of concerns within individuals and to extend a helping
hand to assist in coping with and resolving those concerns” (p. 9). During the pilot study, knowledge and application of individual learning patterns helped both teachers and the facilitator address concerns about implementing RenWeb by creating a shared language of learning. Mezirow (1997) stresses the importance of critical reflection and communication, both self-discourse and with other individuals, is an essential component to learning and change. In fact, during the first national conference on transformative learning in April 1998, Mezirow (2000a) found, “once space is created for transformative learning, ways of listening and speaking within that space become important. The need to discover or create new ways for talking was often expressed by participants during discourse in focus groups” (p. 336).

![School LCI Patterns](image)

**Figure 23.** School LCI Patterns.

Silverberg (2006) stresses for learning to occur it “requires an understanding and ability to articulate and communicate our ways of processing our experience” (p. 49). In other words, we need to use metacognition, “thinking about our thinking”, to learn about
how we learn and communicate that with others. Knowledge of the group’s learning patterns (see Figure 23) provides the facilitator with an overall view of individuals in the group. A detailed report of LCI results for the group (see Appendix H) is available from www.LCRinfo.com and is based on all of the individuals in the group. This is very helpful for a facilitator to use when planning trainings for the implementation of an innovation. The report lists the mean, range, the number of people in each range of use (Use First, Use As Needed, and Avoid), plus characteristics of and recommendations for each of the four learning patterns, as well as Strong Willed and Bridge learners. For example, 27 out of the 28 people in the study have Sequence scores in the Use First or Use As Needed range. According to the report, these people want clear step-by-step directions and time to do work neatly and double check answers. A facilitator needs to be prepared to make sure all directions are clear, provide a model or sample, repeat directions more than once, provide a sequential outline, and refrain from changing directions midstream. The challenge for a facilitator is that these same procedures can create frustrations in individuals that lead with other learning patterns. People that lead with Confluence (less than half of this group), enjoy taking risks, seeing situations differently than others, generating ideas, but, do not like to follow the rules or perform repetitive tasks and may negotiate other ways of completing an assignment.

Although the group averages of the Stages of Concern profiles and the Learning Combination Inventories provide overall information about the school, a facilitator can use individual information to create groups in order to address concerns (based on SoCQ profiles) according to specific learning pattern combinations (based on LCI results). Working with smaller groups that have the same concerns about the innovation and the
same or complimentary learning patterns, may create an environment more conducive to learning than a larger mixed group.

Even though this study did not find a conclusive relationship between an individual’s Stages of Concern and learning patterns, many researchers stress the importance of learning during change. Senge (1999) states, “most advocates of change initiatives … focus on the changes they are trying to produce and fail to recognize the importance of learning capabilities” (p. 9). He continues on by posing, “sustainable development can’t be achieved without innovation, and innovation is best achieved in a culture that embraces and fosters learning and change” (p. 535). Brynjolfsson & McAfee ask, “How can we implement a ‘race with machines’ strategy? The solution is organizational innovation: co-inventing new organizational structures, processes, and business models that leverage ever-advancing technology and human skills” (2011, 71%). Hargreaves, et.al (2001) note “complex changes [such as these] cannot be achieved without considerable learning” (p. 169).

Finally, Friedman (2005) challenges “being adaptable in a flat world, knowing how to ‘learn how to learn’, will be one of the most important assets any worker can have, because job churn will come faster, because innovation will happen faster” (p. 239). Johnston (2010) believes metacognition answers the challenge because “the mind remains the most vital technology for communication with others and … navigating the world of the 21st century requires high-speed learning and communicating” (p.134).

**Future Research**

Through the process of this research, several areas of future research came to mind. While analyzing the LCI patterns, the data revealed a large number of Strong
Willed learners (8 out of 28). Johnston (2010) states this learning pattern combination is “interesting and somewhat rare” (p. 47). In addition, Bridge learners accounted for 3 out of 28 staff members. Johnston (2010) states usually only “3 out of 100 fall into this mix” (p. 48). It would be interesting to find out if this is common in schools (public or private).

The data in this research revealed a small relation between SoCQ profiles and LCI groups, and that was only revealed when there was a larger number of individuals in both groups. Researching a larger population may provide enough data to reveal a stronger relationship between an individual’s Stages of Concern and learning patterns.

Hall and Hord (2011) stress the importance of interventions as the “key to the success of the change process” (p. 11) and that “appropriate interventions can reduce resistance to change” (p. 12). The Let Me Learn© process could be used as an intervention when implementing an innovation. Using the SoCQ before a Let Me Learn© training would provide a snapshot of the concerns of the organization and its members. After a specified period of time, the SoCQ would be used again to examine the changes in concerns. As in the pilot study, would a common language for learning provide a more effective way to discuss the successes and challenges, therefore increasing success? Hall and Hord (2011) believe, “when teachers and others inside the organization share successes and challenges, implementation efforts can be more successful” (p. 15).

**Final Thoughts**

As I finished this dissertation, I reflected back over my learning throughout the process. I loved to gather information so that what I wrote was accurate, but summarizing or finishing was very difficult. As I wrote, I worried about using the right words, or expressing myself correctly. Each time I began a new stage in the research process or got
bogged down in the details, I was able to communicate with Dr. Rusch (my advisor) and find the direction I needed to get back on track. As I analyzed data, I discussed it with others to validate my understanding. If I were in this study, my LCI group would have been Lead Precision. This group wanted complete and thorough explanations, they liked to ask and answer a lot of questions, they needed to be accurate and correct, they liked to see test results (like all of the graphs I created), and they wanted written documentation of success or failure.

Throughout this study the thought that was repeated over and over was learning is change and to sustain change learning must be intentional and ongoing. According to Senge (2006) “the organizations that will truly excel in the future will be the organizations that discover how to tap people’s commitment and capacity to learn at all levels of the organization” (p. 4). I believe that using the Stages of Concern Questionnaire to discover individuals’ concerns during the process of change along with knowledge of learning patterns and how they interact (metacognition) will promote that capacity to learn. My last thought as I conclude this research is I know that using the knowledge I have gained from this study will help me be a better facilitator as I face the challenges of a changing world.
APPENDIX A    EMAIL TO ELICIT RESEARCH PARTICIPATION

Dear Administrator XXXX

My name is Nola Raffail. I am the Dean at Academy in Las Vegas, Nevada. I left you a brief message today about a research project. I have included a summary of what the research involves and would like to talk to your director about participating.

Academy began using RenWeb several years ago and I became interested in how schools adapt to a complex technology change. I am currently developing a proposal for a dissertation research study that will lead to the completion of a doctorate in Educational Leadership at the University of Nevada, Las Vegas.

I am seeking a local private school that is in the third year of implementing RenWeb to participate in a study on change and learning. The research process would include the entire staff that uses RenWeb to respond to two initial questionnaires that explore perspectives on change and individual approaches to learning. The first questionnaire (Stages of Concern Questionnaire created by Dr. Gene Hall et. al. as part of the Concerns Based Adoption Model) would take about 20 minutes to take online. If you choose, I could provide you with the aggregated results of this questionnaire that would reveal the concerns your staff have about implementing RenWeb this year. This may help with staff development. The second survey is the Learning Combination Inventory© created by Dr. Christine Johnston (part of the Let Me Learn Process). This survey would take less than 30 minutes. Each staff member would receive immediate online results of their learning combination with a brief explanation and a website link to receive further information if desired.

Next, Dr. Hall and Dr. Rusch will assist me in choosing a small select group of staff members who would be invited to participate in several short interviews throughout the school year. Finally, all teachers would be asked to complete a final Stages of Concern Questionnaire toward the end of the year. The identity of all participants will be protected.

I believe that Research School is a perfect site for this research because of the size of your school and the range of grades taught. Please let me know if you would be willing to participate in this study and if there are any special policies or procedures for participating in an outside research study. Be assured that the study design will have full approval of UNLV's Institutional Review Board and you will have copies of that approval form.

Thank you for your time,

Nola Raffail
Social/Behavioral IRB – Expedited Review Approval Notice

NOTICE TO ALL RESEARCHERS:
Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation, suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Officer.

DATE: March 16, 2011
TO: Dr. Edith Rusch, Department of Educational Leadership
FROM: Office of Research Integrity - Human Subjects
RE: Notification of IRB Action by /Lori Olafson/ Dr. Lori Olafson, Co-Chair
Protocol Title: Change is Learning: Metacognition to Solve Concerns During Implementation of a Technological Innovation
Protocol #: 1102-3738M
Expiration Date: March 15, 2012

This memorandum is notification that the project referenced above has been reviewed and approved by the UNLV Social/Behavioral Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45 CFR 46 and UNLV Human Research Policies and Procedures.

The protocol is approved for a period of one year and expires March 12, 2012. If the above-referenced project has not been completed by this date you must request renewal by submitting a Continuing Review Request form 30 days before the expiration date.

PLEASE NOTE:
Upon approval, the research team is responsible for conducting the research as stated in the protocol most recently reviewed and approved by the IRB, which shall include using the most recently submitted Informed Consent/Assent forms and recruitment materials. The official versions of these forms are indicated by footer which contains approval and expiration dates.
Should there be any change to the protocol, it will be necessary to submit a Modification Form through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been approved by the IRB. Modified versions of protocol materials must be used upon review and approval. Unanticipated problems, deviations to protocols, and adverse events must be reported to the ORI – HS within 10 days of occurrence.

If you have questions or require any assistance, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 895-2794.
Dear Teacher/Staff at Research School,

Hello, my name is Nola Raffai. I am the Dean at Academy in Las Vegas, Nevada. My school began using RenWeb several years ago and I became interested in how schools adapt to a complex technology change. I am currently involved in a dissertation research study that will lead to the completion of a doctorate in Educational Leadership at the University of Nevada, Las Vegas. I chose your school to participate in this study based on size, grade levels taught, and length of time using RenWeb. The research process will begin with a voluntary meeting for all Research School RenWeb users on Monday, May 9, 2012 at 9:00 am. During that meeting, the research study will be explained and individuals will have the opportunity to sign a consent form and respond to two initial online inventories that explore perspectives on change and individual approaches to learning. The first questionnaire (Stages of Concern Questionnaire, created by Dr. Gene Hall, et. al. as part of the Concerns Based Adoption Model, will take about 30 minutes to complete online. The second online questionnaire is the Learning Combination Inventory created by Dr. Christine Johnston (part of the Let Me Learn Process©). This inventory will also take about 30 minutes. Each staff member will receive immediate online results of their Learning Combination Inventory with a brief explanation and a website link to receive further information if desired.

Next, Dr. Hall and Dr. Rusch will assist me in choosing a small group of staff members who will be invited to participate in two short interviews (by phone or in person) one before the end of this school year and one at the beginning of the 2011-2012 school year. Finally, all staff that use RenWeb will complete a final Stages of Concern Questionnaire at the beginning of the 2011-2012 school year (about 30 minutes). The identity of all participants will be protected. Please let me know you are willing to participate in this study by attending the meeting and signing the consent form. This study design has the full approval of UNLV's Institutional Review Board and your school will have a copy of that approval form. All personal information will be confidential.

Your participation in this research is greatly appreciated!!!

Sincerely,

Nola Raffail, Dean

The Stages of Concern Questionnaire is hosted by Southwest Educational Development Laboratory (SEDL) at www.sedl.org/concerns. The password will direct you to the homepage of the survey where you will complete several demographic questions. All information will be saved at SEDL for the researcher to access for analysis purposes. You will not receive a copy of this information.

Stages of Concern Questionnaire
http://www.sedl.org/concerns  Password for the survey: xxxxxx
When you finish this questionnaire, please proceed to the next website for the last inventory.

To take the Learning Connections Inventory **Education Adult Form** on-line please visit [http://www.LCRinfo.com](http://www.LCRinfo.com) and do the following:

1. **On the homepage enter your case sensitive Group Code and click “enter”**.

   Your **case sensitive** access information is:

   **Group Code:** xxxxxx

2. **Create a Profile (Employee ID, Phone & Mobile Numbers are not required) and Access information.**

3. **Read and Accept the Consent Page (you will not be given access to the LCI if you decline consent).**

4. **Once on the Welcome Page you can click “Take LCI” on the bottom right of the screen under “New Surveys” to access the LCI.**

We recommend you print and hold onto your LCI results, but if necessary you can access your account at any time in the future via the website, your User Name, and Password. In case you have forgotten your account access information you can use the **“Forgot Password?”** feature on the homepage to have a new password emailed to you. If you have any technological problems or questions concerning the LCI please contact **contact@LCRinfo.com**

With respect to security: We always use industry-standard encryption technologies when transferring and receiving consumer data exchanged with our website. We have appropriate security measures in place in our physical facilities to protect against the loss, misuse or alteration of information that we have collected from you at our site. All information collected by the Learning Connections Inventory will be held on site and not disseminated to any third party.
TITLE OF STUDY: Learning through change: Metacognition to resolve concerns during implementation of a technological innovation

INVESTIGATOR: Nola Allen-Raffail (Student Researcher)
INVESTIGATOR: Dr. Edith Rusch (Principal Investigator)

Purpose of the Study

You are invited to participate in a research study. The purpose of this study is to explore the relationship between teacher/staff concerns during the implementation of RenWeb and knowledge of personal learning combinations.

Participants

You are being asked to participate in the study because you fit this criteria: You are beginning the third year of RenWeb implementation at your school.

Procedures

If you volunteer to participate in this study, you will be asked to do the following:
1. Attend an explanatory meeting (about 15 minutes).
2. Complete two online surveys (about 30 minutes each).
3. Complete one follow-up online survey (about 30 minutes).
4. You may be selected to participate in two short interviews in person or by phone (about 30 minutes each).
Benefits of Participation

Each participant will receive immediate online results of their Learning Combination Inventory© with a brief explanation and a website link to receive further information if desired. We hope to learn how knowledge of personal learning combinations affects teacher/staff concerns during the implementation of a technological innovation.

Risks of Participation

There are no physical risks to participants in this study. Participants may feel temporary stress as they answer questions on the surveys. There should not be any psychological or social risks since each participant is answering questions online and the results will not be shared or discussed with other participants.

Cost /Compensation

There will not be any financial cost to you to participate in this study. The study will take between 1.75-2.75 hours of your time. All participants will attend a 15-minute meeting explaining the research and complete two 30-minute surveys. Additionally a follow-up survey will be conducted at the end of the year (about 30 minutes). You may also be invited to participate in two 30-minute interview sessions. You will not be compensated for your time.

Contact Information

If you have any questions or concerns about the study, you may contact Nola Allen-Raffail at xxx-xxx-xxxx or nolaraffail@cox.net or Dr. Edith Rusch at xxx-xxx-xxxx or edith.rusch@unlv.edu. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794 or toll free at 877-895-2794 or via email at IRB@unlv.edu.

Voluntary Participation

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality

All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records
will be stored in a locked facility at UNLV for 3 years after completion of the study. After the storage time the information gathered will be destroyed.

**Participant Consent:**
I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Participant

Date

Participant Name (Please Print)

**Participant Consent to use Audio:**
If selected for a personal interview, I agree to be audio taped for the purpose of this research study. I will have an opportunity to read and amend transcripts and of the interview before it is used for the research. Tapes will be erased after transcription and transcripts will be stored with all research records in a locked facility for 3 years. After the storage time the transcripts will be destroyed.

Signature of Participant

Date

Participant Name (Please Print)
APPENDIX E  STAGES OF CONCERN QUESTIONNAIRE

[Compiled from (Hall & Hord, 2006, p. 139) and (George, Hall, & Stiegelbauer, 2006, pp. 27-28)]

<table>
<thead>
<tr>
<th>Item #</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 0</strong></td>
<td>Unrelated – Awareness – I am not concerned about it.</td>
</tr>
<tr>
<td>3</td>
<td>I am more concerned about another innovation.</td>
</tr>
<tr>
<td>12</td>
<td>I am not concerned about this innovation at this time.</td>
</tr>
<tr>
<td>21</td>
<td>I am preoccupied with things other than this innovation.</td>
</tr>
<tr>
<td>23</td>
<td>I spend little time thinking about this innovation.</td>
</tr>
<tr>
<td>30</td>
<td>Currently, other priorities prevent me from focusing my attention on this innovation.</td>
</tr>
<tr>
<td><strong>Stage 1</strong></td>
<td>Self – Informational – I would like to know more about it.</td>
</tr>
<tr>
<td>6</td>
<td>I have a very 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 the 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 the innovation is better than what we have now.</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td>Self – Personal – How will using it affect me?</td>
</tr>
<tr>
<td>7</td>
<td>I would like to know the effect of reorganization 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 the 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>
<tr>
<td><strong>Stage 3</strong></td>
<td>Task – Management – I seem to spend all of my time getting materials ready.</td>
</tr>
<tr>
<td>4</td>
<td>I am concerned about not having enough time to organize myself each day.</td>
</tr>
<tr>
<td>8</td>
<td>I am concerned about conflict between my interests and my responsibilities.</td>
</tr>
<tr>
<td>16</td>
<td>I am concerned about my inability to manage all that the innovation requires.</td>
</tr>
<tr>
<td>25</td>
<td>I am concerned about time spent working with nonacademic problems related to the innovation.</td>
</tr>
<tr>
<td>34</td>
<td>Coordination of tasks and people is taking too much of my time.</td>
</tr>
<tr>
<td><strong>Stage 4</strong></td>
<td>Impact – Consequence – How is my use affecting clients?</td>
</tr>
<tr>
<td>1</td>
<td>I am concerned about students’ attitudes toward the innovation.</td>
</tr>
<tr>
<td></td>
<td>I am concerned about how the innovation affects students.</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>19</td>
<td>I am concerned about evaluating my impact on students.</td>
</tr>
<tr>
<td>24</td>
<td>I would like to excite my students about their part in this approach.</td>
</tr>
<tr>
<td>32</td>
<td>I would like to use feedback from students to change the program.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 5</th>
<th>Impact – Collaboration – I am concerned about relating what I am doing with what my co-workers are doing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>I would like to help other faculty in their use of the innovation.</td>
</tr>
<tr>
<td>10</td>
<td>I would like to develop working relationships with both our faculty and outside faculty using this innovation.</td>
</tr>
<tr>
<td>18</td>
<td>I would like to familiarize other departments or persons with the progress of this new approach.</td>
</tr>
<tr>
<td>27</td>
<td>I would like to coordinate my efforts with others to maximize the innovation’s effects.</td>
</tr>
<tr>
<td>29</td>
<td>I would like to know what other faculty are doing in this area.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 6</th>
<th>Impact – Refocusing – I have some ideas about something that would work even better.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>I now know of some other approaches that might work better.</td>
</tr>
<tr>
<td>9</td>
<td>I am concerned about revising my use of the innovation.</td>
</tr>
<tr>
<td>20</td>
<td>I would like to revise the innovation’s approach.</td>
</tr>
<tr>
<td>22</td>
<td>I would like to modify our use of the innovation</td>
</tr>
<tr>
<td>31</td>
<td>I would like to determine how to supplement, enhance, or replace the innovation.</td>
</tr>
</tbody>
</table>
APPENDIX F LEARNING COMBINATION INVENTORY

[Compiled from (Johnston, 1998, pp. 42-45) and (Johnston, 1997, p. 79)]

<table>
<thead>
<tr>
<th>Item #</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sequential Processor</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I need to have a complete understanding of the expectations before I feel comfortable starting an assignment.</td>
</tr>
<tr>
<td>5</td>
<td>I become frustrated if I am given a second task to do before I have completed the first.</td>
</tr>
<tr>
<td>10</td>
<td>I clean up my work area and put things back where they belong as soon as I finish a task.</td>
</tr>
<tr>
<td>13</td>
<td>I am told by others that I am very organized.</td>
</tr>
<tr>
<td>18</td>
<td>I need to make lists and develop a plan before I start an assignment.</td>
</tr>
<tr>
<td>21</td>
<td>I feel better when I have time to double check my answers.</td>
</tr>
<tr>
<td>27</td>
<td>I keep a neat desk, or work area.</td>
</tr>
<tr>
<td><strong>Precise Processor</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Before I begin any work assignment, I ask specific questions and read as much information about it as possible.</td>
</tr>
<tr>
<td>7</td>
<td>I pride myself in giving factually correct answers to the questions I am asked.</td>
</tr>
<tr>
<td>9</td>
<td>I automatically take notes whenever I listen to a presentation.</td>
</tr>
<tr>
<td>14</td>
<td>I ask more questions than most because I just enjoy knowing things.</td>
</tr>
<tr>
<td>19</td>
<td>I instinctively want to correct others whose information or answers are not totally accurate.</td>
</tr>
<tr>
<td>24</td>
<td>I am interested in knowing detailed information about whatever I am researching.</td>
</tr>
<tr>
<td>25</td>
<td>I look for well-documented, factual articles and manuals to read.</td>
</tr>
<tr>
<td><strong>Technical Processor</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>I prefer tasks where I use or apply mechanical/technical tools and equipment.</td>
</tr>
<tr>
<td>6</td>
<td>I prefer to work autonomously without anyone’s supervision or guidance.</td>
</tr>
<tr>
<td>11</td>
<td>I enjoy the challenge of repairing or building something.</td>
</tr>
<tr>
<td>15</td>
<td>I like to figure out how equipment and machinery work.</td>
</tr>
<tr>
<td>17</td>
<td>I would rather build a project than read or write about a subject.</td>
</tr>
<tr>
<td>22</td>
<td>I like to take things about to see how they work.</td>
</tr>
<tr>
<td>26</td>
<td>I like the feeling of operating mechanical tools in my hand.</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Confluent Processor</strong></td>
<td>Avoiding conventional approaches; seeking unique ways to complete any learning task. The learner often starts before all directions are given; takes a risk, fails, and starts again; uses imaginative ideas and unusual approaches; and improvises</td>
</tr>
<tr>
<td>3</td>
<td>I become frustrated when I have to wait patiently for someone to finish giving directions.</td>
</tr>
<tr>
<td>8</td>
<td>I don’t like to do my work in just one way, especially when I have a better idea I would like to try.</td>
</tr>
<tr>
<td>12</td>
<td>I react quickly to assignments and questions without thinking through my answers.</td>
</tr>
<tr>
<td>16</td>
<td>I like to make up my own way of doing things.</td>
</tr>
<tr>
<td>20</td>
<td>I generate lots of unique and creative ideas.</td>
</tr>
<tr>
<td>23</td>
<td>I aspire to discover new approaches of doing tasks for the pleasure of doing things differently.</td>
</tr>
<tr>
<td>28</td>
<td>I am willing to risk offering new ideas even in the face of discouragement.</td>
</tr>
</tbody>
</table>
This is number ______. Today is _____________ and the time is __________.

First, thank you for completing the questionnaires at your school and taking the time to participate in this interview. I have your signed release to audiotape this interview and I will email you a transcript of the interview once it is transcribed. Your name and school will remain anonymous when it is published.

3. What is your current position?
   a. How long have you been at this position?
   b. Have you had any other positions while you have been using RenWeb?

2. Tell me all the ways you obtained information about RenWeb when it was first implemented at your school?
   a. Describe what was the most helpful.
   b. Describe what was the least helpful.
   c. Describe how you would have liked to learn to use RenWeb.

3. Tell me all the ways you currently obtain information about RenWeb?
   a. Is that how you usually obtain information about a new idea your administration wants you to try?
   b. If not, how do you usually obtain information about new programs or instructional approaches?

4. You stated on the questionnaire that you consider yourself to be a ________user of RenWeb.
   a. Can you describe what that means to you?
   b. What would you need to do to get to the next level?
c. How could you accomplish that?

5. When you are faced with learning something brand new – something that you did not have much experience with – How do you react? What do you think about? What do you do?

   a. How does your description compare to the explanation of your learning patterns that was provided after you took the Learning Combination Inventory?

   b. Have you looked for any more information about your learning patterns from the website provided with your results?

   c. Do you think your understanding of your learning patterns might influence the way you approach learning more about RenWeb?

   d. Tell me about any conversations you have had with your fellow teachers about the Learning Combination Inventory results.

6. Is there anything else you would like to add?

7. Thank you.
APPENDIX H LEARNING COMBINATION INVENTORY SUMMARY

LCI Results

# of users: 28

Sequence
Mean: 25.04
Range: 16 - 34
Use First Range: 18/28 = 64.29%
Use As Needed Range: 9/28 = 32.14%
Avoid Range: 1/28 = 3.57%

If Sequence Mean of N = 25-35 (Use First Range)
If mean scale scores for Sequence are somewhere between 25 and 35, Sequence is at a Use First level. That indicates the following group characteristics:
1. They want clear directions.
2. They need step-by-step directions.
3. They want time to do my work neatly and double check answers.
4. They like to do work from beginning to end without interruption.
5. They want to know if they are meeting the instructors, supervisor or teammates' expectations.

Recommendations
Be prepared to:
• Make sure that all directions are clearly stated step-by-step.
• Provide a model or sample.
• Expect to repeat the directions more than once.
• Allow adequate time to check over/edit work.
• Do not change directions midstream.
• When possible, provide an outline of the material being covered.
• Bullets and numbered sequences can be helpful.
• Be sure when you use numbered sequences that you are actually listing items in a sequential manner.

Precise
Mean: 24.89
Range: 19 - 33
Use First Range: 13/28 = 46.43%
Use As Needed Range: 15/28 = 53.57%
Avoid Range: 0/28 = 0%

If Precise Mean of N = 18-24 (Use As Needed Range)
If mean scale scores for Precise are somewhere between 18 and 24, Precise is at a Use-as-Needed level. These patterns tend to lay dormant until the person needs to wake them up and let them know that they need to use them NOW! Use-as-Needed patterns don't drive our learning like "Use First" and "Avoid" patterns but can be tapped when needed. There will be times when you experience the following group characteristics:
1. They want complete and thorough explanations.
2. They ask a lot of questions.
3. They like to answer questions.
4. They need to be accurate and correct.
5. They like test results.
6. They seek written documentation of success or failure.

**Recommendations**

Be prepared to occasionally:

- Make sure that directions contain detailed information.
- Provide additional references or URLs for independent information gathering.
- Anticipate requests for detailed information about assignments and tests.
- Anticipate requests for detailed explanations of concepts, procedures, narratives, etc.
- Expect some of the group to feel compelled to write down everything said.
- Expect to help balance a compulsion to gather information against the requirements of assignment deadlines.

**Technical**

- **Mean:** 22.39
- **Range:** 13 - 29
- **Use First Range:** 10/28 = 35.71%
- **Use As Needed Range:** 13/28 = 46.43%
- **Avoid Range:** 5/28 = 17.86%

**If Technical Mean of N =18-24 (Use As Needed Range)**

If the mean scale scores for Technical are somewhere between 18 and 24, technical is at a Use-as-Needed level. These patterns tend to lay dormant until the person needs to wake them up and let them know that they need to use them NOW! Use-as-Needed patterns don't drive our learning like "Use First" and "Avoid" patterns but can be tapped when needed. There will be times when you experience the following group characteristics:

1. They don't like to write things down.
2. They need to see the purpose of what they are doing.
3. They like to work independently.
4. They like to figure how things work.
5. They don't like to use a lot of words.
6. They look for relevance and practicality.

**Recommendations**

Be prepared to occasionally:

- Make sure that the group understands the relevance of the assignment.
- When possible, demonstrate the practical application of the material to be learned.
- Provide opportunities to learn and to be assessed through hands-on activities and/or problem solving.
- Expect requests to demonstrate their knowledge in one-on-one situations.
- Anticipate that some would prefer to work alone.
- Anticipate that some will take minimal notes and will need coaching to meet your expectation for writing.
**Confluence**

Mean: 22.89  
Range: 15 - 31  
Use First Range: 10/28 = 35.71%  
Use As Needed Range: 14/28 = 50%  
Avoid Range: 4/28 = 14.29%

**If Confluence Mean of N =18-24 (Use As Needed Range)**

If the mean scale scores for Confluence are somewhere between 18 and 24, Confluence is at a Use-as-Needed level. These patterns tend to lay dormant until the person needs to wake them up and let them know that they need to use them NOW! Use-as-Needed patterns don't drive our learning like "Use First" and "Avoid" patterns but can be tapped when needed. There will be times when you experience the following group characteristics:

1. I don't like performing repetitive tasks.  
2. I see situations very differently than others do.  
3. I like to do things my own way.  
4. I don't like following the rules.  
5. I enjoy taking risks.

**Recommendations**

Be prepared to occasionally:

- Anticipate that some students will avoid reading or following directions; help them to understand when it is optional or imperative for them to do so.  
- Make sure that the student has opportunities to be assessed for risk-taking.  
- Understand that some students will profit from making mistakes.  
- Negotiate alternative ways for completing an assignment.  
- Anticipate that some students will have difficulty completing repetitive tasks.  
- Anticipate that some students will generate ideas and grasp the larger picture, but may be perceived as not pulling his/her own weight with the tedious parts of a group project.

**Dynamic Learner**

17 of 28 users = 60.71%

Dynamic Learners are those who have a combination of Use First, Use as Needed and Avoid learning patterns. Dynamic Learners require mental effort when moving across learning patterns. Therefore, you may experience student frustration during sudden shifts in content and/or expectations.

**Strong Willed Learner**

8 of 28 users = 28.57%

A Strong Willed Learner is an individual who uses three or more learning patterns at the “Use First” level. SWL’s are their own teams and do not seek external opinions. There is often a level of inertia between SWL and non-SWL as the SWL typically seeks control of challenges as they have great confidence in their learning patterns.

**Bridge Learner**
Bridge learners possess characteristics of being the ultimate team player (they possess four learning patterns at the “Use-as-Needed” range) and often times are not noticed until they are not present. Bridge learners are great facilitators and negotiators, as they naturally understand all four of the learning patterns. The next step would be to analyze the requirements of the activities and assignments based on learning patterns and provide the awareness, support, and vocabulary to identify, decode and apply the importance of knowledge of learning to success.

We hope that this is helpful information to you and encourage your learning communities to manage their LCI Scores and to work with an awareness of how their learning processes can support, encourage and challenge each other towards success. Please review the attached materials to gain a greater understanding of the data accumulated to date and visit www.LCRinfo.com or www.letmelearn.org for additional insights.
16 November 2011

Dr. Nola Raffiul
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Dear Dr. Raffiul:

Congratulations on completing your doctoral program and your dissertation study. You have my permission to include the Implementation Bridge figure in your dissertation. I have found this metaphor to be very useful. I am pleased that you too have found it useful.


All the best of success as your academic career continues to unfold.

Sincerely yours,

[Signature]

Gene E. Hall, Professor
Email: gene.hall@unlv.edu
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