Relationship between Principals' Decision Making Styles

and

Technology Acceptance & Use

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Educational leaders are at the forefront for implementing policies and practices that promote rigorous teaching and learning. In order to plan, implement, and evaluate appropriate programming, educational leaders, especially principals, must make data driven decisions. Educational leaders can afford themselves the opportunity to make informed decisions through the acceptance and use of technology. Through the utilization of technology, educational leaders can incorporate appropriate educational planning through the obtainment of information and knowledge in an efficient and effective manner.

This study attempts to investigate to what extent a principal's decision style influences his/her acceptance and use of technology. The study surveyed 97 K-12 public school principals in western Pennsylvania. The survey consisted of four parts: 1) initial questions, 2) Technology Acceptance/Use Inventory, 3) Decision Style Inventory, and 4) demographics. The technology inventory investigated the acceptance and use of five technology applications—the Internet, email, word processing, database, and spreadsheet. The decision style inventory categorized each principal as analytical, behavioral, conceptual, or directive.

The findings indicate that a principal's decision style has no bearing on his/her acceptance and use of technology. A large number of the principals surveyed were characterized as having an analytical decision style. Further, the study did find that the most widely accepted and used technology application by K-12 principals is email. The study concluded that most

principals feel comfortable using technology, use it on a daily basis, and attend a variety of technology trainings. Lastly, of the principals surveyed, the majority stated that they use technology the most to make decisions regarding student achievement.

Although the findings did not support the research tenets of the study, there are several recommendations to be offered. Technology can be an important tool to assist with data driven decision making. However, educational organizations should support the acceptance and use of technology. Educational leaders should embrace the use of technology and be willing to use it as an assistive tool for decision making. If educational leaders are not affording themselves this opportunity, then they may be inhibiting the ability to provide the most optimal learning environments for their students.

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"*I am the master of my fate and the captain of my soul*."
~ William E. Henley~

As another journey comes to an end…one must reflect on the time…I am incredibly humbled and audaciously joyful.

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1.0 CHAPTER ONE: REVIEW OF LITERATURE

1.1 INTRODUCTION

School organizations operate under the direction, leadership, and vision of their educational leaders. In order to effectively lead an organization, educational leaders must possess the ability to make valued decisions. Decisions are in part, a fundamental means by which opportunities for change and development are possible. The successes and/or failures of an organization may be directly linked to its leaders' decisions (Yuki, 1994). As educational leaders of public schools, this is especially true for building principals.

Building principals are leaders and managers. Within these two roles, principals must plan, implement, and evaluate daily activities in order to fulfill organizational goals and objectives. Throughout performing their duties, principals are continuously making decisions. However, decision-making is not a one step process (Stueart & Moran, 1993). Decision-making can be a slow and deliberate progression of thinking, deciding, and acting (Stueart & Moran, 1993).

This study is designed to evaluate to what extent principals' decision-making styles influence their acceptance and use of technology. The study incorporates two key elements: decision style and technology acceptance/use. The following literature review consists of seven sections: 1) historical perspective of decision making, 2) decision making as a cognitive process,

3) decision making frameworks, 4) decision style and behavior, 5) Decision Style Inventory, 6) technology in education, and 7) Technology Acceptance Model.

1.2 HISTORICAL PERSPECTIVE OF DECISION MAKING

The word *decision* has been defined as "an answer to some question or a choice between two or more alternatives" (Rowe, Boulgarides, & McGrath, 1984). At a very fundamental level, the ability to make a decision relates to making choices within a pool of alternatives (Hammond, 1999). Traditionally, decision making theory has focused on the cognitive process by which an individual makes a decision.

The study of decision making and decision styles has evolved over the last century. In the late 1940s and early 1950s, most research regarding decision making was conducted within the area of psychology under the topics of cognition and leadership. In the 1960s, researchers began to concentrate more specifically on the area of decision making and individuals' decision styles. In 1969, Driver and Streufert developed a style model that examined one's information processing and problem solving abilities. This development was based on previous work conducted in the area of cognitive psychology (Rowe & Boulgarides, 1983).

Most literature regarding decision styles is based on the work of Swiss psychiatrist Carl Jung and his theory of personalities. Jung developed his theories of personality types in the early 1900s. His theories were based on the belief that individual behavior affects the way one thinks, perceives, and evaluates the world (Jung, 1923). Moreover, Jung's approach to personality typing was derived from theories regarding the way individuals perceive and judge their

surroundings (Martin, 1997). A large part of decision theory has stemmed from this empirical work.

In the 1920s, using Jung's theories as a foundation, Myers and Briggs developed a "type indicator" (Rowe and Mason, 1987). The Myers-Briggs Type Indicator (MBTI) was designed to evaluate psychological types and measure individual preferences (Rowe and Mason, 1987). In the mid 1950s and early 1960s, a new paradigm in psychology began to discuss the connection between cognition (how one thinks, learns, and perceives) and personality (Sternberg, 2001). Such efforts led to a new school of thought in cognitive psychology, designed to look at "stylistic constructs," which were said to be psychologically based, individualistic, and unchanging (Sternburg & Li-Fang, 2001).

The majority of decision making research ascribes to the belief that decision making is a process. Krumboltz and Hamel (1977) believe that decision making is a series of steps, whereby one defines, creates, examines, and acts upon collected or gathered information. Rowe, Boulgarides, and McGrath (1984) further suggest that the decision making process includes elements of evaluating the merit of each decision. Therefore, they introduced a five stage process for decision making: 1) defining a problem, 2) finding and analyzing solutions, 3) implementing the decision, 4) achieving the results, and 5) managing the consequences. Phillips (1997) supports these ideas, but rearranged the order of the stages to the following: 1) identifying all existing alternatives, 2) valuing the alternatives according to preferences and potential outcomes, 3) assembling the information, 4) choosing between preferences and outcomes, and 5) selecting the most favorable alternative.

Other researchers believe that decision making is a more personal experience. Stueart and Moran (1993) argue that decision making is based upon an individual's experience,

experimentation, and research. Weiss (1983) claims decision making is a function of one's information, ideology, and personal interest. Further, Petrides & Guiney (2002) believe that decision making is an influential process by which one's core values and beliefs are fundamental to the decision making process. These researchers along with others recognize decision making as a cognitive process.

Rowe and Mason (1987) refer to decision making in terms of five key cognitive processes: 1) the stimuli, that which arouses the decision maker; 2) the response, the manner in which one responds to the stimulus; 3) the reflection, how one thinks about the problem; 4) the implementation, how one implements and executes the decision; and 5) the evaluation, determining the effectiveness of the decision on desired goals.

1.3 DECISION MAKING AS A COGNITIVE PROCESS

Decision making is a human act. Within the decision making process information is structurally managed by an organization through the human manipulation of information (Streufertn and Streufertn, 1978). The human actors are decision makers who ultimately determine the choice among the alternatives in the decision making process. Significant research has demonstrated variations among individual decision processing. Individuals within the decision making process can act very differently. For example, some individuals may be able to think quickly and methodically. Other decision makers may prefer to analyze and reflect, while others may like to act upon their thoughts rather than contemplating their actions. The personalization of such information processing has been defined under the term cognitive style.

Throughout the years, literature has used the term *cognitive style* to mean many different conceptualizations (Leonard, School, and Kowalski, 1999). Similarly, Broeck, Vanderheyden, and Cools (2003) assessed the use of cognitive style in literature and found inconsistencies among the understandings and applications of the term. Leonard et al. (1999) states the term cognitive style is not helpful in defining one's decision making process. These researchers believe that cognitive style refers more to the behavior and manner of one's decision making abilities and not to one's process. Further, Leonard et al. (1999) poses the idea that cognitive style refers to one's actions in relation to one's individual learning style, personality style, and decision making style. Moreover, other research suggests that cognitive style relates to the actions through which individuals seek, organize, understand, process, and evaluate information (Messick, 1984; Leonard, School, & Beauvais, 1996; Hayes and Allinson, 1998). Additionally, Cassidy (2004) implies that cognitive style reflects a type of thinking, remembering, and problem solving.

Rowe and Mason (1987) depict cognitive style as the way in which individuals use information in relation to their cognitive capabilities, explicitly, their ability to process and interpret stimuli. Due to the complexity and variation in use, Rowe and Mason (1987) propose the term *decision style* to mean the way a person uses information to formulate a decision. According to Rowe and Mason (1987), decision style is still a cognitive process which includes one's personality in relation to one's needs, values, and self-concept.

1.4 DECISION MAKING FRAMEWORKS

Over time, there has been a longstanding interest in decision making across many behavioral sciences. Within such sciences—psychology, education, and management—several decision making frameworks have been introduced. Each framework, whether theoretical or applied, has proposed variations in its definitions, classifications, and/or implications surrounding the concept of decision making.

One of the most well known frameworks was suggested by John Dewey in 1910. This framework for decision making stems from five phases of reflective thought: 1) suggestion, 2) intellectualization, 3) hypotheses development, 4) reasoning, and 5) implementation (Dewey, 1933). Dewey's work provides a basis for other research regarding reflective phases. Such research introduces theories which incorporate various numbers of phases—anywhere from three to five and even ten. Jung (1923) rests this thinking of personality on a tri-matrix of bipolar dimensions. The three dimensions of Jung's framework are perceiving, judging, and attention (Bokoros & Golsdtein, 1992). Within each dimension, Jung poses a bipolar relational scale. The relational scale for each dimension is as follows: 1) perceiving could be described as either sensation or intuitive; 2) judgment could be accomplished by either thinking or feeling; and 3) attention could be defined as either extraverted or introverted (Bokoros & Golsdtein, 1992). This framework is the foundation from which Myers & McCaully (1985) formed the Myers-Briggs Type Indicator. This indicator has become one of the most widely used psychometric instruments (Bokoros & Golsdtein, 1992).

During the 1970s, several other theorists continued to investigate the process of an individual's decision making abilities. Witte (1972) looked at the difference between phases of thinking and the sequential patterning of one's thought. Witte concluded that one's ability to

decide is ultimately carried out by a set of operations and a succession of these activities over a noted amount of time (Witte, 1972). On the other hand, Hysmans (1970) researched an individual's way of reasoning. He proposed a two tiered decision style model. Hysmans' (1970) model terms ways of reasoning as either analytical (relational and problem based) or heuristic (pragmatic and intuition based). Another model during the 1970s was introduced by McKeeney and Keen. Their model emphasizes one's mode of gathering and evaluating information, as well as one's decision making tendency. Within this model, an individual's mode can be classified as either perceptive (based on relationships) or receptive (based on details), while a decision maker can be intuitive or systematic (McKeeney & Keen, 1974). This framework introduces four decision styles: 1) systematic-perceptive, 2) systematic-receptive, 3) intuitive-perceptive, and 4) intuitive-receptive (McKeeney & Keen, 1974). The above frameworks are found to support the belief that decision making is cognitively aligned.

In 1984, Keegan researched the functions of perception and judgment and concluded that decision makers possess one dominant decision making style and one auxiliary style. Thus, Keegan introduced eight decision styles. At the same time, other theorists started to recognize the possibility of cognitive differences between individuals and their decision making processes. These differences were concluded to be stylistic. For example, Mason and Mitroff (Mitroff, 1983) recommend a decision making framework based on the independent relationship between information acquisition and information processing. Mason and Mitroff's model incorporates Jung's typology to classify decision styles. Their proposed framework combines modes of information acquisition (sensation or intuitive) with processing approaches (feeling or thinking) (Mason & Mitroff, 1973). The combinations of these modes form a four stylistic model: 1) sensation-thinking, 2) sensation-feeling, 3) intuition-thinking, and 4) intuition-feeling (Mason &

Mitroff, 1973). Hunt, Krzystofiak, Meindl, and Yousry in 1989, reduced the number of descriptive styles to three—analytical, intuitive, and mixed. They believe that information acquisition and information processing were dependent variables and found this to be empirically authentic although it may be theoretically problematic (Hunt et al., 1989).

Some theorists started to review the above works and found it difficult to support the notion of cognitive styles regarding decision making. Mytykyn and Green (1985) reviewed the literature and concluded that such a stylistic theory of decision making was ambiguous and contradicting. By the early 1990s, several theorists embarked on a mission to define the meaning of *decision making style*. Variations in the accepted meaning of decision making style began to surface in the literature. Two definitions are found to be widely used among most researchers. The first definition was introduced by Driver in 1979. He defined a decision making style as a *habitual pattern an individual uses in the decision making process*. The other definition came from Harren (1979), who stated that one's decision making style was an *individual characteristic for perceiving and responding to a decision making task.*

Driver, with assistance from Streufert, Mock, Broussearu and Hunsaker, describe two key factors that account for stylistic differences among individuals when making a decision (Driver, Brousseau, & Hunsaker, 1993). The first factor is information use, which is the amount of information considered when making a decision. The other factor is focus, which is the number of solutions one develops before making a decision. By combining these two factors, Driver and his colleagues, introduced a model for categorizing decision styles—*Five Basic Decision Styles of Information Use* (Driver et al., 1993). The five styles introduced were decisive, flexible, integrative, hierarchic, and systematic. Each of these styles possesses specific characteristics which a decision maker may demonstrate. At this time, Driver also redefined his definition of a

decision making style to incorporate the amount of information gathered and the number of chosen alternatives as a *learned habit* (Driver et al., 1993).

According to Rowe and Mason (1987), decision making is a cognitive process which combines an intellectual process of perceiving, processing, judging, and deciding. These theorists identify two characteristics of a decision maker: cognitively complex and value oriented (Rowe & Mason, 1987). Cognitive complexity describes a decision maker's ability to recognize and draw inferences from various cues (Rowe & Boulgarides, 1992). Within Rowe and Mason's framework, an individual's cognitive complexity is defined by his/her tolerance of ambiguity, which is the ability to cope with a high degree of uncertainty (Rowe & Bouglarides, 1992). An individual with high tolerance for ambiguity will have strong critical thinking skills, while an individual with low tolerance for ambiguity will have difficulty making complex decisions (Rowe & Bouglarides, 1992). The other characteristic of decision makers is the orientation of values. Rowe describes one's value orientation as being either human/socially driven or task/technically driven (1987). This decision style framework is defined by three key factors: 1) the way one thinks about a problem, 2) the way one communicates to others, and 3) the way one expects others' behavior to affect his/her performance (Rowe and Mason, 1987). The decision styles in this model are directive, analytical, conceptual, and behavioral.

Finally, Scott and Bruce (1995) combine various research and theory to produce a holistic conceptualization regarding decision making styles. They define decision style as

> the learned habitual response pattern exhibited by an individual when confronted with a decision situation...it is not a personality trait… but a habit-based propensity to react in a certain way (Scott & Bruce, 1995, p. 820).

In addition, their work concludes with the belief that decision making research lacks a true conceptual framework. In an effort to correlate previous research, Scott and Bruce (1995),

characterize four decision styles. Their four styles are behaviorally based—rational, intuitive, dependent, and avoidant. Applying various analyses, Scott and Bruce (1995) conclude that these decision styles are independent, but not mutually exclusive.

In reviewing the various frameworks applied to the decision making process, there remains a need to investigate the implications of decision making behaviors among various decision making tasks.

1.5 DECISION STYLE AND BEHAVIOR

Decision style models classify an individual's cognitive process by integrating his/her ability to understand, organize, think, process, and formulate information. One definition used in the literature for decision styles is the *identification of a distinctive personality type or behavior* (Sternburg & Li-fang, 2001). Although many researchers believe that the term *style* has been overused, misused, modified, and misinterpreted—Sternburg and Li-fang (2001) note that the working definition for style could be defined as a *habitual pattern* or *preferred way* of doing something that is consistent over time and across activities.

According to Rowe and Mason (1987), decision style is a cognitive process which represents the way an individual approaches a problem. One's decision style reflects the way he/she visualizes, thinks, and interprets situations. Such research has revealed two key factors in how individuals vary in making decisions. The two key factors are defined as information use and focus (number of solutions explored). Such research also suggests that understanding an individual's decision style may impact one's information processing approach (Driver, Svensson, Amato, & Pate, 1996). Furthermore, Nutt (1990) found that decision style portrays an

individual's belief system, including the categorizing and sorting of data—which may be taken for granted and/or unconsciously applied to the decision making process.

Additional studies have investigated several variables that influence certain decision styles. For instance, one study insisted that cultural background influenced an individual's decision style (Tayeb, 1988); while another study argued that decision style differed depending on country, organizational sector, age, region of childhood, social class, and education (Ali, 1989). Yousef (1998) conducted a study and reported that decision style may be influenced by organizational culture, level of technology use, decision maker's education, and job position.

According to Rowe and Boulgarides (1992), decision style may assist in predicting decision outcomes. These two researchers support this belief by showing how the different decision styles react to stress, motivation, problem solving, and thinking. Table 1.1 clarifies their findings.

Table 1.1 Behavioral Reactions According to Rowe and Mason's Decision Styles

(Rowe & Boulgarides, 1992)

Decision Style	**Reaction to Stress**	**Motivated by**	**Solves Problems By**	**Thinking Mode**
Analytical	Procedural	Problems	Analysis and Insight	Logical
Behavioral	Evading	Acceptance	Feeling and Instinct	Emotional
Conceptual	Erratic	Recognition	Intuition and Judgment	Creative
Directive	Explosive	Power and Status	Rules and Policies	Focused

Several other studies have investigated the variation in decision behavior. One study analyzed how educational leaders executed their decision styles. This study found that directive leaders are more likely to repeat information and conceptual leaders are more likely to discuss information (Larson, Foster-Fishman, & Franz, 1998). Moreover, another researcher demonstrated that organizations afforded key decision making to groups of individuals rather than single individuals—as groups are presumed to have access to a broader range of decision-making resources (Vroom, 1988).

1.6 DECISION STYLE INVENTORY

From the above frameworks regarding decision making theory, several stylistic inventories have been created. First, in 1985, Myers and McCaully formed the *Myers-Briggs Type Indicator* which was framed from Carl Jung's work on personality. This inventory is most noted as a psychometric instrument (Bokoros & Golsdtein, 1992). In 1987, Rowe and Mason created the *Decision Style Inventory* which reflects ideals from their Cognitive Complexity Model. This inventory was designed to characterize the way individuals arrive at particular decisions, especially in the area of management (Rowe and Mason, 1987). Then in 1995, Scott and Bruce created a *Decision-making Style Inventory* which was supported by their holistic research of previous decision making frameworks. This inventory was designed to describe an individual's decision making process and pattern. The target audience for this inventory was designed to be broad—from students to military officers to engineers. Although this inventory was supported by various theoretical viewpoints, the validity of the prescribed decision styles appears to be unclear and problematic (Thunholm, 2004).

1.7 ROWE AND MASON'S DECISION STYLE INVENTORY

In relation to this study, Rowe and Mason's Decision Style Inventory (DSI) seems to provide the best model for characterizing school principals' decision styles. The following section provides an explanation of the framework which supports this inventory. Further, a detailed description of the inventory is included with a review of several related studies in which the DSI was utilized.

Rowe and Mason (1987) created a *Cognitive Complexity Model* which conceptualized four decision style categories: directive, analytical, conceptual, and behavioral. Because individuals make decisions in relation to perceived information (cognitive) and evaluative information (personality), this particular model attempts to characterize the way individuals arrive at particular decisions (Rowe and Mason, 1987). The complexity of this model comes from the integration of various bodies of knowledge, including but not limited to cognitive psychology, social psychology, organizational behavior, education, and business (Rowe and Davis, 1996).

According to Rowe and Mason (1987), each decision style elicits specific traits and/or preferences. For example, the following decision making styles of analytical, behavioral, conceptual, and directive, respectively prefer specific facts, accurate and complete data, broad coverage of many options, and limited data that are easily understood (Rowe & Mason, 1987). Further, Rowe and Mason (1987) believe that style descriptors should be able to describe an individual's mental predisposition, cognitive process, and problem solving ability. They also deem that the style descriptors can be contextually explicit—describing the environment in which the decision is being made (Rowe and Mason, 1987). These theorists describe four elements of an individual's decision style. The four elements are: 1) perception and reception to

stimuli, 2) capacity to handle information and to reach a meaningful conclusion, 3) intuition or creativity to develop alternatives, and 4) dexterity to make a decision (Rowe and Mason, 1987).

Rowe and Mason's model provides general descriptions of each style through specific categories such as organizational fit, problem orientation, level of tolerance for ambiguity, technical concern, leadership, and major criticism. The general descriptions of each decision style are as follows:

> Analytical Style – This style is characterized by a problem solving and intellectual orientation. These individuals have a greater tolerance for ambiguity and a cognitively complex personality. This decision style focuses on technical decisions with a need for details, information, and many alternatives. People with this style may be characterized as intellectual with ability to deal with new and complex situations, analyze details, and predict outcomes. This style is criticized for being dogmatic and impersonal.
>
> Behavioral Style – This style is characterized by supportive and friendly orientation. These individuals have a low tolerance for ambiguity and low cognitive complexity. People with this style focus on social concerns and elicit open communication, personal interactions, and empathic attitudes. Such individuals like to be around people and tend to avoid conflict. This style is criticized for its focus on short-term problem solving and difficulty in making tough decisions.
>
> Conceptual Style – This style is characterized by a creative, risk taking orientation. These individuals have a high tolerance for ambiguity and high cognitive complexity. This decision style focuses on social concerns and connecting with people. People with this style may be characterized as people-oriented, open, and truthful. Such individuals like to share power and do not look to control the situation. This style is criticized for being idealistic with a strong emphasis on values and ethics.
>
> Directive Style – This style is characterized by an autocratic and internal orientation. These individuals have a low tolerance for ambiguity and a low

cognitive personality complexity. This decision style focuses on technical questions with a need for speed, efficiency, and limited alternatives. People with this style may be characterized as rigid, structured, practical, and impersonal. This style is criticized for its aggression, need for security, and tight control. (Boulgarides & Cohn, 2001; Rowe & Davis, 1996; Rowe & Mason, 1987).

From Rowe and Mason's Cognitive Complexity Model, a *Decision Style Inventory (DSI)* was created in order to test an individual's preferences when approaching various decision situations. The DSI was supported by the basic assumption that individuals, mainly managers, work with others in achieving a desired outcome (Rowe & Boulgarides, 1992). It was further noted that these individuals must react to various elements within an organizational environment. Rowe defined four basic forces that may influence an individual's thought process, behavior, and decision making within an organization/environment. The four forces are environment, organization, task demands, and personal needs (Rowe & Boulgarides, 1992). By 1992, Rowe and Boulgarides, expanded the four basic forces to include two more—pre-potent needs and emergent behaviors. Figure 1.1 provides descriptions for each of the forces designated in the *Expanded Four Force Model* (Rowe & Boulgarides, 1992).

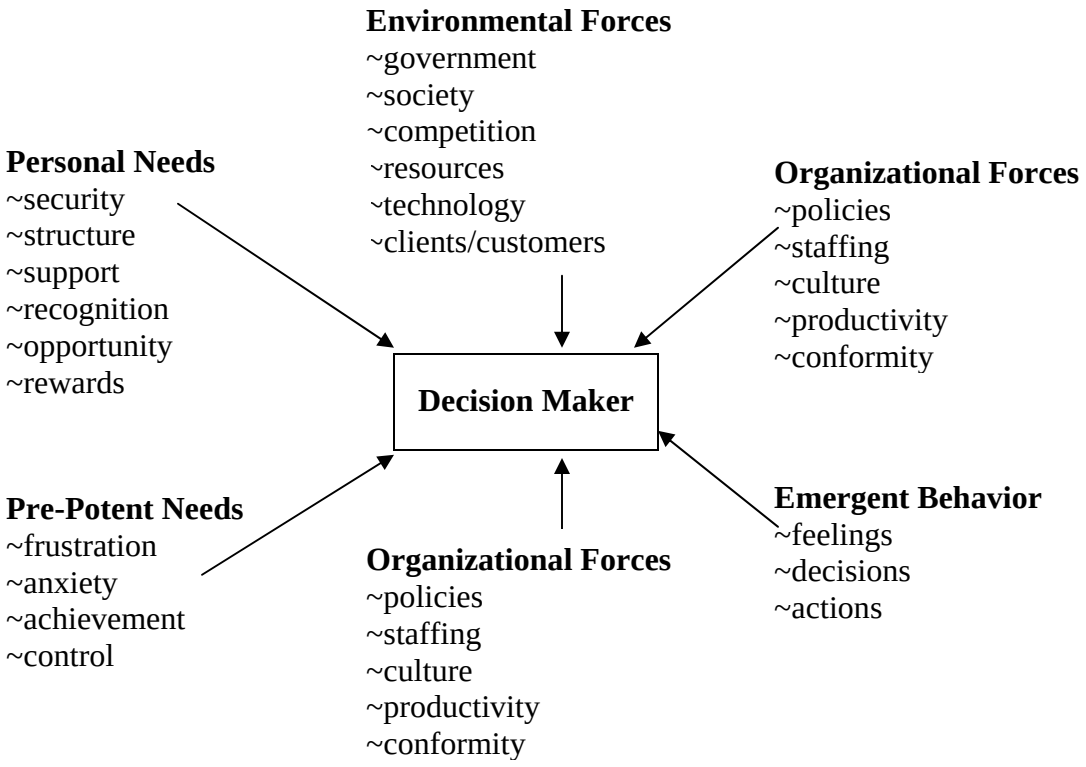

Figure 1.1 The Expanded Four Forces Model (Rowe & Boulgarides, 1992)

Rowe and Mason's Decision Style Inventory consists of twenty questions regarding typical situations facing an individual at a managerial level. Each question poses four behavior responses to a given situation. The decision maker is asked to rank the behaviors according to his/her preference. The options are: 8, 4, 2, and 1—each number indicates a level of preference. For example, 8 indicates the response that is most preferred, 4 indicates the response is considered often, 2 indicates the response is considered occasionally, and 1 indicates the response that is least preferred. Each number may be used only once within a given question. Through extensive examination and testing, the theorists found that doubling the ranking response provided a more accurate measurement than providing a ranking scale of 1 through 4 (Rowe and Mason, 1987).

Several studies have utilized the Decision Style Inventory to investigate relationships between decision style and assorted variables. One study considered the difference in decision styles among individuals at varying management levels. Using the DSI, the researchers concluded that individuals at high management levels displayed a conceptual decision style while lower level managers displayed a behavioral decision style (Pennino, 2000). Another study using the DSI investigated specific reasons behind an individual's decision style. This study found that a leader's decision style tended to result from the amount of information the leader desired and the number of alternatives the leader considered (Herring, 1999).

In 1999, another set of researchers set out to study the interrelationship between four stylistic measures: Myers-Briggs Type Indicator, The Group Embedded Figure Test, the Learning Styles Inventory, and the Decision Style Inventory (Leonard, School, and Kowalski, 1999). This study attempted to conceptually link these four stylistic inventories/tests. The findings indicated no significant interrelation between the measures and demonstrated that each inventory/test attempts to evaluate different aspects of information processing and decision making (Leonard, School, and Kowalski, 1999).

Another study that utilized the DSI looked at managerial decision styles among librarians. This researcher was interested in examining to what extent library directors' decision styles varied depending on institution type (Mech, 1993). The findings of this study demonstrated that the predominant decision style among library directors was behavioral and significantly higher for directors at baccalaureate and community college institutions. Several other variables that were evaluated in this study were administrative experience, public vs. private institutions, and age of the participants. For each of these variables, Mech (1993) found

similarities regarding their preferred decision styles. Additionally, Mech (1993) did find that gender was an irrelevant variable in relation to one's decision style and orientation.

In the United Arab Emirates, researcher Yousef (1998) conducted a study to explore organizational culture and level of technology as a predictor of young Arab managers' decision styles. Due to the fact that this study was conducted in a non-western country, individuals differed in management style from most western countries by demonstrating the conceptual decision style with a participatory element. Furthermore, this study suggested that organizational culture, level of technology use, level of education, and an individual's management position are good predictors of an individual's decision style (Yousef, 1998).

Goodyear (1987) attempted to study the decision making patterns of nurse practitioners and their cognitive processes, personal characteristics, and levels of employment. Goodyear (1987) utilized the DSI and the Myers Brigg Type Indicator. This researcher found that personality types vary among decision styles. For example, participants who were characterized as preferring a directive or analytical decision style preferred the personality preferences of being introverted and thinking (Goodyear, 1987). Furthermore, Goodyear (1987) found an individual's years of experience are of significance in relation to decision style.

Beverly Benson, in 1986, evaluated the relationship between decision styles and various demographic information of chief and assistant nurses in Veteran's Administration Field Hospitals. Benson (1986) used a modified version of the DSI for her study. She found the dominant decision style among participants to be analytical and that the number of years of nursing was the only demographic variable to be of significance.

Through reviewing various studies that utilized Rowe and Mason's Decision Style Inventory, it can be determined that certain variables affect an individual's decision style. From

the studies reviewed, the following variables have appeared to influence one's decision style [this list is not exhaustive, but rather reflects variables from reviewed studies]: age, experience, organizational type/setting, organizational culture, level of technology, and level of management (Yousef, 1998; Mech, 1993; Goodyear, 1987; Benson, 1986).

As mentioned in the introduction, this study will focus on investigating school principals' decision making styles and the relationship between these styles and the principals' acceptance and usage of technology. The reason for choosing the variable of technology is the influential implications of technology use in decision making among educational leaders, specifically school principals. After reviewing the literature, there appear to be few specialized studies that report on decision styles of educational leaders in regard to technology acceptance and use. Furthermore, with the increasing need to perform and adhere to the No Child Left Behind Act, the need for educational leaders to become technologically savvy and data driven is crucial. Therefore, this study intends to provide additional research regarding decision styles among educational leaders, and more specifically the relationship between those styles and the acceptance and usage of technology.

1.8 TECHNOLOGY IN EDUCATION

Technology has become a primary commodity in our current society. However, the educational system is still posing the question, "Is technology in schools a necessary evil?" (Latham, 1998). This question may demonstrate that schools are just beginning to implement and employ various technologies within the educational setting. Latham (1998) elaborates by suggesting that in order for "information technology resources" to be effective, school systems must demonstrate

their abilities to be integrative and compatible with multiple technological and instructional approaches. In addition, other researchers have suggested that in order for technology implementation to be successful in educational organizations, technology training programs must start at the top of the organization—thus beginning with educational leaders (Foster, 1996).

One leading organization in school technology leadership training (*Smart Tools Academy: A Technology Program for K-12 Education Leaders in Washington*, 2000) affirms that technology training is an important component in the implementation of technological systems within educational organizations. The *Smart Tools Academy* believes that

> effective use and understanding of technology is not a luxury, but a necessity… and thoughtful and systemic integration of technology into learning environments begins with the leadership of schools and districts (*Smart Tools Academy: A Technology Program for K-12 Education Leaders in Washington*, 2000).

In a May 10, 2001 article in *Education Week* (*State Profiles Pennsylvania*, 2001), John Bailey, then Director of Technology for the Pennsylvania Department of Education, stated that "leadership is often the key" to driving a technology revolution in order to provide smooth school operations and to increase student achievement. Bailey continues by stating that it often comes down to organizational leadership—the superintendent, school board, or principal in providing the technology implementation within the school setting (*State Profiles Pennsylvania*, 2001). In becoming the Federal Director of Educational Technology, Bailey had begun to draft a new national plan for educational technology (Trotter, 2002).

Within the last few years, a collective search by the Education Commission of the States found that 25 states have been identified as having some sort of statewide leadership academy for school leaders (*Statewide Leadership Academies: A 50 State Scan*, 2001). During this time, the Bill and Melinda Gates Foundation has funded 18 states to develop or continue current leadership academies around the use of technology. Additionally, the Bill and Melinda Gates

Foundation has committed $100 million to provide access to technology leadership training for every superintendent and principal in the nation. The main focus for these trainings is to implement whole system improvement through the creation of high-performance, technological driven learning environments (*State Challenge Grants for Leadership Development*, 2002).

Pennsylvania, among a few other states, was at the forefront in creating and implementing an academy to train school leaders in the use and application of technology driven decision making. The Pennsylvania Principals Technology Leadership Academy (PTLA) (*The Pennsylvania Technology Leadership Academy*, 2002) was created based on the premise that leadership was the crucial indicator for technology being used successfully within a school system. As an incentive to attend the training and a tool to take back to his/her respective school, each principal was issued a palm pilot (PDA). This device was provided with the provision that educational leaders would incorporate its usage into their daily decision making tasks. This product was promoted as a tool for decision enhancement by allowing for flexibility and effectiveness. Moreover, through the generosity of the Gates Foundation, the Pennsylvania PTLA continued by training school board members and superintendents.

Specifically, at the PTLA, principals from Pennsylvania were placed in a technology-rich learning environment to gain insight into the importance of having a vision for technology in education. The PTLA acknowledged how technology can create strategic efficiencies and improve student achievement. As the title of the academy suggests, a rigorous curriculum in "technology leadership" was presented through seminars and activities. In addition, principals were also provided the opportunity to be trained in the use of the Internet, e-mail, word processing, spreadsheet, and database applications. Thus, the academy's objective was for

principals to be trained on strategies to incorporate computer applications into their daily decision making processes.

It has been demonstrated that various leaders have been reluctant to learn how to harness information technologies, whereby impeding the use of new technologies in decision-making functions (Townsend, DeMarie, Hendrickson, & Whitman, 2000). Coppieters (2005) endorses that decision making depends on the level of information and knowledge being produced, as well as the degree of connectivity between the decision, the environmental structure, and the organization's culture. "Data that is electronically collected are often controlled at a district level with little or no access provided for individual school managers" (Petrides & Guiney, 2002, p.1712). The emphasis on individualized accountability is building a case for school site interaction. Therefore, technological systems may allow multiple school personnel the ability to collect data, analyze information, generate reports, explore relationships, provide accountability, and make informed decisions (Rudner & Boston, 2003). The key factor in promoting any system is that the system may only be as good as the user (Brown & Brudney, 2003).

1.9 TECHNOLOGY ACCEPTANCE MODEL

In the educational arena, technology has become a key component in the daily tasks of educators. In particular, the exposure of technology to educational leadership has been dramatic. The issue of technology acceptance and use has become an important focus for many researchers. In particular, Fred Davis in 1989, with assistance from several colleagues, proposed a *Technology Acceptance Model (TAM)* which defines significant factors that affect the use of technology.

This model attempts to frame how individuals come to accept and use technology. TAM is theoretically supported by two behavioral models.

One of the behavior theories used to frame TAM is the *Social Cognitive Theory* (SCT) (Bandura, 1986). SCT suggests three factors that create a reciprocal relationship regarding one's behavior. The three factors are person, behavior, and environment. The reciprocal relationship of these three factors is defined as the person and the environment affects the behavior and vice versa. According to SCT, individuals ask two question before behaving, "Can I do it?" and "Should I do it?" (Bandura, 1986). If a person feels that he/she can accomplish a task and believes that the outcomes are beneficial, then he/she is considered to be in "close proximity" to perform the chosen behavior.

Another theory from which TAM draws is the *Theory of Planned Behavior (TPB)* (Bajaj & Nidumolu, 1998). This theory focuses on attitudinal factors of behavior. According to TPB, one's behavior is exclusively influenced by behavioral intentions; while behavioral intentions are influenced by behavioral attitudes, subjective norms, and perceived control of behavior (Bajaj & Nidumolu, 1998).

From these two theories, TAM (Davis, Bagozzi, & Warshaw, 1989) was created to explain and predict technology acceptance and usage behavior. Mainly, this model explains how one's behavioral intent to use technology affects one's actual technology use. Within this model, two key variables addressed are—perceived usefulness of technology and perceived ease of technology use (Davis et al., 1989). Perceived usefulness of technology was found to be the factor most closely related to an individual's intentions to use a system, whereas perceived ease of technology use related to the direct usage of a technology system. According to TAM, all

other factors related to technology acceptance and use are considered external variables (Davis et al., 1989).

TAM frames technology acceptance according to three factors: perceived ease of technology use, perceived usefulness of technology, and one's behavioral intent to use technology (Davis et al., 1989). These three factors are interconnected to determine an individual's technology acceptance and use. For example, if an individual perceives the technology to be easy to use and useful in completing a given task, then it is believed that such perceptions create positive feelings toward the use of the technology. The positive feelings toward the use of the technology in turn are believed to have a positive relationship on the individual's intent to use the technology. The factorial relationship of TAM is shown in Figure 1.2. In using this model, the following study attempts to determine the technology acceptance and use of educational leaders, specifically K-12 principals.

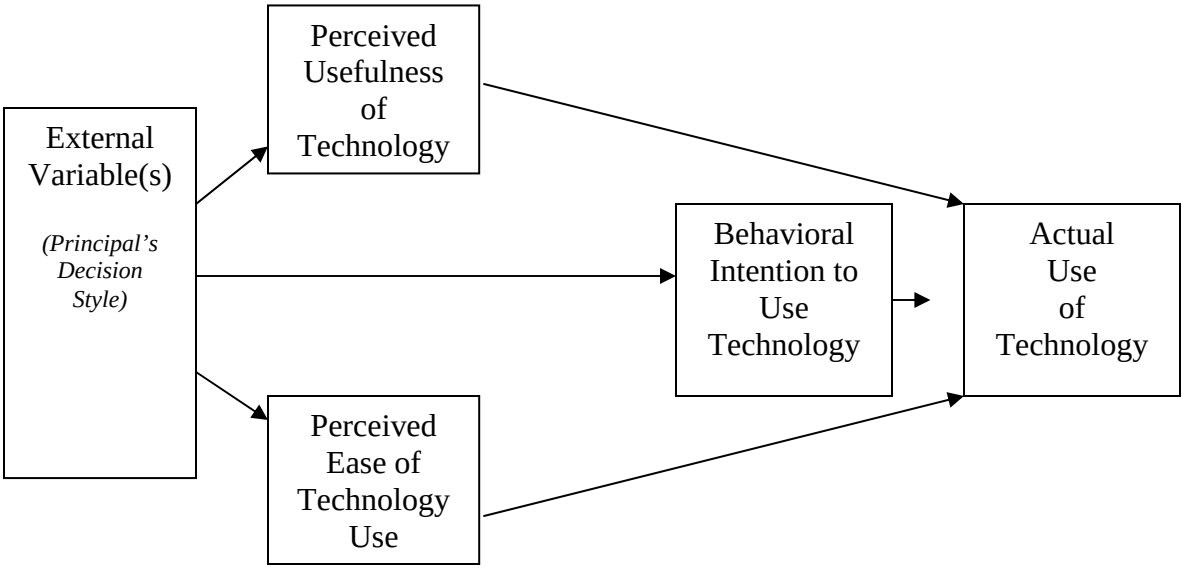

Figure 1.2 Technology Acceptance Model (Davis, Bagozzi, & Warshaw, 1989)

TAM has been widely studied and accepted as a valid model in predicting technology acceptance and user behavior (Adams, Nelson, & Todd, 1992; Davis et al., 1989; Doll, Hendricks, and Deng, 1998; Segars & Grover, 1993; Taylor & Todd, 1995). Since 1999, the Scientific Information Social Science Citation Index has listed 355 citations of the original TAM study by Davis (Morris & Turner, 2004). This model is highly regarded because it is easily administered, it is cost effective, and it is adaptable across contexts (Venkatesh, 2000). Although the TAM has been widely supported, one element researchers have criticized is the lack of explanation regarding cognitive processes in acceptance and usage behaviors (Venkatesh, Moore, Davis, & Davis, 2003).

Several studies have attempted to replicate Davis's original study in order to provide empirical evidence regarding the existence of a relationship between technology usefulness, ease of technology use, and actual technology use (Davis et al., 1989). In addition, several other studies have attempted to test the validity of the questionnaire instrument presented by Davis and others in 1989.

Adam, Nelson, and Todd (1992) replicated Davis's original work attempting to determine the validity and reliability of the TAM questionnaire and measurement scale. Their work demonstrated an internal consistency regarding the questionnaire and exhibited replication reliability of both the questionnaire and the measurement scale (Adam et al., 1992). Hendrickson, Massey, and Cronan (1993) also found high reliability when replicating the original study using Davis's questionnaire. Szajna (1994) found Davis's instruments to be valid and supported their reliability with different sample populations and software choices.

Most of the studies using TAM support the notion that in order to make effective use of technology, individuals must accept technology, learn how to interact with software applications,

and adapt the technology to their organization's task requirements (Doll, Hendrickson, & Deng, 1998). Several of these studies have investigated various characteristics of the user. One study in particular, showed the importance of user willingness to adapt as a factor of technology utilization (Hendrickson, Massey, & Cronan, 1993).

Several studies support the premise that an individual's belief of a system's ease of use is directly correlated to an individual's general use of the system; whereas objective usability impacts ease of use about a specific system only after the individual has had direct exposure to the system(s) (Venkatesh & Davis, 1996). Furthermore, the perceived long-term usefulness of a technology system was found to be significantly influenced by a user's belief of the near-term usefulness of the technology (Chau, 1996). It is proposed that program developers may benefit from focusing on the importance of personal relevance of a system through allowing for the defining of individualized problems, the analyzing of specific information requirements, and the promoting of alternative designs (Jackson, Chow, & Leitch, 1997).

According to Legris, Ingham, and Collerette (2003), TAM is a useful model, but should integrate external variables related to human and/or social change processes. In keeping with this thought, this study will attempt to utilize the Technology Acceptance Model as the overarching framework while integrating the external variable of user decision style. Therefore, this study attempts to suggest that an individual's, specifically a principal's, decision style influences his/her technology acceptance and use. This hypothesis is based on the premise that some decision styles are more apt to use technology than others.

1.10 SUMMARY

Educational organizations are subject to many challenges with the increasing need to demonstrate accountability. As decision makers, educational leaders must explore ways in which technology may assist in the decision making process. Through the endorsement of knowledge management, schools can

> evolve from bureaucracies forged during an industrial era to educational knowledge ecologies that are prepared to compete in a networked information driven global society (Petrides & Guiney, 2002, p.1703).

The challenge becomes how do educational organizations promote the acceptance and use of technology in an environment that is autonomy driven? As proclaimed by Weidner (1999), school leaders should become "collaborative decision makers" in a technological environment. Decision making based on intuition and insight may no longer be enough. The current educational leader needs to understand how to use technology for data collection, information analysis, and learned knowledge to be an effective decision maker (Creighton, 2001; Coppieters, 2005). A decision maker should have a personal mastery of what is needed and self knowledge of what is wished to be achieved (Coppieters, 2005). As stated by Coppieters (2005),

> organizational learning depends on the motivation of the agents… personal attitude is key…it is supposed that the outcome of the learning process has been shared among the agents to stimulate the flow of information and increase change (pp.134-135).

The acceptance and use of technology to assist with decision making may be promoted through the connection of individual perspectives with organizational resources, thereby creating a culture that "supports organizational growth, expansion, and performance" (Petrides & Guiney, 2002, p.1714).

Educational organizations need to prepare their leaders to use technology as a "leadership enhancing professional productivity tool" and "condition them to think in terms of information rather than data" (Coppieters, 2005, p.5). The need to keep current, to integrate support and training, and to promote data driven leadership is fundamental in promoting the use of technology. One should remember, "it is not about the tool or vendor…it is about you [the leader] and what you [the leader] are trying to achieve [through] your outcomes" (Hall, 2004, p. 33). In the future, educational leaders will need to be technologically literate, data driven, analytically competent, and knowledge empowered to create "subject oriented, integrated, time variant, non volatile" decisions regarding the teaching and learning process of the next generation (Petrides & Guiney, 2002, p.1703).

2.0 CHAPTER TWO: THE STUDY

2.1 INTRODUCTION

Decision making is an important element in the daily life of an educational leader. Research has demonstrated that leaders may differ in relation to their decision making behaviors (Stueart & Moran, 1993). Through the differentiation of behaviors, school leaders may vary in their approaches, implementations, and executions of various tasks or duties within their daily schedules. Therefore, a leader's style of decision making may impact the way he/she thinks, acts, and leads. In reviewing the literature on decision making, many studies have investigated the cognitive process of decision making. Specifically, research has looked at how leaders make decisions, why leaders make certain decisions, and what decisions leaders are making. However, there have been very few studies that attempt to relate a leader's decision orientation (style) to his/her use of decision making tools.

This study attempts to investigate the extent to which an educational leader's decision style influences his/her acceptance and use of technology. Due to the fact that educational leaders possess various decision making styles, are leaders of a certain decision style more or less likely to accept and use technology? If principals are not affording themselves the use of technological applications, then they may not be fully utilizing influential leadership tools. Furthermore, the lack of technology use may inhibit the ability of principals to provide the most optimal learning environments.

2.2 STATEMENT OF THE PROBLEM

The problem in this study is while various technology is available to school principals, are principals with a particular decision style more or less likely to accept and use the technology?

2.3 PURPOSE OF THE STUDY

The primary purpose of this study is to evaluate to what extent a principal's decision style influences his/her acceptance and use of technology. The central aim of this study is to determine if a principal with a certain decision style is more or less likely to accept and use technology than a principal with a different decision style. Furthermore, one's ability to accept and use technology may also play a key role in the employment of effective and efficient decision making (Bailey & Cotlar, 1993; Kassim & Tahir, 2000).

In addition to specific demographic variables, there are three key elements to this study. These elements are: 1) decision style, 2) technology acceptance, and 3) technology usage. Davis' (1989) Technology Acceptance Model (TAM) (Figure 2) will be used to provide a bridge from the key external variable of decision style to the internal variables of acceptance and use of technology. Davis' TAM is the general conceptual and theoretical framework for this study. A Decision Style Inventory (Rowe & Mason, 1987) will be utilized as a survey instrument to determine individual principal's decision style. The results of this data collection instrument will be incorporated as the key external variable within Davis' TAM.

2.4 RESEARCH QUESTIONS

Four research questions will be presented in this study to explore the extent to which principals' decision styles influence their acceptance and use of technology. The following represents the four research questions:

RQ1: What are the managerial decision styles of principals?

RQ2: What is the level of acceptance of technology among principals?

RQ3: What is the level of use of technology among principals?

RQ4: To what extent does a principal's decision style influence his/her acceptance and use of technology?

2.5 SIGNIFICANCE OF THE STUDY

Educational leaders, specifically principals, are extremely busy on a daily basis. One component that may assist principals in effectively and efficiently completing their administrative tasks is the use of technology. Thus, the acceptance and use of technology may assist principals by improving their ability to make effective and efficient decisions. If technology, training, and support are available, the question remains to what extent are educational leaders accepting and using the provided opportunities to incorporate technology into their daily decision making processes.

Technology can be a powerful tool for educational leaders, especially in relation to data driven decision making. Thus, a principal's decision style may be a reliable variable as to whether a principal accepts and uses available technology. The effectiveness of technology is a product of the interaction between organizational goals, leadership practices, and software design

(*Information Technology & People*, 2002). The results of this study may have theoretical implications for future technology leadership trainings, as well as a foundation for others to investigate strategies to encourage educational leaders of all decision styles to use technology—especially in their decision making process.

As educational leaders, principals are influential in making decisions that impact goals and practices of their school systems (Gibson, 2000). In understanding which decision styles accept and use technology, it is anticipated that this study may lay a foundation for determining if different approaches are necessary to encourage various decision makers to use technology, especially as a decision making tool. Furthermore, this study will hopefully begin to answer the following question—that despite having the resources available, do principals accept and use technology as a daily tool within their leadership position?

2.6 DELIMINTATIONS

With the utilization of Davis' TAM the provision for building a conceptual framework for this study will be to narrow the scope by incorporating the following variables:

1) Incorporating Rowe and Mason's Decision Style Inventory, and
2) Studying full time K-12 certified principals in Western Pennsylvania public school districts.

2.7 LIMITATIONS

This study will be limited in scope by:

1) Not studying other variables such as personality traits and/or types of decision making,
2) Studying only principals in Western Pennsylvania, though an argument can be made that general conclusions can be drawn concerning other principals in the state and/or country,
3) Keeping conclusions drawn concerning technology to the types of applications included in the study, and
4) Use of an online application for implementation of survey.

2.8 DEFINITION OF TERMS

Decision Style - the way that we perceive and comprehend stimuli and how we choose to respond (Rowe & Mason, 1987).

Level of Technology Acceptance – the degree to which a person intends to use technology, constituting one's perceived ease of use and perceived usefulness (Davis, 1989).

Technology Acceptance Model (TAM) - a model that posits that usage of information technology is determined by beliefs a user holds about the perceived usefulness (PU) and perceived ease-of-use of the technology (EOU) (Davis, 1989).

Perceived Ease of Use (EOU) - the degree to which a person envisions that using a particular system would be effortless (Davis, 1989).

Perceived Usefulness (PU) - the degree to which a person envisions that use of a particular system would improve his or her performance (Davis, 1989).

3.0 CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter presents the research design and methodology of this study. These two elements are explained through descriptions of the study's data collection instruments, procedures, and analysis techniques.

3.2 RESEARCH DESIGN

The conceptual framework for this study is based on the Technology Acceptance Model proposed by Davis in 1989. This model, introduced in Chapter One, is being used as the overarching framework to analyze the extent to which a relationship exists between three key variables—decision style, technology acceptance, and technology usage. In addition to the three main variables in this study, the following demographic variables will be incorporated: gender, age, years of experience, organizational type, organizational size, and technology availability. It is anticipated that the proposed framework will assist the researcher in answering the following research questions:

RQ1: What are the managerial decision styles of principals?

RQ2: What is the level of acceptance of technology among principals?

RQ3: What is the level of use of technology among principals?

RQ4: To what extent does a principal's decision style influence his/her acceptance and use of technology?

3.3 METHODOLOGY

A quantitative methodology has been chosen for the design of this research. The quantitative research will be executed through an online survey of the proposed sample group. Further, the data will be statistically analyzed in order to incorporate an optimal evaluation of the results.

3.4 SAMPLE GROUP

The sample group for this study consists of K-12 public school building principals in the Western Pennsylvania area. The sample group was compiled using an *Educational Directory* (2006) printed yearly by the Pennsylvania Department of Education. From this directory, a listing of all K-12 building principals in the following Western Pennsylvania counties—Allegheny (including Pittsburgh City), Beaver, Butler, Greene, Fayette, Washington, and Westmoreland, was created. From this listing of 582 principals, a sample population of 300 was drawn using a research randomizing application at r*andomizer.org*. The researcher assumes that all participants of this study are certified administrators in the state of Pennsylvania and hold a full time principal's position in a K-12 public school district.

3.5 RESEARCH INSTRUMENTS

The implementation of this study will be conducted through a quantitative design. In attempting to gather quality data, several research instruments will be employed. The research instruments to be used are: initial cover letter, second cover letter, consent form, and survey (online and paper). The following subsections explain each instrument in detail.

3.5.1 Initial Cover Letter

The first instrument of importance is the initial cover letter. The cover letter is constructed as a single page on white paper. The main purpose of the cover letter is to provide an introduction and invitation to the study. The main ideas in the cover letter are underlined, bolded, or italicized. The cover letter provides vital information regarding participants' obligations and procedures. In order to gain a significant participation rate, the cover letter also emphasizes the importance of each participant's response. Further, the cover letter provides important information regarding the nature of the survey, the amount of time it will take for completion, and the protocol for confidentiality.

The fifth paragraph of the cover letter provides detailed instructions for completing the consent form, with specific directions in bold for emphasis. The letter closes with contact information if a participant has any questions or concerns. At the bottom of the cover letter, a P.S. is added with a reminder about completing the consent form and a statement regarding the administration of the online survey. Each facet within the cover letter plays an important role in attempting to increase the overall response rate. A copy of the cover letter may be reviewed in Appendix A.1.

3.5.2 Formal Consent Form

The second instrument used within this study is the formal consent form. The consent form consists of four pages, copied front to back on white paper. The consent form poses several questions and answers related to the participant's involvement in the presented study. Each participant, in accordance with the University of Pittsburgh Institutional Review Board, must complete an *Adult Consent Form* by initialing the bottom right hand corner of each page and signing the last page verifying participants' rights and obligations. In addition, participants are asked to provide a current email address to which the online survey may be sent. A copy of the consent form may be reviewed in Appendix A.2.

3.5.3 Online Survey

The third instrument is the online survey. The online survey instrument was formulated in the spring of 2005. Pre-testing of the questionnaire was completed in March of 2005 through the distribution of paper surveys to 15 assistant principals within 10 Allegheny County school districts. The survey pretest evaluated completion time, direction comprehension, ease of survey completion, and question conceptualization. After conducting the pre-test, several modifications were made to the directions and survey format. A copy of the survey format may be reviewed in Appendix A.5, as well as being outlined in the following paragraphs.

The survey is sectioned into four parts. The four parts of the survey are: 1) initial questions, 2) Technology Acceptance Inventory, 3) Decision Making Inventory, and 4) demographic information. Each section is prefaced with an explanation and/or directions for completion. Due to the online nature of the survey, there are several formatting elements. First,

the survey is given to the participants through personalized email. The email thanks the participants for offering to participate; explains the length of the survey; notifies the participants about a random reward drawing for a $50 BP Gas Card; and ends with contact information. The email also presents the web link to the survey. The email may be reviewed in Appendix A.3.1.

The next formatting item for the online survey is the survey greeting. The greeting welcomes the participant to the survey website and provides details about the survey's structure. At the bottom of the greeting is a purple arrow labeled *start survey*. Participants click on this arrow to begin the survey. The greeting message may be reviewed in Appendix A.3.2.

The survey itself is formatted using the *global blue* design theme. The survey consists of 45 questions, divided up among 13 pages. At the bottom of each page is a purple arrow labeled *submit*—the participants click on this button to move to the next page. Completion benchmarks have been added throughout the survey to let the participants gauge their completion—after question 11, the following statement is presented: At this point, 25% of survey completed. This statement is stated again after question 23 with 50% and again after question 35 with 75%. At the end of survey, after question 45, the word "Done!" is presented with a submit arrow. The survey ends with a closing message. This message is accompanied by a graphic of a person catching a star. The survey closing may be reviewed in Appendix A.3.3.

The following paragraphs give detailed descriptions of each section of the survey. The first section is Part One: Initial Questions which asks participants questions related to their decision style, technology use, technology availability, technology training, and technology plans/goal setting. The section begins with the following directions: Part 1: Initial Questions; Questions 1-9; Each question is multiple choice, choose the answer that best represents you. This section consists of nine questions. These questions were placed at the beginning of the

survey for two reasons. First, these initial questions give the participant a beginning point, in which broad questions begin to assist participants in establishing an appropriate mind set of the survey topic. Secondly, these questions provide data into the participant's personal beliefs regarding his/her decision making style and technology use. These questions are multiple choice, with several questions having a multiple answer option.

The second section is Part Two: Technology Acceptance/Use Inventory which is drawn from Davis' Technology Acceptance Inventory. The framework for this inventory is discussed in Chapters 1 and 2. The purpose of this inventory is to gauge each principal's perceived ease of use, perceived usefulness, and behavioral intention to use particular technology applications. The inventory consists of five questions, with two additional questions being added for this study. The inventory directions are as follows: Part 2: Technology Acceptance/Use Inventory; Questions 10-16; Please rate the following technology applications according to your acceptance and/or use in relation to your job as a building principal; The word "it" in each statement refers to the technology application at the beginning of the question.

The applications being investigated in this inventory are: the Internet, email, word processing, spreadsheet, and database. The inventory uses a four point Likert scale for ranking each statement. Furthermore, the format of this inventory has been modified for ease of understanding. The major modification from the original inventory is the prompt wording. In the presented inventory, the word "it" is added to each prompt line to acknowledge the application under question. The capitalized application preceding the prompt is the reference application for the word "it." Another modification made is the wording of the prompts. The original inventory prompts were awkwardly worded, especially in relation to behaviors regarding

educational leadership. Therefore, a modification of wording was applied; however, the main idea of each prompt was retained.

Additionally, two questions regarding the volume and frequency of technology use were added to collect more detailed information regarding each individual's technology use. These two questions ask participants to designate their volume and frequency of use for each technology application. The directions for this portion of Part Two are: Continuation of Part 2: Technology Acceptance/Use Inventory; Questions 15 & 16; Please designate your volume (how much) and frequency (how often) of use for the following areas of technology.

The third section is Part Three: Decision Making Style Inventory which is Rowe and Mason's (1987) inventory for gauging one's decision style. This inventory asks participants twenty questions to calculate their decision making style. This section of the survey requires the most explanation because a number of responses are required for each question. This inventory is somewhat complex. Therefore, it is very important that the directions are detailed and concise.

The instructions for completing the inventory are as follows: Part 3: Decision Style Inventory; Questions 17 - 36; The Decision Style Inventory consists of 20 questions, each with four responses per a question. There are no right or wrong answers; Each question will consist of four behaviors to be ranked: 1 = least preferred, 2 , 3, 4 = most preferred; The easiest way to answer this section is to: (1) First pick your most preferred behavior and mark it with a 4., (2) Next pick your least preferred behavior and mark it with a 1, (3) Lastly, mark the remaining behaviors with either a 2 or 3 depending on preference; Each number may be used only ONCE within a given question; For example--My prime objective is to: Have a position with status 1, Be the best in my field 3, Achieve recognition for my work 2, Feel secure in my job 4.

The original inventory uses scoring responses of 1, 2, 4, and 8 to rank the four behaviors within each question. For this study, the scoring responses were modified to simplify the directions and response descriptors. Therefore, the proposed inventory uses 1, 2, 3, and 4, respectively. The responses will be reconverted to the original scale during the data analysis portion of the study.

The fourth section is Part Four: Demographic Information which asks participants nine general demographic questions. These questions consist of age, gender, experience, district/school demographics, and available technology. This section is placed at the end of the survey as a closer. The directions for this part are: Part 4: Demographics; Questions 37 – 45; Please complete the following questions in order to assist with categorizing survey responses. All these questions are multiple choice, with the last question having a multiple answer option.

3.5.4 Second Cover Letter

Another instrument created for the execution of data collection is a second cover letter. A second cover letter has been created in case the response rate from the initial mailing does not reach 40%, or 120 responses. Thus, the second cover letter will only be sent to those participants not responding to the first invitation. The second cover letter is also a one page invitation printed on white paper. This letter is created from the initial letter with several modifications. The most apparent change is at the beginning of the letter. A new sentence is added: “I need your help.” This has been added in an attempt to attract attention to the letter. Another change from the initial cover letter is the notification of a reward drawing. In attempts to increase the response rate, the addition of a random drawing for a $50 BP Gas Card is provided. The initial mailing does not include a reward option until the participants have accepted participation in the study by

returning a signed consent form. However, due to the fact that the survey is included in the second mailing, this time the information regarding the drawing must be mentioned in the cover letter. The last modification for the second mailing is the inclusion of the survey.

In order to assist with increasing the overall response rate, the second contact asks participants to complete the survey via paper and pencil. One reason for this modification is the elimination of the technology barrier. Because this study is focusing on technology, the online survey variable may impact the overall response rate. Therefore, adding this modification may encourage participants that do not have or use email. Thus, the cover letter reflects this change by including instructions about the survey and the procedure for returning it. The second cover letter may be reviewed in Appendix A.4.

3.5.5 Paper Survey

Included in the second correspondence is a paper copy of the survey for completion. The included survey is an exact replica of the online survey, with the exception that the directions have been modified to include "circle the answer(s)" for each question. A copy of the paper survey may be reviewed in Appendix A.5.

3.6 PROCEDURES

The data collection procedure for this study involves a three step process. The first step is a mailed correspondence inviting the sample population to participate in the study. Within the initial mailing, the collection of participant consent forms is executed. The second procedural

step is the online administration of the survey. The final step is a second contact to potential participants based on the initial response rate.

The data collection process begins with an initial invitation to potential participants. The entire sample population is mailed a cover letter, two University of Pittsburgh Adult Consent Forms, and a return envelope. Each participant is asked to return one copy of a completed consent form [with his/her initials (on each page), signature (on page 4), and email address (on page 4)] in the return envelope. The other consent form is for the participant's personal records. The receipt of a completed consent form affirms that the individual is willing to participate in the study.

Once the consent form is returned, the online survey will be administered per *Zoomerang.com*. The administration of the online survey is completed by placing the participant's email address into the address book of the *Zoomerang* program. After inputting the email address, a custom email is automatically sent to the participant with a link to the survey. Further, a reminder email may be sent if a participant does not complete the survey within a given amount of time—for this study that is three weeks (21 business days) after the initial survey launch. Once the online survey is completed, it is returned to the *Zoomerang* program. This web based survey program gathers the data and inputs the information into an excel spreadsheet for analysis.

If a participant does not return a consent form within the three week window, a second mailing will be conducted. This mailing will include a second cover letter, two copies of the consent form, the survey, and a return envelope. The second mailing asks participants to return a completed consent form and survey in the envelope provided. Within two weeks (14 business

days) of the second mailing, a closure to the data process will be implemented. Any participant not returning a consent form and/or survey response is considered a non participant.

3.7 DATA ANALYSIS

The collected data are analyzed through the utilization of the statistical package for social sciences (SPSS) (Norusis, 1998). All data from the survey are analyzed through descriptive statistics. The four research questions are answered through descriptive statistics, multivariate analysis (specifically **A**nalysis of Variance, ANOVA) and correlation analysis (Spearman rho). The use of ANOVA is an appropriate method for utilization due to its ability to assess the relative magnitude of variation among differing variables (Ferguson & Takane, 1989). The use of correlation analysis is appropriate because it demonstrates the existence of a correlation between variables when items are observed to be relational (Babbie, 2001).

The purpose of the survey instrument is to provide a vehicle for data collection and analysis regarding the study's research questions. As part of the analysis, this section provides a detailed description of the data collection items, descriptors, response options, and scoring coding. Additionally, Table 3.1 illustrates the survey sections that support the data collection for each research question (RQ).

Table 3.1 Survey Instrument Supporting Research Questions (RQ)

Survey Part	Title	(RQ) Supported
One	Initial Questions	RQ1, RQ2, RQ3
Two	Technology Acceptance and Use Inventory	RQ2, RQ 3, RQ4
Three	Decision Making Style Inventory	RQ1, RQ4
Four	Demographics	~

The purpose of Part One (Appendix A.5, Part One) is to establish an open and inviting tone for the completion of the survey, as well as a way to elicit responses to nine preliminary questions. Data from Part One of the survey are collected to assist in providing answers to RQ1, RQ2, and RQ3.

The first question (Q1) of Part One asks each individual to self-report his/her decision style (based on Rowe's four classifications: analytical, behavioral, conceptual, and directive). The items are coded for scoring as follows: self-report analytical (A = "1"), self-report behavioral (B = "2"), self-report conceptual (C = "3"), and self-report directive (D = "4"). Even though the individual will complete the Rowe Decision Style Inventory later in the survey, this question was presented for two reasons. First, to allow the respondent to take ownership of his/her survey response—by asking for a self-report of his/her own individual decision style—and secondly, to provide a comparison to the individual decision style tabulated from Rowe Decision Style Inventory.

The next eight questions (Q), numbered two through nine, pertain to technology. Each of these questions is multiple choice, with Q5 and Q6 having a multiple answer option. These questions ask the participants the following: (Q2) using a Likert scale, rate your ability to use

technology, (Q3) frequency of technology use, (Q4) most frequently used technology application, (Q5) area of decision making in which technology is incorporated, (Q6) training on which technology applications, (Q7) existence of technology plan for school building, (Q8) existence of technology plan for district, and (Q9) existence of professional technology goals. Table 3.2 illustrates the response options and scoring codes utilized within this section.

Table 3.2 Part I of Survey: Initial Question Items, Descriptors, Response Options, and Scoring Codes

Items and Descriptors	**Response Options**	**Scoring Codes**
Q1	"A, B, C, or D"	1, 2, 3, 4
Q2	"1,2,3,4, or 5"	1, 2, 3, 4, 5
Q3	"everyday, 3 times a week, once a week, or once a month"	1, 2, 3, 4
Q4	"Internet, Email, Word processing, Spreadsheet, Database, None of the Above, or Other"	1, 2, 3, 4, 5, 6, 7
Q5	"Student Achievement, Student Attendance, Student Discipline, Teacher Evaluation, Building Management, Building Communication, Parent Communication, and/or Other"	1, 2, 3, 4, 5, 6, 7, 8 (multiple answer)

Table 3.2 (continued).

Q6	"Internet, Email, Word processing, Spreadsheet, Database, Comprehensive Data Analysis System, PDA, Hardware, Software, Grading/Attendance Software, and/or Other"	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 (multiple answer)
Q7	"Yes or No"	1, 2
Q8	"Yes or No"	1, 2
Q9	"Yes or No"	1, 2

The purpose of Part Two (Appendix A.5, Part Two) is to collect data on each participant's perceived ease of use, perceived usefulness, and behavioral intention to use specific technology applications**.** The data from this part of the survey are collected to assist in providing information to answer RQ2, RQ3, and RQ4.

Within the Technology Acceptance/Use Inventory, twelve prompt descriptors are presented under each technology application. The first six items relate to perceived ease of use; the next three items relate to perceived usefulness; and the last three items relate to one's behavioral intention to use the application. The five technology applications are: 1) Internet, 2) Email, 3) Word processing, 4) Spreadsheet, and 5) Database. A four-point Likert scale is used to score this part of the survey. The four-point scale is marked from left to right using the following scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. Table 3.3 illustrates items, descriptors, response options, and scoring codes utilized for each prompt within this section.

Table 3.3 Part II of Survey: Technology Acceptance Items, Descriptors, Response Options, and Scoring Codes

Items	Descriptors	Response Options and Scoring Codes
Q#-1	Easy Learn Operate	"1,2,3, or 4"
Q#-2	Easy Get Want	"1,2,3, or 4"
Q#-3	Easy Interact Clear	"1,2,3, or 4"
Q#-4	Easy Flexible Interact	"1,2,3, or 4"
Q#-5	Easy Skillful Using	"1,2,3, or 4"
Q#-6	Easy To Use	"1,2,3, or 4"
Q#-7	Useful To Be Efficient	"1,2,3, or 4"
Q#-8	Useful To Be Effective	"1,2,3, or 4"
Q#-9	Useful Easier Decisions	"1,2,3, or 4"
Q#-10	Useful In Completing Daily Tasks	"1,2,3, or 4"
Q#-11	Behavioral Whenever Helpful	"1,2,3, or 4"
Q#-12	Behavioral Whenever Possible	"1,2,3, or 4"

The purpose of the second portion of Part Two is to obtain responses to prompts related to: 1) volume of use, and 2) frequency of use for each of the five technology applications. Data for these questions are collected to assist in providing information to answer RQ2, RQ3, and RQ4. For volume of use (how much), respondents were asked to respond to the prompts of: never, >0-25%, >25-50%, >50-75%, or >75-100%. For frequency of use (how often), respondents were asked to respond to the prompts of: never, monthly, weekly, or daily. In order to provide accurate information, detailed Likert scales are used rather than a typical numerical

scale. The scoring codes for these questions translate the detailed responses into numerical representations. This is illustrated below in Table 3.4.

Table 3.4 Part II Continued: Technology Use Items, Descriptors, Response Options, and Scoring Codes

Items	Descriptors	Response Options	Scoring Codes
Q15-1	Volume Use Internet	"Never, >0-25%, >25-50%, >50-75%, or >75-100%"	1,2,3,4, or 5
Q15-2	Volume Use Email	"Never, >0-25%, >25-50%, >50-75%, or >75-100%"	1,2,3,4, or 5
Q15-3	Volume Use Word-processing	"Never, >0-25%, >25-50%, >50-75%, or >75-100%"	1,2,3,4, or 5
Q15-4	Volume Use Spreadsheets	"Never, >0-25%, >25-50%, >50-75%, or >75-100%"	1,2,3,4, or 5
Q15-5	Volume Use Databases	"Never, >0-25%, >25-50%, >50-75%, or >75-100%"	1,2,3,4, or 5
Q16-6	Frequency Use Internet	"Never, monthly, weekly, or daily"	1,2,3, or 4
Q16-7	Frequency Use Email	"Never, monthly, weekly, or daily"	1,2,3, or 4
Q16-8	Frequency Use Word-processing	"Never, monthly, weekly, or daily"	1,2,3, or 4

Table 3.4 (continued).

Q16-9	Frequency Use Spreadsheets	"Never, monthly, weekly, or daily"	1,2,3, or 4
Q16-10	Frequency Use Database	"Never, monthly, weekly, or daily"	1,2,3, or 4

The purpose of Part Three (Appendix A.5, Part Three) is to calculate each participant's decision making style using Rowe and Mason's Decision Style Inventory. The results from this section will assist in providing information to answer RQ1 and RQ4. The four decision styles outlined in Rowe and Mason's inventory are: analytical, behavioral, conceptual, and directive. This inventory assesses five areas: 1) psychological aspects, 2) leadership style, 3) best organizational fit, 4) major criticism, and 5) basic style patterns. The scoring of this instrument is completed by tabulating each column. A raw score for each participant is calculated according to decision style. The column with the highest score represented the participant's primary decision style. If a participant has two styles with the same score, then a combined style will be noted—i.e., directive-analytical. Table 3.5 presents the decision style items, descriptors, response options, and scoring codes.

Table 3.5 Part III of Survey: Decision Style Items, Descriptors, Response Options, and Scoring Codes

Items	Descriptors	Response Options	Scoring Codes
Column 1	Decision Style Directive Score	"1, 2, 3, and 4"	20…80 Converted to "1, 2, 3, and 8" 20…160
Column 2	Decision Style Analytical Score	"1, 2, 3, and 4"	20…80 Converted to "1, 2, 3, and 8" 20…160
Column 3	Decision Style Conceptual Score	"1, 2, 3, and 4"	20…80 Converted to "1, 2, 3, and 8" 20…160
Column 4	Decision Style Behavioral Score	"1, 2, 3, and 4"	20…80 Converted to "1, 2, 3, and 8" 20…160

The last section of the survey, Part Four (Appendix A.5, Part Four), collects the demographics of the participants. This section is meant to gain general descriptors regarding the participants, as well as an understanding about their personal responses and backgrounds. The general descriptors are as follows: gender, age, years in current position, total years as a principal, building level, district enrollment, school building enrollment, district demographic, and computer application availability. Five questions within this section are reported through response ranges. The main reason for using response ranges is the attempt to increase response

rate. Some individuals may feel reluctant to report certain information (i.e., age) if exact numbers are requested. Furthermore, the descriptor of student enrollment fluctuates constantly; therefore, it is more applicable to use a response range rather than an actual number. The provided response ranges are based on ranges used by Pennsylvania Department of Education.

Table 3.6 presents items, descriptors, response options, and scoring codes for this section of the survey. Every item in this part is multiple choice, except for item nine which has a multiple answer option.

Table 3.6 Part IV of the Survey: Demographic Items, Descriptors, Response Options, and Scoring Codes

Items	Descriptors	Response Options	Scoring Codes
Q37	Gender	"Male or Female"	1 or 2
Q38	Age	"30-40, 41-50, 51-55, or >55"	1, 2, 3, or 4
Q39	Years in Position	"<2, 2-6, or >6"	1, 2, or 3
Q40	Total Years as a Principal	"<2, 2-6, or >6"	1, 2, or 3
Q41	Building Level	"Elementary, Middle, High School, or Jr./Sr. High School"	1, 2, 3, or 4
Q42	District Enrollment	"<1,500; 1,500-2,500; 2,501-4,000; or >4,000"	1, 2, 3, or 4
Q43	School Building Enrollment	"<500; 500-1,000; 1,001-3,000; or >3,000"	1, 2, 3, or 4

Table 3.6 (continued).

Q44	District Demographic	"Urban, Suburban, or Rural"	1, 2, or 3
Q45	Computer Application Availability	"Internet, Email, Word-processing, Spreadsheets, Databases, School-wide Comprehensive Data Analysis System, District-wide Comprehensive Data Analysis System, and/or Other"	1, 2, 3, 4, 5, 6, 7, and/or 8 (multiple answer option)

The central aim of this study is to determine if a principal with a certain decision style is more or less likely to accept and use technology than a principal with a different decision style. Through the proposed data analysis, it is anticipated that significant results should answer the hypothesis through the derived research questions. The data analysis will be presented, interpreted, and explained in subsequent chapters.

4.0 CHAPTER FOUR: THE FINDINGS

4.1 INTRODUCTION

This chapter presents the quantitative findings of this study. The central aim of the study is to determine whether principals with a particular decision style are more or less likely to accept and use the technology? As this study was designed to answer four research questions, this chapter presents, interprets, and evaluates the collected data in relation to each research question. The data were obtained through a four part survey which was elicited through online and paper distribution. A detailed description of the data collection process may be found in Chapter 3 of this document.

This chapter is organized into three subsections: participants, survey data, and responses to the research questions. The first subsection is an overview of the general demographics the study's participants. The second subsection is the presentation and interpretation of the statistical data gained from the administered surveys. The final subsection is the evaluation of the data in relation to the posed research questions for this study.

4.2 PARTICIPANTS

The sample group for this study consists of 300 K-12 public school building principals within the Western Pennsylvania area. The sample group was contacted in late August, 2006 via a mailed cover letter and consent form. The letter requested principals' participation through an online survey that would be issued once a signed consent form was received by the researcher.

The first data collection phase ended 3 weeks later with a total of 36 participants returning a completed consent form, but only 27 of those participants completing the online survey. Due to the low number of responses, a second point of contact was made with the remaining 273 principals. The second contact was conducted through a mailing which included a cover letter, consent form, and paper copy of the survey. The potential participants were asked to complete the paper survey and return it with a signed consent form. A total of 76 surveys were returned with six being nullified due to lack of consent form or correct completion survey. The finalized number of participants for this study is 97 out of 300, which is a return rate of 32%.

In determining the representation of the participants, Part 4 of the implemented survey asked participants several demographic questions. The demographic variables are not relevant to the study's research questions; however, it can be significant to know who makes up the participation group. Therefore, the following data in Table 4.1 come from Part 4 of the analyzed surveys.

Table 4.1 Part IV of Survey: Demographic Data

Item Descriptors (***Survey Responses: 97***)	**Response Options**	**Number of Participants**	**% of Participants**
Gender	Male	56	57.7
	Female	41	42.3
Age	30 – 40	30	30.9
	41 – 50	23	23.7
	51 – 55	20	20.6
	>55	24	24.7
Years in Current Position	<2	16	16.5
	2 to 6	37	38.1
	>6	44	45.4
Total Years as a Principal	<2	7	7.2
	2 to 6	33	34
	>6	57	58.8
Building Level	Elem.	48	49.5
	Middle	20	20.6
	HS	18	18.6
	Jr./Sr.	11	11.3

Table 4.1 (continued).

Student Enrollment in District	<1500	21	21.6
	1500 – 2500	23	23.7
	2501 – 4000	25	25.8
	>4000	28	28.9
Student Enrollment in his/her School	<1500	40	41.2
	1500 – 2500	43	44.3
	2501 – 4000	14	14.4
	>4000	0	0
Setting of District	Urban	14	14.4
	Suburban	57	58.8
	Rural	25	25.8
Technology Applications Available	Internet	97	100
	Email	97	100
	WP	96	99
	Spreadsheet	95	97.9
	Database	91	93.8
	School Wide	53	54.6
	District Wide	55	56.7
	CDA	1	1

Table 4.1 (continued).

Technology Applications Available (continued)	CSIU	1	1
	DIBLES	1	1
	Integrated Learning	1	1
	PA Educator	1	1
	Publishing	1	1
	Prosoft	2	2.1
	Gradequick	1	1
	Edline	1	1
	PVASS	1	1
	United Streaming	1	1
	SIS	1	1
	Study Island	1	1

The demographic data reveal that each gender was fairly represented with a few more male participants than female. This could be considered a typical occurrence, since the educational leadership field is prone to a higher volume of men than women. In the same sense, the representation of age is comparatively equivalent between groups—a few more in the 30 to 40 age bracket, but again that is prone to happened due to retirements, burn out, or job changing later in life. The majority of respondents have been a principal for over six years with most of them being in their current position for most of that time. This is interesting since it is commonly thought that the retention rate for educational leaders is in constant fluctuation.

As for the district and school contexts the participants' lead—the majority of the principals are from suburban school districts with district enrollments evenly spread across the first three ranges (<1,500 to >4,000). Most of the respondents are elementary principals with the next most being middle school. The school enrollment sizes are fairly even between small and moderate (<1500-2500), with a significant less response from the 2501-4000 size category. Further, no one responded from a school with over 4000 students. A main reason for this outcome is the overwhelming response from elementary principals. These individuals are most likely to have small building with smaller enrollments. As well, the sample population was contained to Western Pennsylvania which is characterized for having smaller school districts.

The last question in this section is raised to obtain information regarding the availability of various technology applications. This question is being used to verify that the technology applications being researched are readily available to participants within their job setting. The data show that all the participants have the Internet and email available, while up to six participants do not have word processing, spreadsheet, and database. Interpretatively, this information may not be accurate in relation to the question. The participants may have the applications available but may not know they have them or may not use them within their positions. Furthermore, over half of the participants have school or district wide comprehensive data analysis applications available. This is enlightening to know that districts are beginning to move towards implementing these applications. Lastly, several individuals added to the list of available resources. This information may be reviewed in the above table.

4.3 SURVEY DATA

4.3.1 Part I: Initial Questions

The next data section was derived from Part I of the elicited surveys. Part I asked participants nine initial questions to introduce the survey topic while gaining individual participant insight into their decision styles and technology acceptance/usage. Table 4.1 presents the obtained data for each question in Part I.

Table 4.2 Part I of Survey: Initial Questions Data

Item Descriptors *(Survey Respondents: 97)*	**Response Options**	**Number of Participants**	**% of Participants**
Question 1: What decision style most closely reflects you?			
	Analytical	28	28.9
	Behavioral	33	34.0
	Conceptual	18	18.6
	Directive	18	18.6
Question 2: On a scale of 1 (poor) to 5 (excellent), how would you rate your ability to use technology (relative to other principals)?			
	1	2	2.1
	2	3	3.1
	3	26	26.8

Table 4.2 (continued).

	4	41	42.3
	5	25	25.8
Question 3: How often do you use technology within your daily tasks as a principal?			
	Every day	95	97.9
	3 times a week	2	2.1
	Once a week	0	0.0
	Once a month	0	0.0
Question 4: What technology application do you use the most as a building principal?			
	Internet	8	8.2
	Email	59	60.8
	Word Processing	21	21.6
	Database	8	8.2
Question 5: What areas of decision-making do you incorporate technology? (may have more than one answer)			
Responses listed in order from greatest frequency to least frequent...	Student Achievement	89	91.8
	Building Communication	87	89.7
	Student Attendance	79	81.4
	Parent Communication	78	80.4
	Student Discipline	75	77.3
	Teacher Evaluation	70	72.2
	Building Management	58	59.8

Table 4.2 (continued).

Other:	5	5.3
Budgeting	1	1
Data Analysis	1	1
Data Sharing	1	1
Personal Documentation	1	1
Student Communication	1	1
Question 6: What technology applications have you attended trainings on within the last 2 years? (may have more than one answer)?		
Grading/Attendance	58	59.8
Comp Data Analysis System	50	51.5
PDA	39	40.2
Software	37	38.1
Databases	33	34
Hardware	31	32.0
Spreadsheet	30	30.9
Internet	28	28.9
Email	24	24.7
Online Education	20	20.6
Word Processing	14	14.4
Web Design	13	13.4

Table 4.2 (continued).

	Blogging	3	3.1
	Other:	7	7.1
	4Sight	1	1
	Assessment Software	1	1
	Curriculum Development	1	1
	Safety Plans	1	1
	Electronic RC	1	1
	Podcasting	1	1
	PowerPoint	1	1
Question 7 & 8: Do you have a Technology Plan…			
	For your building?	70	72.2
	for your district?	93	95.9
Question 9: Are any of your professional goals related to technology implementation and/or use?			
	Yes	75	77.3

The presented data from Part I of the survey depict the participants' personal reflections about their decision style, acceptance, and use of technology. As participants reflected on their decision style, 34% chose behavioral, with 29%, 19%, and 19% choosing analytical, conceptual, and directive, respectively.

Regarding the participants' use of technology, the majority responded they are at least average if not better at using technology than other principals—95% rated themselves as a 3/5, 4/5, or 5/5 (excellent). In addition, 98% of the survey respondents stated that they use technology daily with the most frequently used application being email (61%) followed by word processing (22%) and then the Internet and database (each with 8%). Spreadsheet was not chosen at all as being the most frequent application used. This is not surprising since spreadsheet, for many, is a very specific application for numeric or formulation tasks.

The next question asked participants to choose those areas in which they would use technology to make decisions. The most popular area chosen was student achievement with 92%, followed by building communication, student attendance, parent communication, student discipline, teacher evaluation, and building management, respectively. In addition, some participants added other areas in which they use technology. Those areas can be reviewed within the above table.

As for responses regarding training, the data were fairly stratified among the areas presented. From the most frequently attended in the last two years to the least attended, the training topics were grading/attendance, comprehensive data analysis systems, PDA, software, databases, hardware, spreadsheet, Internet, email, online education, word processing, web design, and blogging. Several other areas were added by participants and may be viewed in the above table.

The last three questions in Part I of the survey refer to building/district technology plans and professional goal setting. Out of the 97 respondents, 93 stated they have a district technology plan with 70 of them also stating that they have a building plan. For professional

goals related to technology, 75 of the participants declared that they have technology specified goals in their professional development plans.

4.3.2 Part II: Technology Acceptance/Use Inventory

This section of findings comes from Part II of the designed survey. Part II is a Technology Acceptance/Use Inventory intended to rate a participant's acceptance and usage of five technology applications: Internet, email, word processing, spreadsheet and database. The inventory consists of seven questions: the first five questions relate to user acceptance and the other two questions relate to an individual's use of technology. Within the first five questions, the participants are asked to rate 12 behaviors in accordance with each technology application. Of the 12 behaviors, six relate to an individual's perceived ease of technology use; three relate to an individual's perceived usefulness of the technology; and the remaining three relate to an individual's intentions to use the technology. These 12 questions provide two sets of data. The first set of data encompasses three scores—a score regarding ease of use, usefulness, and intent to use. These three scores are combined to provide an overall technology acceptance score. For interpretive purposes, the data were presented using a mean score to show the average of all the participants' responses. The following table demonstrates this calculation for the first section of the Technology Acceptance Inventory.

Table 4.3 Part II of Survey: Technology Acceptance/Use Inventory

	Mean	Std. Deviation
Ease of Use	***Maximum Mean = 4.0***	
Internet	3.6	.49
Email	3.7	.43
Word Processing	3.6	.60
Spreadsheet	2.8	.76
Database	2.9	.71
Usefulness	***Maximum Mean = 4.0***	
Internet	3.4	.51
Email	3.6	.48
Word Processing	3.5	.59
Spreadsheet	3.0	.75
Database	3.1	.64
Intent to Use	***Maximum Mean = 4.0***	
Internet	3.3	.67
Email	3.6	.51
Word Processing	3.5	.65
Spreadsheet	2.7	.83
Database	2.9	.77

Table 4.3 (continued).

All Areas Combined—Ease, Usefulness, and Intent	***Maximum Mean = 4.0***	
Internet	3.4	.49
Email	3.7	.43
Word Processing	3.5	.57
Spreadsheet	2.8	.73
Database	2.9	.67

The presented data show that most of the survey participants believe email is the easiest application to use, followed by word processing, Internet, database, and spreadsheet. In regards to the participants' perceived usefulness of the five presented applications, email was found to be the most useful, followed by word processing, Internet, database, and spreadsheet. Lastly, the participants' intent to use the applications were found to be the same as the other categories—first email, followed by word processing, Internet, database, and spreadsheet. When the means were combined for an overall acceptance score, of course, the result remained consistent. The participants in this study accept the following applications in order, from greatest acceptance to least: email, word processing, Internet, database, and spreadsheet.

The last two questions included in the technology inventory rate the participants' volume (how much) and frequency of use related to the five technology applications. Participants were asked to rate their volume of use as "never (1), >0-25% (2), >25-50% (3), >50-75% (4), or >75-100% (5)" and their frequency of use as "never (1), monthly (2), weekly (3), or daily (4)." Therefore, a volume of use could have a mean of 1.0 – 5.0 and frequency of use could have a mean of 1.0 – 4.0. As with the above analysis, a statistical mean is calculated to show the

average of all the participants' responses. The following table presents the findings regarding the participants' volume and frequency use of the technology applications.

Table 4.4 Part II of Survey: Volume and Frequency of Technology Use

	Mean	**Std. Deviation**
Volume	***Maximum Mean = 5.0***	
Internet	3.5	1.08
Email	4.3	.957
Word Processing	3.8	1.11
Spreadsheet	2.6	1.04
Database	2.8	1.13
Frequency	***Maximum Mean = 4.0***	
Internet	3.7	.5
Email	3.9	.27
Word Processing	3.6	.75
Spreadsheet	2.5	.93
Database	2.8	.94

The above data demonstrate that the majority of participants use email the most, followed by word processing, Internet, database, and spreadsheet. In relation to frequency, how often one uses the applications, the data show that the study's participants use email the most, followed by Internet, word processing, database, and spreadsheet. Through interpreting the data, it can be

stated that participants in this study may spend a large amount of time using email and creating word documents (letters, memos, schedules, or the like); but, they are more likely to use email and the Internet frequently throughout the day.

4.3.3 Part III: Decision Style Inventory

A Decision Style Inventory encompasses Part III of this study's survey. This inventory consists of 20 questions each requiring four rated responses. The four decision making styles being investigated in this inventory are analytical, behavioral, conceptual, and directive. The applied inventory elicits a primary decision style for each participant. Table 4.4 displays the number and percentage of participants whose scores reflect the prescribed decision styles.

Table 4.5 Part III of Survey: Decision Style Inventory

Decision Style (***Survey Respondents: 97)***	**Number of Participants**	**% of Participants**
Analytical	41	42.3
Behavioral	14	14.5
Conceptual	21	21.6
Directive	21	21.6

The above data provide insight into the 97 principals researched in this study. According to this inventory, 41 of the 97 principals can be categorized as having an analytical decision style. Out of the remaining participants, 21 are thought to have a conceptual style with another 21 thought to have a directive decision style. The remaining 14 participants are slated as having a behavioral decision style.

4.4 RESPONSES TO THE RESEARCH QUESTIONS

The purpose of this study is to determine to what extent a principal's decision style influences his/her acceptance and use of technology. This issue generates interest due to the increasing need for principals to afford themselves various opportunities to enhance their instructional leadership abilities. One opportunity thought to assist principals in this manner is the utilization of technology. Hypothesizing that not all individuals, specially building principals, will accept and use technology— this study attempts to determine whether an individual's decision making style positively or negatively influences his/her acceptance and use of technology. As stated in the review of literature, individual decision styles elicit variations in behavior, thought process, and beliefs. Therefore, it is expected that one's decision making style can directly influence one's acceptance and use of technology. For instance, decision styles that embrace fact seeking and are data driven, specifically analytical and directive should be more likely to use technology to expedite the quest for information. On the other hand, decision styles that focus more on the orientation of people and compromising nature of discussion should be less likely to spend their time using an inanimate medium such as technology. It is intended, that these thoughts and predictions tie the collected data to the posed research questions.

The following section uses the obtained data to answer this study's four research questions. In attempts to fully answer each question, some data are taken directly from the above tables, while other data have been statistically manipulated to provide clear and concise answers. After presenting the answers for each research question, the next chapter will discuss implications for policy and practice through summation, recommendation, and reflection.

4.4.1 Research Question #1

What are the managerial decision styles of principals?

In accordance with the decision style inventory chosen for this study, there are four possible managerial decision styles. The four styles are analytical, behavioral, conceptual, and directive. Each style has distinct descriptors regarding elements of organizational fit, problem orientation, level of tolerance for ambiguity, technical concern, leadership, and major criticism. Although a thorough description of each style has been outlined in Chapter 2 of this document—a brief description of each style is as follows:

> Analytical: deliberate and calculated while searching for complete and accurate facts
> Behavioral: loosely controlled, people oriented using persuasion
> Conceptual: creative with a broad outlook and compromising
> Directive: action oriented and decisive while looking for speed and efficiency (Rowe and Mason, 1987)

The determination of decision styles for participants in this study was conducted through the use of a commonly used and well researched Decision Style Inventory by Rowe and Mason (1987). The structure and scoring of the inventory is comprehensively explained in Chapter 3 of this document. Moreover, the administered survey began with a question asking participants to

choose what decision style they thought best represented them. This question was designed to introduce the participants to the survey topic, as well as propose a question for self reflection. Through correlating the results between the self reflection and the decision style inventory, a comparison can be made between what the participants' thought their decision style was and what the inventory stated their decision style to be.

From the 97 responses received, the decision style inventory results determined that 41 participants are analytical, 14 participants are behavioral, 21 participants are conceptual, and 21 participants are directive. These results may be reviewed in Table 4.5. These results seem realistically aligned with decision making positions of education leaders.

The data from the Decision Style Inventory show that almost half, 42% of the principals researched are believed to possess an analytical decision style. This style is characterized by an intellectual orientation that focuses on problem solving. Through problem solving analytical decision makers most likely have the ability to deal with new and complex situations, analyze details, and predict outcomes. Analytical decision makers usually have a high tolerance for ambiguity (ability to make complex decisions) and exhibit a cognitively complex personality (ability to recognize and draw inferences). Although this decision style is known to be impersonal and dogmatic, it may be the relevancy of a leadership position that draws individuals to depict them as such. These characteristics can be directly aligned with the daily behaviors of a building principal—the continual need to make effective decisions in a thoughtful and deliberate manner. Principals in today's educational institutions can be depicted as instructional and managerial leaders who are data driven decision makers.

How well did participants predict their decision styles? Table 4.6 shows the relation between the participants' decision styles from the inventory and their decision style from the self reflection question in Part I of the survey.

Table 4.6 Correlation between Decision Style Inventory and Decision Style Self Reflection

		Inventory			
	%	Analytical	Behavioral	Conceptual	Directive
Self Reflection	Analytical	46.4	17.9	10.7	25
	Behavioral	45.5	12.1	21.2	21.2
	Conceptual	33.3	11.1	33.3	22.2
	Directive	38.9	14.4	27.8	16.7

The data reveal that 46.4% of the participants who self reported themselves as having an analytical decision style were determined to have that style according to the inventory. For the other decision styles, the following represents correct predictions of one's style to the inventoried findings—12.1% being behavioral, 33.3% being conceptual, and 16.7% being directive (these data were highlighted in the above table). The compelling data from these results are 45.5% of participants reported themselves as being behavioral and were found to be analytical according to the inventory. In the survey question on self reflection, the behavioral style was described in terms of being "loosely controlled, people oriented using persuasion," while the analytical style was termed as being "deliberate and calculated while searching for complete and accurate facts."

Although these descriptions are within the research by Rowe and Mason (1987), one can state that these descriptors may have lead the participants to choose one style over another. The findings may have been related to the perception of the description rather than the various

attributes of the style. On the other hand, some individuals may state that personality inventories, such as the one used in this study, are poor predictors of true behaviors. This may be true; however, the inventory utilized in this study was reported to be statistically reliable and valid, while providing many examples of use across disciplines of leadership (Boulgarides & Cohn, 2001; Rowe & Davis, 1996; Rowe & Boulgarides, 1992; Rowe & Mason, 1987.

Another conclusion for this phenomenon may be the disparity of tasks that makeup an educational leadership position. Educational leaders exist in a dichotomous world. On one hand, such leaders are seen as the effective problem solver, utilizing thought provoking analysis, and as the data driven decision maker. Opposite of these behaviors, educational leaders must also be people oriented, socially concerned, and attitudinally empathic. Thus, these individuals may struggle between the variations that are needed to fulfill the assortment of tasks within the position. As supported by various areas of research, individuals in capacities of authority strive to be strong decision makers who use logic, reason, and relevant information to make informed decisions (Cassidy, 2004). Therefore, it may be the contextual nature of the position that supports the dichotomous variation in one's believed decision making style.

4.4.2 Research Question #2

What is the level of acceptance of technology among principals?

The level of technology acceptance among principals can be answered several different ways. First, one must qualify the term "level of acceptance." For this study, the level of acceptance is the degree to which a person intends to use technology while constituting one's perceived ease of use and perceived usefulness (Davis, 1989). Part II of the designed survey

uses Davis's Technology Acceptance Inventory (TAI) to determine an individual's level of technology acceptance. Table 4.3 presents this information in numerical detail. The following data results are derived from that above data.

The TAI can be broken down into three separate predictive categories: 1) one's ease of technology use, 2) one's usefulness for the technology, and 3) one's intent to use the technology. Finally, an average of the three categories can be derived to predict one's technology acceptance level. For this study, the TAI focused on five software applications most likely to be used by building principals. Those five software applications are Internet, email, word processing, spreadsheet, and database.

The data collected from the 97 respondents indicate that the following results for each category of acceptance from most likely to least likely:

> Ease of Use—email, word processing, Internet, database, spreadsheet
> Usefulness— email, word processing, Internet, database, spreadsheet
> Intent to Use—email, word processing, Internet, database, spreadsheet
> Overall Acceptance—email, word processing, Internet, database, spreadsheet.

Statistically, none of the above applications had a mean (Table 4.3) low enough to support the notion that it was not being accepted at all. All the applications were accepted to some degree, with email having the greatness mean of 3.7 out of 4.0.

At the onset of this research, this outcome was not expected. It was anticipated that word processing would be the most accepted application with spreadsheet being closely behind. The reason for this prediction was the increasing support for data driven decision making within the educational arena. From this thought, the majority of quantitative data are formatted in a spreadsheet or chart layout. Therefore, it was assumed that building principals would have ongoing interaction with this application whereby displaying a sense of acceptance. In

retrospect, database and spreadsheet applications are technically the most demanding of the five applications to use. It is understood that individuals may not feel proficient using these applications, thereby decreasing their acceptance to use.

An interesting observation from this data is the idea that email is the most accepted application among building principals who were surveyed. There may be several reasons for this—email is efficient, widely available, and effective. Email is an application that can be used very quickly without a lot of instruction. Second, email is widely available—most individuals have email at home, at work, and even on their cell phones. Lastly, email is very effective. With a few clicks of a mouse, principals are able to communicate with their entire faculty, student body, or school community. Thus, it is not surprising that email is accepted and used far more by the sample population of this study. However, one must remember that 68% of the sample population did not participate in this study—there may be far more principals not using any technology than this study reports.

In addition to the TAI, three questions in Part I of the survey asked participants about technology plans/goals in their building, in their district, and in their professional evaluation plans. The intent in asking these questions was to determine if the principals being surveyed may be implementing a technology plan(s) or goal which would increase their acceptance of technology. The numerical data to support this hypothesis are displayed in Table 4.2. The data demonstrate that 72% of principals surveyed have a building technology plan, 97% have a district technology plan, and 78% have professional goals related to technology. The reason for the overwhelming percentage of district technology plans is that these plans are now incorporated as a mandated portion of a district's strategic plan. Therefore, most districts have already or are working on creating district technology plans. This correlates with the data that

most principal's in this study accept some form of technology given their position as educational leader.

4.4.3 Research Question #3

What is the level of use of technology among principals?

Data regarding the level of technology use by building principals were gathered several different ways. First, in Part I of the survey several questions were asked regarding one's technology abilities, areas of technology use, and technology training. The questions were as follows:

1. On a scale of 1 (poor) to 5 (excellent), how would you rate your ability to use technology (relative to other principals)?
2. How often do you use technology within your daily tasks as a principal?
3. What areas of decision-making do you incorporate technology? (may have more than one answer)
4. What technology applications have you attended trainings on within the last 2 years? (may have more than one answer)

Another element that investigated the participants' technology use was the last two questions in Part II of the survey. These questions obtained data regarding the volume (how much) and frequency (how often) of use among the respondents related to the five technology applications. Once again the numerical data can be found in Tables 4.2 and 4.4, respectively.

In order to demonstrate one's use of technology, it is helpful to know a few key components. One important component is an individual's perception of his/her ability to use the technology. In many cases, one's perception to use technology may be just as important as one's true technological ability (Bandura, 1986). From the survey data a varied set of responses were

obtained—26% of participants stated they have a 5/5 or excellent ability to use technology (relative to other principals), while 42% stated 4/5, 27% stated 3/5, and 5% stated they are a 1 or 2/5. Therefore, the overwhelming majority of principals surveyed stated they have good or excellent skills regarding technology use.

The next important component is how often technology (of any kind) is used to complete daily tasks. Of the 97 principals surveyed, 95 of them say they use technology every day with two principals stating they use it at least three times a week. Thus, it can be stated that the principals who responded to the survey use technology on a daily basis. Another component to consider is what educational areas do principals use technology to make decisions. The data from this study conclude that student achievement is the number one reason why principals use technology in their decision making processes. Other reasons to incorporate technology to make decisions, in order of frequency, are building communication, student attendance, parent communication, student discipline, teacher evaluation, and building management. Several other uses that were added by participants were budgeting, data analysis, data sharing, personal documentation, and student communication.

Another area of importance for technology use is training. According to the collected data, the following trainings have been attended in order of most popular to least: grading/attendance, comprehensive data analysis systems, PDA, software, databases, hardware, spreadsheets, Internet, email, online education, word processing, web design, and blogging. Other trainings added by participants were 4Sight (assessment tool), assessment software, curriculum development, safety planning, electronic report cards, podcasting, and powerpoint. Although most of the trainings were attended by a third of the participants surveyed, the data indicate that

various trainings are being attended which may offer that principals' feel these applications are important, and that they want to know how to use them.

In reviewing the data regarding the volume and frequency of technology use, a reoccurring theme appears. As seen in research question #2, the most heavily and frequently used technology application is email with a mean of 4.3/5.0 for volume and 3.9/4.0 for frequency. However, for volume use word processing is found to be used more than the Internet, with database and spreadsheet being used the least. In regard to frequency of use, the Internet is used more than word processing, with database and spreadsheet being used the least. Although none of the applications have means that demonstrate they are not being used, database and spreadsheet applications are shown to have a limited volume and frequency use by principals.

Once again, these results may not be significant since email is an efficient application with a high ease to use factor. One element for consideration is the discrepancy between what technology application is most often used (email) and what decision making area most often incorporates technology (student achievement). It is problematic to align the use of email with the need to use technology to make informed decisions regarding student achievement. The next three areas, building communication, student attendance, and parent communication can be directly aligned to the high volume of email. As stated in a previous section, most of the data for student achievement are compiled using statistical approaches or organizational applications which should include the use of databases and spreadsheets. This is a contention for consideration—Are principals using technology to optimize their instructional leadership abilities, and/or to minimize their managerial job performances? This question may be better served in a future study regarding appropriate utilization of technology for educational leaders.

4.4.4 Research Question #4

To what extent does a principal's decision style influence his/her's acceptance and use of technology?

The final research question incorporates the relationship among several elements from the administered survey. This question is the culminating element for the study—are principals with a particular decision style more or less likely to accept and use technology. Research question 1 provided the decision making styles of the study participants, while research questions 2 and 3 provided the acceptance and use of technology. Therefore, it may prove feasible to determine if principals of a particular decision style are more or less likely to use specific technology applications.

The correlated data for this question have been divided into five categories: ease of use, usefulness, intent to use, volume of use, and frequency of use. It is intended that each of these areas could demonstrate statistical differences; therefore, it is reasonable to delineate the data in this manner. Five represented categories present data by the decision style for each presented technology application. The technology applications explored are Internet, email, word processing, spreadsheet, and database, while the four decision styles are analytical, behavioral, conceptual, and directive.

In order to conclude that one decision style is more or less likely to accept and use technology, the data should indicate a difference between the statistical means of the various decision styles within any of the five technology applications. The following tables present the statistical means of the five posed categories for technology acceptance and use by decision style and technology application.

Table 4.7 Mean Differences among Decision Making Styles for Ease of Use of Technology

Mean of 4.0	Internet	Email	WP	Spreadsheet	Database
Sign.	0.98	0.93	0.53	0.49	0.44
Analytical	3.58	3.78	3.61	2.83	2.94
Behavioral	3.56	3.73	3.64	2.82	2.82
Conceptual	3.54	3.70	3.70	2.92	2.92
Directive	3.52	3.69	3.43	2.57	2.63
Difference between max. mean and min. mean	.06	.09	.27	.35	.31

Table 4.8 Mean Differences among Decision Making Styles for Technology Usefulness

Mean of 4.0	Internet	Email	WP	Spreadsheet	Database
Sign.	0.92	0.76	0.67	0.63	0.43
Analytical	3.46	3.59	3.51	3.04	3.09
Behavioral	3.40	3.66	3.52	2.88	2.89
Conceptual	3.40	3.60	3.52	3.04	3.23
Directive	3.37	3.49	3.33	2.80	2.98
Difference between max. mean and min. mean	.09	.15	.19	.24	.34

Table 4.9 Mean Differences among Decision Making Styles for Intent to Use Technology

Mean of 4.0	Internet	Email	WP	Spreadsheet	Database
Sign.	0.90	0.92	0.85	0.36	0.50
Analytical	3.36	3.64	3.55	2.84	2.98
Behavioral	3.21	3.71	3.57	2.61	2.68
Conceptual	3.29	3.60	3.52	2.81	3.00
Directive	3.29	3.62	3.40	2.48	2.79
Difference between max. mean and min. mean	.15	.11	.17	.36	.32

Table 4.10 Mean Differences among Decision Making Styles for Volume of Technology Use

Mean of 5.0	Internet	Email	WP	Spreadsheet	Database
Sign.	0.087	0.077	0.005	0.097	0.299
Analytical	3.56	3.43	3.90	2.63	2.88
Behavioral	3.59	3.66	4.29	2.79	2.93
Conceptual	3.98	3.87	4.05	2.90	3.19
Directive	3.37	3.22	3.10	2.14	2.52
Difference between max. mean and min. mean	.61	.65	1.19	.25	.67

Table 4.11 Mean Differences among Decision Making Styles for Frequency of Technology Use

Mean of 4.0	Internet	Email	WP	Spreadsheet	Database
Sign.	0.88	0.47	0.38	0.36	0.53
Analytical	3.71	3.90	3.63	2.44	2.68
Behavioral	3.79	4.00	3.86	2.43	2.57
Conceptual	3.76	3.95	3.81	2.86	3.00
Directive	3.67	4.00	3.48	2.48	2.76
Difference between max. mean and min. mean	.12	.10	.34	.42	.43

In evaluating the presented data, within the context of each technology application, the greatest variations are within Table 4.10 Volume of Technology Use under the application word processing. The presented data are found to be statistically significant by revealing a significance value of .005. Although it may be a statistical error, this phenomenon must be noted, and in all probability the data may be determined to be invalid in terms of data analysis.

As for the overall data, there are no significant differences between the acceptance/use of any technology application among the four presented decision styles. Although slight variations can be seen in the acceptance and/or use of various applications, none are significant enough to clearly state that a participant's decision style directly influences the acceptance and/or use of the technology application. Furthermore, in analyzing the data, there are no set patterns of discrepancy between the four decision styles in relation to the acceptance or use of the five technology applications. For example, although the directive decision makers have the majority of low end statistical means for acceptance and use of the various technology applications—the means do not vary significantly enough to statistically support the belief that the decision style

influences the acceptance and use of the technology. Moreover, analytical decision makers in many cases had the highest statistical mean for acceptance and use of the various technology applications. However, again the data are not statistically significant to support the theory that the participant's decision style was the influential factor in determining this result.

In summary, the data indicate that one's decision style is not significantly relevant to one's acceptance and use of technology. The final chapter will consider implications for policy and practice by summarizing the study's findings, discussing the study's implication, suggesting policies and/or practices for implementation, posing recommendations for future research, and offering final reflections on the presented study.

5.0 CHAPTER FIVE: IMPLICATIONS FOR POLICY AND PRACTICE

5.1 INTRODUCTION

As stated by Rowe and Mason (1987), decision making is a cognitive process. Through this process, individuals can clarify, determine, and enact upon thoughts, reflections, and interests (Rowe, Boulgarides, & McGrath, 1984). Decision making can be a personal experience or a collaborative venture with others highlighted by possible sociological influences (Stueart & Moran, 1993). In light of the contextual meanings, decision making for most is an organized process. Within this process, individuals are able to gather, perceive, and evaluate information through a form of reasoning filtered by personality styles of perceptions (Scott and Bruce, 1995).

Educational leaders, especially building principals, are entrusted with the job of gathering, perceiving, and evaluating various situations within the daily routines of school communities. With the increasing demands being placed on the educational system, principals may become overwhelmed by the challenges of the organization, and the ambiguous nature of the organizational culture. Thus, school leaders must become savvy decision makers—decision makers who are efficient, effective, and realistic.

Decision making can be a formative approach in which policies and practices are planned, implemented, and evaluated (Cassidy, 2004). In order to enhance the decision making process, it is recommended that educational leaders accept the need to quantify, calculate, and

analyze the factors affecting the outcomes. This implies the ability to embrace the age of data driven decision making.

Data driven decision making is at the forefront of educational change. Educational leaders are bombarded with requirements to implement policies and practices that are driven by research based programs and supported by data driven results. Given the consideration that leadership and decision making may be influenced by personal attributes, today's educational leader would do well to understand the predictive force of facts and figures—that powerful data-mining tools lie within technology's touch to enhance data driven decision making. Thus, principals would benefit by recognizing the usefulness of technology in their quest for information, knowledge, and results, especially in terms of increasing student achievement. Technology acceptance and use may prove to be a significant step in authentically engaging the era of educational accountability, as well as further advancing school principals from educational managers toward instructional leaders.

5.2 SUMMARY

The central aim of this study was to determine to what extent a principal's decision style influences his/her acceptance and use of technology. It was postulated that specific decision styles would be more likely to accept and use technology than others. This premise was derived from the belief that decision style may directly influence an individual's thoughts, beliefs, and actions (Rowe and Mason, 1987).

The study's overarching framework was derived from Davis's Technology Acceptance Model (1989). This model interconnects three variables of behavioral use—perceived ease of

technology use, perceived usefulness of the technology, and intent to use technology—to estimate an individual's acceptance towards the use of technology. Furthermore, a key external variable, decision style, is applied to determine if decision style influences the acceptance and/or use of technology of educational leaders, specifically K-12 principals.

The following research questions were posed to explore the extent to which principals' decision styles influenced their acceptance and use of technology. The research questions were as follows:

RQ1: What are the managerial decision styles of principals?

RQ2: What is the level of acceptance of technology among principals?

RQ3: What is the level of use of technology among principals?

RQ4: To what extent does a principal's decision style influence his/her's acceptance and use of technology?

The findings of this study nullified the researcher's hypothesis. The findings exhibit no relationship between the acceptance/use of technology and any one decision style presented in this study. It was presumed that an individual's decision style, to some extent, would influence the acceptance and/or use of technology. This hypothesis was assumed relevant in accordance with reviewed research regarding the influential nature of decision making styles. According to many theorists, decision style can reveal an individual's actions toward seeking, organizing, processing, and evaluating information (Messick, 1984; Leonard, School, & Beauvais, 1996; Hayes and Allinson, 1998). Therefore, one's decision style may reflect the innate nature in which one thinks, remembers, and/or problem solves (Cassidy, 2004).

In accordance with the review of literature, this study attempted to support the proposition that specific decision styles, such as analytical and directive would be more likely to

accept and use technology than others. The rationale for this premise was the proposed likelihood that analytical and directive decision makers would be more likely to seek facts and figures before ascribing to a decision. According to the literature, both of these styles are described as being action oriented using efficient and effective strategies to gather details and facts (Rowe & Boulgarides, 1992). Therefore, the researcher posed that these decisions styles would embrace the use of technology to seek desired information in an efficient and effective manner. On the other hand, reviewed literature noted behavioral and conceptual decision makers to be more likely to interact with people and seek contextual conclusions before making decisions (Rowe & Boulgarides, 1992). These two styles were thought to be less likely to accept and use technology to promote their decision making abilities, since face-to-face interactions would preempt reliance on computer assisted data gathering and analysis.

Although the intended hypothesis was not supported by the study's findings; several conclusions can be drawn from the study's results. Additionally, it is noteworthy to mention that the following outcomes reflect data from 32% of the sample population—68% of the sample population did not respond to the solicited survey. The following list presents several of the study's conclusions:

- According to Rowe and Mason's Decision Style Inventory, a large percentage of K-12 principals in Western Pennsylvania are found to possess an analytical decision style.
- An overwhelming majority of K-12 principals in Western Pennsylvania have most technology applications readily available, believe they have "good" to "excellent" technology use abilities, and use technology on a daily basis.

- According to Davis's Technology Acceptance/Usage Inventory, K-12 principals in Western Pennsylvania find that the technology application of *email* is the easiest to use, the most useful, the most often used, and most frequently used.
- K-12 principals in Western Pennsylvania state that student achievement is their number one reason to use technology for decision making.
- The majority of K-12 principals in Western Pennsylvania have attended a technology training in the last two years.
- According to this study, one's decision style is not an influential factor to whether one accepts and uses technology.

5.3 DISCUSSION

As stated above, the anticipated results of this study did not resonate in the findings. Though it may seem rather disappointing to report a hypothesis as null, the process aside from the product may prove equally revealing. In reviewing the research, it seemed sensible that one's decision style would readily determine the means by which one would make a decision. Through conducting this study, it has been determined that a principal's decision style is not a significant variable to whether he/she will accept or use technology. Although this statement can be supported by *this* study's findings, the researcher believes several limitations should be discussed.

First, the response rate of 97 respondents (32%) is believed to be significantly low in relation to the total sample group of 300 potential respondents. In reviewing the study's findings, it must be remembered that 68% of the sample group did not participant. With the

majority of the participants being non-respondents, the researcher finds it problematic to generalize the results.

Another limitation of this study is the use of an online survey. The online survey was found to be unproductive with a total of 27 individuals responding through this medium. As the researcher found out—busy principals are difficult to survey, especially when administering a survey. If one is intending to survey educational leaders, such as principals, it is suggested to either mail paper questionnaires or attempt to complete face-to-face or phone interviews. Most revealing may be that though the majority of the principals responding to the survey indicated email as the main use of technology, a number of the principals contacted by email did not respond. Perceived use of email as opposed to actual use may indicate a disconnection; or, those principals responding to the study are more apt to accept and use the technology application of email. It may be concluded that survey respondents were more willing to participate in the survey due to their beliefs in technology whereby providing a higher degree of technology acceptance and usage, regardless of their decision making style.

Lastly, Rowe and Mason's Decision Style Inventory (1987) may not be appropriate to use with educational leaders. In conducting the literature review of various decision style inventories, several researchers supported the versatile nature of Rowe and Mason's inventory, as well as supporting the validity and reliability of the instrument (Boulgarides & Cohn, 2001; Rowe & Davis, 1996; Rowe & Boulgarides, 1992; Rowe & Mason, 1987). The variation between the styles from the participants' self reports and the inventory reports are contradictory in many cases. With these inconsistencies, it is difficult to support either group of findings.

Furthermore, the behavioral constructs within the inventory may not be descriptive enough regarding decisions made by educational leaders, especially building principals. From

this particular study, the results of the inventory did not present enough data to support the utilization of this instrument in future studies. One may want to employ a mixed method research construct to gain more in depth data regarding participants' decision styles. For example, given a sample group of K-12 principals, the researcher would support the utilization of the Decision Style Inventory followed by face-to-face or phone interviews employing additional open ended questions regarding decision style behaviors. Further investigation into the types and kinds of decision making behaviors by educational leaders, such as principals, may offer new theories for this area of educational research.

As a tenured principal, this researcher believes that one's decision style may fluctuate depending upon the existing situation. From experience, the researcher concludes that each decision as a building principal is unique. Building principals wear many hats—they are instructional leaders, managers, customer service representatives, social workers, counselors, and in loco parentis. For example, each day can be filled with a variety of decisions—determining how to mend a leaky roof while waiting for board approved repairs; determining whether a kindergarten student should be suspended for bringing a plastic toy sword to school for show and tell; deciding if a court order allows a student to be released to a specific parent because the student is sick; or deciding what is the best reading program for a group of low achieving readers in third grade. Each situation varies in importance, effect, and affect to the school building as well as the larger school community. Therefore, a principal's decision style may vary depending on the situation, and the human factors involved. Rowe and Mason's Decision Style Inventory does not take these aspects into consideration. Therefore, this inventory may not be the most optimal instrument to use with sample groups related to the field of educational leadership.

Although technology may play an important role in each of the above situations, the determining factor of use may correspond to the situational type. For example, a principal deciding about a leaky roof may use: the internet to collect names of local repair companies, email to contact the maintenance director and/or business manager, spreadsheet to detail the number of times the roof has been leaking in various places, and/or a digital camera/camcorder to document position of leaks as they occur. On the other hand, the suspension case may use: word processing to compile written documentation of the event, email to make other district leaders aware of the situation, and/or database to track the discipline of the student. Therefore, the technology being used may depend on the situation and the anticipated outcome. Perhaps, the situational nature of decisions influences the acceptance/use of technology, making moot the relevance of one's decision making style.

Although the presented results do not represent the intended outcome, this study's findings may provide influential insight and enlightenment into the nature of technology acceptance and use for decision making among educational leaders. The following section outlines several educational policies and practices that may be explored from the results of presented research.

5.4 POLICY AND PRACTICE

The findings of the presented study can provide several educational policies and practices for implementation in the area of educational administration and leadership. The proposed policies and practices encompass three overarching themes—collaboration, education, and delineation.

The first policy and/or practice suggestion is the incorporation of collaborative leadership. The position of educational leader is evolving from a building manager to an instructional leader. Through this transition, the demands of the job are increasing in order to meet current accountability requirements. Building leaders can no longer guide singularly—collective and collaborative leadership is paramount. Such leadership should involve the formation of site leadership teams; the creation of reciprocal communication between central office leadership and building administration; the implementation of data driven decision making; and/or the support of shared accountability.

The formation of site leadership teams should include the expertise of the building principal(s), lead teacher(s) (or experienced teachers willing to share their knowledge), curriculum/content specialist(s), and/or others who may provide additional input or knowledge. These teams should be collaboratively engaged in the process of data gathering, analyzing, and interpreting. Building principals are still being immersed in the daily demands of the building; therefore they may be unable to mine through the mounds of available data. Through the incorporation of leadership teams, data can be accessed, analyzed, and utilized to formulate data driven decisions. The utilization of leadership teams embraces a new paradigm shift in which a leader must share the control with others through collaborative and supportive working relationships.

The need to create open communication between central office leadership and building administration is crucial to the success of an organization. In some cases, central office personnel receive pertinent information that may or may not be shared with various building personnel. Thus, it is important to build strong communicative lines that promote healthy interactions between the central office leadership and those working at various building sites.

The communication lines should be reciprocal, whereby ideas are mutually exchanged from one organizational level to the other. Through the use of technological communication tools, this procedure may be readily achieved and consistently practiced.

Furthermore, team driven leadership should share the responsibility of making data driven decisions. Currently in educational systems, decision making is intended to be driven by data related decisions. The difficulty with this assumption is the ability to retrieve, interpret, and utilize the available data in a timely manner, and involving a variety of stakeholders. The data available to building personnel is most typically retrieved electronically. Most of the data warehousing being used by educational institutions is password protected. Therefore, it is essential that all appropriate entities are availed the opportunity to receive passwords in order to gain access to existing data.

Through the implementation of a procedure or practice, the ability to receive immediate access to pertinent data can be afforded to building personnel. This may be conducted through the incorporation of password banks in which appropriate personnel could retrieve needed passwords through an email or online account system. Such a system may not only assist persons in need of the information, but may also alleviate burdens placed upon the initial data recipient.

In practicing collaborative leadership, reciprocal communication, and data driven decision making, building leaders can be at the forefront for supporting shared accountability. Although accountability should be a shared endeavor between all organizational stakeholders—the incorporation of the above mentioned policies and/or practices may encourage continual engagement by multiple entities of an organizational. Educational organizations may no longer be able to survive on a lead and follow mentality. The future progress of education needs to be

supported through a collaborative venture of shared leadership, communication, and decision making, assisted by technological advancements, and embraced by school leaders.

Another policy and/or practice suggestion from the presented research is the implementation of technological education. As society becomes grounded in a technological based world, the educational arena must embrace this change to produce productive and informed citizens for the next generation. All building personnel should be expected to know and understand the functionalities of technology. From teacher to superintendent, each facet of an educational organization should be required to attend technology trainings relevant to his/her position. Many trainings are already available to teachers, principals, and superintendents; however, most of these trainings are voluntary and constrained by time and/or resources. Effective trainings should include hands-on instruction on how to use specific hardware, as well as how to manipulate various software applications. Most importantly, continual training and support is necessary to provide follow-up, review, and trouble-shooting for daily task requirements.

Many states require certified educators to obtain continual professional development. For example, in Pennsylvania, all certified educators must obtain six credits or 180 professional development hours every five years under Pennsylvania Department of Education Act 48-1999. In modifying this act or similar requirements in other states, the ability to mandate professional educators to attend technological training(s) could be easily established. The main concern in implementing such a mandate is the need to ensure that appropriate and adequate technology trainings are available. Valuable technology trainings should incorporate topics that are relevant, available, and useful to the trainee. Furthermore, effective technology trainings should be instructed by individuals knowable about the topic with the incorporation of hands-on

application. Technology training can be extremely useful and productive when appropriately created and effectively delivered.

A third policy and/or practice suggestion is the delineation of information from one organizational sector to another. There are many stakeholders in an educational organization—students, parents, district personnel, community members, business members, and elected officials, such as board members. Each stakeholder group should remain informed about the development and progress of the organization. Thus, organizational reporting should be embedded in a district's culture. The reporting of relevant, reliable, and timely information is not a simple task. Educational organizations should attempt to devise systematic procedures maintaining the delineation of appropriate information in a consistent and continual manner. Such examples of information delineation could include—community forums, community newsletters, parent newsletters, parent meetings, faculty/grade/department meetings, assessment reports, grade reports, board meeting minutes, or the like. Each of these examples could be aligned with a technological communication tool—electronic signs, email bulletins, web pages, wikis, video conferencing, podcasting, or the like—thereby creating efficient means in which to report the information. None of the noted examples are innovative; however, the relevancy and immediacy of the information is influential to the delineation of organizational growth.

The noted policy and practice suggestions are broad frameworks from which systemic modifications and/or changes may be drawn. Systemic change in an organization such as a school district can be a slow and timely process. Therefore, in order to begin implementing data driven decision making and/or the acceptance and use of technology—it may be useful to consider incremented policies and/or practices that will ultimately support the intended goal(s).

5.5 FUTURE RESEARCH

In completing this study, there are several recommendations that can be made in response to future research within the areas of decision making and technology use among educational leaders. Recommendations for future research include:

- Expand the study to include other technology applications, such as data analysis systems, web-based data warehouses, or the like
- Expand the study to investigate how principals are using technology to make informed decisions or data driven decisions
- Expand the study to correlate technology acceptance and use data with demographic information to determine composition of technology users
- Expand the study to determine specific decision making traits between avid technology users and limited technology users
- Expand the study to gain insight about the variation in decision style between self report and inventory results
- Expand the study to visit school sites where principals are optimizing technology use for decision making
- Expand the study to evaluate the acceptance and use of technology by an educational organization—How does the contextual nature of an organization influence an individual's acceptance and use of technology?
- Replicate this study using a different decision making inventory and/or technology acceptance inventory—one could attempt to validate or repeal the presented findings

- Replicate this study using a controlled sample group, such as principal candidates in a graduate degree program or recently retired principals—acting principals are very difficult to survey due to the high job demands creating low response rates
- Alter the research design or implement a mixed method construct—survey participants through the mail, or by face-to-face/phone interviews—the online survey demonstrated a very low return rate, therefore making the process impractical to implement
- Utilizing findings as a needs assessment for future technology training and development of K-12 principals

5.6 REFLECTIONS

In reflecting on the progression of this study, my thoughts revert back to a statement made by Dr. Alan Fagan, a retired Superintendent from Fox Chapel Area School District. He stated that "leaders are not the bright yellow sun, but rather the moon which reflects the sun's rays." In relation to this study, an educational leader's intent to accept and use technology may be derived from the contextual nature of his/her surroundings. Whether it be one's leadership style, decision style, or personality style, leaders may alter these attributes to fit within the confines of his/her organization, and the contextual nuances of the organization's culture. Thus, it may not be one's style that elicits a specific behavior, but rather the cultivated opportunities availed within one's organizational system. If this proves significant, the acceptance and use of technology needs to encompass the organization and the organizational culture as a whole.

This study will hopefully open new doors for future research. Educational leaders, most particularly building principals, may find the job description finally shifting from operational manager to instructional leader—a position best served by data driven decision makers.

Through an ever-increasing reliance upon interpreting and understanding data analysis, assistive tools, such as technology, may be the key to improving student achievement within the social interactive nature of a school culture. It is only with time that the educational arena will be forced to support the multifaceted uses of technology. As stated by Bill Gates, "the advancement of technology is based on making it fit in so that you don't really even notice it, so it's part of everyday life" (*State Challenge Grants for Leadership Development*, 2002). There is no better time for educational leaders to embrace the use of technological tools to assist in the decision making process for the advancement of educational opportunities for all students.

APPENDIX

DATA COLLECTION INSTRUMENTS

A.1 INITIAL COVER LETTER

The initial cover letter is a one page document printed on the University of Pittsburgh, Department of Administrative and Policy Studies letterhead. The letter is formatted in Times New Roman, 12 pt, single spaced. An example of the initial cover letter is shown below:

Dear Fellow Principal: August 14, 2006

As part of a Doctoral Program at the University of Pittsburgh, I am conducting a study on the *Relationship between Principals' Decision Styles and Technology Acceptance/Use*. I respect your busy schedule; however I am asking for your assistance in completing an online survey which will be sent to you via email.

Your personal response is important in validating this study. I anticipate that the results will help all educational leaders to better understand the relationship between one's decision making style and his/her use of technology. The results of this study will be available to you upon completion.

The online survey should take less than 20 minutes to complete. The survey is divided into four parts. Part One asks several general questions regarding your technology use, professional development participation, and technological implementation. Part Two consists of questions in a Likert format related to your use of the Internet, e-mail, word-processing,

spreadsheets, and databases. Part Three consists of a Decision Style Inventory. Finally, Part Four asks for demographic information regarding your school and yourself.

All results will be correlated collectively; no individual or district will be identified. Each survey response will be electronically numbered to track response completion. All completed surveys and collected data will remain in my possession and will be securely stored until the analysis is complete. Upon completion, all data will be destroyed.

In order to participate in this study, I am required to gain your formal consent. Therefore, I have enclosed two copies of the University of Pittsburgh Adult Consent Form. Please review the provided information. If you have any questions, comments, or concerns, regarding this study or the consent form information, please contact me at your earliest convenience. Once you have read and understand the terms of this study—**please initial each page and sign your full name on page 4** (above Participant's Signature). In addition, under your name, please provide a **current email address**—the listed email address will be used to send the online survey for completion.

You may keep one copy of the consent form for your own records and **return the other signed copy in the envelope provided.**

In advance, I appreciate your time and energy. If you have any questions, please feel free to contact me at 724.796.1551 ext.105, or by e-mail at jjacoby@fortcherry.org.

Very truly yours,

Jill M. Jacoby
Elementary Principal

P.S. Please remember to return your signed consent form in the envelope provided
Once your consent form is received, you will receive the survey via your email account.

A.2 UNIVERSITY OF PITTSBURGH ADULT CONSENT FORM

The adult consent form is a four page document printed on the University of Pittsburgh, Department of Administrative and Policy Studies letterhead. The form is formatted in Bookman

Old Style, 10 pt, single spaced with a footer that includes the page number and place for participant's initials. An example of the consent form is shown below:

University of Pittsburgh
Institutional Review Board
Approval Date: June 20, 2006
Renewal Date: June 19, 2007
IRB Number: #0603072

University of Pittsburgh Adult Consent Form for Doctoral Research

CONSENT TO ACT AS A PARTICIPANT IN A RESEARCH STUDY

TITLE: **Relationship Between Principals' Decision Styles and the Acceptance and Use of Technology**

PRINCIPAL INVESTIGATOR: Jill M. Jacoby
Doctoral Student in Administrative and Policy Study
Elementary Principal, Fort Cherry School District
110 Fort Cherry Road, McDonald, PA 15057
Telephone: 724.796.1551
smilejmj@yahoo.com

UNIVERSITY COORDINATOR: Charles Gorman, PhD
Associate Professor of Administrative and Policy Studies
University of Pittsburgh
WWPH 4307,
Telephone: 412.648.7086
gorman@pitt.edu

SOURCE OF SUPPORT: None

Why is this research being done?

You are being asked to participate in a research study which intends:

To gain insight into the extent to which principals' decision styles influence their acceptance and use of technology. The central aim of the study is to determine if there is a relationship between a principal's decision style and his/her acceptance and use of technology.

The main objectives of this research study are as follows:

1. performing educational research on the relationship between principals' decision styles (using Davis' Technology Acceptance Model) and the acceptance and use of technology.
2. defining relationships between principal's technology acceptance and use to their decision making style.
3. identifying factors for creating educational leaders who are technology users.

Who is being asked to take part in this research study?

You are being invited to take part in this research study as a principal in a K-12 building within the state of Pennsylvania.

This research study includes a total of 300 K-12 principals within the Western Pennsylvania area (this area includes the counties of Beaver, Butler, Allegheny, Washington, Fayette, Greene, and Westmoreland). Each principal is being asked to complete a four part on-line survey.

Furthermore, two school district sites will be included to host on-site interviews of all district principals.

What procedures will be performed for research purposes?

If you decide to take part in this research study, you will be asked to complete an online survey. This survey should take less than 20 minutes. The questions will include the following information: your use and acceptance of technology, your past and current training regarding technology, your decision-making style, and several demographic questions.

If you are an administrative member of the South Fayette or West Allegheny School Districts, you will be asked to take part in a 30 minute, person-to-person, on-site interview. The interview will be audio taped and documented (quotations noted) for the purpose of accuracy. At the end of the study, the tapes will be erased or destroyed. Fictitious names will be assigned to the interviewed participants, as well as selected site name.

All collected information will be coded through ID numbers to protect the confidentiality of each participant.

What are the possible risks, side effects, and discomforts of this research study?

There are no risks of physical, emotional, or psychological harm associated with participation in this research. However, due to the use of an online (Internet) survey, participation may involve a potential risk for breach of confidentiality regarding participant privacy. Such risks will be minimized by 1) using a secured survey site to conduct the survey implementation; 2) using user ID coding to identify participants; and 3) limiting access to participant ID codes (only available to the Principal Investigator).

What are possible benefits from taking part in this study?

There are no direct personal benefits associated with participation in this research study. However, the research conclusions may guide and assist educational leaders, specifically principals and superintendents, in recommending programs and policies that impact the effectiveness of future educational and school operations.

Who will know about my participation in this research study?

Any information about you obtained from this research will be kept as confidential (private) as possible. All records related to your involvement in this research study will be securely stored by the Principal Investigator. Your identity in this study will be indicated by an ID number rather than by your name, and the information linking these ID numbers with your identity will be kept separate from the research records. You will not be identified by name in any publication of the research results unless you sign a separate consent form giving your permission (release).

In unusual cases, your research records may be released in response to an order from a court of law. It is also possible that authorized representatives from the University of Pittsburgh Research Conduct and Compliance Office and/or the University of Pittsburgh IRB may review your data for the purpose of monitoring the conduct of this study. Also, if the investigators learn that you or someone with whom you are involved is in serious danger of potential harm, they will need to inform the appropriate agencies, as required by Pennsylvania law.

For how long will the investigators be permitted to use and disclose identifiable information related to my participation in this research study?

The investigators may continue to use and disclose, for the purposes described above, identifiable information related to your participation in this research study for a minimum of five years after final reporting or publication of a project.

Is my participation in this research study voluntary?

Your participation in this research study, to include the use and disclosure of your identifiable information for the purposes described above, is completely voluntary. (Note, however, that if you do not provide your consent for the use and disclosure of your identifiable information for the purposes described above, you will not be allowed to participate in the research study.) Whether or not you provide your consent for participation in this research study will have no affect on your current or future relationship with the Principal Investigator, the school/school district/intermediate unit in which you work, or the University of Pittsburgh.

May I withdraw, at a future date, my consent for participation in this research study?

You may withdraw, at any time, your consent for participation in this research study, to include the use and disclosure of your identifiable information for the purposes described above. (Note, however, that if you withdraw your consent for the use and disclosure of your identifiable information for the purposes described above, you will also be withdrawn, in general, from further participation in this research study.) Any identifiable information recorded for, or resulting from, your participation in this research study prior to the date that you formally withdrew your consent may continue to be used and disclosed by the investigators for the purposes described above.

To formally withdraw your consent for participation in this research study you should provide a written and dated notice of this decision to the Principal Investigator of this research study at the address listed on the first page of this form.

Your decision to withdraw your consent for participation in this research study will have no effect on your current or future relationship with the Principal Investigator or the University of Pittsburgh.

If I agree to take part in this research study by signing this consent form, can I be removed from the study without my consent?

It is possible that you may be withdrawn from the research study by the researchers; if, for example, your information subsequently is found to meet any of the study criteria that would exclude you from participating.

****

VOLUNTARY CONSENT

The above information has been explained to me and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by a qualified individual or by the investigator(s) listed on the first page of this consent document at the telephone number(s) given. I understand that I may always request that my questions, concerns or complaints be addressed by a listed investigator.

I understand that I may contact the Human Subjects Protection Advocate of the IRB Office, University of Pittsburgh (1-866-212-2668) to discuss problems, concerns, and questions; obtain information; offer input; or discuss situations in the event that the research team is unavailable.

By signing this form, I agree to participate in this research study. [You have been provided two consent forms, please initial and sign one copy to be returned to the Principal Investigator in the enclosed envelope. The other copy is for your personal records.]

_____ _____

Participant's Signature Date

_____

Email Address for Online Survey

CERTIFICATION of INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual(s), and I have discussed the potential benefits and possible risks of study participation. Any questions the individual(s) have about this study have been answered, and we will always be available to address future questions as they arise.

Jill M. Jacoby Principal Investigator

Printed Name of Person Obtaining Consent Role in Research Study

_____ _____

Signature of Person Obtaining Consent Date

A.3 ONLINE SURVEY ELEMENTS

A.3.1 Email with Survey Link

The survey email is a customized email deployed by Zoomerang.com. The email is formatted in Times New Roman, 12 pt, single spaced. An example of the survey email is shown below:

From: jjacoby@fortcherry.org
Reply to : smilejmj@yahoo.com
To: *Participant email address*
Subject: Jill Jacoby's Dissertation Survey re: Principal's DM Styles & Tech. Acceptance/Use

Dear Administrator,
Thanks for offering to participate in my doctoral research study.

The study will take no more than 20 minutes. Upon your completion of the survey, your name will be placed in a random drawing for a $50 BP Gas Card.

Click on the link below to begin--Move quickly and answer with your first instinct.

If you have any questions, please feel free to contact me at jjacoby@fortcherry.org.

Sincerely,
Jill M. Jacoby
Doctoral Candidate

A.3.2 Survey Greeting

The survey greeting is a customized greeting shown at the beginning of the online survey. The greeting is formatted in Arial, 10 pt, single spaced with the title in bold purple. An example of the survey greeting is shown below:

Principals' Decision Making Styles and Technology Acceptance/Use Survey

Welcome to my online survey!

This survey is part of my doctoral research study titled Relationship Between Principals' Decision Making Styles and Technology Acceptance/Use.

The survey consists of four parts:
Part 1--Initial Questions
Part 2--Technology Acceptance Inventory
Part 3--Decision Style Inventory
Part 4--Demographics

The survey should take less than 20 minutes to complete and you will be asked to answer 45 questions.

Your input is very important to my research. Upon your completion of this survey, your name will be placed in a random drawing for a $50 BP Gas Card.

In advance, I truly appreciate your time and participation.

With sincere gratitude,
Jill M. Jacoby
Doctoral Candidate

A.3.3 Survey

The survey is a customized data instrument produced through Zoomerang.com. The online survey is formatted according to the *Global Blue* theme. A hard copy of the survey questions is provided in section A.5 of this Appendix.

A.3.4 Survey Closing

The survey closing is a customized end screen for the online survey. The closing is formatted in Arial, 13.5 pt, single spaced, and displayed in purple. A graphic of a girl catching a star is displayed to the left of the message. An example of the survey closing is shown below:

Thank you for helping me catch my dream!
Your name has been placed in the $50 BP Gas Card drawing.
If you would like a copy of the results, please feel free to contact me at jjacoby@fortcherry.org.

Sincerely,
Jill M. Jacoby

A.4 SECOND COVER LETTER

The second cover letter is one page document printed on the University of Pittsburgh, Department of Administrative and Policy Studies letterhead. The letter is formatted in Times New Roman, 12 pt, single spaced. An example of the second cover letter is shown below:

Dear Fellow Principal:

I need your help!

This is follow-up mailing and your particular response is extremely important in validating this study.

As part of a Doctoral Program at the University of Pittsburgh, I am conducting a study on the *Relationship between Principals' Decision Styles and Technology Acceptance/Use*. I understand the difficulty in balancing a busy schedule; however I am asking for your assistance

in completing the enclosed survey and returning it by *October 11, 2006*. Upon receipt of your completed survey, you will be placed in a random drawing for **BP $50 gas card.**

I anticipate that the results will help all educational leaders to better understand the relationship between decision making styles and the acceptance/use of technology. The results of this study will be available to you upon completion. Please let me know if you would like a copy.

Enclosed you will find a two consent forms, the survey, and a self-addressed stamped envelope. The survey should take less than 20 minutes to complete. The questionnaire is divided into four parts. Each part has specific directions on how to complete that section. Part One asks several initial open-ended questions regarding your technology use, professional development participation, and technological implementation. Part Two consists of questions in a Likert format related to your use of the Internet, e-mail, word-processing, spreadsheets, and databases. Part Three consists of a Decision Style Inventory. Finally, Part Four asks for demographic information regarding your school and yourself.

All results will be correlated collectively; no individual or district will be identified. Each survey response will be numbered to track response completion. All completed surveys and collected data will remain in my possession and will be securely stored until the analysis is complete. Upon completion, all data will be destroyed.

In order to participate in this study, I am required to gain your formal consent. If you have not already completed the University of Pittsburgh Adult Consent Form, please find the two copies enclosed. If you have any questions, comments, or concerns, regarding this study or the consent form information, please contact me at your earliest convenience. Once you have reviewed the provided information, please initial each page and sign your full name on page 4 (above Participant's Signature). You may keep one copy for your records and return the other signed copy with your completed survey in the envelope provided.

In advance, I appreciate your time and energy. If you have any questions, please feel free to contact me at 724.796.1551 ext.105, or e-mail me at jjacoby@fortcherry.org.

Very truly yours,

Jill M. Jacoby
Elementary Principal

P.S. ***Please*** return your completed survey and consent form by ***October 11, 2006***.

A.5 PAPER SURVEY

The paper survey is a four page document printed on white paper. The survey is formatted in Times New Roman, 12 pt, single spaced. An example of the paper survey is shown below:

Title: **Principals' Decision Making Styles and Technology Acceptance/Use Survey**

Instructions: Each section will have specific directions on how to complete that part of the survey. Please follow the directions carefully and mark your answers in clear manner.

Part 1: Initial Questions **Questions 1 - 9**

Directions: Please circle the answer that best represents you.

1. What decision style most closely reflects you?

   A. Analytical: deliberate and calculated while searching for complete and accurate facts
   B. Behavioral: loosely controlled, people oriented using persuasion
   C. Conceptual: creative with a broad outlook and compromising
   D. Directive: action oriented and decisive while looking for speed and efficiency

2. On a scale of 1 (poor) to 5 (excellent), how would you rate your ability to use technology (relative to other principals)?

   1 2 3 4 5

3. How often do you use technology within your daily tasks as a principal?

   Every day 3 times a week once a week once a month

4. What technology application do you use the most as a building principal?

   Internet
   Email
   Word Processing
   Spreadsheet
   Database
   None of the above
   Other, please specify _____

5. What areas of decision-making do you incorporate technology? (may have more than one answer)

   Student Achievement
   Student Attendance
   Student Discipline
   Teacher Evaluation
   Building Management
   Building Communication
   Parent Communication
   Other, please specify _____

6. What technology applications have you attended trainings on within the last 2 years? (may have more than one answer)

   Internet
   Email
   Word Processing
   Spreadsheets
   Databases
   Comprehensive Data Analysis System(s)
   PDA (i.e. Blackberry/Palm Pilot)
   Hardware (i.e. Smart Boards/Projectors)
   Software (i.e. Curricular Programming)
   Web Design
   Blogging
   Online Education
   Grading/Attendance Software
   Other, please specify _____

7. Do you have a Technology Plan for your building? Yes No

8. Do you have a Technology Plan for your district? Yes No

9. Are any of your professional goals related to technology implementation and/or use?

   Yes No

Part 2: Technology Acceptance/Use Inventory **Questions 10 - 16**

Directions: Please rate the following technology applications according to your acceptance and/or use in relation to your job as a building principal.

The word "it" in each statement refers to the technology application at the beginning of the question.

Circle one number per line according to the following scale:
SD = Strongly Disagree; D = Disagree; A = Agree; SA = Strongly Agree.

10. **THE INTERNET**	**SD**	**D**	**A**	**SA**
I find it easy to learn to operate	1	2	3	4
I find it easy to get it to do what I want it to do	1	2	3	4
My interaction with it is clear and understandable	1	2	3	4
I find it flexible to interact with	1	2	3	4
It is easy for me to become skillful in using	1	2	3	4
I find it easy to use	1	2	3	4
Using it enables me to be more efficient	1	2	3	4
Using it enables me to be more effective	1	2	3	4
Using it can make it easier to make decisions	1	2	3	4
I find it useful in completing daily tasks	1	2	3	4
I always try to use it for completing daily tasks whenever I find it helpful	1	2	3	4
I always try to use it for completing daily tasks whenever possible	1	2	3	4

11. **EMAIL**	**SD**	**D**	**A**	**SA**
I find it easy to learn to operate	1	2	3	4
I find it easy to get it to do what I want it to do	1	2	3	4
My interaction with it is clear and understandable	1	2	3	4
I find it flexible to interact with	1	2	3	4
It is easy for me to become skillful in using	1	2	3	4
I find it easy to use	1	2	3	4
Using it enables me to be more efficient	1	2	3	4
Using it enables me to be more effective	1	2	3	4
Using it can make it easier to make decisions	1	2	3	4
I find it useful in completing daily tasks	1	2	3	4

I always try to use it for completing daily tasks whenever I find it helpful	1	2	3	4
I always try to use it for completing daily tasks whenever possible	1	2	3	4

12**. WORD-PROCESSING**	**SD**	**D**	**A**	**SA**
I find it easy to learn to operate	1	2	3	4
I find it easy to get it to do what I want it to do	1	2	3	4
My interaction with it is clear and understandable	1	2	3	4
I find it flexible to interact with	1	2	3	4
It is easy for me to become skillful in using	1	2	3	4
I find it easy to use	1	2	3	4
Using it enables me to be more efficient	1	2	3	4
Using it enables me to be more effective	1	2	3	4
Using it can make it easier to make decisions	1	2	3	4
I find it useful in completing daily tasks	1	2	3	4
I always try to use it for completing daily tasks whenever I find it helpful	1	2	3	4
I always try to use it for completing daily tasks whenever possible	1	2	3	4

~At this point, 25% of survey completed~

13. **SPREADSHEET**	**SD**	**D**	**A**	**SA**
I find it easy to learn to operate	1	2	3	4
I find it easy to get it to do what I want it to do	1	2	3	4
My interaction with it is clear and understandable	1	2	3	4
I find it flexible to interact with	1	2	3	4
It is easy for me to become skillful in using	1	2	3	4
I find it easy to use	1	2	3	4
Using it enables me to be more efficient	1	2	3	4
Using it enables me to be more effective	1	2	3	4
Using it can make it easier to make decisions	1	2	3	4
I find it useful in completing daily tasks	1	2	3	4
I always try to use it for completing daily tasks whenever I find it helpful	1	2	3	4
I always try to use it for completing daily tasks whenever possible	1	2	3	4

14. **DATABASES**	**SD**	**D**	**A**	**SA**
I find it easy to learn to operate	1	2	3	4
I find it easy to get it to do what I want it to do	1	2	3	4
My interaction with it is clear and understandable	1	2	3	4

I find it flexible to interact with	1	2	3	4
It is easy for me to become skillful in using	1	2	3	4
I find it easy to use	1	2	3	4
Using it enables me to be more efficient	1	2	3	4
Using it enables me to be more effective	1	2	3	4
Using it can make it easier to make decisions	1	2	3	4
I find it useful in completing daily tasks	1	2	3	4
I always try to use it for completing daily tasks whenever I find it helpful	1	2	3	4
I always try to use it for completing daily tasks whenever possible	1	2	3	4

Continuation of Part 2: Technology Acceptance/Use Inventory Questions 15 & 16

Directions: Please designate your volume (how much) and frequency (how often) of use for the following areas of technology.

Mark an "X" under the appropriate percentage. One mark per a line.

15. Volume of Use: I use the following technologies "X"% of time…

	Never	> 0-25%	>25-50%	>50-75%	>75-100%
The Internet	_____	_____	_____	_____	_____
Email	_____	_____	_____	_____	_____
Word-processing	_____	_____	_____	_____	_____
Spreadsheets	_____	_____	_____	_____	_____
Databases	_____	_____	_____	_____	_____

16. Frequency of Use: I use the following technologies this often, "X"…

	Never	Monthly	Weekly	Daily
The Internet	_____	_____	_____	_____
Email	_____	_____	_____	_____
Word-processing	_____	_____	_____	_____
Spreadsheets	_____	_____	_____	_____
Databases	_____	_____	_____	_____

Part 3: Decision Style Inventory **Questions 17 – 36**

Directions: The Decision Style Inventory consists of 20 questions, each with four responses per a question. There are no right or wrong answers.

Each question will consist of four behaviors to be ranked according to this scale:

1= least preferred 2 3 4= most preferred

The easiest way to answer this section is to:

1. **First pick your most preferred behavior and mark it with a 4.**
2. **Next pick your least preferred behavior and mark it with a 1.**
3. **Lastly, mark the remaining behaviors with either 2 or 3 depending on preference.**

Each number may be used only ONCE within a given question.

For example:

My prime objective is to:	**Have a position with status**	**1**	**Be the best in my field**	**3**	**Achieve recognition for my work**	**2**	**Feel secure in my job**	**4**

17. My prime objective is to:	Have a position with status		Be the best in my field		Achieve recognition for my work		Feel secure in my job	
18. I enjoy jobs that:	Are technical and well defined		Have considerable variety		Allow independent action		Involve people	
19. I expect people working for me to be:	Productiv e and fast		Highly capable		Committed and responsive		Receptive to suggestions	

20. In my job, I look for:	Practical results		The best solutions		New approaches or ideas		Good working environment	
21. I communicate best with others:	On a direct one-to-one basis		In writing		By having a group discussion		In a formal meeting	
22. In my planning I emphasize:	Current problems		Meeting objectives		Future goals		Developing people's careers	
23. When faced with solving a problem, I:	Rely on proven approaches		Apply careful analysis		Look for creative approaches		Rely on my feelings	
~At this point, 50% of survey completed~								
24. When using information, I prefer:	Specific facts		Accurate and complete data		Broad coverage of many options		Limited data that are easily understood	
25. When I am not sure about what to do, I:	Rely on intuition		Search for facts		Look for a possible compromise		Wait before making a decision	
26. Whenever possible, I avoid:	Long debates		Incomplete work		Using numbers or formulas		Conflict with others	
27. I am especially good at:	Remembering dates and facts		Solving difficult problems		Seeing many possibilities		Interacting with others	

28. When time is Important , I:	Decide and act quickly		Follow plans and priorities		Refuse to be pressured		Seek guidance or support	
29. In social settings, I generally:	Speak with others		Think about what is being said		Observe what is going on		Listen to the conversation	
30. I am good at Remembering:	People's names		Places we met		People's faces		People's personalities	
31. The work I do provides me:	The power to influence others		Challenging assignments		Achieving my personal goals		Acceptance by the group	
32. I work well with those who are:	Energetic and ambitious		Self-confident		Open-minded		Polite and trusting	
33. When under stress, I:	Become anxious		Concentrate on the problem		Become frustrated		Am forgetful	
~At this point, 75% of survey completed~								
34. Others consider me:	Aggressive		Disciplined		Imaginative		Supportive	
35. My decisions typically are:	Realistic and direct		Systematic or abstract		Broad and flexible		Sensitive to the needs of others	
36. I dislike:	Losing control		Boring work		Following rules		Being rejected	

Part 4: Demographics **Questions 37 – 45**

Directions: Please complete the following questions in order to assist with categorizing survey responses. Circle the appropriate answer.

37. Gender: Male Female

38. Age: <30 30 - 40 41 - 50 51 – 55 >55

39. Years in Current Position: <2 2-6 >6

40. Total Years as a Principal: <2 2-6 >6
(not including years as an Assistant Principal)

41. Building Level: Elementary Middle High School Jr./Sr. High School

42. Student Enrollment in my district is:
<1,500 1,500 - 2,500 2,501 - 4,000 >4,000

43. Student Enrollment in my school is:
<500 500 – 1,000 1,001 - 3,000 >3,000

44. My district is considered primarily:
Urban Suburban Rural

45. I have the following computer applications available to me in my current district:
(Please circle all that apply.)
Internet Email Word-processing Spreadsheet Database
School Wide Comprehensive Data Analysis System
District Wide Comprehensive Data Analysis System
Other, please specify _____

Done!

Please return completed survey in envelope provided. Thank you. # _____

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