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Investigation of tacit knowledge in principal leadership

INVESTIGATION OF TACIT KNOWLEDGE IN PRINCIPAL LEADERSHIP

by

Lorraine St. Germain

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and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Education

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Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director Alberto Arenas, Ph.D. — Date 11/12/03

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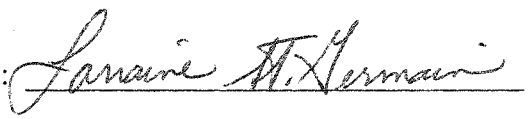
SIGNED: 

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ABSTRACT

This study investigated how the tacit knowledge of novice and expert principals was demonstrated in problem solving situations. Participant profiles were developed and contrasted using the transformational leadership dimensions identified by Leithwood (Leithwood and Steinbach, 1993, 1995).

A phenomenological approach was selected as the primary theoretical perspective. The qualitative methodology employed the protocol developed by Nestor-Baker (2002), along with a comparative method of interpreting the data (Patton, 2002). Three expert and three novice principals were each interviewed twice to determine how they used their tacit knowledge within self-identified, problem solving incidents. Results were analyzed by horizonalizing the data and identifying those portions of the interview that formed the essence, or the invariant constituents of the experience (Moustakas, 1994, p. 121). The invariant constituents were clustered into leadership dimensions and individual textural-structural descriptions were generated for the participants.

Experts possessed a greater accumulation of tacit knowledge than did novices. Experts tended to maintain a calmer approach, to see long-term ramifications immediately, and to have a better sense of timing for problem solving. Experts demonstrated greater if-then thinking, had a better understanding of interpersonal relationships, employed Model II (Arygris and Schön, 1974) thinking, and used context more effectively than did novices. Experts used tacit knowledge more inclusively in

contexts that required an understanding of the effects of social class than did novices. Novices used Model I thinking, tended to become emotionally affected by problems, delayed problem solving, and experienced a disconnect between intellectually reflecting upon problems and reaching appropriate, timely, solutions.

The identification of leadership dimensions by participants was found to be inconsistent. Expert secondary principals tended to think and act upon identifying and articulating a vision and fostering group goals. The secondary novice principal focused most upon providing individual support. The elementary school expert principal emphasized identifying and articulating a vision and providing individual support. The elementary novice principals focused most upon fostering the acceptance of group goals.

The researcher concluded that experience alone does not signify expertise. The accumulation of tacit knowledge, along with experience, results in expert school principal leadership.

CHAPTER 1

INTRODUCTION TO THE STUDY

Background

Upon entering a typical school campus, visitors may well believe that they have stumbled upon a small city. Today's school communities include parent advisory councils; curriculum, technology, standards, and student activities committees; a school newspaper; and a myriad of after-school clubs. The principal works at the center of this metropolis, often interacting with the following individuals and groups during the course of a single day: teachers' union representatives, drug offenders, parents, members of the student council, school secretaries and assistants, the textbook committee, the director of technology, the business manager, the superintendent, and the media. In fact, the role of the principal has been likened to that of a circus ringmaster who keeps all the acts in tandem while participating as the least memorable performer to the young children under the big top (Loader, 1997, p. 139).

Although principals have often completed years of advanced coursework in academic and pedagogical areas, they have little formal training in assuming many of the foregoing responsibilities (Malone & Caddell, 2000). According to Malone and Caddell, to be effective, principals must meld both "practical and conceptual skills" (p. 2). When superintendents were surveyed to determine the primary reasons for the failure of principals on the job, neither instructional competence nor content area knowledge were found to be of major significance (Davis, 1998; Deluca, Rogus, Raisch, & Place, 1997). Instead, Davis noted, "the careers of principals ended most

frequently due to the inability "to communicate or build positive relationships" (p. 76). In a separate study, a survey of 660 superintendents found that floundering principals most often experience difficulties in *problem-solving* (Deluca, Rogus, Raisch, & Place, 1997). Davis concluded that more research was needed to determine the "situational forces that can influence, neutralize, or modify the onset of leadership behaviors that might eventually lead to a principal's involuntary departure" (1998, p. 76).

School leadership problems have changed over time and across school settings. This has led researchers to note that "the tasks associated with effective leadership vary across time and school settings" (Hallinger & McCary, 1990, p. 91). These researchers felt that the knowledge base of principals must go beyond the typically offered areas relating to specific skills and academic tracking of students to include strategic thinking, problem solving, and a knowledge of "personal, contextual, and organizational factors" (1990, p. 91; Leithwood & Steinbach, 1992, p. 318). While research on effective practices of principals was abundant, there was little research on the strategic and practical knowledge that principals displayed when faced with a myriad of tasks on a given day (Leithwood & Steinbach, 1992, p. 2). There was also a dearth of research in educational administration and leadership in "how expert school leaders think about what they do....how the thinking of leaders changes as expertise develops....and....how school leaders approach problem-solving tasks" (Hallinger, Leithwood, and Murphy, eds., 1993, p. 72).

Statement of the Problem

Wagner and Sternberg (1986) described the knowledge that managers exhibited on a daily basis as tacit (p. 51). The word, tacit, may be defined as "not spoken," or "implied by or inferred from actions or statements" (The American Heritage Dictionary, 1992). Tacit knowledge is procedural in that it means knowing how as opposed to declarative knowledge, which refers to knowing that (Sternberg, Wagner, Williams, & Horvath, 1995, p. 917). As emphasized by Von Krogh, Ichijo, and Nonaka (2000), tacit knowledge also included "issues such as how to relate in a group, deal with a stressful situation, or handle leadership" (p. 31). Wagner and Sternberg (1986) posed questions regarding tacit knowledge such as, "Can its acquisition be accelerated?" and "How is tacit knowledge acquired over the course of experience in a real-world setting?" (p. 78).

Other research led to the conclusion that the means for transforming tacit knowledge into formal knowledge systems for training was still largely undiscovered, regardless of profession (Eraut, Alderton, Cole, and Senker, 2000, p. 257). Among the possible outcomes identified by Eraut, Alderton, Cole, and Senker as important for further investigation in this area included the following:

- Improving the quality of a person's or a team's performance;
- Constructing aids to decision making;
- Enabling people to review their actions and to keep them more under critical control even when they are not easily described;
- Possible creation of new knowledge. (p. 257)

All of the foregoing expressions of tacit knowledge are critical for "situational understanding" (p. 256). The complexity of investigating these areas is magnified by the characteristic manner of occurrence, "when decisions are rapid and complex and made under conditions of pressure and uncertainty" (p. 256). In view of the challenge of unraveling the essence of tacit knowledge, this area appeared to be almost unchartered by previous study in the area of education.

This lack of investigation in the area of on-the-job learning of managers was addressed by McCauley and Brutus (1998) after compiling an annotated bibliography of nearly 200 research reports in this area. McCauley and Brutus claimed that "research on ability to learn from experience has been scattered and seems to have only scratched the surface of this construct (1998, p. 50). McCauley and Brutus summarize the research in the area of tacit knowledge as follows:

> Although the way in which managers acquire tacit knowledge has not been looked at closely, studies of this phenomenon do support the notion that, in order to be successful, managers need to develop increasingly complex levels of expertise. (1998, p. 5)

McCauley and Brutus maintained that although the worksite had always been recognized as a major influence upon learning by those in management positions, this area had been studied only since about 1983. When reviewing this area, they found it significant that only one citation on school administrative management was included in this major compilation of studies. The single citation referred to a doctoral dissertation in which it was found that middle school principals claimed that "most if not all of their

development was reported as being the direct result of on-the-job experiences or experiences with other people" (Perry, 1994, as cited in McCauley and Brutus, 1998, p. 21). This propelled me to wonder that if this were true, why had some principals excelled and others failed? Were school campuses functioning as boot camps for leadership training?

Yet, tacit knowledge had been the rose that was renamed and splayed for study for decades. One such investigation was a collection of works edited by Agor (1989) under the title, *Intuition in Organizations*. Agor defined intuition as follows:

> ...a rational and logical brain skill than (sic) can be used to help guide decision making. It is not paranormal....Intuition is a product of a series of input sources including both factual and feeling cues. (p. 15)

Agor offered the following catalogue of organizational characteristics that require intuitive skills:

- Where there is a high level of uncertainty
- Where there is little previous precedent
- Where reliable 'facts' are limited or totally unavailable
- Where time is limited and there is pressure to be right
- Where there are several plausible options to choose from, all of which can be plausibly supported by 'factual' arguments (p. 11)

The foregoing list was remarkably similar to that offered by educational researchers as the typical environment in which the school principal made decisions daily. Simon (1987, 1989) noted that while management science has made gains in assisting

managers in decision-making, little resolution existed in "loosely structured, intuitive, and qualitative" situations (p. 23).

While for Simon and Agor, intuition was a rational process, others such as Isenberg (1984, 1989) separated intuition from rationality. After observing and interviewing twelve senior corporate managers during a two year period, Isenberg described their decision-making process as follows:

> ...when viewed retrospectively over a long time period, effective executives often appear quite rational. Yet when studying their concurrent thinking processes, being 'rational' does not best describe what the manager presiding over the decision-making process thinks about nor *how* (sic) he or she thinks. (p. 93)

Isenberg's solution for improved corporate operations was organizational rationality. This meant applying quantitative measures and computerized data analyses systematically throughout the organization. This would unfetter leaders so that they could proceed to confront "ambiguous, ill-defined tasks" with a necessary "artistic sense" (p. 104). At the same time, Isenberg suggested that leaders use methods that included analyzing concurrent problems with the assistance of a task force; applying greater imagination when confronting problems, and looking beneath the surface for relationships among problems. While Isenberg's analysis appeared to be conflicting in its bifurcation of rationality and intuition, his recognition that successful problem solving extends beyond the scientific method was important.

Years later, Simon (1993) defined rationality as "the set of skills or aptitudes we use to see if we can get from here to there – to find courses of action that will lead to the accomplishment of our goals" (p. 393). For Simon, intuition was merely the demonstration of the ability to apply the skills of recognition to arrive at a solution to a problem within bounded rationality. Using bounded rationality, one could arrive at the best possible choice given the range of knowable solutions. Those individuals who acted intuitively were able to make decisions based upon identifying familiar cues developed through habit. Expertise occurred when this process was combined with knowledge. Simon noted that the typical lecture method used at universities was antithetical to the development of such habits. This led me to the following question: If not at universities, how could such knowledge and skill be cultivated?

Recent research showed that "between 75% and 96% of the variance in real world criteria such as job performance could not be accounted for by individual differences in intelligence test scores" (Sternberg et al., 1995). And, while performance on cognitive intelligence tests decreased with age, the tacit knowledge involved in problem solving tasks appeared to increase into advanced age. Wagner (1993) summed up the results of a series of studies conducted by Wagner and Sternberg, as follows: "For every analysis, tacit knowledge was found to account for a significant and large proportion of the variance in managerial performance regardless of the other variables [IQ and personality] that were partialled (sic) out" (p. 99).

Wagner (1993) opined that school leadership should be viewed as "a craft that is not easily reducible to a set of principles" (p. 100). Since many of the past precepts

regarding school leadership have had inconsistent results, an alternative approach may be to provide instruction in tacit knowledge to administrators. However, some researchers have doubted that such training could be successful outside of the work environment (Eraut, Alderton, Cole, and Senker, p. 259). These researchers stated that "learning in one context will not easily transfer to the other" (p. 259). The researchers suggested that the very nature of learning situations must change for students from adolescence upwards. For these researchers, increasing the variability of situations would present one way to increase tacit knowledge.

Although studies of tacit knowledge have been conducted in the military, medical, legal and business fields, little research existed regarding the application of what is known about tacit knowledge to the areas of educational administration and leadership (Nestor-Baker & Hoy, 2001). Yet, as we enter an era in which there is a shortage of principals, it seems critical to understand the effects of tacit knowledge upon job performance. How does tacit knowledge manifest itself among principals? How does tacit knowledge differ among principals? Are there any extant programs for training leaders to gain a repertoire of tacit knowledge?

Purpose of the Study

It appeared that a study that evolved out of the foregoing questions would contribute to an understanding of the problem solving approach used by principals, who typically make as many as 150 decisions daily (Leithwood, 1990, 1994, p. 152). According to Leithwood, these numerous brief, unscheduled meetings characterized "the high levels of spontaneity" in the decision-making role of the principal. Since, as

Leithwood continued, "the largest single expenditure of a principal's time is reported to be unanticipated meetings," it seemed essential to discover how problem-solving could be conducted with such apparent reflexivity (p. 152). And if, as indicated above, interpersonal skills were essential to the role of the principal, it seemed important to determine whether and how tacit knowledge enhanced these skills.

This seemed especially pertinent in light of the conclusion reached by Leithwood and Steinbach, (1992) in which they proposed a definition of strategic knowledge that included the "explicit strategies and heuristics associated...with expertise, as well as the (usually) tacit knowledge required for its actual use in real-life administrative contexts" (p. 321). These researchers described tacit knowledge as "knowledge that is strategic or procedural in the sense that it is knowledge concerned with how to solve problems, rather than knowledge about problem solving" (p. 321). Leithwood and Steinbach summarized their findings by noting that "the importance of [tacit] knowledge is often overlooked in discussions of expertise" (1992, p. 321). This led to the following question: If, indeed, tacit knowledge was central to the daily performance of experienced principals, what implications would this hold for principal training or induction programs?

Research Questions

Based on the foregoing analysis, it seemed that an examination of the tacit knowledge exhibited by school principals would add to the investigation of school leadership. The following research questions came to mind:

1. Is there a difference between the tacit knowledge demonstrated in problem solving situations between principals recognized as "expert" and novice principals?
2. How is tacit knowledge manifested among the seven domains of leadership as identified by Leithwood?

Assumptions

As outlined, this study included the following two assumptions.

1. It was assumed that the principals would honestly describe those situations in which they had confronted and resolved problems.
2. It was assumed those individuals identified as experts and novices were, in fact, experts and novices.

Limitations

There are several factors that have limited the generalizability of the findings reached in this study. These factors are as follows:

1. A small number of participants were included in the study.
2. Some of the novices had prior administrative experience.
3. The experts may have encountered different problems due to their level of administration.
4. The experts and novices in this study may not represent typical expert and novice groups.

Definitions of Key Terms

Cognitive Model – "a set of psychosocial components, more or less tightly linked to each other, more or less, unitized, and often named. The components include ideas, percepts, values, motives, and feelings" (Glidewell, 1993, p. 38).

Domain knowledge - the "knowledge base that pertains to the areas of competence" (Ohde and Murphy, 1993, p. 76).

Gestalt – "a physical, biological, psychological, or symbolic configuration or pattern of elements so unified as a whole that its properties cannot be derived from a simple summation of its parts" (The American Heritage Dictionary of The English Language)

Heuristics – Of, relating to, or constituting an educational method in which learning takes place through discoveries that result from investigations made by the student (The American Heritage Dictionary of The English Language)

Intersubjectivity - the perception of a world in which individuals experience "fields of perception and memory" that are different, in spite of a shared view of the natural world (Schutz, 1931, p. 105).

Procedural knowledge – "tacit or implicit knowledge" (Patel, Arocha, & Kaufman, as cited in Sternberg & Horvath, eds., p. 78)

Propositional knowledge - - "underpins or enables professional actions and practical know-how which is inherent in the action itself and cannot be separated from it" (Eraut, 1994,p. 15)

Subception – "the mechanism underlying the formation of Gestalt" (Polanyi, 1967, n. p. 95). Polanyi distinguishes his application of this word from both the "unconscious or

preconscious awareness, or Jamesian fringe of awareness" and Freudian conceptions of defensive mechanisms. As described by Polanyi, subception is a form of subsidiary awareness that is characterized by the *function it fulfills* (sic) (p. 95).

Tacit knowledge – This type of knowledge may be described as follows: practical rather than academic, (2) informal rather than formal, and (3) usually not directly taught" (Wagner and Sternberg p. 54).

Organization of the Study

Chapter One provides an introduction to the study. It includes a statement of the problem, the purpose of the study, the research questions, the definitions of key terms used in the study, and a review of the assumptions and limitations of the study. Chapter Two, the review of the literature related to the study of tacit knowledge, includes the following sections: theories and models, acquisition of tacit knowledge, ecological/psychological perspectives, tacit knowledge and problem solving among school leaders, explications of novices and experts across fields, contextual effects, making tacit knowledge explicit within organizations, and leadership and flow. Chapter Three, the methodology, includes the following sections: the qualitative perspective, parameters for participant selection, and design modifications. Chapter Four, the presentation and analysis of the data, includes sections of data describing the findings for each of the six participants in the study. Chapter Five provides a summary of the findings, implications, and recommendations for further study. It includes the following sections: the experience factor, elementary and secondary leadership factors, the

contextual lens, emergent categories, and leadership dimensions and tacit knowledge. It also includes separate sections on the tacit knowledge of expert and novice principals.

CHAPTER 2

REVIEW OF THE LITERATURE

Theories and Models

Horvath et. al (1999) notes that the conceptual basis of tacit knowledge lies in the fields of philosophy, ecological psychology, and organizational behavior (p. 44). The philosophical framework may be found in the work of Polanyi, who also applied his medical experience to conceive a description of tacit knowledge that continues to underlie much of the research currently performed in this area across fields. Polanyi (1967) distinguished tacit knowledge from Gestalt, arguing that tacit knowledge is not the activity of *spontaneous perception*, but instead, is the outcome of the "active shaping of experience performed in the pursuit of knowledge" (p. 6). Rather than perception, which Polanyi claimed was the "most impoverished form of tacit knowing," the process is closer to that coined as *subception* by Lazarus and McCleary (as cited in Polanyi, 1967, p. 7). In fact, according to Polanyi, when we understand something tacitly, we "incorporate in our body" (p. 16). Polanyi further described tacit knowing as *indwelling*, and *interiorization* (pp. 16 – 17). By indwelling, Polanyi meant neither learning through empathy nor by looking at things; instead, tacit knowing means *dwelling in them* (p. 18). Through interiorization, we accept and integrate the moral precepts and theories that are conveyed to us.

Following Polanyi's thesis, true understanding for educational leaders emerges through application, or practice. Polanyi explained that just as one cannot fully understand a poem by reading about poetic structure, neither can individuals employ

empirical knowledge to understand reality. The features of interiorization and integration are especially important when examining the perspectives of subsequent researchers and compatible theories. For example, after substantial research of tacit knowledge in non-education fields, Sternberg and Wagner (1986) concluded that relational knowledge rather than automaticity was the overriding feature of tacit knowledge in memory. Learning the definitions and functions of bushings, washers, eyebolts, "C" pins, and hitch pins requires intelligence; yet, subsequently assembling a home gym with these components would be easier for some individuals than others. The former challenge requires automatic recall; the latter demands an understanding of the relationships among components. Practical knowledge is *complex*, involves "part-whole, causal relations, inductive reasoning, and spatial relations" within combinations that change according to the situation (p. 261).

Kolb (1984) defined learning as "the process whereby knowledge is created through the transformation of experience" (p. 38). Viewed in this way, learning may be regarded as a "process of adaptation" rather than a goal oriented activity. In this process, knowledge is not seen as discrete bits of information to be acquired, but as an epistemology that is "continuously created and recreated." Kolb maintained that "to understand learning, we must understand the nature of knowledge and vice versa" (p. 38).

Drawing upon the work of Dewey and Piaget, Kolb (1984) defined knowledge as the "result of the transaction between social knowledge and personal knowledge" (p. 36). Social knowledge is "the civilized objective accumulation of previous human

cultural experience" (p. 36). Personal knowledge is "the accumulation of the individual person's subjective life experiences." This process results in experiential learning, which he described as a four phase cycle. The four phases of experiential learning included concrete experience, reflective observation, abstract conceptualization, and active experimentation. Kolb proposed this process as an alternative view to scientific inquiry as the crux of knowledge. Kolb maintained that the process of knowing depends upon both "grasping experience and transforming it" (p. 41). Using a dialectical, cyclical model, Kolb conceived a learning styles theory that included "individual choice" within "emerging events" (p. 64) that ultimately influenced the decisions made during each circumstance.

Eraut (1994) offered an alternative definition of experiential learning that focused less on selective, intentional learning. He claimed that experiential learning arose from the following specific circumstances:

> ...where experience is initially apprehended at the level of impressions, thus requiring a further period of reflective thinking before it is either assimilated into existing schemes of experience or induces those schemes to change in order to accommodate it....One reason why learning might remain initially at the level of impressions may be that there is often no specific learning intent.... (p. 107)

Eraut likened learning through "specific intent" as using implicit images to create explicit knowledge (p. 50). Eraut opined that this theory served as an alternative to Kolb's thesis, which he maintained did not allow for the "interpretative use of knowledge" and routinization of procedural knowledge, that may occur throughout

experience. Moreover, an abstract conception cannot portray experience. For this reason, one cannot imbue teachers or administrators with essential tacit knowledge purely by describing the experience or the situation. The identifying feature of tacit knowledge is that it is "knowledge that is acquired through personal experience rather than received from others (i.e., through instruction)" (Patel, Arocha, & Kaufman, as cited in Sternberg & Horvath, eds., 1999, p. 78).

In a similar vein, Klein (1998) pointed out the deficiencies of analytical methods, and instead offered a theory of "recognition-primed decision making" (hereafter, RPD) (p. 138). The strength of this model was that it attempted to explicate the manner in which individuals "make decisions without having to compare options" (p. 138). While studying the work of the leaders of firefighting groups, Klein found that their decisions did not follow the deliberative protocols established in typical decision-making theory. When pressed for time, these leaders did not consider "probabilities" or chose among various options; instead, they did not even choose between two options, but immediately selected and proceeded with a course of action. Klein speculated that "It is possible that the fireground (sic) commanders were contrasting alternatives, but at an unconscious level...." (p. 139). He expanded upon the foregoing conclusion as follows:

> The reasons we believe that the fireground commanders were rarely contrasting options are: it seems unlikely that people can apply analytical strategies in less than a minute...; each FGC argued forcefully that he or she wasn't contrasting

> options; and they described an alternative strategy that seemed to make more sense. (1998, p. 139)

In addition to the fireground commanders in the foregoing study, Klein's work included results from tank platoon leaders and design engineers. It is significant to note that among those results comparing the percentage of RPD between expert and novices, the experts reported higher RPD percentages than did the novices. Expert fire commanders reported 58% RPD as compared to 46% RPD by the novices. In the case of design engineers, who reported that 60 percent of their decisions were made using RPD even though they did not feel compelled to make decisions swiftly, the group studied were described as experienced (p. 145). As noted earlier, the work of principals has been found to be characterized by instantaneous decision-making in novel situations. This finding was similar to the description offered by Klein after reviewing the results of his studies. He noted "that recognitional (sic) strategies are the most frequent, even for non-routine decisions. Analytical strategies are more frequently used by decision makers with less experience" (p. 145).

Building on the work of Klein, Randel, Pugh, and Reed (1996) used the RPD model to study the situational awareness that enables individuals to make decisions within "naturalistic environments with time constraints, changing conditions, and stress" (1996, p. 580). The design was one in which they simulated real-time conditions experienced by electronic warfare technician operators (hereafter, EWs) within a controlled laboratory setting. Their purpose was to compare the characteristics demonstrated by experts with those of novices. The researchers hypothesized that

experts employ domain knowledge stored in the form of intricate models aimed at identifying underlying causes.

Twenty-eight EWs, with experience ranging from six months to over seven years, participated in the study. Data was compiled from videotapes, interviews focusing upon hypothetical critical incidents, and questionnaires. Results showed that experts "placed a greater emphasis on situation assessment" (Randel, Pugh, and Reed, 1996, p. 592). Novices, on the other hand, were more intent on "deciding the course of action" (p. 593). These finding were similar to those Leithwood and Steinbach (1992), to be discussed later. Briefly, Leithwood and Steinbach found that experts focused more on the initial phase of problem solving, rather than the solution itself. Randel, Pugh, and Reed (1996) concluded as follows:

> Our results indicate that experts...show a better knowledge of how to apply the rules...[which] corresponds to what Sternberg calls tacit knowledge....the competent individual subtly bends the rule in appropriate situations. (p. 595)

Years ago, Schön (1982) posed the question: "How is professional knowing like and unlike the kinds of knowledge presented in academic textbooks, scientific papers, and learned journals?" (p. viii). His study of the epistemology of practice, reflection – in-action, or intuitive thinking was an inquiry into the tacit knowledge displayed by managers in fields ranging from business to psychology (pp. viii – ix). According to Schön, the positivist emphasis on the ends, or obtaining the solutions to the problems, resulted in a neglect of the means, which included the context and setting of problems (p. 40). This was especially true for novel situations outside the established

methodologies. In this respect, Schön shared the outlook of Polanyi (1967) who claimed that positivistic theories offered a futile avenue to the investigation of tacit knowledge (p. 25).

Knowing-in-action was advanced as the source for reflection-in-action and the basis of tacit knowledge (Schön, 1987, p 25). Schön described knowing-in-action as "the sorts of know-how we reveal in our intelligent action - publicly observable, physical performances ... and private operations" (p. 25). Schön continued his explication by noting that as we attempt to describe our knowing-in-action, we formulate *constructions* to "put into explicit, symbolic form a kind of intelligence that begins by being tacit and spontaneous." Schön described this activity-based process as follows:

> The knowing-in-action is tacit, spontaneously delivered without conscious deliberation; and it works, yielding intended outcomes so long as the situation falls within the boundaries of what we have learned to treat as normal. (Schön, 1987, p. 28)

Unusual circumstances, or surprises, prompt reflection. According to this theory, reflection could occur in three ways: After the action was completed; in the midst of the action by stopping the activity; or in the midst of the action by not stopping the activity (p. 26). The third type of reflection, or reflection-in-action, was characterized by three major qualities: First, it was a conscious activity that included reflection upon knowing-in-action. Second, it included a component of critical thinking and reframing. Third, it enabled individuals to experiment to find new ways to solve a problem (p. 28).

One criticism of Schön's theory was that it neglected the problem of time when decisions must be made quickly (Eraut, 1994, p. 145). Eraut maintained that "the flow of experience and need for simultaneous action is so rapid that little further attention can be devoted to reflection until some later occasion" (p. 107). For example, when principals review teacher performance at a mutually arrived at time under pre-established conditions, they have ample time to use reflection, or knowing-in-action, to bring their accumulated knowledge into the act of assessing instructional competence. However, a potentially violent student confrontation or an impromptu parent conference leaves no time for conscious reflection-in-action. It seemed that when considering the daily interactions of principals, Schön's theory did not adequately account for "how patterns of reflection vary according to profession, situation and circumstance" (Eraut, 1994, p. 145). Eraut concluded that the reflection-in-action described by Schön may be closer to metacognition, a term that will be defined later in this paper.

In their critique of Schön's epistemology, Munby and Russel (1989) noted that for many researchers, reflection-in-action simply became reflection-on-action, or recollection (p. 77). These researchers also likened this to a meta-cognitive (sic) approach, to be discussed later (p. 76). On the other hand, Schön's reflection-in-action had been described by MacKinnon (1989) as the "non-logical processes" that are involved in the ways in which one frames and reframes problems (as cited in Munby & Russel, p. 77). This entailed acting in the moment and seeing new permutations of problems within the context in which they occurred. As noted by Munby and Russel as well Schön, this experiential process had been theorized by educators beginning with

Dewey. Yet, the distinguishing feature of Schön's theory remained the emphasis on "*seeing a professional puzzle differently*" (sic) (Munby & Russel, p. 77). Munby and Russel noted the paucity of research in this area. Yet the type of learning in which "professional knowledge arises immediately from the direct interaction between the practitioner and the action" may lie at the heart of school leadership" (p. 78).

Acquisition of Tacit Knowledge

Researchers noted that in order to begin to solve a problem or address a novel experience in a particular field, domain knowledge was required (Ohde & Murphy, 1993; Leithwood & Steinbach, 1992). Ohde and Murphy described domain knowledge as the "knowledge base that pertains to the areas of competence" (1993, p. 76). In order to acquire the substantial knowledge base required in a field of expertise, it was necessary to learn the subject matter of the field. Usually, this learning could be acquired through some type of formal instruction and often supplemented with field experiences.

The narrative approach to transforming tacit to explicit knowledge was studied quantitatively using a "knowledge exchange protocol" (Herschel, Nemati, & Steiger, 2001) with 238 students in a university technology course. The investigators defined knowledge exchange protocol as follows:

> A knowledge exchange protocol is a process that structures information exchange in such a way that the provider of the information and/or the recipient of the information can systematically present/recall information in a focused manner.

Would student recall be improved by listening to highly structured narratives or by following highly structured recall methods or a combination of the two? Two instructional videos were created to determine which process would be more effective. One of the films was composed of a "rich free form narrative," and the second was structured according to the subjective, objective, assessment plan (hereafter, SOAP) as previously studied by Patel, Arocha, and Kaufman (1999).

Students were divided into two groups, watched the films on their computer monitors in class, and entered their responses immediately after viewing the films. Students watching the free form film were asked only what they learned from the film. Students who viewed the SOAP film were not only asked what they learned from the film, but also were required to respond to specific questions that followed the SOAP format. Results showed no significant differences in gender. Nor were there any significant differences in recall between those who had seen either film. The only significant increase in performance was among those students who responded using the SOAP questions. The researchers concluded as follows:

> What this means is that rich narratives may facilitate tacit to explicit knowledge conversion, but their effectiveness may critically depend on whether the recall process is structured.....when structure is employed in the tacit knowledge sharing process, employing it in a narrative recall procedure seems to be the most critical factor for enabling effective knowledge transfer.

Limitations in the study included the use of undergraduate students who might have been less interested or attentive to the study (Gordon, Slade, & Schmitt, 1986). Another

limitation may have existed in the development of the films, even though, as the researchers noted, "every effort was made to ensure that the content expressed in the two films was equivalent" (p. 110). Finally, the study did not differentiate among students watching the film, so the effect of experience upon results was not examined.

Other researchers focused upon practice as the complementary component of knowledge acquisition (Ohde & Murphy, 1993, p. 77). It was concluded that tacit knowledge was acquired by "actively practicing the targeted performance" (p. 77). Feltovich and Patel (1993) claimed that as a result of gaining a tacit knowledge base, the experienced practitioner "'seldom has to deal with novelty, having brought much of his work-world into the realm of the familiar'" (as cited in Ohde & Murphy, p. 77). However, according to the conclusions of those such as Leithwood, Cousins, and Smith, later reviewed in this paper, novelty was a critical and challenging aspect of the problem solving experienced everyday by principals. Rather than concluding that experience eliminated novelty, as suggested by Feltovich and Patel, the preponderance of research appeared to support the conclusions of Ohde & Murphy, who felt that "experience expands and refines the knowledge base," and thus mitigated the effects of novelty (1993, p. 77).

The result of two studies conducted by Boshuizen and Schmidt (1990) supported the foregoing conclusion. These researchers studied whether the diagnosis and treatment decisions made by physicians were a result of biomedical knowledge, clinical knowledge, or a combination of the two types. The researchers defined biomedical knowledge as knowledge that "concerns itself with the pathological

principles...underlying the manifestations of disease" (p. 5). In contrast, clinical knowledge was defined as "knowledge of attributes of sick people...." (p. 5). They questioned the previous conclusions of Feltovich and Barrows (1984) that emphasized the role of domain related knowledge in diagnosis. The researchers summed up this view as follows: "Comprehension, and hence the diagnosis, of a case emanates from biomedical knowledge" (p. 4). The researchers contrasted this view with that of those such as Patel, Evans and Groen (1989), who assert the primacy of clinical knowledge in diagnosis (p. 5). This opposing view holds that "biomedical knowledge is in (sic) particular characteristic for non-expert reasoning" (p. 5).

In the first study, the researchers used a qualitative methodology in which the oral deliberations of four participants were examined. A student in the second year of medical training was identified as the novice; two students in the fourth and fifth year of study were designated as intermediate; and a family practitioner represented the expert participant. Hypothetical cases were provided to the participants on a series of preprinted cards. The participants were requested to voice their thoughts as each card was offered, leading to the ultimate diagnosis of the patient. Responses were tape recorded for subsequent transcription and analysis. Results of the first study showed that the more advanced the practitioner, the more likely the individual was to employ clinical knowledge. The researchers concluded that "practical experience might play an important role in this change" (p. 21). Interestingly, the researchers noted that "a peak in the functionality of the biomedical knowledge applied was observed at the lower intermediate level, whereas after this stage in development the application of clinical

knowledge appeared prominent in the protocols" (p. 21). One wonders whether this same feature would apply to the evolving expertise of principals. Does domain knowledge peak after several years of experience? Can significant experiences change the learning curve of principals?

The second study served to further explicate the results of the first investigation. It involved twenty participants and employed the same qualitative methodology, but also required that the participants provide written summaries of the scientific processes that that they believed were at the root of the case. Upon their analysis of the findings, the researchers theorized that biomedical knowledge among experts does not simply become "inert" (p. 27). In fact, experts appeared to possess a "more elaborate biomedical knowledge base" (p. 28). Boshuizen and Schmidt described this process not as the knowledge accretion, but of "knowledge compilation" (p. 31). Their reasoning is as follows:

> Let us imagine what happens if two knowledge bases about the same domain both accumulate. One would expect to find not only an increasing number of common concepts, but also an increasing number of *common propositions*...since these propositions are the carriers of causal knowledge relevant to both the biomedical and the clinical way of looking at the world....The essence of knowledge compilation is that chains of interrelated propositions are reduced to a fewer number of propositions *of a different nature*.....In other words: Compilation of interrelated sets of propositions results in 'shortcuts'. (1990, p. 31)

This characteristic of experts was summed up by Means, Crandall, Salas, and Jacobs (1993), as follows:

> This goes beyond the obvious fact that experts 'know more' than novices do. As expertise grows, individuals come to know things differently. Thus, an expert and a novice radiologist confronted with an e-ray do not *see* the same event. Often much of the expert's knowledge is tacit.... (as cited in Klein, ed., et al., p. 311)

As a result of their investigations, Boshuizen and Schmidt found a positive relationship between the number of shortcuts employed and the level of expertise of the study participants. Moreover, experts "do not overtly apply biomedical knowledge in clinical reasoning" (pp. 33 – 34). Instead, this knowledge was "compiled and integrated" within the practical knowledge of the attributes of sick people. In conclusion, rather than seeing the domain knowledge and the clinical knowledge as disparate, the researchers maintained that "our findings suggest a tacit role of biomedical knowledge in expert clinical reasoning" (p. 34). Do years of experience in schools similarly create a sea-change in the domain knowledge of principals so that it is tacitly employed in expertise? Do principals see incidents differently? How can we explain cases in which experience helps some principals to become expert leaders while others fail in their efforts?

One answer to the foregoing unanswered question can be found in models that extol the benefits of intuition over rationalistic approaches. The Dreyfus theoretical model supported the theory of experiential learning over the "rationalist tradition of analytic reasoning" and eventually became identified as an explication of the

development of the novice to the expert (Eraut, 1994, p. 124). It seemed that the tenor of the Dreyfus critique sprang from the background of its originators. One of the Dreyfus brothers was a *philosopher* and the other an *industrial engineer* who worked in computer applications (p. 124).

The model set forth five stages of development from novice to expert, emphasizing "perception and decision-making rather than routinized action" (pp. 124 – 125). In the first stage, the novice followed rules completely, and evinced little insight or reasoning. In the second stage, that of advanced beginner, the individual identified generalized features of situations, but still within a restricted perception. In the competent stage, long-range goals were perceived within habitual procedures. In the proficient stage, individuals adopted a holistic view by identifying priorities and using rules for guidance that may change according to circumstances. At the expert level, rules were no longer necessary, since there was an "intuitive grasp of situations based on deep tacit understanding" (p. 124). Experts also retained a "vision of what is possible" (p. 124). Dreyfus and Dreyfus summed up expertise as follows:

> An expert generally knows what to do based on mature and practiced understanding…An expert's skill has become so much a part of him that he need be no more aware of it than he is of his own body…the expert business manager, surgeon, nurse, lawyer, or teacher is totally engaged in skillful performance. (as cited in Eraut, 1994, p. 126)

Eraut maintained that "the strength of the Dreyfus model lies in the case it makes for tacit knowledge and intuition as critical features of professional expertise in

'unstructured problem areas' (p. 127). Still unanswered, according to Eraut, were questions relating to how knowledge was mentally filed and extracted by experts. Another weakness of the model appeared to be the emphasis upon intuition at the expense of analysis for decision-making.

Later, Hammond (1994) developed a model that placed analytic and intuitive thinking along a continuum, concluding that the majority of decisions include both elements (p. 140). When more cues and redundancy occurred in the presentation of the problem, a greater tendency existed for a more intuitive solution. Hammond opined that the best solutions were reached when the approach matched the "critical features of the task" (as cited in Eraut, p. 142). However, in most cases, when speed was involved in decision-making, there was little time to analyze the task in order to select the optimal approach. Instead, the intuitive approach usually satisfied the requirement for speed.

Ecological/Psychological Perspectives

As noted earlier, tacit knowledge had been previously studied from an ecological psychological perspective. This perspective was defined as the investigation of behavior as it differed in various environments (Simco, 1995, p. 50). Wagner investigated 'situated leadership,' which he defined as "competence [that] is confined to domains of experience" (1993, p. 89). Wagner proceeded to contrast domain problems with those presented in practice. The former were clearly defined, presented by others, contained all the information necessary to solve them, had only a single answer and a single method for solution, and did not require everyday experience to solve them

(1993, p. 96). Practice problems were not well defined, were generated internally, lacked all of the information necessary to solve them, offered no one answer, required various methods for obtaining more than one solution; and were unraveled only through practical experience (p. 96).

Following the work of Wagner and Sternberg (1986), Somech and Bogler investigated the influence of gender and socioeconomic status (hereafter, SES) upon the tacit knowledge demonstrated by university students (1999). They first developed a Likert-type scale of tacit knowledge questions by interviewing seniors. Next, they administered the instrument to 30 college freshmen and 27 seniors. The two groups represented expert and novice groups based upon the Wagner and Sternberg (1986) schema.

For the purposes of this study, it was necessary to elaborate upon the foundation set by Wagner and Sternberg (1986) for the work of Somech and Bogler. In their assessment of tacit knowledge, Wagner and Sternberg used the knowledge-based approach of cognitive psychologists that holds that "experts differ from novices primarily in the amount and organization of their knowledge about the task, rather than in underlying cognitive abilities" (1986, p. 54). Rather than applying this distinction to "academic intelligence," Wagner and Sternberg chose to assign it to their investigation of "practical tasks faced by individuals in several real-world pursuits" (p. 54). As a result of their research, Wagner and Sternberg established a strategy for identifying tacit knowledge that was based upon comparing the performance of an individual with that of an *expert group* (p. 54)

The final survey instrument developed by Somech and Bogler was administered to 243 undergraduate students from the fields of education, social work, law, and philosophy (1999, p. 608). Results showed that tacit knowledge was influenced by SES Specifically, students from low SES employed tacit knowledge more successfully than those from higher SES backgrounds. Although there were no significant differences between gender, there was a relationship between gender, tacit knowledge, and achievement. While male students who scored high in tacit knowledge received better grades than those who scored low in tacit knowledge, there was no such difference among females. The researchers opined that these differences suggested that "male students may make better use of it than female students to promote personal goals" (1999, p. 608). If this was the case, do male principals use tacit knowledge more successfully than female principals? If those from low SES sectors use tacit knowledge more effectively, is it possible that tacit knowledge represents a type of social capital for those who lack the advantages of a high SES? Does knowledge management require "trade-offs" (Shearmur, 2000) that many women are not prepared to make?

After a review of the literature on tacit knowledge, Williams (1991) created a framework for a quantitative investigation of tacit knowledge among business managers. The framework consisted of a number of subcategories under two domains: intrapersonal and interpersonal knowledge. Intrapersonal knowledge was defined by Williams as "knowledge about behaviors relating to the self and the interrelationship of the self and the environment" (p. 19). Interpersonal knowledge was defined as knowing "how and when to do three main things—influence and control others, support others,

and understand others" (p. 21). The aim of the study was to assess tacit knowledge within the foregoing frameworks.

Williams developed and administered a questionnaire to 109 managers, representing all management levels in four technology companies ranging from 250 to 500 employees. Analysis of tacit knowledge levels involved examining the differences between the knowledge of experts and novices, as represented by upper and lower management, years of experience, and salaries. Overall results showed that intrapersonal and interpersonal tacit knowledge increased with management levels and culled novices from experts, regardless of education and experience.

Differences in the tacit knowledge subcategories on the survey were evident at different management levels. For example, the area relating to "influencing and controlling peers and outsiders" was significant at the upper levels of management and not significant at the middle and lower levels (1991, p. 69). Williams surmised that this result related to the lack of interface by middle and lower level managers with the public. Although school principals may be equivalent to middle managers, they consistently interface with the public. Thus, while the results of this study corroborate previous investigations of tacit knowledge among experts and novices, the work environment of technology firms may prohibit further generalizations to school administration based upon the results of this study.

This relationship between tacit knowledge and expertise as explored in non-educational studies may be useful in tracing parallels in the field of education. For example, the conclusions reached by Spaeth (1999) in his analysis of the tacit

knowledge of attorneys presage those found by Leithwood, Cousins, and Smith (1990,1995), to be discussed later in this paper. Spaeth noted that although the official guidelines of the legal profession offer no room for tacit knowledge, the "knowledge that is acquired implicitly" is critical to the success of experienced lawyers (1999, p. 21). Given a novel situation, such as the case of a client who impulsively offers harmful testimony, the "experienced counsel will be more resourceful in coping with, or exploiting, such an event" (p. 33).

In 1993, researchers from the U.S. Military Academy, the U.S. Army Research Institute, and Yale University joined together to develop a survey instrument aimed at assessing tacit knowledge among military platoon leaders (Hedlund, et al., 1999). By 1999, the survey had been designed and validated through administration to 368 platoon leaders and military experts. The focus of survey was to measure tacit knowledge in order to determine how to apply it to training programs for military platoon leaders. The researchers also wanted to learn how leaders are developed in the course of their military experiences. Prior to developing the instrument, researchers conducted a review of the military literature on "experienced-based, tacit knowledge of Army leaders" (p. 2). They also conducted interviews with 30 platoon leaders. The interview process was described as follows:

> During the interviews, we asked officers to 'tell a story' about a personal experience from which they learned something important about leadership at the platoon level. Interviewers and interviewees worked together to clarify and capture the important features of these experiences. (p. 2)

Story components were gauged as tacit if they adhered to the following principles: 1) knowledge must be gained only through personal experience; 2) knowledge must be "intimately related to action" (1999, p. 2); 3) knowledge could not be related to formal instruction; and 4) knowledge must be linked to "leadership rather than technical performance" (p. 2).

Elements were categorized into "if-then" constructs that will be further elaborated upon later in this manuscript. In addition, items were initially grouped within emerging "content-based categories" and later into more encompassing dimensions of leadership for platoon leaders. After the questionnaire was developed and administered, results showed that "platoon leaders who possessed greater tacit knowledge…were rated as more effective by their company commanders" (Hedlund, et al., 1999, p. 9). While this result was not replicated in peer ratings of leaders, tacit knowledge was found to be distinct from verbal ability and from managerial effectiveness. Consequently, the researchers suggest that the instrument be used only within training discussions rather than as an evaluation measurement or as a vehicle for arriving at personnel decisions.

One reason for the lack of concurrence among peer ratings as well as the lack of generalizability to other fields may lie with the military establishment itself. In a subsequent article, the limitations of the study were more extensively identified, as follows:

> The military is unique as a profession in that professional membership is tied to organizational membership…. given the unique features of military

> organizations (e.g., salience of rank/status differences), it is not clear to what degree some of the tacit knowledge that we obtained might apply to other types of professional organizations. (Horvath et al., 1999, p. 50)

The authors concluded by emphasizing that they could not recommend instructional programs aimed at imparting tacit knowledge. They emphasized that "knowing the items [on the survey] is not the same as knowing military leadership" (Hedlund, et al., 1999, p. 55). Instead, they recommended that developing activities that fostered "experiential learning" may be essential to developing future military leaders.

Later in this study, the research of Watkins and Marsick as well as Aryris will be reviewed more fully. At this point, it is important to note that that these researchers also dealt with the psychological aspects of tacit knowledge in ways that illuminated the relationship between experience and expertise. In addition to their work on organizational learning, Watkins and Marsick noted the following:

> ...people learn continuously from their experience....there is a high potential for error, in large part because people leave much of what they are thinking unconscious, implicit and unshared. They may not test their beliefs as they go along, yet they act on their unexamined assessment of the situation. Hence, they might not adequately frame or contextualize the problem, review their experience, invent a solution, or learn what they need to implement a solution. (1992, p. 298)

The above comments indicate that multiple exposure to incidents through experience may not result in expertise if problems were not correctly interpreted and understood by individuals at the outset.

In his recent work on organizational learning, Argyris noted his debt to the area of the learning theory approach of cognitive psychology. Using this theory as his starting point, Argyris proposed that the crux of behavior change, both for individuals as well as organizations, was the "reasoning processes" used within situations (1999, p. 67). Argyris felt that after years of socialization, many individuals created internal systems of response that resulted in "less than effective" outcomes (p. 82). He maintained that "tacit knowledge is the primary basis for effective management and the basis for its deterioration" (p. 54). His solution, Model II theory and practices, will be discussed later in this paper. It is important to note that in this model, years of experience may, in fact, result in negative outcomes if individuals do not accurately interpret problems. If this theory were applied to school principals, experience alone would become a questionable gauge with which to measure expertise.

Tacit Knowledge and Problem Solving Among School Leaders

Contextual knowledge in school administration may be viewed as either *cognitive* or *organizational* (Leithwood & Steinbach, 1995, p. 150). The cognitive context refers to "those factors, including those in the external environment, that administrators actually think about as they frame their problems" (p. 150). Organizational context applies to "the size of the organization" in which administrators work (p. 150). Leithwood and Steinbach suggest that contextual features may go

beyond the consideration of the number of people engaged in the specific problem solving. Other factors, such as the timing of exposure to the problem may have an effect upon how it is solved.

Leithwood, Cousins and Smith (1990,1995) investigated the types of problems experienced by principals in order to differentiate the quantity and type of routine problems faced by principals on a daily basis from those problems that were non-routine. After conducting nine interviews with 52 primary and secondary principals and assistant principals on a monthly basis, these researchers found that approximately one in five problems faced by principals were non-routine. This proportion was greater in the area of student problems, since many more were viewed as non-routine. The researchers concluded as follows:

> Principals do not see themselves simply applying a well-rehearsed repertoire of solutions over and over again to the same problems....Rather, adaptation of old solutions to new contexts and circumstances, as well as fresh thinking about largely novel problems, seem to better describe the demands faced by principals. (Leithwood, Cousins, & Smith, 1990,1995, pp. 28–29)

Instead of a fast-paced day composed of numerous brief meetings on routine issues, a greater proportion of the day of the school leader may be consumed in deliberating upon problems in different contexts that require novel approaches.

The nature of unstructured problems was further studied in a comparison of the problem solving processes between expert and novice principals (Leithwood and Stager, 1989,1995). The theoretical framework was the "psychological expression of

[the] ... constructivism" used by Schön (p. 38). Constructivism, which deals with creating meaning from experience, will be more fully defined later in this paper. According to Schön, tacit knowledge lies at the core of constructivism:

> When practitioners respond to the indeterminate zones of practice by holding a reflective conversation with the materials of their situations, they remake a part of their practice world and thereby reveal the usual tacit processes of worldmaking that underlie all their practice. (Schön, 1987, p. 6)

When Leithwood and Stager (1989, 1995) focused upon the "psychological expression of constructivism," they defined this area as "information processing theory" (Leithwood and Stager, p. 38). In this vein, the researchers hypothesized that the essence of effective school administration was the manner in which problems were addressed and solved. They maintained that problem solving, as opposed to the *technical action*, resided at the heart of school administration. The researchers used the term, *technical action* to subsume the decision-making models of school administration that they believed characterized the effective schools movement. Leithwood and Stager opined that models of *technical action* "reveal little or nothing about how actions were selected or created, and treat the administrator's mind as a "'black box'" (p. 38). The researchers suggested that while technical action theories accurately describe the actions of effective administrators when faced with well-structured problems, the problems faced by administrators daily may not be so easily catalogued, dissected, and ordered.

To explore their hypothesis, Leithwood and Stager (1989, 1995) compared the problem solving processes of twenty-two elementary school expert and novice principals. Of this group, six were identified as experts based upon the corroboration of central office staff. Two rounds of interviews were held with the participants. The first round involved a problem-sorting task and the second required principals to rank a series of problems based upon their perceived clarity. Participants were also requested to provide solutions to the problems.

The researchers found little differences between typical and expert principals in their identification of well-structured and poorly structured problems. There was also little difference between the typical and expert principals on solving well-structured problems. However, for poorly structured problems, there were substantial differences. First, the experts possessed faster pattern-recognition skills (1989, 1995, p. 65). Second, the experts possessed "greater sensitivity to the task demands and social contexts within which problems are to be solved" (p. 66). And, finally, the experts showed a greater ability to apply metacognitive control to problems (p. 65). Yukl defines metacognition as follows:

> ...[metacognition] is distinct from other conceptual skills (e.g., verbal reasoning, creative thinking) and from social skills. It involves 'learning how to learn,' which is the ability to introspectively analyze your own cognitive processes (e.g., the way you define and solve problems) and to find ways to improve them. It also involves 'self-awareness,'.... (2002, p. 198)

In fact, metacognition may be at the top of the knowledge hierarchy, since it has been described as "knowledge that controls the application of other forms of knowledge" (Bereiter and Scardamalia, 1993, p. 60).

The findings of Leithwood and Stager concurred with earlier research by Berliner (1986), who found that the metacognitive control evident in expert teachers included the self-monitoring skills of "planning and using time sensibly" (p. 11). Berliner's study is especially relevant for the insights offered regarding tacit knowledge during his comparison of novice teachers to their expert counterparts. In his study, Berliner delineated the role played by tacit knowledge in the skills demonstrated by experts. He stated that the "domain of knowledge...sometimes called practical knowledge...is often least valued in society" (p. 10). Berliner described tacit knowledge as follows:

> It is knowledge that influences classroom organization and management and is the basis for transforming subject matter. Such knowledge is complex, often tacit, derived from experience, and worthy of being called expert knowledge in most other fields of endeavor. (p. 10)

The conclusions of Berliner as applied to experts will be reviewed later in this paper. At this point, it is important to emphasize that while little research exists in the study of tacit knowledge as directly applied to school administration, discussions of tacit knowledge as practical knowledge surfaces in much of the research on problem solving by school administrators. For example, in the aforementioned study by Leithwood and Stager, the researchers frame their study within the work of Schön, who offered a

description of tacit knowledge as discussed earlier. Results of their study mirror some of the information already known regarding experts and tacit knowledge as will be reviewed later. In sum, tacit knowledge appears to figure in the problem solving of the expert principals investigated in this study.

As stated earlier, there is little research in education that investigates tacit knowledge displayed by school leaders. One recent study was initiated to explore the tacit knowledge of school superintendents (Nestor-Baker & Hoy, 2001). In this study, Nestor-Baker and Hoy examined the tacit knowledge of school superintendents by using a combination of sense-making and critical incident approaches within a qualitative research design (2001). As defined by Dervin (1983, 1997), sense-making is "behavior, both internal (i.e. cognitive) and external (i.e. procedural) which allows the individual to construct and design his/her movement through time-space" (p. 3). The critical incident definition and technique used in this study was originally devised by Flanagan (1954). The researchers define this technique as "a post hoc method used to identify factors involved in success or failure" (p. 7). This method will be described more fully later in this study.

The investigation by Nestor-Baker and Hoy also included a comparison of the tacit knowledge of reputationally successful superintendents to typical superintendents. Of the forty-four Ohio superintendents selected for interviews, twenty-two were designated as reputationally successful by a panel of administrative and consultative professionals with extensive experience and credentials in the area of education. Results were grouped into twelve clusters within twenty-one categories. Of these

clusters, after sustaining board relations, the primary emphasis was upon interpersonal relationships (2001, p. 10). The following comment by a superintendent may be indicative of this focus:

> When I decided to become a superintendent, I had no idea how much time I'd be spending with people outside the system...when it comes to being a superintendent, the term educational leader really doesn't have much to do with curriculum and books. (p. 10)

Among those items that related most strongly to reputationally successful superintendents were "positional authority (p. 15)," the "maintenance of a unified front (p. 16)," and "a concern for fairness towards employees (p. 17)." Typical superintendents were more concerned with group decision-making, working closely with the management team and those who reported to them, and behaving consistently.

Findings also showed that the success of superintendents was related to their amount of tacit knowledge. Nestor-Baker and Hoy described this phenomenon as follows:

> The reputationally successful—those who can be considered as expert performers-have larger amounts of if-then scenarios to draw on in navigating the superintendency, allowing them a seemingly intuitive orientation to the tasks at hand. (2001, p. 24)

In addition, the researchers noted that the identified tacit knowledge areas correlated with the components of the superintendentcy upon which these leaders were evaluated

by school boards. Thus, tacit knowledge areas were found to be related to overall performance indicators for superintendents.

One limitation of this study was that audiotaped interviews were the only means used to generate data. While research showed that tacit knowledge could be distinguished from verbal intelligence (Wagner and Sternberg, 1986, p. 76), researcher bias, in spite of the training received, could not be ruled out. In addition, as Nestor-Baker and Hoy noted, the administrative demonstrations of tacit knowledge might have been more related to image control than student academic performance. However, this study did illuminate the internal resources used by administrators as they sought to solve everyday problems with a practical knowledge base that was not included in their preparatory programs.

The training program conceived by Leithwood and Steinbach (1992) was an attempt to provide a solution to the lack of training available to school administrators in general problem solving skills. The researchers chose to focus upon cognitive aspects of problem solving, which included the following areas: "problem interpretation, goal setting, identifying constraints, and solutions processes" (p. 320). The researchers chose to place less emphasis upon domain related information; they informed the participants that "problem-relevant knowledge" would be shared with them as necessary during the study. The overall goal of the training was to assist administrators to find answers to "ill-structured problems for which there is relatively little available content knowledge and no readily available solution" (p. 321).

This description of the often ill-structured context for problem solving and decision-making by school administrators was supported by previous research (see Leithwood, Cousins, and Smith, 1990; Kerchner, 1993; & Cohen, March, & Olsen, 1972). In this study, the researchers hypothesized that strategic knowledge for problem solving could be taught by repetition, in much the same way that tennis or cycling skills were taught to aspiring sports enthusiasts (Leithwood & Steinbach, 1992, p. 5). Accordingly, the researchers suggested that ability might be increased by expert models, repeated opportunities, and a progression of challenging activities within a training program that offered group input and guidance. The key to the utility of the instructional program in this study was authenticity, which would facilitate the linkage of learning from the discrete behavioral repertoire to the underlying tacit level. Continuing in this vein, the researchers theorized as follows:

> This formerly tacit knowledge of one's colleagues may be easily as important a contribution to problem solving expertise as the research-based knowledge more typically the exclusive focus of formal instruction. (p. 324)

Leithwood and Steinbach (1992) differentiated the examination and transfer of automatic, skills-based, or "low road" (p. 293) transfer of knowledge involved in activities such as the above-mentioned sports from "high road" (p. 293) knowledge. High road knowledge was the concentrated, reflective, metacognitive expertise in which knowledge is applied to new situations.

The method used by the researchers was designed to improve problem solving processes, including metacognition, by providing problem-based instruction using a

group format (Leithwood & Steinbach, 1992). Sixteen administrators were identified as the control group; the experimental group consisted of twenty-two principals and vice-principals. The experimental group was provided with four days of instruction within a four month period. Participants completed written evaluations and case studies for holistic and specific content review. Results showed that the greatest gains in the experimental group, as compared to the control group, were in the areas of "interpretation of the problem, goals set for solving the problem, and ... understanding and planning for the handling of possible constraints" (1992, p. 330).

The researchers found that this emphasis upon the initial phase of problem solving, rather than the solution phase, was common to research results of experts in non-education fields. According to Leithwood and Steinbach (1992), "experts clarify goals and values, and these processes together greatly simplify the demands placed on solution processes" (p. 331). By using the group format, the researchers concurred with Lindblom and Cohen, that the participants were able to exchange "the typically tacit, ordinary knowledge" as the vehicle for demonstrating the strategic knowledge that is essential to solving problems on a daily basis (p. 332). Lindblom and Cohen (1979) defined 'ordinary knowledge' as follows:

> By 'ordinary knowledge,' we mean knowledge that does not owe its origin, testing, degree of verification, truth status, or currency to distinctive PSI [professional social inquiry] professional or thoughtful speculation and analysis. It is highly fallible, but we shall call it knowledge even if it is false. (p. 12)

Based upon the results of this study, Leithwood and Steinbach (1992) concluded that providing instruction in problem solving may be a faster and more reliable means of improving the problem solving skills of administrators than waiting for such expertise to accrue on the job.

Among the limitations of the study was the lack of information to elucidate whether problem solving strategies might have been more advanced among experts in the experimental group of school leaders. The researchers admit to this shortcoming as follows:

> Finally, it would be helpful to know, through subsequent research, whether the extent of improvement in administrative problem-solving capacities was influenced by either level of experience or level of expertise upon entry to a program. (1992, p. 333)

Since assistant principals appeared to learn more than veteran principals in this study, the researchers noted that more research might reveal a possible leveling off of learning among veteran principals.

Building upon the cognitive approach of Leithwood and Steinbach, Hart, Bredeson, Scott Marsh, and Paredes Scribner (1996) compared the problem solving errors made by expert school administrators with those committed by novices. These researchers were interested in discovering the significance of the temporal aspect of problem solving upon problem resolution. These researchers hypothesized that reaching a decision too quickly or too late may have an adverse effect upon problem solving. The expert group of participants consisted of seven male and three female

Ed.D. candidates with at least three years of school leadership experience. Of the three males and seven females in the novice group, eight individuals were assigned to principal internships, the ninth was in the first year of an assistant principal assignment, and the tenth was a first year principal. The ethnic make-up of the group was primarily Caucasian, representing seventeen out of the twenty participants.

Using an unstructured interview format, the researchers requested participants to describe and analyze one successful and one unsuccessful problem solving experience. This format was selected because the researchers noted that much of the previous research in problem solving was not conducted in authentic environments. They maintained that "hypothetical solutions to fictionalized problems do not allow for the leaders' own problem solving and thinking processes to emerge in the actual professional context" (Hart, et al., 1996, p. 5). During the interviews, the researchers noted that they used extensive probing to "elicit elaborations of incidents and fuller descriptions of the activities, people, and contexts that surrounded the problems and their resolution" (p. 8).

Data analysis included three activities: (1) transcript coding for mistakes in problem solving; (2) a review of each incident to "understand the implicit and explicit criteria respondents used to categorize problem solving events as successful or less successful"; and (3) a review, comparison of findings. The foregoing third step also involved a process in which the researchers reached agreement on any differences in findings noted in the first two steps. Findings showed that most of errors made by

novices included reaching decisions or "closure" too soon during the problem solving process (Hart, et al., 1996, p. 9).

While both novices and experts drew upon previous experiences, since the novices had less experience "integrated into their professional knowledge base," they often incorrectly identified the essence of presented problems (p. 9). In many cases, this was because the novices were forced to draw upon their teaching and support staff experiences since they possessed only limited administrative experience. Novices also were found to use "inappropriate scanning," meaning that they sought to find information that would not be useful in resolving the problem. (p. 11). The unsuccessful situations described by novices were laden with "emotional and personal feelings," which resulted in perceptions including powerlessness and "doubts about professional legitimacy" (pp. 13 – 15). Experts, on the other hand, were able to obtain greater "feedback from context" (p. 16). While they indicated strong feelings regarding outcomes, feelings were displayed in conjunction with the process used or the influences of others in the process. In addition, they were concerned with "goal achievement and effects on the organization or its clients....(p. 19).

The researchers concluded that the administrative experiences themselves provided the essential elements that distinguished experts from novices. The researchers note that experiences that "practitioners reflect upon" so that they can be later "integrated into a personal professional knowledge base" were essential for both administrative training and the ongoing professional development of administrators (Hart, et al., p. 16). Most importantly, the researchers differentiated this learning from

"the rational, highly linear descriptions of both expert educational leaders' problem-solving" and the problem-solving of novices...developed from fictionalized problem-solving exercises...." (p. 17). Instead, they described the process as one of "continuous adjustment and rectification of errors" throughout the problem solving process (p. 17). According to the researchers, the process was one in which outcomes were influenced by a combination of "contextual, human and organizational variables" (p. 18).

Explications of Expert and Novice Performance Across Fields

There was substantial research on the characteristics that distinguished experts from novices in areas such as board games, science, and computer programming (McClelland & Klemp, 1986, p. 54; Chi, Glaser, & Farr, 1988). While these areas allowed comparisons of individuals to expert groups, this type of assessment was more difficult, but perhaps not impossible, to apply to school principals (Wagner, 1986, p. 373). This difficulty existed because I knew from my own experience that not all experienced principals became experts. There was a difference in the ultimate abilities of principals that went beyond years on the job. As Wagner summed up the findings of Dixon and Bates in this area, he began to differentiate the experiences between individuals as follows:

> ...intellectual development beyond adolescence is not related to further development in basic cognitive processes. Rather, the primary form of development through adult life involves the acquisition of procedural and declarative knowledge associated with education, occupational life, and

> everyday life.....What is needed...[is an] understanding of the acquisition and use of expertise (1986, p. 376).

Wager's emphasis in the foregoing statement was upon the "acquisition of tacit knowledge" as applied to decision-making in the working world (p. 376). Most importantly, Wagner also pointed out the need for further research to determine whether the time span required for the development of tacit knowledge can be modified. If research eventually shows that this process can be hastened, would adding tacit knowledge development to training programs result in more highly qualified principals? The above statements were echoed later by Leithwood and Steinbach (1995) when they concluded their review of research related to the study of expertise among educational administrators:

> Current interests in cognitive perspectives, for the purposes of reforming instructional practice, tend to give short shrift to the value of prepositional knowledge. This is an error. There is a great deal of prepositional knowledge underlying and informing expert problem solving in educational administration. (pp. 314 – 315)

This area of study should be differentiated from previous work in the area of *typical* and *effective* school administrators (Leithwood & Stager, 1989, 1995, p. 38). Much of the research in the area of typical and effective administrators was aimed at showing best practices, but did not offer any insight as to how problems were addressed by school administrators.

As a result of their study in the area of expert problem solving, Leithwood and Steinbach (1995) offered several defining qualities that differentiated expert administrators from novices in school environments (p. 311). Experts choose to study problems that offer major implications for their organizations as a whole. Also, when engaged in problem solving, their objectives tend to be more *inclusive*, suggesting that they approach the problem differently from novices. Their approach appears to reflect their *vision* as applied not only their defined area of responsibility, but to the entire organization, "the community, and larger social contexts" (p. 312). Because they are imbued with a more expansive vision and drive, they are more likely to gain the support of their followers. Expert administrators were guided by their *values*, even in those cases in which they held no significant *domain knowledge*. However, the degree to which decisions are guided by values may be somewhat uncertain, because the very nature of muddy problems may lead to situations in which "value choices and trade-offs" are necessary.

Expert school leaders also perceive roadblocks to problem solving differently (Leithwood and Steinbach, 1995, p. 312). They expect that there will be obstacles to their strategies and confront them without responding as if such problems were '*crises*' (p. 312). This response to problems was evident in a study of eight superintendents with varying ranges of experience selected from school districts with a minimum of 10,000 students in Canada (Leithwood and Steinbach, 1991, 1995). All superintendents were interviewed twice, with time segments extending to 45 minutes. During the first session, superintendents were asked to engage in a problem solving activity. They were

then requested to reflect upon the process they used to select the problem and solve it. In the second interview, principals were presented with six problems, and were asked to rank them in terms of the structure of the problems and choose solutions from those presented to them. Then superintendents were asked to compare the problems with those they encountered in their own practice. Coding was completed and confirmed by the independent analysis of a sample of results.

Results showed that superintendents consistently chose the same problems as the most complex and murky. When analyzing the approach of superintendents to restrictions, the researchers found that there were differences between the way that principals compared to the superintendents in this study. However, experts in both groups viewed constraints as "subproblems to be solved, not insurmountable hurdles" (Leithwood and Steinbach, 1991, 1995, p. 85). Both groups of experts were able to sort the obstacles and determine which of those impediments could be modified or overcome in order to reach a solution. Experts engage in 'if-then' thinking to create a mental map that includes a path of alternative modes of action. (Leithwood and Steinbach, 1995, p. 313). As they engage in this process, they often involve others, realizing that one individual may not hold all the answers to problems that go beyond the cognitive domain.

Using a simulation model, Lawrence (1988) also compared the 'if-then' thinking of novice and expert judges. This technique included the review and selection of three case files completed within the six months prior to the study. The cases were then presented to two experienced magistrates and one novice magistrate. Participants were

requested to describe, using the "thinking out loud" method, how they would resolve the cases and impose sentences upon the offenders (p. 235). Data analysis was completed by analyzing audiotapes of the responses. Results showed that the experts used an individualized approach and focused upon rehabilitative goals; whereas, the novice used a less flexible and bureaucratic approach, as evinced by the focus on deterrence through financial penalties. For the most part, the experts were more proficient in observing more details and "pulling leads out of the files" than novices (p. 257).

Based upon these findings, Lawrence developed a schema to represent problem solving similar to that described above by Leithwood and Steinbach. However, Lawrence proposed that the 'if-then' thinking patterns between novices and experts were different (1988, p. 248). In the "if" phase, experts showed a larger frame of reference than the novice, who focused upon isolated details. Experts were more interested in the cause of the behaviors, since their focus was upon treatment.

Lawrence then applied this method to the review and disposition of two cases. Results confirmed the model as presented and added additional components that Lawrence maintains describe the problem solving process of expert judges. First, experts are aware of the range of external constraints that apply to the process involved in solving problems. These contingencies present limitations that affect the possible choices available for the solution. Once the limitations are recognized and all the supporting information is obtained, the expert judge makes inferences and then arrives at a final judgment and sentence. As noted by a subject in this research, "'the facts are

only as good as the people who give them'" (1988, p. 234). Thus, the inferences made by the judge after hearing the facts are critical to the judgment. Compounding the deliberation process are the environmental factors (p. 234). Environmental factors include larger contextual influences, such as the effect of heavy caseloads. A subset of environmental factors is the overriding guidelines, which might include case law.

Throughout this schema, the parallels to the complexities of problem solving and tacit knowledge within the field of educational administration are ubiquitous. For example, using a recent actual example involving an administrator accused of assaulting a student, the administrator responsible for an internal investigation would first need to understand the frames of reference for the case. This would include the typical penalties for such a transgression as well as the range of alternative consequences. Following this, the administrator would need to review the larger contextual parameters: the criminal findings available from the police department and the office of the attorney general as well as the ramifications of the imposed consequences upon both the offender and the larger school community. As the internal investigation proceeds, the number and types of witnesses available may prove to be a human limitation. During the process of gathering information, making assessments, and formulating recommendations, the tacit knowledge of experts may be evident throughout the consideration of the case, as described in the process outlined by Lawrence. Experts may have better "ideas about what to look for, and ways to follow up leads in the data" (Lawrence, 1988, p. 256-257). Glaser and Chi (1988) sum up the additional differences as follows:

> Although novices knew and responded to ritualized evidence-gathering procedures, they seemed to work with single details, as compared with the more patterned approach of experts. These patterns enabled experts to reduce their work loads. (p. xxv)

Voss and Post (1988) offered several observations on the differences between novices and experts as they sought to solve ill-structured problems. In addition to the findings discussed above, Voss and Post noted that the difference between clear and murky problems may be "a matter of degree" (as cited in Chi, 1988, p. 283). It may also be difficult to design such problems, when, at the outset, a specific problem may appear to be more structured to the expert than to the novice. In addition, it is essential that we consider the effect of the "community of solvers" upon those who seek to solve a given problem. This consideration looms large for administrators, since they must consider the ramifications of their solutions upon students, parents, teachers, other administrators, and even the local community.

As a result of their examination of the research on expertise, Ohde and Murphy (1993) proposed that three differences exist among novices and experts that are significant for school administrators (p. 76). First, experienced principals have much greater domain and tacit knowledge (p. 77). Domain knowledge is evident in the results of the simulation activity conducted by Frederiksen, Hemphill, & Griffiths (Sternberg, R. J. & Wagner, 1986, p. 84). The simulation was composed of films and in-basket activities that were completed by 232 elementary school principals. The in-basket problems were prepared to simulate the typical tasks encountered by principals

during the course of a year. At the conclusion of the simulation, cognitive ability tests, personality tests, and a biographical survey were administered. Results showed that a "knowledge of elementary education and school supervision apparently provided the content needed for activities involving communication" (p. 103). This corresponds to the prerequisite domain knowledge discussed earlier.

However, other factors that reflect tacit knowledge were also identified. Once such factor was "discussing before acting" (Ohde and Murphy, 1993, p.104). While the parameters of the study did not allow for further examination of this factor, it has been identified by other researchers as pivotal in the examination of the influence of values upon problem solving (Raun & Leithwood, 1993). This conclusion is also supported in the work of Leithwood and Steinbach, who found that multiple opportunities to engage in real life situations increases both the domain-specific knowledge as well as the strategic knowledge of experience of school leaders (1992, 1995 p. 292).

The second area in which experts diverged from novices, according to Ohde and Murphy, was in "the patterns of their thinking" (1993, p. 76). Berliner notes that since experts have a larger knowledge base, they tend to remember information that is more practical than domain specific (1986, p. 11). They also "perceive facts and events differently" and use different mechanisms for remembering. They use "higher order systems of categorization" as they approached problems (p. 11). For example, when expert teachers were asked to outline a program for specific students based upon written descriptions, the responses of the experts differed in major ways from novices. In the case presented of a child who was gifted and disabled with a special interest in

technology, the novices responded in general terms to the effect that the student should be encouraged in the area of interest. In comparison, an expert responded that the student's "needs can be broken into three broad areas: academic enrichment, emotional adjustment, and training to cope with his handicap" (p. 11).

The third area that distinguishes expert school administrators from novices, as identified by Ohde and Murphy, is performance. In the foregoing example, the expert was able to arrive at the solution rapidly because patterns had developed that led to an automatic recall and synthesis of information (Ohde and Murphy, 1993, p. 80). Yet, when faced with complex problems, experts take longer time at the onset to study the problem and formulate a plan a for resolution (Berliner, 1986, p. 11). Experts use domain knowledge as underlying structure and increase their efficiency through repetition and practice. When experts approach problems, they tend to automatically view the core of the issue, while novices examine only the surface of it. Novices employ "literal interpretations" of scenarios, while experts "make inferences" to analyze problems (Berliner, 1986, p. 16). Experts consider the context of the problem and the underlying substance of it (Ohde and Murphy, 1993, p. 80).

Two studies reported by Bereiter and Scardamalia (1993) found similar connections between thinking processes and performance. In one study, one expert pianist, one advanced pianist, and one novice were provided with a non-Western musical score for percussion instruments and asked to render it on the piano (pp. 154–157). All participants were requested to articulate their thoughts as they solved the problem. Results showed that the expert and the advanced pianists both spent extensive

time beforehand deciding upon their strategy. Both reinterpreted the score and found a method of rendering it for the piano that still retained the essence of the piece. In contrast, the novice thought that the piece resembled a European period style already known to him and he played the piece to resemble others from the era. The latter work was judged as derivative and inferior.

The second involved a comparison of advanced medical students with novice students when presented with the five percent of medical cases that escape ready diagnosis (Bereiter & Scardamalia, 1993, p. 158). The advanced or expert-like students engaged in the development of theories about the problems presented. This was their attempt to account for all the symptoms exhibited by the patients. The novices attempted to fit the symptoms into configurations that they had studied, even when their repertoires were relatively small.

Even though both studies were from different fields, the similarity between the mental processes of the experts and novices are unmistakable. Moreover, these consistencies appear in the conclusions of the researchers cited earlier in this paper. In addition, according to Bereiter and Scardamalia, "the experts seemed to learn more from the experience" (p. 159). This continuous learning, coined as progressive problem solving, will be discussed later. At this point, it seems essential to note that one hallmark of expertise across fields is the ability to bring past experiences and knowledge together to find optimal solutions to real life problems that are seldom identical.

Frederiksen described this process as *hypotheses formulation* (1986, p. 88). Hypotheses formulation means finding possible explanations when presented with data. In the example provided by Frederiksen, the subject would examine data tables of lags in employee work schedules and offer reasons for the lags. The explanations would then be analyzed in order to determine the analytical process used by the subject. Forward thinking occurs when a theory is constructed from "actual information in the problem statement". On the other hand, as noted by Larkin, McDermott, Simon, and Simon, experts work in a *forward* fashion and novices work *backwards* (as cited in Ohde and Murphy, 1993, p. 83). Backward thinking occurs when novices are presented with a problem and attempt to fit the various aspects of the problem into their preconceived theory to explain it (Ohde and Murphy, 1993, p. 83).

Contextual Effects

However, other research disputes the method used by Frederiksen on the basis that oftentimes laboratory settings are too controlled, docile, and simple (Prestine, 1993, p. 200). According to this view, the context in which the problem occurs is crucial to an understanding of the problem solving procedures of experts. Successful school administrators need to combine "procedural, how-to knowledge" with "the ability to critically access and flexibly reconstruct and use prior knowledge in novel, context-specific, and action-oriented (ill-defined) problem situations" (p. 201). According to Prestine, the best vehicle for training school administrators in this technique is not through formal, instructional coursework, but through case-based training (p. 203). The advantage of this type of instruction is that it may be modeled by "articulating and

externalizing internal tacit knowledge structures through use of the guide" (p. 203). This allows the instructor to work within the zone of proximal development of students, so that students can make progress within their own ability levels and under the tutelage of the instructor (p. 203). Another model for melding the procedural and the action-oriented is through apprenticeship programs. Apprenticeship programs can offer a developmental process involving "modeling, coaching, scaffolding, articulation, reflection, and exploration" within a system-wide approach that considers the social arena in which the administrator will be working (p. 209).

Yet another means of training employees in the use of tacit knowledge stems from artificial intelligence methods, in which computer programs are used to transform implicit knowledge to explicit formats (Shearmur, 2000, p. 38). The rationale is that similar problems do not need to be solved again if solutions are in a computerized database. While this process opens new disputes about knowledge management and control for organizations, it may offer an alternative and more encompassing approach to administrative training for solving ill-defined problems. For example, the 1998 text by Snowden and Gorton of case studies and simulations for school administrators might be expanded upon by the development of a database that includes possible solutions for the scenarios presented. Further research may be necessary in order to determine whether the loss of spontaneity and lack of time constraints will diminish the effectiveness of such training.

Making Tacit Knowledge Explicit Within Organizations

Organizational behavior, as it applies to tacit knowledge within the area of education, may have been most thoroughly analyzed by Argyris, who theorized that tacit knowledge is both the crux of superior management and its weakest link (1974, p. 123). Argyris and Schön described tacit knowledge as follows:

> Tacit knowledge is what we display when we recognize one face from thousands without being able to say how we do so, when we demonstrate a skill for which we cannot state an explicit program, or when we experience the intimation of a discovery we cannot put into words. (1974, p. 10)

According to Argyris and Schön, the aim of management is to create routines of sound performance on the part of the employees. The more efficient the managers become, the more likely that their actions will be completed automatically. For these researchers, "skillful actions are automatic and taken for granted" (1974, p. 125). The weakness of automaticity is that reflection upon actions is often minimal. Argyris and Schön describe this as Model I, or "theories in use" (p. 126). In Model I, the *governing values* were conceived as follows:

1. Achieve your intended purpose
2. Maximize winning and minimize losing
3. Suppress negative feelings.
4. Behave according to what you consider rational. (pp. 126–27)

When engaged in confrontational situations, individuals who act according to Model I will exhibit an attitude of well-fortified confrontation. They "keep their premises and

inferences tacit, lest they lose control" (p. 127). A lack of trust dominates the situation and prevents both learning and change. Managers who engage in this type of behavior typically find that they cannot win the support of their staff. Yet, because the behavior is automatic, managers may be ignorant of their *skilled incompetence* (p. 128). The defensiveness colors the outlook of the staff as well as the manager, since both become obsessed with "being in control, winning, and suppressing negative feelings" (p. 128).

In contrast to Model I, Model II values were described as "valid information, informed choice, and vigilant monitoring" (Argyris and Schön, 1974, p. 131). The actions of *advocate*, *evaluate*, and *attribute* continue from those developed in Model I. However, individual actions stimulate analysis through the use of *productive reasoning*. Productive reasoning allows individuals to reflect upon their behaviors and change them as necessary. Model II learning is *double loop learning* (p. 132). Double loop learning may be defined as "reexamining the underlying program" (Argyris, 1982, p. xii). In addition, double loop learning includes "the help of others and a particular facilitative organizational milieu" (p. 183). The key, then, to facilitating productive action is engaging in reflection. One method to train leaders in Model II learning is through the use of the case technique. In this technique, leaders "examine inconsistencies and gaps" in their reasoning by writing and reviewing case studies. This process allows them to become aware of their own defensive, controlling behavior. The outcome is that the activity "produces data about the respondents' causal theories, especially those that are tacit because they are taken for granted" (Argyris and Schön, 1974, p. 133).

Marsick and Watkins (1990) based much of their incidental learning theory

upon the work of Argyris and Schön. These researchers defined incidental learning as "the tacit learning that is embedded in our actions" (p. 128). They included incidental learning within the "informal learning from experience and learning from problem solving" (p. 223). They defined informal learning as learning that is "experienced-based, non-routine, and often tacit" (p. 15). This point, central to the expansion of the Argyris and Schön model, was explicated by Marsick and Watkins as follows:

> ...both informal and incidental learning often take place under non-routine conditions, that is, when the procedures and responses that people normally use fail. In such cases, people may become aware of many tacit, hidden, taken-for-granted assumptions. In the process of doing this, people often reframe the problem they are experiencing, that is, they realize that a particular situation can be defined and solved in many different ways (1990, p. 6).

Marsick and Watkins contrast this type of learning with formal educational models, which they believe is exemplified by the work of theorists such as Kolb. Formal educational models are practices in which learning is governed through the "design and control of trainers" (p. 35). Marsick and Watkins hold that while informal learning can be planned, incidental learning is "a byproduct of some other activity" and is "unintentional" (pp. 6 – 7).

After examining various case studies, these researchers first summarized the Argyris and Schön model and then proposed an extension of this model to include their focus upon incidental learning. For Marsick and Watkins, the Argyris and Schön model appeared as follows:

> ...problem solving is a cycle that moves from diagnosis of the problem to the invention of a strategy for solving it, to producing that strategy, to drawing evaluations and generalizations from the consequences of what was produced. Errors occur because there is often an interruption between the invention and the production stage. Individuals can invent strategies that they cannot produce either because they do not have the necessary skills or because assumptions and defensive routines...lead them to produce behavior that is different from that which they intended. (Marsick & Watkins, 1990, p. 223)

In the revised conception of the Argyris and Schön model as outlined by Watkins, "incidental learning... is subsumed in the problem-solving process" (p. 223). Individuals first diagnose the problem, then move to *problem framing* (p. 223). This is followed by the development of a strategy in which answers are considered "through the lens of context (p. 223)." Contextual application creates opportunities for "experimentation or learning from mistakes," which the Watkins identifies as *incidental learning*. Subsequently, a "strategy is implemented" and both intended and unintended consequences arise. These consequences figure into the "evaluation and generalization" of the strategy. Watkins emphasizes that errors made at the point of initial problem identification are those that are most likely to hinder any problem resolution.

For Marsick and Watkins, the key to effective problem solving was to make tacit knowledge explicit. In the course of several chapters of this work, they presented and contrasted four different methods used to make tacit knowledge explicit: the Action Learning Method used by executives in Sweden; the paraprofessional model used in

Nepal; the Phillippines Rural Reconstruction Movement; and the professional trainers case studies. However, as these researchers noted, action theory was used in the design and implementation of all of these projects. As described by Marsick & Watkins, action theory stems from action research, which originates from the *scientific method* (1990, p. 17). Typically, this methodology includes the use of an outside consultant, and represents a process in which "a group of people jointly identify a problem, experiment with a solution, monitor results, reflect on the process, and use the resultant information to reformulate the problem...." (p. 17). It seemed that while this method had yielded useful findings for the foregoing groups of educators, it appeared to be less applicable to the study at hand, which was focused upon examining how principals solved problems in situations that allowed little time for formal reflection.

Although mentoring models were not the subject of the current study, it should be mentioned that mentoring had been proposed as an alternative to formal training methods (Dix, 1990). Dix noted that the work of Wagner and Sternberg (1985) resulted in the conclusion that "mentoring is really the sharing of tacit knowledge about how to master the vocational development tasks of the career establishment stage" (1990, p. 6). However, Dix concluded that mentoring models were often unsuccessful for women and minorities. With Levinson (1978), Dix noted that many experts did not have the prerequisite "approachable, open, supportive, and helpful" skills (1990, p. 6). And, Dix continued, Burke (1984) found that not only did females "have more difficulty developing relationships with mentors," but those relationships could be "more complex and riskier than the relationships for men" (as cited in Dix, 1990, p. 6).

Dix (1990) investigated the tacit knowledge of 50 male "career experts" across a range of fields through the use of a structured interview format. Career experts were defined as "individuals who have successfully negotiated the systems in which they are currently working" (p. 8). Those interviewed ranged from physicians and attorneys to custodians. The average age of the participants was 37, with a median age of 38.5. Through statistical analysis, results were organized within the following six categories identified by the Career Adjustment and Development Inventory: "organizational adaptability, position performance, work habits and attitudes, co-worker relationships, advancement, and career choice and plans" (pp. 12 – 14).

The findings of Dix were in agreement with those previously reached by Williams (1991) and Wagner and Sternberg (19865). Dix concluded that the investigation of the tacit knowledge of these career experts led to a confirmation of previous studies that found that "high internal standards," expressed as the ability to "manage self" along with the ability to "manage others, manage task, and manage career," were essential components of job success (p. 18). Similarly, Wagner (1993) theorized that the structure of tacit knowledge, as it applies to management, is a mix of specific *content*, *context*, and *orientation* knowledge (pp. 96 – 97). Content knowledge is concerned with managing self, others, and activities. Contextual knowledge may be local or far-reaching, depending upon how it is related to the immediate issue or activity. Wagner maintained that although tacit knowledge can be either pragmatic or idealistic in formulation, in most situations the two orientations are exercised in combination.

Perhaps most important for this study, however, is the lack of consistency in the recommendations offered by Dix. While admitting that "formal education has limitations," Dix maintained that individuals would benefit from trainings in which the identified list of coping skills were used by "well-qualified instructors" in "voluntary" trainings" (p. 18). In view of previous research, it appeared that these recommendations would have minimal effect upon enhancing professional leadership expertise by making tacit knowledge explicit. As noted earlier, formal learning environments were shown to have minimal success in transmitting the tacit knowledge involved in expertise to adults. Another limitation in the usefulness of this study was that participants were drawn across a wide range of fields. The tacit knowledge used by employees for sustaining employment might be quite different from that required by principals in school leadership.

Eraut (2000) made this point in his analysis of the earlier theoretical work of Argyris and Schön, which he described as a "classic distinction between espoused theories and theories in use" (p. 20). Eraut opined that a shortcoming of the single and double loop learning dichotomy, as theorized by Argyris and Schön, was that it may apply more to situations described by Jackson as "cool" rather than the action-laden, or "hot" situations encountered daily by school principals (as cited in Eraut, 1994, p. 66). While this shortcoming seemed to be most applicable to the deliberative activity of double loop learning, Model I theory was not without its advantages, according to Argyris and Schön. The researchers opined that tacit knowledge was based upon actions that are controlled by *theories-in-use*, which included "assumptions about self,

others, the situation, and the connections among action, consequence, and situation" (1974, p. 7). According to Eraut, one could not learn a theory-in-use and expect that one will learn a skill: It was impossible to simply replace tacit knowledge with explicit knowledge. However, it was essential to learn ways to state theories-in-use after the skill was demonstrated. This was found to be especially important both to correct errors as well as to instruct others in the skill (pp. 14 – 15).

Eraut (1994) noted that the field of education may be more prone to the contradiction between *espoused theories* and theories in use than other fields because educational leaders are schooled and assessed in unrealistic conceptions of the practice that often do not reflect the reality of schools. Eraut described this concept as a "replicative mode of knowledge" within an *epistemological context* common to most of K – 12 educational systems and much of higher education as well (p. 48). The *replicative model* operates under the assumption that the knowledge learned mirrors the knowledge used by professionals. This may result in the following scenario:

> …espoused theories provide professionals with a 'professional conscience' which urges them to judge their work according to a form of idealized practice which is unachievable. Over time this leads either to skepticism or to frustration and burnout or they become professional educators and perpetuate the cycle. (Eraut, as cited in Coffield, ed., 2000, p. 20)

If, as Eraut maintained, "knowledge is shaped by the context(s) (sic) in which it is acquired and used," the contradiction between explicit knowledge, or that information learned by principals about leading schools, and implicit, or intuitive knowledge, shed

light on the conflicted feelings of principals during rapid decision-making. Spender (1996) described this as the result of the overlay of social, or "collective knowledge" (p. 73). Such occasions prompt an experiential learning that occurs in the presence of others on busy school campuses. In this way, rather than examining knowledge as accumulated by individuals over time, it appeared to be more accurate to think of the explicit and implicit knowledge accrued by individuals as the accretion of *public* knowledge (p. 27). While this did not negate the above described dissonance between espoused and implicit theories, it underscored the need for further analysis of the school leader's activities within the site of specific school experience.

The "pluralistic epistemology" proposed by Spender (1996) served to explicate this thesis more fully. When describing knowledge within organizations, Spender drew from the work of Vygotsky (1962) and Reber (1993) to reconcile theories of positivistic epistemologies with "interpretative," ways of knowing (p. 63). Spender disputed Simon's view, as described earlier in this paper, by maintaining that intuition was not "explicit individual reasoning internalized" (1996, p. 70). Instead, Spender defined tacit knowledge as "that which has not yet been abstracted from practice," leaving open, as he maintained, the pathway between positivistic and implicit ways of knowing (p. 67). With Reber (1993) Spender asserted that "there were qualitative differences between pre-conscious and post-conscious reasoning," and that the "flow between them involved two different modes of knowing" (p. 70). Following the philosophical phenomenology of Husserl, implicit knowledge among individuals, then, was "preconscious reasoning,"

as opposed to explicit knowledge, which reflected consciousness. Phenomenology will be defined and discussed in the methodology section of this paper.

This theory may be contrasted with the earlier description of tacit knowledge by Sternberg and Wagner as relational rather automatic. Even though Spender proposed a dialectical relationship among individual, social, implicit and explicit knowledge, he refrained from including a conscious element of tacit knowledge. For example, he stated, "clearly, the boundary between conscious and automatic memory is imprecise" (p.71). Yet, the usefulness of his theory may lie in its debt to Durkheim (1938). Following Durkheim's theory of the "conscious collective," Spender joined with those social researchers who posited that "the social implicit element of the individual's knowledge processes is typically called collective" (p. 71). He reconciled the relational and automatic descriptions of tacit knowledge as follows:

> ...learning at the collective level is the outcome of the interplay between the conscious and automatic types of knowledge, and between the individual and collective types of knowledge as they interact through the social processes of the collective....(p. 71)

As Spender pointed out, not all organizations exhibited, valued, or produced the same types of knowledge. The collective knowledge and influence of the school organization might be quite different from that evinced by Exxon Corporation, for example, due to the differences in activities and the values of each organization. As Spender noted, "there is a relationship between researching meaning and participating

in activity because meaning is implicit knowledge and is embedded in and communicated through activity" (p. 72).

Leadership and Flow

In their examination of individual expertise, Bereiter and Scardamalia (1993) offered a useful analysis that extended the thesis of Argyris as well as the problem solving analysis of Leithwood as discussed earlier. Bereiter and Scardamalia maintained that with *experience*, people acquired "a repertoire of learned patterns and procedures" (p. 111). However, this did not mean that all individuals "get into ruts" (p. 111). Experts were those who did not succumb to automatic responses: they succeeded because they were able to employ *progressive problem solving* (p. 112). Progressive problem solving means that previous patterns of thought are used as "building blocks for increasingly sophisticated analyses and strategies" (p. 111). The key to this technique lies in ensuring that the *progressive challenge* (p. 103) of an activity remains concurrent with increases in individual ability.

Bereiter and Scardamalia likened this experience to that coined as operating "in flow" (Csikszentmihalyi & Csikszentmihalyi, eds. 1988, p. 29). The progressive challenges intrinsic to the "in flow" experience have been described as follows:

> The complexity of a flow activity depends on the gradient of challenges it can provide, and consequently on the difficulty of the skills it requires.....Surgeons who repeatedly perform the same operations, such as appendectomies, quickly become bored with their work. Academic surgeons who do state-of-the-art

> operations report experiencing flow as intense as any artist or sportsman. (p. 31).

If, as noted by Bereiter and Scardamalia (1993), the challenge of increasingly difficult problems leads to expertise and flow, did principals experience this "in flow" quality when engaged with challenging, novel problems? In any event, Csikszentmihalyi & Csikszentmihalyi (1998) contended that this experience was difficult to "identify and discuss" even when found (p. 51). Csikszentmihalyi & Csikszentmihalyi noted that this may been because "most people are not used to putting the contents of their consciousness into words" (p. 71).

Danzig (1999), studied this area, theorizing that transforming experience into words through the use of narratives was a means of unraveling the tacit knowledge within the explicit practice of school administrators. Danzig gathered the stories of 14 graduate students who held positions ranging from school principals to business and community leaders. The study consisted of two audio taped interviews for each participant, resulting in 14 written *leadership stories*, each approximately 2000 – 3000 words in length. Upon reviewing the stories, the other students were encouraged to write reactions and analyses that were later included among the concepts and themes explored. Following the theories of Schön and others, Danzig maintained that "stories connect the explicit, formal, symbolic presentations of knowledge and the practical know-how found in action" (p. 118). From his findings, Danzig grouped a number of key leadership concepts into the following seven areas: "inclusionary leadership,

leadership as coaching, situational leadership, visionary leadership, participatory leadership, servant leadership, and moral leadership" (p. 121).

For Danzig, stories enabled would-be leaders "to hear the inner thinking and dialogue" of leaders (1999, p. 118). Stories allowed "students to consider multiple perspectives," and to understand the values that under gird the specific actions of experienced leaders. Although this was a viable means of teaching leadership skills as demonstrated by experienced practitioners, the actual tacit knowledge displayed in the stories might have been limited by the study design. The stories, once told and transcribed, were allowed to be edited prior to final analysis. It was possible, then, that some of the stories might have been modified to resemble best practices rather than the unarticulated knowledge gleaned from experience.

If accurate, such renditions of inward thinking would correspond to the ineffable, secreted components of expertise (Bereiter & Scardamalia, 1993, pp. 46 – 47). Bereiter & Scardamalia identified three types of tacit knowledge that reside in expertise: *informal*, *impressionistic*, and *self-regulatory* (p. 47). Informal knowledge was acquired through lived experience rather than formal courses of study. This was exemplified in the foregoing study by Danzig (1999), which was directed at enabling "students to consider and inspect the informal systems that exist side-by-side with the formal systems operating in schools and other organizations" (p. 130). Informal knowledge might also allow a principal to determine which student backpacks were too heavy for third graders by observation rather than actually weighing the packs. Impressionistic knowledge was derived from impressions formulated in either the recent

or distant past. This type of knowledge might allow the principal to intuit contraband in a backpack prior to inspection. Self-regulatory knowledge enabled individuals to "manage themselves so as to attain their goals" (p. 48). Detecting a suspicious backpack while walking across a busy campus would require self-regulatory knowledge.

Summary

In summary, research showed that tacit knowledge had been an understudied but essential component of the problem solving of educational leaders on a daily basis. Insufficient research existed for conclusions as to whether tacit knowledge could be taught to educational leaders. However, experience with problem solving instruction indicates that this was the case. One training program on problem solving for educational leaders indicated that high road knowledge, including metacognition, must be emphasized. However, it was not known whether improvement was related to expertise. As noted earlier, experience alone did not guarantee expert leadership.

Expert leaders across fields appeared to engage in greater "if/then" thinking and progressive problem solving. Experts often spent more time on initial problem analysis and did not perceive individual problems as crises. Expert school principals engaged in discussion before acting, which may have predisposed them towards reflective problem solving in authentic situations. Experts appeared to display a more comprehensive analysis and focus upon contextual and situational features of problems than did novices. In the studies reviewed, most problems encountered by school leaders were not duplicative of previous problems; instead, most problems had features that required a

thoughtful, reflective approach that resulted in the incorporation of similar patterns and features found in previous solutions used to resolve a novel problem.

Questions that remain unanswered include an understanding of how tacit knowledge is used by expert principals when confronting a myriad of problems in the course of the day. Was there a ceiling effect of tacit knowledge, as questioned by a researcher? At what point did a less experienced principal acquire sufficient informal, impressionistic, and self-regulatory tacit knowledge to operate in the flow? How did tacit knowledge appear in the essential dimensions of leadership that are necessary to guide staff through the process of school improvement and change?

CHAPTER 3

METHODOLOGY

The Qualitative Perspective

As apparent in many of the foregoing studies, while tacit knowledge was used to solve murky problems confronted by school administrators, it had been difficult to adequately study for useful replication in training programs for school leaders. Yet, the lack of thorough investigation in this area seemed surprising because tacit knowledge had been identified as critical to the worldwide hegemony of our institutions (Augier & Vendelo, 1999). As evident in the foregoing research both within the educational field and external to it, the successful articulation of tacit knowledge for leadership development was an expanding area of interest. The permutations of the acquisition and use of tacit knowledge appeared to be best investigated not with a single methodology, but with the added perspective of multiple methods. Byrne-Armstrong, Higgs, and Horsfall express this viewpoint as follows:

> Methods and methodology are not always singular, *a priori*, fixed and unchanging.....Methodology and method often emerge, shifting and changing as knowledge is produced. Methodology may be like a patchwork quilt, created and stitched up during the research. (2001, p. 5)

Consequently, it seemed that a clear view of how principals attach meaning to experience must rely on a combination of analytical lenses and methodologies, ranging from the ontological insights of phenomenology, to the epistemological understandings yielded through the social constructivism of Vygotsky, to be discussed below.

It also seemed important to consider the work of social theorists as relevant to this study due to the previously noted collective nature of knowledge expressed by Durkheim (1938), Spender (1996), and Vygotsky (1962). While it was recognized that the school environment remained an influence upon the school leaders, this study focused upon an examination of how tacit knowledge was used by individual expert and novice principals. It was anticipated that the outcome of this study would allow for conclusions about the use of tacit knowledge that could, to some extent, be useful towards generating further research would might later encompass the school environment as a whole.

Given the previously noted obstacles in studying how tacit knowledge was expressed, it seemed difficult to analyze this quality through quantitative methods. Spender contrasted quantitative and qualitative methods in this regard as follows:

> While positivism treats actors as objects whose behaviours (sic) can be observed by outsiders searching for general laws, interpretive methods focus on the subjective meanings attached to these behaviours. Researching the latter cannot mean collecting individuals' answers to explicit questions about these behaviours since the meaning of both the questions and the answers must remain as problematic as the meaning of the actions. (1995, p. 72)

As pointed out in the above discussion of methodologies, the most important reason for this qualitative approach resided in the substance of this investigation. The format required an interpretative approach, since focus was upon "the ways in which we attach meaning to our experience" (p. 72).

The interview process employed an exploratory, heuristic approach (Merriam, 2001). Heuristic was defined as "an educational method in which learning takes place through discoveries that result from investigations made by the student" (The American Heritage Dictionary, 1992). As evident in the foregoing research, the accumulation and use of tacit knowledge was closely related to the context of administrative environments, but has not been extensively studied among school principals.

While the tacit knowledge of specific individuals who represented experts and non-expert principals was studied heuristically, the methodology was underpinned by a phenomenological approach. Phenomenology had been defined by its originator, Husserl, as "the philosophy of the Beginning" (1931, p. 16). Phenomenology, then, was concerned with "something other than the world ostensibly given to us through experience" (p. 15).

As defined by Marton (as cited in Richardson, 1999, p. 60) phenomenology may be further described as "directed towards the prereflective level of consciousness." Marton noted that its aim was to "describe either what the world would look like without having learned to see it or how the taken-for-granted world of our everyday existence is lived" (p. 60). The worldview of Husserl appeared to be intrinsic to the examination of tacit knowledge in principals. For Husserl, principals, as the "other," apprehend prior to cognition.

Speilberg described phenomenology as the attempt to "discover the essential – i.e., the objective or absolute – structures in what otherwise would be merely subjective phenomena" (1982, p. 688). Most important to this study of the tacit knowledge of

principals was not whether the beliefs or experiential learning of principals was based upon fact, but how those beliefs or experiences were filtered into the total expertise of the principals. Speilberg analogized this phenomenological position as follows:

> Even more important is the fact that phenomenology in this sense is disinterested in the whole question of whether or not the reports of such 'introspection' are faithful accounts of one individual's actual experience at the time, whether, for instance, the particular introspectionist is or was really in doubt or in love or merely believed that he was. All that matters is that his experience presented him with the phenomenon of doubt or of love.... (p. 688)

Thus, it was not essential to determine the actual experiential basis that contributed to the tacit knowledge demonstrated by expert leadership. Instead, it was more useful to discover the "force" or "dynamic factor" behind the convictions of leaders (p. 686).

Husserl's concept of *bracketing*, or the "suspension of belief....in everyday experience" was seen as intrinsic to the foregoing concept (p. 709). For example, although the research reviewed earlier in this study showed that the day of the school principal was fragmented by numerous interruptions, this fact was temporarily ignored, but not overlooked, when examining the resolution of a specific problem. Similarly, while the school environment was an important indicator of the school climate and culture, my attitudes as researcher regarding the obstacles or advantages posed by the physical environment of the school were bracketed in order to examine the texture of the leadership displayed by the principal.

While the phenomenological approach had been successfully used for the study of tacit knowledge by researchers such as Mott (1994), other researchers have pointed out its limitations in social research (Richardson, 1999). Early criticisms were voiced by Schutz, who claimed that one must "abandon the strictly phenomenological method" since it leads to "transcendental solipsism" (as cited in Richardson, p. 62). Husserl (Welton, 1999) admitted as much when he raised the question himself, as follows:

> Should not a phenomenology that proposed to solve the problems of Objective (sic) being, and to present itself actually as philosophy, be branded therefore as transcendental solipsism? (p. 135)

As Husserl later explained, unless philosophically overcome, transcendental solipsism leads to a profound subjectivity, making objective determinations about the world or others impossible (p. 158). For both Husserl and Schutz, the concept of intersubjectivity allowed them to eschew this problem. The crux of the definition of "intersubjectivity" offered by Schutz was as follows:

> A category which, in general, refers to what is (especially cognitively) common to various individuals. In daily life, a person takes the existence of others for granted. He reasons and acts on the self-understood assumption that these others are basically persons like himself, endowed with consciousness and will, desires and emotions. (Schutz, 1970, p. 319)

Intersubjectivity was essential to this qualitative study in which data was gleaned through interviews. As noted by Seidman, "a basic assumption in in-depth interviewing

research is that the meaning people make of their experience affects the way they carry out that experience" (1998, p. 4).

However, for Maggs-Rapport (2001), it was essential not only for the qualitative methodology to remain consistent, but also that the phenomenological approach adhere to the purposes of the study. Since the focus was upon identifying the tacit knowledge of principals, making sense of it, and applying it to the leadership domains identified by Leithwood, an interpretative, hermeneutical phenomenological approach was employed in this study. In spite of the previously mentioned blurry line between cognition and perception, it appeared necessary to posit that the knowledge-creating experiences of principals could be regarded independently. This led to fulfilling the purpose of this study, which was to determine the ways in which principals made sense of their experiences and applied them towards dealing with novel situations.

Parameters for Participant Selection

This study was formulated to identify, examine, and explore how tacit knowledge was used by six school leaders. It was proposed to illuminate how tacit knowledge was used by novice and expert principals to solve non-routine problems. Yet, prior research had shown that expertise and experience were not synonymous. Due to the time constraints of this study, I was not able to conduct a search within a pool of experienced principals to determine which experienced principals were also experts. Instead, I decided that I would take two precautions to ensure that the principals selected and identified as experts were actually expert principals rather than simply those principals with five years of experience. First, I chose to consult with the

educational leaders on my committee to locate principals who had in excess of five years of experience. While my research had led me to stipulate that five years of principalship experience would be the minimum level required for expertise, I used this method to provide a greater likelihood that these principals were experts in their field. Secondly, I selected expert principals with performance histories that were known to both the school superintendent and the educational leadership instructor on my committee. According to these committee members, the principals identified as experts were highly regarded within their own districts for their outstanding performance. In summary, principals were considered to be experts if they had served as school principals for over five years and evinced the following definitional characteristics:

(a) the possession of complex knowledge and skill

(b) its reliable application in actions intended to accomplish generally endorsed goals

(c) a record of goal accomplishment, as a consequence of those actions, which meets standards appropriate to the occupation or field of practice, as judged by clients and other experts in the field (Leithwood and Steinbach, 1995, p. 13)

Since the foregoing research showed that tacit knowledge develops over time, the additional requirements ensured that effective principals were those who possessed sufficient tacit knowledge for purposes of this study. Novices were designated as those with two or less years of experience as school principals. In reality, all the novices in this study had less than one year of experience as a school principal.

Design Modifications

The design of the study followed the in-depth phenomenological approach described by Seidman (1998), but with several major modifications. First, two, rather than three interviews were conducted with three expert and three novice principals. This reduction in the total number of interviews was due to the use of the critical incident and sense-making methodologies rather than amassing a life history as proposed in the model outlined by Seidman. Due to the anticipated work schedule of the participants, the interviews were scheduled to extend for approximately one hour in length, rather than the 90 minute sessions proposed by Seidman. The protocol developed by Nestor-Baker was used for the interviews (See Appendix A for protocol). Results were compared to the earlier research of tacit knowledge such as the previously discussed Nestor-Baker and Hoy (2001) study of tacit knowledge among superintendents. Comparisons were made between the tacit knowledge exhibited by principals and the dimensions of leadership that had been set forth by Leithwood as indicative of expert reasoning of transformational school leaders. (Leithwood and Steinbach, 1993, 1995, pp. 256 - 258). Transformational leadership had been defined as leadership in which "the followers feel trust, admiration, loyalty, and respect toward the leader, and they are motivated to do more than they originally expected to do" (Yukl, 2002, p. 253). The dimensions of transformational leadership, as identified, may be listed as follows:

Identifying and Articulating a Vision

Fostering the Acceptance of Group Goals

Providing Individualized Support

Intellectual Stimulation

Providing an Appropriate Model

High Performance Expectations (Leithwood and Steinbach, 1993, 1995, pp. 257 - 258)

The forgoing comparison was used to etch a profile of the participants (Seidman, 1998). Seidman asserted that through profiles, "in-depth interviewing is capable of capturing momentous, historical experiences" as well as daily routines (p. 105). The unit of analysis was the school principal: The tacit knowledge comparisons between expert and novice principals as related to the dimensions of leadership were used to create a composite profile of leadership.

Based upon the research reviewed earlier, it might have been theorized that tacit knowledge was an indispensable component of principal leadership; however, little was known regarding the effect of situational influences upon the approaches of new principals to problems requiring tacit knowledge. As described in the sense-making methodology discussed earlier, it seemed important to understand how individuals were able to make sense of situations in which not all the information was known. Did principals, like the musicians discussed earlier, see problems as variations on a theme or familiar lyrics from which to construct a new melody? How did tacit knowledge as opposed to domain knowledge appear in the critical moments when principals needed to solve unforeseen problems? Was there any way to prepare new principals other than by

years of mistakes by learning on the job? Were there any implications for improving the training of principals in higher education?

A variant of the Flanagan critical incident methodology described by Nestor-Baker and Hoy (2001) was used for this study. As noted by Angelides, the Flanagan definition and method is rooted in quantitative and psychological theory and often involves a "significant turning-point or change in the life of a person or an institution...or in some social phenomenon" (2001, p. 432). Angelides suggested that an alternative definition be used by educators as follows:

> [Critical incidents]...are not 'things' which exist independently of an observer and are waiting discovery...but like all data, critical incidents are created. Incidents happen, but critical incidents are produced by the way we look at a situation: a critical incident is an interpretation of the significance of an event. (Angelides, p. 431)

In addition, Angelides noted that when incidents, reflections, and interpretations are studied in their varieties and magnitudes, the critical incident methodology may facilitate the gathering of "rich qualitative data" in a shorter time than required under the Flanagan approach.

The foregoing interpretation differed from the original use of the concept as described by Miles and Huberman. These theorists maintained that the description of "critical incidents" evolved from the analyses of biographies, in which they were related to exceptional occurrences that altered the lives of others (1984). This distinction was important because biographies, as well as many case studies, are often described as

"holistic" because they examine an entire career or individual. As pointed out by Tripp, this type of critical incident methodology may be the antithesis of a holistic study. Given the goals and conditions of this study, it seemed more fruitful to examine the tacit knowledge of principals within a critical incident methodology rather than a holistic, or *global* one (Yin, 1994, p. 42). The critical incident technique required principals to be introspective and reflective, since they were recalling problems and describing their thought processes and their ultimate solutions after the problems had been resolved.

While dissenters may point out that the resulting information may be skewed by the passage of time or by the subjectivity of the participants, as noted earlier, the factual representation of the problem and the solution was not the object of this study. Just as Tripp found when working with teachers on their biographies, the critical incident methodology was a useful tool for ferreting out tacit knowledge. Tripp concluded that through reflection our responses are assimilated into "'craft knowledge,' that is, knowledge that is experientially derived, seldom articulated, but constantly and consistently acted upon" (Tripp, 1994, p. 71). He continued as follows:

> [The use of critical incidents] involves working back in time from an account of our current practice towards aspects of its genesis in order to use that knowledge in change ourselves and our current practice.....one is not aiming to produce a complete, holistic personal history, but a fragmented and discontinuous account of only certain parts of the past. (p. 71)

In fact, Trip claimed that even if there was "over a decade" between the incident and the reflection upon it, the examination of the participant remained valid for the study. The intent was not to duplicate a past reality, but to find the "deeper underlying mental constructs" and "emergent viewpoints" (1994, p. 74).

While specific major incidents may indeed have been critical to the leadership development of school principals, it was contended that the accumulation of tacit knowledge, as discussed earlier, occurred over time and through lived experiences. Many of these experiences were not major ones in the professional lives of these principals; yet, their problem solving approaches have been shaped by occurrences such as those described by the participants in this study. As stated by Bereiter and Scardamalia, "Everyone learns, more or less continuously throughout the waking hours of their lives. Yet not everyone becomes an expert" (1993, p. 77). Simon opined that "nobody reaches world-class expertise in any domain with less than ten years of intense application" (1993, p. 407). Many expert school administrators may be visionary, efficient, and memorable, but never reach the world-class status described by Simon. While at least one of the experts in this study may have been world class, this was not the object of this research. Instead, this study focused upon examining the tacit knowledge of experienced principals with more than five years of experience who were reputed to be expert in terms of their school leadership abilities. It was believed that a comparative model between experts and novices would illustrate how tacit knowledge was manifested by school leaders.

Interviews were conducted with the principals to discover information about tacit knowledge gained retrospectively. The *sense-making* technique, as described earlier and adapted for the tacit knowledge investigation of school superintendents, was used to guide the interviewing process (Nestor-Baker, 2002). This technique was especially useful for the study of tacit knowledge because it focused upon "the thought processes used by the individual to attempt to make sense of the situation, and the conclusions drawn from the situation" (p. 1). Dervin noted that the theory of *sense-making* proposes that "reality is ...filled with fundamental and pervasive discontinuities or gaps" (1983/1997, p. 4). Nestor-Hoy stressed that during the interviews it is essential to determine ways in which the participants seek to bridge these gaps (2002, p. 1). While not scripted, the interviewer must seek to follow the reasoning of the participants as follows:

> The idea is to focus on the steps taken, the rationale constructed by the respondent in making sense of occurrences. It is in this reasoning that the development of tacit knowledge may reside. (2002, p. 1)

This outlook appears to be consistent with constructivism, which contributed to the perspective used in the analysis of results. The theoretical orientation of this study is consistent with that of the social constructivism of Vygotsky, in which individuals construct meaning through social interactions (Oakes & Lipton, 1999, p. 80). It was initially theorized that earlier leadership experiences might be the "scaffolding" within the "zone of proximal development" that Vygotsky believed was essential to the learning process (Oakes & Lipton, 1999, p. 80; Vygotsky, 1978, p. 86). But how do

expert school leaders build upon these experiences? How was tacit knowledge related to transformational leadership? This study sought to find a path through the prickly thicket of experience to the essence of transformational leadership.

Summary

This project used a qualitative approach to determine how tacit knowledge was used by expert and novice principals. It employed a variation of the critical incident technique to illuminate the daily problem solving situations encountered by the participants. The theoretical fabric of this study was woven from several theories that, when taken as a whole, were used to illuminate the use of tacit knowledge by the participants. These theories included sense-making, social constructivism, and phenomenology.

Instead of using three separate interviews for each subject, two interviews were used, each approximately one hour in length. A total of six school principals participated in this study. Three of the participants were novice principals and three were experts. One half of the participants were from the elementary level and one half were secondary school principals. Expert principals were defined as those who possessed more than five years of school principalship experience. In addition, experts were those judged to show consistent superior performance by a university professor and a school superintendent. Novices were defined as those holding less than two years of experience as school principals.

Interpretation of data would be accomplished through a phenomenological perspective. An individual textural-structural description was generated for each school leader.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to investigate how tacit knowledge was accessed and used by expert and novice principals. A tacit knowledge profile of the principals in this study was to be generated and then compared within the transformational leadership characteristics outlined by Leithwood and Steinbach (1993). The methodology employed emphasized the interpretation of critical incidents without regard for factual details that might be forgotten over time. In fact, one of the distinguishing features of this study was that the epistemology of expert school leaders, as it related to the application of tacit knowledge, may be different from that of novice principals when confronting non-routine problems. The reflections of the subjects over the passage of time, regardless of verisimilitude, may lend even greater credibility to the tacit knowledge trail.

A phenomenological approach was selected as the means to gain an understanding of how principals made sense of their experiences and manifested tacit knowledge. To ensure the confidentiality of the participants, all names were replaced with pseudonyms. The locations of the previous administrative experiences, as well as the current assignments were removed whenever references were made to the backgrounds of the participants. Rather than review each participant's responses to each of the research questions, both questions have been placed together in the presentation and analysis of the data. This was done because it seemed more useful to

examine how tacit knowledge was demonstrated along with the articulated domains of leadership together to form a composite sketch of each subject.

Six subjects were interviewed twice. Three participants were principals at the elementary school level. The remaining three participants were high school principals. Each principal was asked to share a story about an administrative experience that resulted in a lesson about leadership. Each principal was instructed that the information sought was not related to their academic learning, but to their tacit, or informal, on-the-job knowledge gleaned from experience. At the onset of the second interview, each participant was presented with a transcript of the previous interview and requested to review it. This was done in case the subject wished to modify any portion of the information shared at the first interview. The principals were also told that if they wished to correct or add portions to the transcript after the second interview ended, they were free to contact the researcher at any time during the duration of the study.

The data analysis followed the format outline by Moustakas (1994) and Patton (2002). First, all statements that had relevance to the study were listed without any judgments as to their relative value (p. 120). It was necessary to maintain epoche, so that ordinary conclusions or reactions to the phenomena would be set aside (Patton, 2002, p. 484). As a researcher who possessed a considerable background in school administration, I found it essential to maintain epoche so that my conclusions would not be colored by my own experience. After the interviews were transcribed, I horizonalized the data by spreading it out before me for analysis with equal value afforded to all statements.

Subsequent to horizonalizing the data, the portions of the interview that formed the essence, or the invariant constituents (Moustakas, 1994, p. 121), of the experience were listed. Statements that were repetitive or unrelated to the study of tacit knowledge were eliminated (p. 121). The invariant constituents were clustered into themes or essences of each of the experiences, using the leadership dimensions outlined by Leithwood and Steinbach. In addition, new themes emerged from the data. All of the new themes were previously identified in the review of research except that of first and second order change. First and second order change is associated with expert and novice leadership within school restructuring (Leithwood, 1994, pp. 498 – 519). In this thesis, Leithwood proposed that first order change and problem solving dealt with school operations such as curriculum and instructional strategies. Second order change included "organization building: developing shared vision, creating productive work cultures [and] distributing leadership to others...." (p. 500). While both types of change are important, Leithwood noted that novices are most often involved with first order change, while experts work to develop the vision, culture and organizational characteristics that form the essence of effective organizations. This theme, as well as others, will be more fully described in terms of the ways it was manifested among the participants.

In this way, the themes were first collated and arranged from the data so that textual descriptions could be formulated for each principal. Following the sequence described by Patton (2002), these textural descriptions were developed after listing the invariant constituents. A textural description is "a description of the experience that

doesn't contain that experience" (Patton, 2002, p. 486). It is a view of the meaning of the experience that lies below the surface, or the simple relating of the experience.

Following the textural descriptions for principals, individual structural descriptions were generated. According to Moustakas (1994), individual structural descriptions offer "a vivid account of the underlying dynamics of the experience, the themes and qualities that account for 'how' feelings and thoughts ...are aroused" (p. 135). The researcher employs *imaginative variation*, or *free fantasy* in order to complete "a picture of the conditions that precipitate an experience and connect with it" (p. 35). From all of the foregoing views, an individual textural-structural description was then generated for each principal. The individual textural-structural description incorporated the invariant constituents and themes found in the transcript of the interview. Portions of these steps have been included below in order to provide a rich rendition of how tacit knowledge was accessed and used by each principal. The individual textural-structural description is included for each school leader.

The Participants in the Study

Brian. Brian was a novice principal at the secondary level. He held five years of previous experience as a school administrator. After working as an Assistant Principal in a school system outside of Arizona for two years, Brian returned to Arizona, and accepted a position as an Assistant Principal. In the year prior to his new role as high school principal at Serenity High School, he served as the school Athletic Director. In his first year as a principal, Brian said that his focus had been upon the administrative team, upon "building relationships in a group." Brian believed that the

success of any high school principal depended upon the ability to "have that rapport" with the key administrators of the school.

Jessica. Jessica was a novice elementary school principal with ten years of teaching experience at the middle school level. She completed a total of four years of administrative support experience prior to assuming her current role as principal. One of those years was completed in another district; for the past three years, she had served as an assistant principal at a middle school in the district. Jessica promised the staff at the beginning of the year that she would not make many changes at the school "because I felt that the staff needed to have some healing."

Melissa. As a novice principal, Melissa felt that her experience in curriculum and instruction had been an asset to her leadership. In addition to thirteen years as a classroom teacher at the elementary level, Melissa was a curriculum specialist for five years. All of her experience was accumulated in the same district. Melissa noted more than once that she tried to let teachers know that "we certainly aren't in the same business as 35 years ago, when some of these people were just starting their teaching careers." She continued, "It isn't my intention to mandate things, although certain things like lesson plans, they have a higher standard now." For Melissa, it was essential for her to help teachers to "understand what we have to do to move all students forward."

Cathy. Cathy, an expert principal, was in her tenth year as an elementary school principal. She had completed seven years of elementary teaching experience in the district. She had also completed nine years as principal in a different elementary school

than the one to which she was now assigned. As Cathy shared her former experience as the first principal of a newly constructed school, she said that it provided her with a situation in which she "picked every person who ever worked there." She said that this circumstance allowed her to "build the culture - to build the way that we were going to do everything." She noted that this year, since she had been assigned as a principal to a different elementary school, she wanted to focus upon "building a sense of community among the staff."

Jeffrey. Jeffrey, an expert principal, had been a classroom teacher for twelve years and a school administrator for the past twenty years. In addition to his fifteen years of experience as a school principal, he served as an athletic director and as a district-wide administrator. All of his experience had been obtained working within the same district. Charro High School was the third school in which Jeffrey had assumed the principalship and it was his first year as principal of the school. Jeffrey said that he looked forward to each new challenge and maintained that "leadership is really about establishing relationships with people."

Doris. Doris, an expert principal with seven years of teaching experience, had previously been a high school department chair, a high school assistant principal, and a coach. Prior to beginning her position as high school principal, she held a principalship at a middle school in the district for five years. She was now in her fifth year as principal at Aurora high school. Doris credited her success to her team spirit and to the mentoring she had been given by present and previous principals and superintendents. She recalled designing her first staff retreat at a local park where she could end the "pod

block" of the middle school staff by placing the teachers on a variety of teams throughout the sessions. "I am a team player. I don't want to make decisions by myself," she said.

The foregoing information regarding the years of experience, current school level assignment, and classification as an expert or novice principal has been depicted schematically in Table 1. As evident in this table, the contrast in years of experience between expert and novice principals appeared to be substantial. As I proceeded to interview the principals and listen to their reflections, it became clear that this contrast was not as great as initially desired when I designed this project. This was because novice principals tended to complete assignments in administrative support areas as a prerequisite for obtaining appointments as school principals. The experience generated through these support positions proved to be a mitigating factor in generalizing from the data reviewed in this study. This finding will be explained more fully in Chapter Five.

What are the differences between the tacit knowledge of expert and novice principals in problem solving situations? How is tacit knowledge manifested among the seven domains of leadership as identified by Leithwood?

Brian. Although this was Brian's first year as principal in a high school of approximately 1500 students, Brian remarked that he owed much of his current acumen to his previous administrative positions held in California and at the high school in which he was currently the principal. Each of the incidents shared by Brian involved situations in which effective problem solving depended upon successful communication

Table 1

Principal Experience, Current School Level Assignment, and Classification

Name (fictitious)	Principalship Experience (yrs.)	School Level	Classification (expert or novice)
Brian	0	High School	Novice
Jessica	0	Elementary School	Novice
Melissa	0	Elementary School	Novice
Cathy	9	Elementary School	Expert
Jeffrey	20	High School	Expert
Doris	*9*	High School	Expert

with others. As he analyzed and reflected upon situations, he focused upon interpersonal communications. Interpersonal communications included both conversation as well as non-verbal communication. For the purpose of this study, the following description shared by Goleman (1995) appears to be a useful description of nonverbal communication: "The key to intuiting another's feelings is in the ability to read nonverbal channels: tone of voice, gesture, facial expression, and the like" (p. 96). Brian's advice in this area was as follows:

> You have to bet better at communicating than everything....I always - even as a teacher – (sic) my own criticism of some administrators that I've worked with is that they didn't understand their impact on how they treated people, the impact they had on people....

Before he began to share specific recollections of critical incidents, Brian also emphasized the importance of "knowing the political game" and "being able to negotiate."

Brian felt that his past administrative positions had provided him with substantial administrative experience that contributed to his ability to understand the political nature of problem solving. He asserted that he did not have a single story, but several. His explanation appears in an initial section of the data as horizonalized below:

> And it's so tough, and I remember when you gave me the question – and I don't mean to be digressing – I don't have one story; it's a collection of stories. There are several experiences that I've had I still bring to here. To coin a phrase, 'it's the same crap: different pot. So here, I think the difference in this office,

compared to being an assistant, has been knowing the political game, and it all comes to me, you know.

According to Moustakas, one essential element of horizonalization is the development of a free flow, so that the situation described can unfold as felt and perceived by the participant. At this point, I anticipated that Brian would share more than a single story. Each of the following two stories offered details of tacit knowledge that contributed to a composite structural and textural-structural description of how Brian used his accumulated tacit knowledge.

The first story shared by Brian took place in California, where he was an assistant principal at a high school. Another assistant principal who supervised student registration told him that a parent and her child would be visiting him to make sure that she was enrolled in the ninth grade at the beginning of the year. Brian was told that neither the student nor her parent should have been led to believe that she was eligible to begin the ninth grade because she had not completed the necessary requirements for the eight grade. Brian said that he was the administrator who finally had to "break the bad news" to the parent and child. As he described it, "the mother's (sic) in tears, the daughter's (sic) in tears....and "they were very upset." After the parent and child left, Brian went to his car and drove to the middle school with all the files that belonged to the student. According to his narrative, he wanted to return the files to the middle school and tell them what had happened at the high school. The data for the story told by Brian were horizonalized as follows:

1. The credits weren't valid. All the "i's" and "t's"" weren't crossed, and they

were trying to pull a fast one.

2. So, lo and behold, they [mother and child] come in looking for me because they've been told no by everybody else and I was the last one. So they came in, wanted to speak to me and I had to break the bad news.
3. So we got through that, and they understood, and I can't remember all the details at this point but I just know that they were very upset and part of that, and that was probably another little lesson I learned, to try to separate emotionally from things.
4. You can't have that hooked in.
5. So, I thought – I'm going to go down and tell them [middle school administrative staff] this is what happened. I'm going to take the stuff back to them so they have the records where they should be.
6. Finally, I found the registrar, and I said, "Hey, I need to talk to you. I need to give these records to you – Can we go speak?" So we go into her office, I sit down, and I said, "Here's what happened." And I remember saying, "I'm kind of upset she was sent over here when there was a communication that already said, 'No, she can't come.'" And I said, "I kind of got played the patsy."
7. The details escape me, but I walked out of there thinking, "Okay, you handled it; it's done, it's over."

8. He [supervising principal] said, "Well, I guess they had it that you were ranting and raving and yelling and angry, yelled at the registrar, yelled at a counselor. They don't want you in that building."
9. I'm sitting there like it's almost like it's Kafkaesque.
10. Oh my God. I wish I had a videotape because – no, that's not how it was – No!
11. I still quote him [Covey] now – "Perception is reality".
12. He [supervising principal] started talking – "Were you angry?" "I don't think I was, but obviously, they did."
13. I go, "Emery, [supervising principal] I'm sorry. What do I need to do?"
14. I said, "You know, I'm a big guy. When I start walking fast, talking fast, maybe I can be a little bit intimidating."
15. I apologized to the registrar, the assistant principal, and it became a standing joke that I was banned from there.
16. It was a hard lesson.
17. I've got my AD who's in the second year but he's come through the building and the hardest thing for me to try to get them to do is sit back, sit back. You know what – wait for them to come to you. You pick up that gauntlet and you run over there thinking you are going over the hill like John Wayne, you are coming back with your head in your hand.
18. To do this job, you have to be a passionate person, you have to be passionate about kids, you have to be passionate about teachers, you have

> to be passionate about education and when those juices get going, it's real hard to control.

At this point, I became concerned that the above incident had occurred before Brian had become a school principal. I then reviewed the focus of the study with Brian. I explained to him that he should provide experiences that occurred this year, during his year as a high school principal. As noted earlier in this study, the reflection over time by participants obviated the need for time parameters; however, participants were requested to focus upon those experiences from their roles as principals, not as assistant principals.

At this point, Brian related a recent incident that occurred this year, during his first year as a school principal at Serenity High School. The incident involved student vandalism in a back hallway, which, as Brian described it, was "not well supervised." According to Brian, the incident was brought to the attention of the Governing Board because one of the Governing Board members was formerly a classified employee at Serenity High School as well as a representative of the classified employees association. The election of this individual to the Governing Board had created the belief among some staff members that he would emphasize areas of school operation that were central to the concerns of classified staff members.

As I know from my prior experience overseeing school campuses, problems that arose in the area of school operations that include custodial and maintenance work sometimes impaired the performance of teachers, administrators, and students. On occasion, I have found that as alternative arrangements were planned to accommodate

repairs and renovations to damaged buildings, substantial administrative time was spent on devising plans to curtail or relocate staff, students, and programs. When such disruptions were communicated to parents and families, they often expressed concern, fearing that the school administration may not have taken the necessary precautions to ensure school safety for the student population. Community agency representatives also expressed frustration when academic programs were impeded by such operational problems.

These issues often gain the attention of the Governing Board even without the classified employee input described by Brian. Since Brian was aware of the complex relationships between classified staff members at Serenity High School and the former classified employee who was elected to serve on the Governing Board, it would seem that Brian would have an advantage in terms of designing a problem solving approach aimed at addressing all levels of concern. However, for Brian, the problem solving process did not proceed smoothly. The full horizonalization of this experience appears below.

1. The perception is there's a political motive behind him [Governing Board member] being here. You know, to set things right.
2. Well, my people here are tight with him [Governing Board member]. For whatever reason, the custodians felt like the school was going to hell in a hand basket.
3. In the back of my mind I'm thinking I keep hearing the same kind of crap, over and over.

4. And these kids are so bad, and this is the worst ever, and Chicken Little – the sky is falling – all the time.
5. So, about a week later, he [Governing Board member] shows up on campus, doesn't come to see me and didn't tell me he was coming. And, you know, he came in the morning and the place is looking immaculate. And so, that goes away, and as this thing is kind of building and I sit back on this 'cause I think something's coming - so I went to the Board meeting – it was right after that. Nothing was said at the Board meeting. I said, "Okay, I don't know what's going on. Maybe there's another factor at play. I don't know."
6. In the end, when we followed up the kid didn't – but he [teacher who was the brother of the lead custodian] was convinced that he had caught them red handed, had them right there, and all we needed to do - It looks like we didn't follow up on it. So, we are swinging in the breeze already - so that windmill – then the monitors are talking, then a couple of incidents of some windows being broken.
7. And they got their tornado going….
8. Once again, I'm feeling good. I'm thinking, 'Okay, the boss has taken care of this one for me.'
9. And I just looked at him [custodian] and I said, "Did you schedule it [a meeting] with Filomena [secretary]? Did I miss something?" "No, Dr. Phillas [superintendent] did." I said, "No, that didn't happen." But they [custodians] said, "We are supposed to have a meeting with you."

10. So I go down there and there's about four or five of my custodians that are sitting down there – to be frank with you, it's just a bitch session.
11. And the head custodian, he reads this, "Well, I've really become disgusted with how we are doing this…."
12. And I'm sitting there listening and I'm thinking, "Okay guys – . " – And they say, "There's all this graffiti - ." They have to recount every single incident of every single leaf out of place and trees being destroyed.
13. It's just listing all these indictments and - "Nothing's being done and these monitors, you know, the other people aren't doing their jobs - ." And they had all the suggestions.
14. Finally, I said, 'Well, what are your solutions?'
15. So they are talking and I said, "What are your solutions?" And they went off on the monitors needed to do their job better.
16. I said, "I check the bathrooms constantly."
17. And the head custodian said indignantly – He kind of goes, "I haven't seen you out there."
18. Well, I know damn well, when I say hi to them in the morning it's when I'm out making my rounds.
19. And then they keep going and tell me about kids that are tearing off tree branches and this and that and I said, "What do you guys think we're doing?"

20. And I turned my head and I looked at him and said, "What?" And he said, "Do we have a right to see a receipt?"
21. I just went into a – I just let the M bombs go. It's like – "Are you fucking kidding me?" I said, "What are you saying – that I didn't do something? You don't believe me?'
22. 'Well, I guess you could see a receipt, Gary, but are you saying you don't trust me? You don't believe me?'
23. In my tirade, I upset one of my other custodians. And truth is – he's one of my favorites. But it's one of those things, it's like construction mentality. You get a bunch of construction workers together and they swear like a bunch of Navy Seals, but the CO comes in and starts talking like that and it's a whole other thing. You know, I understand – I slipped a notch there, and, to be honest with you, that one we're still working on. But to have that moment again, what I would do differently is stop the meeting at that point and get up and say, "Guys, I think the meeting is over because that comment upset me. I need to leave." And I think I would have had less damage. I should have said, "Let me get with the other administrators and we will all come back when we can visit about some of these things."

As the interview proceeded, it appeared that Brian continued to draw parallels between the earlier incident when he was an assistant and the current incident in which he was still immersed. For this reason, the earlier incident was not discarded from the accumulated data regarding the tacit knowledge of this principal. In fact, the earlier

incident proved to be a useful guide for examining the tacit knowledge gained by this principal over time. Although Brian cognitively recognized the outcome of his actions in the earlier experience, it had not helped him grapple with the recent experience, even though both situations required similar leadership skills for problem solving. This observation was supported by the conclusions elucidated by researchers earlier in this study. Expertise does not conform to specific experiential timelines. Moreover, it would seem that expertise does not proceed in a cumulative fashion among individuals; nor can it always be predicted to occur after years of experience. In this case, as noted earlier by Seidman (1998), it is important to examine the meaning extracted from an experience so that subsequent actions may be illuminated. Both of the incidents together contributed to the portrait of leadership exhibited by this novice principal as well as to additional insight regarding the acquisition of tacit knowledge.

As the analysis proceeded, an individual structural description was formulated in order to link the feelings and emotions experienced by Brian to the circumstances that engendered his response. This description appears as follows:

> *In interpersonal situations, it is not always easy to exchange the lens to which one is accustomed for a different view of the world as seen by others. This difficulty is exacerbated by the dichotomy between the relative positions of the school principal and those supervised, especially when the supervisees hold support, or classified, positions. Support staff feel marginalized by their non-contractual work status, their low pay, and their comparatively low prestige within the school organization. Discussions that relate to their area of*

responsibility are often viewed as criticisms of their performance and attacks upon themselves. When speaking with these staff members, the principal feels isolated and defensive, and the situation is transformed into an elemental struggle in which both sides seek to dominate the other. Simultaneously, the principal becomes like the other and sees himself beginning to lose control, but is powerless to stop the emotional flow that surges within him. Like Don Quixote, he feels that his beliefs and feelings are just, and cannot understand the resistance he encounters. He swings at these unmoving, massive, windmills and only later realizes that they were not windmills at all, but his brothers.

The themes and invariant constituents in the stories related by Brian were fused into the following textural-structural description:

Passion fuels teachers to work late into the evenings; it sparks parents to follow the exotic adventures of their children; it pushes athletes towards gold medals; it creates multi-million dollar organizations; and it spills out into highway deaths, family abuse, and the international carnage of zealots. We admire passionate, colorful, vibrant individuals; we incarcerate and hospitalize impetuous, irrational, and anti-social individuals. The oxymoronic phrase, crime of passion signifies an illicit idealism, a forgivable transgression. "You have to be passionate about education and when those juices get going, it's real hard to control." Without reflection, "You pick up that gauntlet and you run over there thinking you are going over the hill like John Wayne, you are coming back with your head in your hand." Passion without reflection fuses the mind

and body together with an emotional adrenalin that obfuscates our ability to identify with the observed (Husserl in Moustakas, 1993, p. 46). After the passion has subsided, the actual events may appear to be unreal, or "Kafkaesque." The possibility exists that the individual will remain trapped in a circumscribed view of reality in which the other appears alien and potentially dangerous. With additional experience and reflection, a flexibility and openness to other points of view can be cultivated. This requires an acceptance of the human condition, that there is no single Quixote, not one John Wayne, but many partners working together with unique gifts and talents to create the best possible world for students and staff.

Brian chose to relate two major incidents, one from his experience as an assistant principal at a high school. Several years intervened between the two experiences. In the first situation, the principal appeared to be unaware that he had generated a situation in which employees may have felt estranged and threatened by him. In the second situation, the principal felt his integrity threatened and his sense of self besieged by others. He reacted quickly with invectives that stopped the progress of the meeting and created hostility among the support staff. The barriers between himself and the support staff ultimately concretized, and the opportunity for a collegial connection dissolved.

A critical component of automaticity, as elucidated in the research reviewed earlier, is the temporal application of tacit knowledge. Leaders who possess extensive tacit knowledge must be able to refrain from reaching decisions too early or too late.

Errors in timing were central to the two incidents recalled by Jeffrey. In the cool phase of reflection-on-action, Jeffrey recognized that impulsive, emotional responses were ineffective. In fact, he mentored his own staff about the same responses: "…. I've got my AD [athletic director] … and the hardest thing for me to try to get them to do is sit back, sit back…wait for them to come to you (sic)….".

Krogh, Ichijo, and Nonaka (2000), referenced earlier, described tacit knowledge as both emotional and social. Murakami, the president of a large corporation in Japan, reflected, "What is most important to us is keeping in close contact with various customers and reading their thoughts and desires" (p. 138). In neither of the two foregoing situations was Brian able to read, plan for, or intuit, the responses of others to his actions. Nor was he able to cultivate the tacit advantages of *physical proximity*, *time*, or *caring relations* among community members as a means to resolve the interpersonal problem (p. 84).

Brian did demonstrate the double loop learning outlined by Argyris as described earlier. He said that these incidents caused him to believe that after any incidents with others, the best plan of action would be to call his staff together and ask, "What can we learn from this?" He said that he typically advises others to "Take a moment's pause, pull up yourself, think it through, and say, "Where could this go?" Although Brian did manifest this type of thinking as he reflected upon situations, he did not seem to be able to demonstrate the advantages of double loop thinking when in the middle of a stressful incident.

Of the six leadership dimensions, the opportunity to provide individualized support to others was most frequently addressed by this principal. He reflected upon this area and asked himself questions such as, "How can I develop my assistants?" While Brain articulated other dimensions of leadership, his focus was upon his administrative experiences rather than his role as a transformational leader. For example, when he mentioned that it was important to be consistent, he was reflecting upon his prior interpersonal communications rather than communicating information directly related to the goal of providing an appropriate model for staff. As will be discussed later, it appeared that since the focus of this study was upon critical incidents, the participants may not have found other leadership areas to be relevant as they shared their stories.

Jessica. After Jessica was hired for the position of elementary school principal at the end of the previous year, her supervisor told her that the school staff needed to be reunited as a team. She was told that she was free to operate as she wished, but that the school staff needed to be "brought back together." Under the previous principal, many staff members were frustrated and at odds with one another. According to Jessica, "the prior principal was a very top-down management type person [sic] and came in and made the decision and said this is how it will be - no discussion, move on." When she began, Jessica promised the staff that she would allow them to heal by continuing with the same "policies, procedures, and schedules" as the year before. She planned to make only minor adjustments as necessary during the year. Since Jessica had expressed her intention to stay with the "status quo" during the year in order to allow the staff to heal, it was important to examine how Jessica used her tacit knowledge as she approached

those daily problems that needed a resolution before the staff could move on with their instruction. For the most part, these problems represented minor facets of first order change. One such area, devising the testing schedule for spring assessments, became the center of a polarizing decision-making process at a staff meeting. As Jessica shared her internal thinking process, her conclusions, and her subsequent decisions regarding this activity, it was possible to examine how she used her own warehouse of tacit knowledge. The questions generated by Jessica during the course of her problem solving also illuminated her difficulty with this new aspect of her position, as she described her deliberations upon the "who's" and the "what's" of the situation.

As one assembles the whole from the recollections of the principal, it is clear that Jessica recalled feeling pressured and frustrated during the staff meeting. She said that she "dreaded the meeting" because of her anticipation that various groups would be at odds regarding the testing schedule. She felt stress because she was unable to provide the answers to the numerous questions elicited by staff members during the meeting. The description offered by Jessica was as follows:

> So that's what those questions – "who was going to assist in Special Ed.? What were the times? Were we still going to go to the specialists? Who was going to assist with the test?" All those questions started to bombard me in that meeting and I wasn't prepared to answer them.

Eventually, Jessica decided to tell the staff that she would prepare the schedule herself. She continued to wrestle with this solution, since she had originally planned to "empower the staff to make decisions."

When confronted with this situation, Jessica noted that since her previous experience in school administration was at the secondary level, she was unsure about how to arrange testing schedules at the elementary level. In this case, Jessica may have simply lacked the domain knowledge that several researchers found to characterize expert principals, as outlined earlier in this study. And perhaps there had not yet been enough opportunities to engage in those real life situations that Leithwood and Steinbach found to be essential for expertise. However, in addition to her lack of domain knowledge, her emotional discomfort suggested that she may have lacked the repository of tacit knowledge which would have carried her through a situation in which her domain knowledge proved to be insufficient.

Later in the year, Jessica appeared to gain confidence in her leadership role as she worked closely with the staff to refocus a staff training program initiated by the previous principal. She began her work on the staff training program due to a series of discipline problems that she had addressed alone earlier in the year. Though the process, she said that she was able to take advantage of "a situation that just arose - it just came 'cause I was struggling." This ability to spontaneously identify a situation and use it for the purposes of problem solving exemplifies the contextual component of tacit knowledge that is integral to effective leadership. While it appeared that Jessica had not yet acquired the bank of knowledge or the skills of an expert principal, she had begun to accumulate the tacit knowledge in areas related to interpersonal skills and contextual abilities that are the hallmarks of the tacit knowledge that characterizes expertise. The

textural-structural description that shows the change in Jessica's accumulation and use of tacit knowledge from the beginning to the end of the year appears as follows:

> *A staff meeting is dreaded because conflict is anticipated. Conflict is regarded as pre-existing the new leader: the leader is not the object of the conflict, but a witness to it. The goal of the leader during the first year of the principalship is to observe the staff for a year, to promote healing, and make little change: I really wanted to stand on the sidelines.... The choice to remain at the sidelines may also signify a subconscious fear to enter the fray, to assume responsibly for second order change within the school. The sidelines are safe, since one cannot experience failure if one does not compete. In this case, since the teachers could not agree on the test schedule, the principal resolves this dispute by assuming the responsibility for the assignment, and thus implements a first order change. Subsequently, the principal feels ambivalence regarding the decision because it did not result in staff empowerment or delegation.*

> *Near the end of the year, the leader re-examines goals and provides intellectual stimulation that fosters a commitment to second order change by distributing leadership among others. As this principal moved from a static, passive role to an active involvement in staff and school issues, a defining vision of leadership began to emerge, as encapsulated by the following comment: "I'm rearing to go...It's probably about a month ago I said, 'I can't do this any longer....".*

The external, existential relationship was eviscerated by a sense of frustration with the status quo. The frustration led to a search for solutions that would unite and empower staff. Efforts were made to bring this change about as the year ended. As the staff entered the change cycle, the perspective of the principal changed from an external observer to change agent for the school. At this point, the principal has ended this year with the anticipation of active school leadership, having used the day-to-day activities of the school as the platform for making sense of the responsibilities of leadership.

Since Jessica entered a school that had been identified as previously split by staff divisiveness, she expressed her determination to focus only upon healing. Although she chose not to initiate change throughout most of the year, at the same time she needed to provide daily direction and support to the instructional staff. Citing surveys and other indicators, Jessica believed that she had successfully generated trust between herself and the staff members. While her focus was still upon relationship building, Jessica noted that she did not provide as many overt gestures to the staff as did other elementary principals. She identified this difference and reflected upon her success in this area as follows: "I'm not a real foofy type of principal – I don't do the gifts and the breakfasts.....I feel like I'm not - that they are not happy because I'm bribing them to be here to make them be happy....".

It should be noted that two of Leithwood's dimensions, articulating the mission and maintaining high performance expectations, were only slightly evident in the data for this principal. This may have been due to her continuous focus upon observation

and healing. Jessica appeared to be aware that this might be perceived as a lack of observable leadership skills, since she appeared to feel compelled to underscore her inaction with purpose through self-justification as follows: "I've sat back, I've watched, I've observed, I've seen how things go." She then commented on her intent and plan for leadership in the next year as follows: "I can't do this any longer, I've got to put my foot down and say this is working or this isn't working, we're going to change this and we're going to do this." Other dimensions, such as fostering the acceptance of group goals, and providing individualized support figured strongly. This may have been the case because these dimensions can be connected to social goals such as that of healing.

Melissa. Melissa began her first year as an elementary school principal in the shadow of the former principal, a popular leader with many staff members due to her gregarious personality. Melissa contrasted her own personality with that of the previous principal as follows: "She would sing up on the stage and I'm just not in that place, you know. While I think that I'm very nurturing and caring...it's just not the same." Melissa said that she thought that the staff had a difficult time adjusting to herself as the third principal in the past nine years.

The major problem solving activity shared by Melissa involved her work with the staff in the area of setting pay for performance goals and explaining the salary ramifications as a result of not meeting those goals. The situation involved a series of staff meetings that Melissa held at the beginning of the year to formulate pay for performance goals with her staff. Melissa recounted that the staff members wanted to

set goals for the coming year that had already been met by the students. In addition, a negative atmosphere surrounded these meetings because the former principal had incorrectly informed the staff that the students had met all of the goals established for them last year. Since the students had not met the identified goals, the teachers were not eligible to receive their pay for performance monies for the previous year. Melissa described a particularly difficult staff meeting and the repercussions from the meeting as follows:

> …they just kept coming back to the idea that we wanted clear goals, and at one point I felt like I had addressed it and the superintendent had addressed it and we just needed to move on and I guess that maybe I was a little short in my response to an individual who asked yet again about taking another route. I don't remember exactly what I said, but I remember thinking, 'Oh, no, not this question yet again!' and I remember being polite, but getting to the point and not really thinking that I had been rude, but knowing that I hadn't been, you know, extremely gentle, so to speak. I felt like this was just the same thing over and over again. Well, that sort of stirred with this person and over a time, they (sic) sort of vented to other people about the way I had been rude to them….This sort of became kind of behind the door conversations with staff….And so I finally decided--…. I said well, is it best to call this person in individually or is it best to kind of globally say an apology even though I didn't really feel that I had said anything wrong. So I kind of waited … and continued to debate what battles…(sic) you're going to let go or not.

The above segment shows that Melissa had used a single loop approach to problem solving with a vision that focused only upon the immediate, first order change. She did not use her tacit knowledge to intuit and predict the affect of her comments upon the staff. Her timing for the resolution of the problem was also questionable. She chose to ignore the comments from disgruntled staff members and then spent substantial time deciding how she would eventually address the problem. In the meantime, the staff morale plummeted and the tension increased.

Eventually, Melissa decided that she would apologize to the entire staff at a staff meeting and did so. To symbolize the pain she may have inflicted upon her staff, she spilled a number of band-aids – "for healing hurt feelings" - from a box onto the table as she spoke. Afterwards, she said that "not necessarily right then, but you could see [sic] the tension dissipated almost immediately in the building." After reflecting upon the incident later in the interview, Melissa speculated that the outcome of the meeting might have been different had she planned ahead. As she reviewed and reconsidered the staff meeting, she claimed that her leadership skills had changed as follows: "In this situation, I learned to listen - not that I wasn't – I've learned to calculate what you're going to do." This is the type of incidental learning, or learning from one's mistakes, that was described by Marsick and Watkins (1990) earlier.

The above statement is also indicative of another theme that emerged from the data that was extensively noted in the research on the tacit knowledge and problem solving of expert principals: the presence of initial problem analysis. Problem analysis was not regarded by the principals in this study as solely a pencil and paper activity.

Instead, it ranged from anticipating obstacles within a specific situation to an understanding of the type of data that needed to be collected prior to an activity. The above reflective comment is an example of the first type of problem analysis.

Melissa identified several external sources for the staff resistance and low morale that she had encountered during the year. She offered the following three reasons for the school climate: The loss of their access to the pay for performance stipend signified a lack of value on the part of the district; low morale was endemic throughout the district; and staff were in mourning for the loss of their previous principal. She described the effect of losing the previous school leader as follows:

> I think that there is a grieving process that people have when they lose an administrator. Not that she died or anything, but they had expectations of a life lived out with her so to speak…that relationship part after two years had kicked in for some of them, [sic] really felt that they had really lost something valuable.

To dispel these feelings of loss among the staff, Melissa initiated a number of activities aimed at building strong staff relationships. Melissa described her efforts as follows: "I have tried….I deliver candy to them…I've served them a pancake breakfast…I've done a raffle…I send them notes….". In spite of her work to create a unified staff, Melissa remained concerned because staff surveys indicated that the staff was not satisfied with the school leadership.

One such program survey to which a number of staff responded negatively included a question ascertaining whether or not they felt respected at school. On a district survey, staff responses to two questions concerned Melissa. One question dealt

with school leadership and the other was aimed at determining whether the staff felt that they had input into decision-making. Melissa said that she received a number of low ratings on both of these questions. Upon reflecting on the staff discontent and communication obstacles she had experienced during the year, Melissa stated she thought that continuing to build relationships was essential. She described her feelings as follows:

> I think that building relationships, which I tried to do from the very beginning, is the most important, but if I were to go back and do it again, I would do something a little bit more social, instead of things geared to the school....It might have been nice to go to a happy hour.

Based upon the insights gained from my interview with Melissa, my view of her experience using the interior magnification allowed from the textural-structural approach is as follows:

> *To find that the trust of a faculty remains elusive throughout the course of a year leaves the individual leader susceptible to a continuous feeling of vulnerability. It also leads to frustration and stress, since "nothing happens in isolation." The repeated phrase, "We've never done it that way before," adds to the tension felt by the new administrator and unveils the grieving process among staff for the loss of the previous principal. Surveys showing that the staff does not feel respected or involved in the decision-making at the school contribute to the dissonance and isolation felt by the leader. The leader feels besieged, ostracized by the faculty, and the object of their war of resistance.*

> *Conflicted between the perceived need to mandate higher standards for instruction and the need to nurture and care for the community of teachers, the leader finds that increased dialog with staff sows the seeds of cooperation. Feelings of impatience for the length of the grieving process of others are minimized by recollections of responses to similar situations in the leader's own past. Empathic I-thou feelings are experienced by the leader. Reflection over time allows the leader to formulate a strategy for the expiation of feelings of isolation through a public symbolic healing ritual. The leader feels a sense of renewal as the tension dissipates and the focus of staff anger shifts to external sources.*

Of the leadership dimensions identified by Leithwood, Melissa most often spoke of fostering the acceptance of group goals, followed by providing individual support to her staff. However, as pointed out earlier, Melissa initially experienced a number of roadblocks when attempting to build consensus among the staff, making it difficult for her to provide support in a way that was valued by her staff. As the year proceeded, she appeared to grow more successful in these areas.

Cathy. Cathy, an expert elementary school principal, focused more upon developing strong relationships with teachers than did any of the participants. At one point, this principal stated that "half the battle is giving them praise." Cathy provided individual support to low performing teachers, and stated that it is important to "work from the positive and go build them up …." Cathy was completing her first year of re-

assignment to a new school within the district. In contrast to the other two novice elementary principals, who wrestled with the change process, Cathy seemed comfortable with initiating first order change within the school from the very beginning of the year. This principal also engaged in substantial metacognitive, double loop thinking and, to some degree, second order change, as stimulated by the district policies. Like the other expert principals, Cathy appeared to have an understanding of the patterns of response generated by situations: She appeared to instinctively know when to make decisions and when to empower the staff with this responsibility.

As seen earlier in the data accumulated for the novice principals, initiating change was often regarded as difficult. For example, it appeared that Jessica may have felt some trepidation at initiating the change process because she feared it might have increased staff dissention. Seen in this way, first order change, if not addressed effectively, may be counterproductive to the school climate. Yet Cathy introduced a number of first order changes early in the year. She appeared to do so easily and exhibited the sequential planning that was described in the earlier research on if-then thinking as typifying the tacit knowledge exhibited by experts.

According to earlier research, if-then statements found in the data were regarded as additional indicators of how tacit knowledge was expressed among the participants. Both explicit and implied if-then comments were included in the invariant constituents for principals when they were found in the transcripts. Cathy demonstrated the if-then thinking through implication when she planned first order change at the beginning of the school year. She described the specific requests that she had made of teachers based

upon her implicit knowledge that her requests would result in improved instructional practices. Even more importantly, she implicitly knew how to initiate those requests in a way that was less likely to cause staff dissention and turmoil.

In her interview, Cathy described how she introduced first order change and brought the teachers to accept it. Her implied if-then thinking may be illustrated as she requested that teachers turn in lesson plans regularly and prepare instructional timelines, or curriculum maps, to ensure that the required curriculum was completed during the course of the year. She described how she presented these initial requirements to teachers in a manner that minimized staff dissonance as follows:

> That [requiring that lesson plans be turned in regularly] was new. They weren't turning them in regularly. That was new for them this year, and nobody complained about that. And another thing that nobody had ever done before was a curriculum map, and nobody really grumbled about it in the beginning. Here's why they didn't grumble at the beginning: I did a retreat in August and they got stuff, and everybody came and everybody really felt good afterwards, and just some of the things that I said, and my theme was "My Teacher, the Hero," and that was the focus of it. I brought in a lot of stuff, different little tear jerker things, and door prizes and they all got little business cards which they were just like, "Oh my God – nobody's given us anything like this before." An I think that set a tone for them that they were going to be valued and appreciated, but also that I was going to expect a lot of them as professionals.

The implied if-then statement of this principal may be rendered as follows: If you set the tone of valuing teachers and holding high expectations for them initially, less people will object to new requirements such as preparing regular lesson plans and curriculum maps. It is also important to note that Cathy chose to initiate these requirements even before the school year began. The phenomenological textural-structural description for Cathy appears as follows:

> *Encountering new leadership situations prompts self-reflection: "Can I do it?" Feelings of inadequacy were overcome by advance problem analysis, outside study in domain areas, knowledge of district rules and regulations, and consultation with peers and mentors. Feelings of uncertainty created initial fear of the unknown represented by unfamiliar staff and suspicions of an unwelcoming school culture. Feelings of uncertainty were assuaged by recollections of successful prior experience within the district and advance communication with the staff.*
>
> *The focus of the leader was upon increasing the perceptions of self-worth among the faculty. The leader took precautions to equalize overtures demonstrating the perceived value of individual staff members by refraining to engage with staff members outside the daily school routines. Separate social units were seen as a threat to the personal autonomy of teachers within the school and created an atmosphere of distrust. While this perception increased the loneliness of the*

administrator, the feeling was countered by maintaining peer and mentor relationships.

Democratic rules were initiated in staff meetings, but delayed responses were perceived as ideal. Delayed responses and votes allowed teachers to consider multiple solutions and to select among alternatives after engaging in reflection. If-then statements of the leader represented implied goals such as the following: If one works positively with teachers who have potential, then instruction will improve. If one sets a tone of valuing teachers, then they will respond to high expectations. First order change was initiated in two major instructional areas, Title I and Special Education, as well as in procedural areas relating to instruction. Positive changes in the school culture were perceived to occur through valuing teachers. As a result of continuous teacher valuation, the positive emotions generated from teachers, like flames from a campfire, reflected upon the leader. Consequently, the leader feels a stronger sense of self, as reflected in the perceptions of the staff.

Jeffrey. Jeffrey also shared several stories that provided insight into the relationship between the tacit knowledge accumulated through experience and the resolution of school-based problems. Rather than relate stories from his past principalships, he shared his responses to incidents that had recently occurred at Charro High School. One of those incidents had occurred in the evening, when Jeffrey was on school grounds while teaching an evening class. During a class break, Jeffrey approached a school custodian who was working the evening shift in order to alert him

of some ceiling tiles that needed to be repaired. A portion of the horizonalization from one of those incidents is as follows:

1. I was in the faculty lounge last night about 6:15.....
2. The custodian was in the lounge here using the telephone.
3. It's his half hour for dinner so I mentioned to him that we had a ceiling tile up

   here that really needed to be changed up – That was, it looked very bad, and this is his area.
4. His response was, 'No, I'm not going to do that. That's the engineer's responsibility to change those things out.'
5. Maybe that's the way it's been done in the past, but that's well within his area of responsibility and what he is capable of doing.
6. So he basically refused to do that and I had to write a letter of reprimand.
7. [I didn't say anything to him then]...there were people in the room...so that was not an appropriate time. I just noted his attitude towards me at that time.
8. Actually...I reiterated the story to our Assistant Principal, and he did the letter ...with the intent that it would be given to him today.
9. [It's]...being able to say 'the rules have changed; the rules around us are changing. Here's the things that need to be accomplished.' It's not really a thing about me; it's the job performance in this case.

10. You know, in saying 'I need to have a better job done in cleaning this area that isn't getting done,' and maybe it was accepted with the last principal, then maybe it wasn't but that's immaterial but it's not acceptable now.
11. And when I get complaints, or I see it myself, I need to deal with it even though it may be – I have an Assistant Principal that handles the building and operation, but if I'm walking around in the evening and see something that isn't getting done properly in my mind, I think as the supervisor of everyone, I think I ought to say something.

Jeffrey felt no indecision, stress, or conflict when he approached the custodian. He did not react emotionally to the negative response of his staff member. His internal sense of timing informed him that no further interaction would be appropriate at that moment.

When the invariant constituents were listed, additional themes emerged from the data provided by the principal. The invariant constituents were then organized under those themes as follows:

1. Leadership relationships

   Try to listen a lot.....Try to establish some relationships with key people and being able to get the pulse of the organization from them..... I think more and more, I believe in the impact of leadership...I feel much more strongly about it now than when I began as a leader.

2. Single or double loop learning

   Am I saying, am I doing what it is I'm saying? When I constantly think of it, am I truly listening? Am I trying to understand someone else's

perspective – or am I moving past that. So I am constantly thinking about the leadership skills and - am I the type of leader I would like to be under? ….that's why one observation isn't something good to do, 'cause you can draw a conclusion for walking in…that might not be a reality.

3. Explicit or implied if-then statements

   People can come up with their own answers if they feel empowered…..If the soda machines weren't there, we might not have as much problem as the custodians have, but yet, it's nice to have the money to spend on kids for extra curricular activities and all the things that it's used for…..if teachers feel good about coming to work, if kids feel good about coming to school and if they take some pride in themselves and their surroundings, they are going to achieve a high level.

4. First or second order change

   Being able to move a large organization of 1500 and 70 something kids and 180 something adults in a positive direction, and keep momentum going. But what I try to get across is – 'Let's get beyond the personality aspect and try to look at what the goals here at Hope High are and how are we going to achieve those together? In the spring of 2006, when the students have to pass the AIMS, how am I going to answer to a parent that says, 'My child's got all B's in their high school career and they don't pass the AIMS?' I've talked to teachers a lot about what does a grade actually mean. So we are doing a lot of thinking as far as changing in mindset and then

delivery....Something is being done or not done depending upon whose eyes you look through....

5. Identifying and articulating a vision

   All kids have the right to come to school in a clean, attractive, atmosphere. If teachers feel good about coming to work, if kids feel good about coming to school and if they take some pride in themselves and their surroundings, they are going to achieve a high level. Everything that happens here is related to student achievement.....Sports is my life, but if we look at our primary focus being student achievement in the classroom, then those sports are extra curricular....There's a different paradigm that will shift now, as we look at outcomes.

6. Fostering the acceptance of group goals

   Anytime that there's issues [*sic*], let's get the perspectives from all the groups here. Instead of me directing and saying "Here's what I want to do, let's let the group come up with the decision because that empowers them." That gives them the charge and purpose for their existence. That's not a micro-management issue – they are not trying to do my job, but they are assisting me.

7. Providing individualized support

   By having these one-on-one conversations, and being able to ask the question, "What were the students expected to learn today, and how do you know they learned it?" And if they can't answer that question, then I think

we need, they need to begin to think about how can I get the answer to that questions? How can I really know that my student has learned or not?....You try to take the personality out of it; it's not about the person; it's about the job....I guess you get to the point when you've worked with the person, counseled the person, and you don't see any willingness to change, then you come to the realization that this person needs to go. I tell people all the time that I think that's really what evaluation is. Evaluation is whether it be teacher, classified, or custodian, the evaluation process is to improve job performance, to improve instruction in the classroom, and when you work within that system, you come to the determination that 'no, it's not happening.'

8. Intellectual stimulation

   By changing the mindset through professional development...increase the time for professional development...set up focus groups...once a month, I do something...By being flexible by giving them a menu of options to choose from...We conduct needs assessments....

9. Providing an appropriate model

   I have been successful because I hope I still am a teacher, and I really view leadership as teaching and I enjoy sharing. I just did a panel discussion....

10. High performance expectations

    By talking about school pride, by hopefully complimenting custodians and people in this case that are taking pride in their work, and doing an

> exemplary job, or maybe going beyond their job responsibilities, and I guess I am not one that feels like I should … compliment people that are doing the job that they are paid for. As a parent yourself, what would you expect from your child's teacher? Would you settle for a second rate teacher, a C teacher? No, so we need to make sure that we can put ourselves in the place of the parent all the time and try to ask those types of questions.

As shown above, in addition to the dimensions identified by Leithwood, four additional areas emerged when examining the data. One of those areas, if-then thinking, was closely aligned to the expression of tacit knowledge, as illustrated in the research reviewed earlier. Throughout the major portions of Jeffrey's narrative, this category overlapped with the first leadership dimension identified by Leithwood, that of articulating a vision. However, it seemed that the if-then analysis added depth to the tacit dimension, so this category was maintained. In addition, it seemed useful to maintain the category of single or double loop learning. The latter type of learning within problem solving is indicative of strategic thinking, as discussed earlier. As noted by Argyris, the double loop thinking listed above shows that the principal has considered the previously reviewed "underlying program" associated with the school-wide goal of maintaining an attractive campus. He has automatically connected this goal with his vision for school improvement and academic achievement and engaged in reflection about this vision.

The category regarding first and second order change emerged from the transcripts as well. Although there was some overlap between if-then and first and

second order change, the distinction appeared important. The following comments from Jeffrey exemplify the strategic, integrated, and inclusive qualities as described by Leithwood that are indicative of second order change.

> I think that in my mind the purpose of the site council is to set - kind of from a global perspective - the kinds of things we are trying to accomplish...Let's let the group come up with the decision cause that empowers them....So I got an agreement from the site council that they would meet once a month...we can get more and more things....the site council can be very helpful in setting goals and setting a direction for the school because it receives input from all the clients and groups out there.

For this principal, there appeared to be a coalescence of vision and action. He did not simply imagine a better school; he acted upon his insights. This may be seen in the following textural-structural description generated from the review of the interview data for Jeffrey:

> *It is essential that leaders look beyond the world of appearances. They must find the essence of observed performance, yielding neither to the constraints of time nor circumstance. While staff members share the world with the leader, the leader must look beyond their appearance to find their imprint upon students. For the most part, the leader feels confident in the validity of initial impressions that arise as indicators of instructional competence. This is not simply a hunch, but an implicit feeling of connection with and understanding of the teachers observed as each goes about the tasks of instruction. Though ongoing contacts*

with all levels of staff and students, the leader seeks confirmation of initial perceptions through the use of multiple sources of information. While temporal limitations must be overcome while assessing isolated performance, it is also important to value performance over time as one determinant of success. External regulations and rules should be regarded as fungible: modifications and substitutions are embraced within the context of school improvement.

The patterns of continuous self-growth appears through the ongoing juxtaposition of the self in the immediate school environment to the self in the larger world. The leader sees active participation in a wider community as the means to decontextualize experience and further develop or refine the school vision. This stimulates reflection upon school goals as well as upon the evolving qualities of leadership. The leader feels further empowered and energized by this involvement to create change within the immediate school environment.

Like the other principals, Jeffrey shared several stories rather than a single one. What emerged from these stories was a perception of the school as an organic, malleable, enterprise. The leader provided the vision and articulated the change process to reflect larger societal needs: the staff, students, and community created the means to the envisioned end. His approach was inclusive: He served as a leader, a teacher, and a role model for staff and students. The instructional aspects of the leader were not limited to his association with the school, but existed as part of his identity. His self-reflection and double loop thinking was continuous, as when he stated, "I think every

time I teach, I hope that the things I teach I think about – am I able – am I really like that?" He continues, "It [teaching] keeps me fresh and it requires me to think a little bit about what it is that I am doing. Is that really the way that it should be done – if there is a should be." Jeffrey was guided by his values, which included comments such as those asserting that students have certain inalienable rights, as excerpted in the above dimension of identifying and articulating a vision.

Like Brian, Jeffrey shared stories about his interactions with support staff. On one occasion, Jeffrey recalled a situation in which the custodians complained that teachers were allowing students to eat and drink in classrooms. Like Brian, Jeffrey noted that it was important to listen to them and to encourage them to offer solutions to problems. However, a key difference appears to have occurred in the free flow of communication established by the leader. When Jeffrey commented on the importance of eliciting solutions from others, he added, "I think a lot of times people can come up with their own answers if they feel empowered to do that." Once again, the trust that stemmed from positive relationships existed as the key to principal effectiveness.

Jeffrey also seemed to plan his strategies carefully, to engage in forward, rather than backward thinking, and to do so non-judgmentally. This enabled him to intuitively perceive the essences, or guideposts of his leadership path (Moustakas, 1994, p. 52). Although additional insights and meanings were added upon reflection, his response to the first appearance of each phenomenon, when regarded non-judgmentally, was not colored by emotion. When presented with the above custodial problem, Jeffrey first met with the custodial staff and then with the teachers, receiving input and involving

both groups in a plan for remedying the problem. He approached the problem as if it were outside and separate from himself, so that he could gaze upon it free of bias. In a similar manner, he confronted a custodian regarding a repair that needed to be completed. When the custodian refused to complete the repairs, Jeffrey maintained a position that allowed him to apprehend the problem objectively, thinking to himself, "It's not really a thing about me; it's the job performance."

As Jeffrey related his stories, he framed his approach to problems in temporal terms, with more if-then thinking than any of the other participants. His thinking was sequential and relational, yielding the impression that school plans were carefully conceived, alternatives considered, and informal evaluations were continuously conducted by staying in contact with teachers and students. In addition to reviewing various discreet changes he had initiated, Jeffrey used a higher order system with non-linear reference points to describe his goals. For example, one of his intentions, he noted, was to keep the momentum of the school going; another was changing the mindset of the staff.

Doris. Instead of waiting or observing, Doris felt a sense of urgency regarding school change and began the process immediately with teachers during a retreat before the year of her first principalship began. This principal credited her success to the support of the superintendent, along with strong mentoring by a number of other administrators. This support afforded this principal with opportunities to build upon relationships already established. Doris commented upon this advantage as follows: "I was a teacher over there …and there were a number of people that had taught with me.

I was in a no lose situation." Although Doris appeared to have an insider's advantage, it may be important to note that she had also acquired years of administrative experience, which may have resulted in a prior accumulation of tacit knowledge. But as noted in earlier research, experience alone does not always result in expertise.

Doris's description yielded comments that showed that she participated in many duties with the high school teachers and used this participation to remain central to the activities of the school. This afforded her the opportunity to implicitly know school issues before they became major problems. One example occurred after the principal found that teachers were sending students to the office for discipline for minor infractions. To address this problem, Doris placed numerous teachers in leadership cohorts so that they would experience discipline problems from an administrative perspective. A second example occurred when planning student supervision on field trips. When Doris requested that the administrators go with students on field trips, she also took her turn in these supervisory activities. It seemed that this principal regarded herself less a quarterback than a roving forward on a large athletic team. She expressed her readiness to be anywhere, to assume any role, as would an expert shape shifter who possesses an intuitive ability to understand incipient problems and obstacles.

For this principal, a critical incident that made use of her tacit knowledge required a forward thinking look at her school and the goals for the future. Teachers were empowered to create change in her school and developed a plan that proved to increase student attendance and reduce behavior management and classroom discipline problems.

Doris initiated this empowerment by conducting a meeting with her staff in which she asked them to participate with her in creating second order change. Her comments were as follows:

> I gave each table a different set of data to look at, and with some things in mind: 'What do you see? What would you like us to be? - And how are we going to get there?'

The textural description of the experience for Doris was as follows:

> *I need to hear from everybody's side and I need to think about what we need to do next, so I don't start with giving all of this, 'You go home, you're on leave, you did this, I'm docking you.'....it's kind of like – we need time to find out what's going on. Let me interview the people involved, let me talk with my team.... I am a team player. I don't want to make decisions by myself. I like the synergy; I like the energy; I like the creativity that more than one person brings to the leadership. And then I think what in turn that does is it gives my assistants authority and ownership and that feeling that they are running the school too. That it's not just my school and they are doing my bidding - that they make a lot of the decisions that are needed to be made and they take pride in – "Well, we solved that one."*

The above comments applied to the "how," or the way in which this expert principal provided leadership during the incidents shared with the researcher. The textural-structural description generated from the data for Doris is as follows:

The feeling of operating in the zone, with a momentum that enlivens and provides direction to an organization is described as "just a wonderful gift." The self characterization is "serendipity." Serendipity is analogized as "It's kind of like when you are a teacher and you finally go to the Essential Elements of Instruction workshop – it took me seven years to know I've been doing all this stuff!" The feeling of being in synch is implicit and difficult to make understandable to others. "I didn't sit down and say this is what I'm gonna do; I've got it all planned out: It happens." Yet, it happens as a result of a number of unseen, relational factors occurring in consonance. Inclusionary leadership, an earmark of flow, involves dropping one's defenses and allowing others the freedom to create. Statements that embrace the input of others appear as " I need to hear from the people involved; I need to hear from everybody's side and I need to think about what we need to do next." Both inclusionary and intellectually stimulating roles for staff were described as follows: "I got buy-in ... because I put them in a leadership cohort." The coaching and individualized support inherent in leading with flow appears as "I like to coach; I like to cheerlead, I like to push them out there and say 'you are doing a wonderful job.'" The moral element of flow exists in the perception that societal expectations should be reflected in the decisions arrived at and the instructions given to others in the school. In this case, it figures in the decision that administrators will participate in field trips in order to provide an appropriate model for students. It is recounted as "No, we want to go and we want to

supervise and we want to sponsor and we want to teach ....getting my administrators to do modeling of proper behaviors and role modeling and following procedures was real important....". In servant leadership, another aspect of flow, leaders let others lead. Leaders relinquish their fear of failing, place their trust in others and foster the acceptance of group goals. Doris watches and applauds, saying, "They were coming up with wonderful ideas and they worked, but they were allowed to come up with the ideas."

While Doris displayed all of the leadership dimensions outlined by Leithwood, she was especially strong in articulating the vision, fostering the acceptance of group goals, and providing an appropriate model. It appears that these three dimensions were integral to the way in which Doris led her staff. When she reflected, "I got to be the winner because I am coachable," she may have highlighted a major component of tacit knowledge. But Doris is distinguished as an expert not only because she internalized the coaching of her mentors, but because she has continued to stay in the game alongside of her staff.

Summary

This chapter examined the data obtained from interviews with six principals to determine how tacit knowledge was used by expert and novice school leaders. Two research areas were central to this study: First, the study explored possible differences in tacit knowledge between expert and novice principals. Second, it investigated the manifestation of tacit knowledge within Leithwood's dimensions of leadership. In addition, other themes and categories emerged that were indicative of tacit knowledge

areas identified through research. These additional categories were examined in terms of how tacit knowledge and expertise were manifested among principals in problem solving situations.

The methodology I chose for this study was a modification of the critical incident technique undergirded by a phenomenological perspective. It was as important to me to hear the rendering of discrete incidents in the past as it was to examine recent incidents with the advantages of the fresh memories of principals. I then horizonalized the information and developed textural-structural descriptions for each principal. As the various portraits were painted, differences, inconstancies, and strengths emerged to generate a composite view of how tacit knowledge was accessed and used by each school leader.

CHAPTER 5

SUMMARY OF FINDINGS, IMPLICATIONS, AND RECOMMENDATIONS

While I had originally planned that the summary and analysis of results would address the research questions separately, I found that this would be impossible. As the study progressed, it appeared that there was an overlap between the two research questions and that they were so closely related that this distinction would blur the major findings. This was because the second question, which related to the dimensions of leadership, turned out to be embedded in the first question, which dealt with determining if there were differences between how experts and novices used tacit knowledge. Although this relationship became evident as the analysis proceeded, it should be noted that instead of operating as a second question as in the original research design, the dimensions of leadership served to provide greater detail regarding the contextual aspects of leadership. In brief, certain situations or incidents tended to ignite one or several dimensions while often leaving others in darkness.

Before discussing the central findings of this study, this chapter will include a discussion of the factors that obfuscated a clear comparison of the tacit knowledge of expert and novice principals. These two factors were as follows: first, the varying experiential backgrounds of the principals; and, second, the differences associated with elementary and secondary principal leadership. Next, areas that shone a beam on tacit knowledge will be reviewed. These areas included the advantage of context afforded by viewing specific situations and the emergent categories that were found to be important in determining how tacit knowledge was used by principals. Finally, the tacit

knowledge within the leadership dimensions identified by Leithwood will be summarized, followed by summaries of how tacit knowledge was used by expert and novice principals.

The Experience Factor

I framed the first research question in order to determine if there were differences in how tacit knowledge was demonstrated in novice and expert principals as they engaged in problem solving. At the onset of the study, my intention had been to compare seasoned principals with their unseasoned counterparts. However, the similarities in background between the principals at the elementary and secondary levels may have limited the possibility of generalizing the findings from the data. While results indicated that there were differences between expert and novice principals in how they used their tacit knowledge in problem solving situations, these differences were somewhat moderated due to the prior experience of novice principals. As the interviews progressed, it became clear that the intent of the study, to compare experts with novices, or to those who possessed limited principalship experience, might be muddied by these prior administrative experiences of the novice principals. While no novice principals had been in their positions a full year, two novices had extensive previous experience in administrative support positions. Once again, my own familiarity with school leadership led me towards this realization. Having seen assistant principals perform all of the duties of school principals in the absence of their principals, I knew that assistant principals are presented with numerous opportunities to accumulate tacit knowledge. The same was true of another novice principal, who had

been an administrative assistant. Once she described her previous experience, it was clear that this position was also like that of an assistant principal.

These opportunities for the accumulation of tacit knowledge in previous administrative positions did not result in the same advantages for all the participants in the study. For example, Brian, entered this study as a novice principal, with several years of administrative experience. His lack of accumulated tacit knowledge might mean that he did not have sufficient opportunities as an assistant principal to acquire sufficient tacit knowledge. On the other hand, it seems plausible that this finding might confirm previous research in other fields pointing to the conclusion that tacit knowledge is not accrued evenly, and some individuals may never gain sufficient knowledge for expertise. Another interpretation may simply confirm the initial guidelines of this study: expert principals must function as school principals for a minimum of five years. However, this conclusion would not illuminate how tacit knowledge is actually accrued and acquired, which is the goal of this study.

What became most interesting in this examination of the tacit knowledge demonstrated by Brian appeared to be that he had not significantly progressed in eliminating emotional reactions to problems. The prior incident that he related when he was an assistant principal provided the opportunity for tacit knowledge accumulation. In that situation, he may have been at fault in two areas: First, his initial decision to go to the middle school to let them know that they had mistakenly sent records of promotion to the high school may have shown poor judgment. Second, when his comments or body language at the middle school left staff with feelings of intimidation,

he had an opportunity to confront the reality that he needed to improve his interactions with support staff. Also, in both the prior incident at the middle school and the current one with the maintenance staff at the high school, he did not spend sufficient time on an initial understanding of the problem. In both cases, he had not yet acquired the long-range vision to use his tacit knowledge effectively in interpersonal communications.

However, for the purposes of this study, Brian's behavior did serve to show how tacit knowledge is acquired and the length of time that may be necessary for some individuals to have accumulated sufficient tacit knowledge for successful leadership. Individuals do differ in how they acquire tacit knowledge. For example, by the end of her first year as a principal, Jessica had resolved the problems that appeared before her and was looking forward to an active leadership role in her second year. On the other hand, the issues related by Brian were more serious and had not dissipated by the end of the year. Experience alone did not appear to be the critical factor in how tacit knowledge was acquired and used by principals.

In addition, it was previously decided that the study would offer greater balance if three secondary and three primary school principals were selected as participants. The possibility for prior experiences presented an even greater likelihood at the secondary level, where principals usually serve in the roles of assistant principals prior to assuming principalships. This was especially true for Brian, who had five years of administrative experience prior to assuming his current position as principal. Jessica also had several years of experience as an assistant administrator at the middle school level prior to her current position as an elementary school principal. The only principal

who appeared to lack the experiential advantage of a prior leadership position was Melissa. Although Melissa had held the position of curriculum specialist, this position is very different from that of an assistant principal.

Elementary and Secondary Leadership Factors

As I examined the data, differences between the roles of the elementary and the secondary principals in this study emerged. These differences became important as I sought to determine how tacit knowledge resided within the leadership dimensions identified by Leithwood. Elementary principals tended to be more directive. While they encouraged staff participation and sought to empower teachers, at some point, they felt it necessary to orchestrate solutions for staff. For example, the expert elementary school principal, Cathy, related the process she used to change the planning schedule for the teachers as follows:

> I just said, 'This is what I know about collaborative planning time based on my involvement with the faculty in 1997 when it was passed and here is my perception of what the time is supposed to be used for. Here's how I propose to use it.' And then I just kind of laid out a schedule, and no one ever questioned it or complained.

The foregoing example may be contrasted with that of the expert high school principal, Doris, who also wanted to make changes in teacher planning schedules and student class schedules. This principal shared her strategy as follows:

> And I kind of put little ideas in their mind about what kinds of things make a school a school....So what I really wanted them to do was come up with a

> way to have more teachers on campus....And they came up with about four different things they wanted to do.....I kind of put a little bug in their ear [sic], "why do we have to have the schedule? Could it be a smaller schedule?" And they came up with the Blue and Gold schedule so the kids would go to four classes a day and the teachers would teach three and have a long period of time in order to plan and work with one another.

While Doris did appear to have accumulated a bank of tacit knowledge that was exceptional, the differences between the manner in which the two principals arrived at scheduling changes may not solely be the reflection of a shortage in tacit knowledge in the elementary principal.

Instead, it became clear to me that because elementary and secondary schools are organized and operated differently, they may require different leadership skills. While the leadership qualities that distinguish elementary leaders from secondary leaders was not the focus of this study, the contrast that emerged between the levels in terms of how tacit knowledge was used was pertinent to the findings of this project. In fact, it appears that an unanticipated secondary finding generated by this investigation of tacit knowledge may be as follows: Tacit knowledge is often used differently, but not less effectively, in the elementary and secondary levels.

The Contextual Lens

Contextual issues also played a critical part in how tacit knowledge became visible in this study. One means of illustrating the differences exhibited in this area was by contrasting the thinking of Doris, an expert principal, with that of Brian, when both

entered potentially confrontational situations with support staff. As he reflects upon the confrontation, Brian says the following:

> Maybe I wasn't smart enough to pick up that there was some mistrust to begin with, but I don't know that I can reestablish the trust.....And so, in talking about doing the job, I say, "Here's how we are going to play it –" but when he's not doing his job, you know what – if he wants a boss, he just got one. And I don't like to play that role; I don't want to play that role with an adult, you know.

In contrast, Doris describes encountering a cafeteria problem created by a change in dispensing lemonade at lunchtime as follows:

> You know and I don't blame her; she's working for five dollars an hour and she's going, "I've got to do more stuff now."....I think if I would have pitched a fit it would have been a big deal...by saying, "I'm going to write a memo, – I'm going to go to your boss," and then do all these kinds of things, it would have turned into a nightmare.

Doris chose to defer the confrontation in order to handle it quietly, in a way that ultimately gained the respect of the worker, as evinced by the following comments:

> And God bless her, the next day we had a retirement banquet, and she came up to me and said, 'Doris, I just wanted to tell you that you were so right about that, and I just felt like I needed to gain control...I learned that I don't have to fix everything just right this minute; I can think about it. I'm going to buy you lunch tomorrow!

Consistent with the findings described in the earlier review of research, this expert principal was able to use context more effectively than did the novice principal. While Doris was aware of the frustrated instructional staff in the cafeteria who were looking to her to make an instantaneous decision, she was also aware of the predicament of the cafeteria workers and intuitively grasped their situation. Using a metaphor from organizational studies of tacit knowledge, Brian acted as a *silo*, a separate unit, while Doris worked within a network of collaboration (Koenig, 1999, p. 24). As shown in the earlier research, individual repositories of tacit knowledge are most easily identifiable in context. These parallel situations allowed tacit knowledge expertise to be magnified for examination.

Emergent Categories

Some types of thinking, such as thinking involving second order change, were not demonstrated by all of the expert principals in this study. This, too, may have been related to the critical incident methodology. While if-then thinking was displayed by all of the expert principals, it was also displayed by the novice principals. However, the novices tended to use this type of thinking to reflect upon the incident after it occurred. In those cases, the novices thought about and arrived at different courses of action that would have been more effective than the actions they had already taken to resolve a problem. The experts used if-then thinking during the problems. This allowed them to automatically select one course of action among alternatives.

Experts spent more time on values clarification early in the problem stages, and did so more continuously than did novices. For example, when Doris wanted the staff

to change the organizational aspects of the school, she spent time with them initially. She asked questions such as, "What would you like us to be?" These questions initially engaged the staff and involved them in the planning for change. When Brian agreed to meet with the maintenance staff members, he approached the meeting defensively. He felt that they were set to attack him and he responded as if engaged in an adversarial combat situation. While he did spend time listening to their complaints, he had no alternative plan for addressing the issue. Instead, he evinced the inappropriate scanning described earlier in this paper. This occurred because he had focused upon the wrong information as he listened to the workers. Instead of tuning in to their underlying discontent, he looked at the surface of the problem and grew angry at all the issues they raised. When he reacted emotionally and cursed at the staff, all hope of cooperative problem solving was eliminated. With greater ability to effectively combine domain knowledge and if-then thinking, the expert principals did not succumb to such mixed emotions. When Jeffrey approached the evening custodian about the damaged ceiling, he had already identified the school plant as one of the areas that the entire staff would work together to improve that year. He had called for and completed a custodial audit of the campus at the beginning of the year and had input from the teachers and the custodians regarding areas of improvement. When the employee responded negatively, Jeffery calmly and automatically initiated consequences and knew how these consequences would be received by both the custodial and non-custodial staff. Like the other experts, Jeffrey appeared to have greater access to internally viewing and

discarding alternative scenarios and to have understood the problem or situation prior to engaging staff in defining or developing solutions.

Leadership Dimensions and Tacit Knowledge

For the most part, all of the principals made reference to the six leadership dimensions outlined by Leithwood. Expert secondary principals tended to think and act upon the following dimensions identified by Leithwood: identifying and articulating a vision and fostering group goals. The expert elementary school principal focused upon identifying and articulating a vision and providing individual support. The novice secondary principal focused upon providing individual support to his assistants and to his staff. The elementary novice principals focused most upon fostering the acceptance of group goals. The lack of differentiation among the various leadership dimensions by the principals may have occurred because they tended to focus upon relating a critical incident, as set forth in the original study design. While articulating a vision is integral to many problems encountered, providing intellectual stimulation may not be as prominent in problem solving. As they told other stories and reflected upon their responses, they alluded to the dimensions of leadership when they were related to the incident. The dimension of high performance expectations was the one most minimally discussed by principals, but it was evident through implication. The second least referenced area was intellectual stimulation. One principal, Jeffrey, stands out due to his numerous references to all of the leadership dimensions. Since Jeffrey was the most experienced of any of the principals, it may be that his tacit knowledge of the dimensions of leadership enabled him to thread them though his reflections.

Novice Principals and Tacit Knowledge

Upon examining the obstacles faced by the elementary novice principals, commonalties existed that were not apparent during the interviews with expert principals. Both of the novice principals perceived situations differently than did their elementary level expert counterpart. Melissa perceived a situation in which the staff were again asking questions about a topic that she believed she had already covered. Jessica experienced uncertainty regarding her domain knowledge and mixed feelings about her decision to quell a staff disagreement at a staff meeting by assuming the scheduling task herself.

While the novice principals engaged in thinking about their strategies in a format that was metacognitive, they did so after a disruptive incident rather than before or during the incident. Oftentimes, they chose to wait to address a problem rather than doing so at the time it occurred. In other cases, when novices did think about an incident as it transpired, they lost their perspective and reacted emotionally. If the particulars of an incident did not conform to what they imagined to be the direction and outcome of a problem solving activity, they tended to lose sight of their goals. They lacked the ability pointed out by Leithwood and Steinbach (1995) to create a mental map of alternative courses of action.

Novices appeared to lack a complete understanding of the social and political ramifications of their actions. Surprisingly, the articulation of these areas was not neglected by the novice principals. Yet, there appeared to be a disconnect between the articulation of their beliefs and the manifestation of them in the complex realities of the

public sphere of school administration. For example, Melissa stated that she used consensus-building techniques and placed teachers on site decision-making teams. When Melissa received the survey results and found that she had received the lowest possible rating in whether staff felt that they had input into the decision-making process, Melissa objected to these findings, stating, "I hardly ever make a decision, and that's that. That's what surprised me." She went on to say that she raised the subject at a later staff meeting and told the teachers that they needed to let her know if and when they thought she was ineffective. She expressed it to them as follows: "I'm doing what I think a good leader does – So if you don't interrupt my journey, my path, I'm not going to know that that's not working for you." As one teacher left the meeting, the teacher asked her, "Was a four good or bad?" Melissa then concluded that "maybe this [the survey] wasn't worth so much anyway."

The foregoing example suggests that what novice principals are likely to say and to believe may not accurately represent the truth of a situation. As a researcher with school leadership experience, it was essential for me to maintain the required epoche; yet, at the same time, it was important to understand the situations described by the principals and find the noetic substance of the noemata presented in the reflections so as to arrive at the truth of events. The noetic, or the explication, occurred from the noema, the perception of the phenomenon of the meeting. The noema of the meeting for the principal was responsible for her rendition of the facts and her interpretation, or sense-making, of them. Her perception did not appear to reflect the feelings of the staff.

When there appeared to be a contradiction between the interpretation of the principal and that of others, the invariant constituents within the data relating to the specific incident served as the guide towards reaching a decision that was unfettered by either the bias of the principal or by my own biases as a school administrator and researcher. In this case, the novice principal had described her typical method of decision making as a consensus-building; yet, the incident appeared to yield a different perception shared by the staff. Ultimately, a structural description was presented that reflected the researcher's perception of the problem confrontation and resolution experienced by this novice principal. It appeared that Melissa felt all of the stress and anxiety that occurs when novice principals are immersed in confrontations with staff. This issue took several months to subside. Afterwards, Melissa said the following, "I learned to listen – not that I wasn't – I've learned to calculate what you're going to do." Most important is the embedded comment, "not that I wasn't." This is really the crux of the tacit knowledge conundrum for many new leaders. While it appears that they have been doing what they always were doing, there is a new and major difference in the way they think about what it is that they are doing. For Melissa, this represented a watershed of enlightenment. Undoubtedly, she will still experience difficulties as she learns from each new situation. However, the difference is that she learned *how* to learn.

Like all principals, novices encounter potential obstacles in either group or individual settings. Novices first attempt to make sense of information that appears to be conflicting. The novice then usually presents a plan of action to the staff with

minimal consideration of alternative views. If the situation occurs spontaneously, the novice feels tempted to arrive at instantaneous decisions. These decisions often run concurrent with feelings earlier described as "doubts about professional legitimacy" (Hart et al., 1996, pp. 13 –15). The novice then becomes emotionally involved with the outcome. Oftentimes, the problem escalates to another level.

When the novice is faced with making decisions during staff meetings, the novice has usually planned ahead and has imagined a preferred outcome. The novice then confronts the group, speaks with feelings of honesty to them, and is sometimes greeted by silence or by a few questions. The novice typically looks at the surface response and does not see the tacit communication from others. The novice makes conclusions based upon appearances, and proceeds with a plan of action. When the discontent among the staff escalates, the novice is confused because the seemingly accepted plan of action did not follow the predetermined course. As the novice gains experience, the novice begins to understand that unspoken signs of communication can be powerful. The social elements that are implicit in face-to-face meetings of potentially confrontational situations are paramount to their resolution. Issues as subtle as class conflict cannot be overlooked. Only though continuous sense-making will novices be able to accumulate sufficient tacit knowledge to intuit the feelings of the staff, who will not always be forthcoming in raising their objections.

For these principals, the timing of responses to obstacles was critical. In several cases, the novices reacted quickly to perceived attacks or situations that appeared to be accelerating beyond their control. When the rebuffs from those administrators were

transmitted among the staff, an underground network of sympathy was created for those who felt injured during a negative verbal exchange. Staff responses snowballed into a larger resistance that threatened to undermine the efforts of those principals. What may have begun as a controllable situation became ominous and unsettling to many other staff members. In one case, the situation was most likely communicated to Governing Board members as well. These reactions by novice principals followed the Model I governing values outlined by Argyris. In confrontation situations, novice principals became defensive, acted rashly, and jeopardized their relationships with their staff.

Expert Principals and Tacit Knowledge

One distinguishing characteristic of the expert principals that emerged from this study was the calm assurance they brought to solving problems. This demeanor was similar to that described by Leithwood and Steinbach (1995), when they noted that experts, unlike novices, do not perceive problems as *crises*, but as subunits within larger problems (p. 312). They tended to handle problems more quickly than did the novice principals. Of course, to some degree, even non-expert principals with experience will not confront as many critical issues because experience helps even typical principals avoid crises. Yet, the distinction between experts and non-experts, as evident in this study, was in the accumulation of tacit knowledge so that expert principals engaged in more productive, collegial, and rapid problem solving. It appeared that experts had developed a sufficient repertoire of responses to unanticipated obstacles so that these were handled with ease. Experts knew which problems required forceful resolution and which problems would best be solved with diplomacy. Most importantly, the experts

seemed to possess a greater understanding of the social demands and repercussions of their actions. They appeared to have greater analytical skills for initial problem analysis than did novices.

Experts began with a more encompassing vision than did novices. The vision extended beyond the particular staff meeting or sudden encounter with an unforeseen problem. Experts were more likely to have articulated the vision to the numerous levels of staff in the organization. Experts tended to be more inclusive in their thinking and to find ways to translate their implicit thinking into their actions. Experts gained the trust of their staff by showing respect for them in ways that were valued by others. Experts appeared to draw upon their tacit knowledge to find ways to solidify the sense of value and trust perceived by the staff. They understood the ramifications of the divisions caused by class in the workplace and worked effectively with individuals from all levels of the organization. Experts intuitively grasped the effects of powerlessness and put in place continuous structures to empower others in the organization. Experts did not feel threatened by staff members who did not perform to expectations. They had an internal sense of the mission of the organization and used that as a guide when confronting obstacles. Experts were less likely to feel stressed during potentially hostile situations. They engaged in more if-then thinking than did novices and were not stymied by perceptions of roadblocks in their intended course of action.

In fact, expert principals appeared to view roadblocks like skillful downhill skiers regard a slope of moguls before them. The feelings of *synergy* described by the expert principal in this study may be no different than the *in flow* experience of the

proficient skier who carves rhythmically through troughs of blue ice and becomes weightless in untracked powder. This exhilaration of precise, split second decision-making when facing novel experiences eludes easy description, as noted earlier by Csikszentmihalyi and Csikszentmihalyi (1998). It is clear, though, that the opportunities for growth increase as problems become more formidable. The expert principals in this study appeared to possess the confidence of athletes who savor the opportunities to face increasingly complex challenges in order to reach higher levels of prowess.

Summary

All of the principals in this study made reference to some of the dimensions of leadership identified by Leithwood. Expert secondary principals tended to think and act more upon identifying and articulating a vision and fostering group goals. The most referenced dimension of leadership for the secondary novice principal was providing individual support to his assistants and to his staff. The elementary school expert principal focused most upon identifying and articulating a vision and providing individual support. The elementary novice principals focused most upon fostering the acceptance of group goals.

While expert principals manifested tacit knowledge in ways that enabled them to approach and solve problems successfully, it could not be concluded that all novice principals will proceed to the expert level after several years of experience. Based upon the background of the novice principals, although experience was evident in some cases, problem solving did not reflect a direct relationship with experience. In fact, one

novice, Jessica, appeared to have less difficulty in her first year as principal than did another novice who had more administrative experience. It seems, then, that the accumulation of tacit knowledge may be even more important than experience to those principals on the path to expertise.

All principals demonstrated extensive metacognitive strategies, in which they thought about their thinking regarding complex problems. However, novices tended to do so after situations occurred. Novices often waited a lengthy time before they chose to deal with problems. Experts approached the problems with a broader perspective and appeared comfortable addressing the problem immediately. While experts tended to be calm and confident in their approach to difficult problems, novices spent substantial time after confronting the problem in anxious deliberation about possible solutions. Novices used words such as "dread," to describe the feelings about problem resolution. They used words such as "battle," to describe their preparation for tempestuous staff meetings to deal with unresolved problems. On the other hand, the solutions of experts tended to show more collegiality and a thorough understanding of each of the subgroups or stakeholders involved in the problem. While novices knew that they were different from those they led, they did not know how to use those differences in social class or position effectively. Table 2 presents a chart that contrasts the ways in which tacit knowledge was used by expert and novice principals.

An unanticipated finding was that the ability to build and maintain strong relationships with staff was most often articulated by all of the principals. The expert principals possessed a greater supply than did the novices of the tacit knowledge for

Table 2

Contrasting Characteristics Of Tacit Knowledge as Used by Expert And Novice Principals in Problem Solving

Expert Principals	Novice Principals
Relaxed, calm	Anxious; sometimes emotional
Leadership Dimensions: identifying and articulating a vision, fostering group goals, and providing individual support	Leadership Dimensions: providing individual support and fostering the acceptance of group goals
Rapid	Preferred to delay problem solving
Collegial approach	Often done in isolation
Used context effectively	Decontextualized solutions
Understood issues of social class	Incomplete understanding of polarizing class issues
Substantial if-then thinking	Minimal if-then thinking
Substantial repertoire of responses	Limited repertoire of responses
Early and continued values identification	Identification of values in isolation
Model II (Argyris and Schön, 1974)	Model I (Argyris Schön, 1974)
Extensive initial problem analysis	Minimal initial problem analysis
More inclusive thinking	Less inclusive thinking
Structured empowerment of staff	Limited, unstructured empowerment
Effective use of interpersonal skills	Interpersonal skills used less successfully

understanding the value of specific ways to gain staff trust and to interact supportively with staff.

Suggestions for Further Research

Future researchers may wish to study a larger group of principals at either the elementary or secondary levels. In this study, it became apparent that there were differences in the outlook and methods of leadership used between the two groups. Although the difference in this study offered additional insights between the two groups, it would have been useful to obtain more permutations within groups. This may also be

related to the small sample size. While the small size allowed one researcher to complete this study within a limited amount of time, a larger sample size would offer the benefits of greater validity.

Another means of increasing validity is triangulation, which Webb et al. (1965) originally defined as a method to confirm findings by using "two or more independent measurement processes" (p. 3). In their discussion of this technique, Miles and Huberman (1994) added a fifth type of triangulation to the four previously identified by Denzin (1978). These five triangulation methods include research using various combinations of data, methods, investigators, theories, and types of studies (Miles & Huberman, p. 79). In the case of this project, additional research might include interviews from superintendents and teachers to offer several perspectives upon the insights presented by the principals. The observation of Mathison (as cited in Miles and Huberman, 1994) that such methods may increase reliability more than validity seems

especially pertinent in this case. Since this research seeks to investigate how tacit knowledge is transformed and employed among novice and expert principals, the conclusions of other staff members may be based upon factors unrelated to implicit knowledge. However, additional views from staff members may contribute to school designs that are aimed at developing expert leaders who create schools with high achieving, dedicated staffs and students.

It may also be beneficial to employ a team of researchers to remain on school sites so as to observe novice and expert principals in action. While the opportunities for reflection allowed this researcher to re-examine situations and discuss the ways that obstacles afforded opportunities for the growth of tacit knowledge, even more information might have been obtained through an action research model. If situations were examined as they occurred, then they could be reviewed with the principals and observations would be paired with recollections. Another advantage of this type of research is that it offers immediate opportunities for change.

The above strategy might also serve to open a wider path towards the opportunities for the collection of tacit knowledge. Although it would still be recommended to continue with a critical incident approach, it should be formulated with the goal of collecting numerous stories from all of the participants. As was found to be the case in this study, a more comprehensive view of how tacit knowledge affected performance was achieved by examining several stories from each principal.

Another area of research would be to investigate the impact of training models upon the accumulation of tacit knowledge of principal trainees. It is clear that

experience alone does not always bring about expertise. Instead, expertise occurs when accumulated tacit knowledge is effectively used by principals. It seems urgent then, that future study be initiated to determine if and how the accumulation of tacit knowledge can be accelerated. There were indications in this study that it may be more difficult for some individuals than others to gain this type of knowledge, even with years of experience in assistant principal positions. If aspiring principals are able to address identified areas of weakness in numerous situations over a brief period of time, will these opportunities enable them to gain the skills they need more quickly? In addition, it appeared that two of the novice principals reflected upon situations in ways that would not be conducive to future problem solving. How, then, can novice or aspiring principals be assisted in their reflections upon incidents in order to improve their leadership skills? If mentoring programs are the answer, how will mentors gain the trust of aspiring principals? Can mentors be taught to peer into the minds of the tyros, shape the metacognitive process, and accelerate their transformation into expert leaders? Based upon the information collected, the training models for principals will need to be dynamic, interactive, and intensive in order to expose them to the situations that will increase their skills. Such training opportunities must also allow time for reviewing problematic situations with experts so that leadership solutions appear to be nearly as easy, and as automatic, as navigating among the icons on our computers.

One final area for research lies in exploring change models using the identification, control, and transmission of tacit knowledge within the field of the educational leadership. In the arenas of business and industry, knowledge management

has generated multiple models for the control of intellectual capital (Koenig, 1999). However, while numerous attempts have been made to make tacit knowledge explicit, for the most part, change has occurred in only the more clerical, mundane tasks (p. 24). One reason for the lack of success in making tacit knowledge explicit has been that employees have not been given sufficient incentives to share their knowledge. According to Hayek (in Shearmur, 2000, p. 33), it was less the coordination of the manager that resulted in superior products than it was the "spontaneous" cooperation of the workers as they joined together in production. For Hayek, it was essential to recognize that knowledge is "socially disaggregated," meaning that it is the result of a community of workers sharing their information within a specific work culture (p. 33).

In school organizations, employees ranging from computer technicians to teachers possess knowledge that is tacit and unavailable to the principal. These employees often hold knowledge that is not specifically circumscribed to their contractual assignment, but that might be very useful to the school organization as a whole when engaging in problem solving or the change process. In addition, employees hold knowledge that is integral to the organization as a community (Spender, 1996, p. 75). The high school English teacher, for example, may know how to gain teacher support for after-school programs.

When principals, or any leaders of large organizations, make decisions using only their own knowledge, they run the risk of making two mistakes: First, with incomplete knowledge of the organization, they may reach incorrect or partial solutions; second, they may cause resentment among those staff members who are deprived of

participating in the decision, as occurred in this study. When either leaders or employee groups make decisions or solve problems without sharing information, resentment occurs because the other group becomes disempowered through the lack of information Bordum (2002).

For some principals, this control of tacit knowledge becomes an ideological weapon when it is used as a "veil for power" (Bordum, p. 52). Further research might look more closely at the ways tacit knowledge is used within the school organization as a means of social oppression. Such research would also examine innovative models of knowledge sharing and incentives provided to staff members for sharing their tacit knowledge in ways that create a more egalitarian school organization. By making tacit knowledge public, as suggested by Bordum (2002), the very basis for oppression may be dismantled. Knowledge would no longer remain a threatening tool available to certain privileged individuals. By increasing the open communication of tacit information, the school community would truly be empowered to provide better services to students, families, and employees.

APPENDIX A

NESTOR-BAKER INTERVIEW PROTOCOL: SENSE-MAKING REMINDERS AND INTERVIEW QUESTIONS

First Interview

"Tell me a story about an experience you have had as a school administrator from which you learned a lesson about leadership.

Sample Probes

- How did you feel? What do you think others were feeling?
- How did you put that into action? *or* What did you do?
- What were you thinking about during this?
- What were some of your other options? *or* What do you think people in this situation usually do?
- What happened? *or* How might it have worked out?
- What barriers did you face in the situation? How did you work through them?
- Have you had a similar experience/challenge/problem before? If so, please tell me about that.
- Have you had a similar experience since this one? If so, please tell me about it.
- How will you handle a similar experience if it happens in the future?
- Are/were there any positive or negative outcomes?
- What did you learn from this experience? *or* What did you think about his experience later on?" (Nestor-Baker, 2001)

INTERVIEW PROTOCOL (Continued)

Second Interview

Questions will extend/clarify and make meaning from the information acquired from the first interview (Seidman, 1998, p. 15).

APPENDIX B

SUBJECT'S CONSENT FORM

Investigation of Tacit Knowledge in Principal Leadership

I AM BEING ASKED TO READ THE FOLLOWING MATERIAL TO ENSURE THAT I AM INFORMED OF THE NATURE OF THIS RESEARCH STUDY AND OF HOW I WILL PARTICIPATE IN IT, IF I CONSENT TO DO SO. SIGNING THIS FORM WILL INDICATE THAT I HAVE BEEN SO INFORMED AND THAT I GIVE MY CONSENT. FEDERAL REGULATIONS REQUIRE WRITTEN INFORMED CONSENT PRIOR TO PARTICIPATION IN THIS RESEARCH STUDY SO THAT I CAN KNOW THE NATURE AND RISKS OF MY PARTICIPATION AND CAN DECIDE TO PARTICIPATE OR NOT PARTICIPATE IN A FREE AND INFORMED MANNER.

PURPOSE

I am being invited to participate voluntarily in the above-titled research project. The purpose of this project is to investigate the tacit knowledge of expert and novice principals and to determine the domains of leadership exhibited by each group. The following research questions will be investigated: 1.) Is there a difference between the tacit knowledge demonstrated in problem solving situations between principals recognized as "expert" and novice principals? 2.) How is tacit knowledge manifested among the seven dimensions of leadership as identified by Leithwood?

SELECTION CRITERIA

I am being invited to participate because I have been identified by professors in the Educational Leadership Department as either an expert or novice principal based upon my years of experience in the position of principal. Novice principals have completed two or less years as a principal; experts have completed five or more years as a principal. throughout the U. of A. Educational Leadership program. Six participants were selected from the following school districts: Sunnyside, Flowing Wells, Tucson, and Marana.

PROCEDURE(S)

The procedures used will consist of audiotaped interviews. Each participant will be interviewed twice. The second interview will include a review by the participants of the information collected at the first interview to ensure that the content accurately expresses the narration as presented. It will also offer an opportunity for the participant to reflect upon the information presented at the first interview and add details to the narrative. The central district office is not involved in this study and my views will not represent those of the district.

RISKS
While no known risks are likely to be encountered, the psychological effects of introspection may pose a minimal amount of anxiety. The researcher will take steps to put me at ease prior to the two sessions. I may refuse to answer any question or wthdraw from the study at any time.

BENEFITS
There are no guaranteed direct benefits, but the study offers an opportunity to gain greater insight into the administrative skills of principals and the applications of tacit knowledge.

CONFIDENTIALITY
As a protection of my anonymity, I will be requested not to place my name on any material associated with this study. Since the method employed in this research is an oral interview format, I will be identified by a pseudonym during the data collection and analysis portions of this study. My identity will not be revealed in any presentation/publication that results from this study. Nor will my views be revealed to my school or school district. Only the Principal Investigator, Lorraine St. Germain will have access to my data.

PARTICIPATION COSTS AND SUBJECT COMPENSATION
No compensation will be paid for participation in this study. The personal time, approximately three to three and one half hours, will be the only cost incurred for this study.

CONTACTS
I can obtain further information from the principal investigator, Lorraine St. Germain, Ed.D. candidate, at (520) 577 – 0887. If I have questions concerning my rights as a research subject, I may call the Human Subjects Committee office at (520) 626-6721.

AUTHORIZATION

BEFORE GIVING MY CONSENT BY SIGNING THIS FORM, THE METHODS, INCONVENIENCES, RISKS, AND BENEFITS HAVE BEEN EXPLAINED TO ME AND MY QUESTIONS HAVE BEEN ANSWERED. I MAY ASK QUESTIONS AT ANY TIME AND I AM FREE TO WITHDRAW FROM THE PROJECT AT ANY TIME WITHOUT CAUSING BAD FEELINGS. MY PARTICIPATION IN THIS PROJECT MAY BE ENDED BY THE INVESTIGATOR OR BY THE SPONSOR FOR REASONS THAT WOULD BE EXPLAINED. NEW INFORMATION DEVELOPED DURING THE COURSE OF THIS STUDYWHICH MAY AFFECT MY WILLINGNESS TO CONTINUE IN THIS RESEARCH PROJECT WILL BE GIVEN TO ME AS IT BECOMES AVAILABLE. THIS CONSENT FORM WILL BE FILED IN AN AREA DESIGNATED BY THE HUMAN SUBJECTS COMMITTEE WITH ACCESS RESTRICTED TO THE PRINCIPAL INVESTIGATOR, LORRAINE

ST. GERMAIN OR AUTHORIZED REPRESENTATIVE OF THE EDUCATIONAL LEADERSHIP DEPARTMENT. I DO NOT GIVE UP ANY OF MY LEGAL RIGHTS BY SIGNING THIS FORM. A COPY OF THIS SIGNED CONSENT FORM WILL BE GIVEN TO ME.

_____ _____

Subject's Signature Date

_____ _____

Parent/Legal Guardian (if necessary) Date

_____ _____

Witness (if necessary) Date

INVESTIGATOR'S AFFIDAVIT

INVESTIGATOR'S AFFIDAVIT

I have carefully explained to the subject the nature of the above project. I hereby certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

_____ _____

Signature of Investigator Date

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