ABSTRACT

Title of dissertation: EXPLORING THE RELATIONSHIPS OF TEACHERS' EFFICACY, KNOWLEDGE, AND PEDAGOGICAL BELIEFS: A MULTIMETHOD STUDY

Helenrose Fives, Doctor of Philosophy, 2003

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Teacher efficacy has been related to many positive educational outcomes (e.g., Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). However, a literature review revealed little research assessing the relation of teacher efficacy to pedagogical knowledge or pedagogical beliefs. This work explored the relations among these constructs. A proposed model was tested in which efficacy served as a mediator between teachers' demonstrated knowledge, pedagogical beliefs, and performance.

One hundred-twenty preservice and 102 experienced teachers completed a test packet that assessed demographic information, knowledge, efficacy, beliefs, and teachers' ability to assess common instructional situations. Three experienced high-

knowledge teachers with differing efficacy levels participated in in-depth interviews for instrumental case study analysis.

Correlational analyses demonstrated a significant relation for pedagogical beliefs and efficacy. The data for preservice and experienced teachers was fit to the proposed model and analyzed by path analysis. The resulting models differed for each group. Preservice teachers' knowledge related directly to performance, and did not relate to efficacy. Beliefs related to performance as well as efficacy. Experienced teachers' knowledge and beliefs related to teacher efficacy. However, efficacy was not related to performance. The relation between demonstrated knowledge and teacher efficacy was negative in nature, indicating that teachers with greater demonstrated knowledge tended to have a lower sense of efficacy.

Case study analysis revealed a tendency in these teachers to verbalize efficacy beliefs as explanations for not engaging in particular teaching practices. Teacher beliefs also emerged as a common theme in the case studies, specifically beliefs about the nature and evaluation of teaching.

This investigation confirmed the need to further explore the relations of teachers' knowledge, pedagogical beliefs, and efficacy. Of particular interest are the beliefs teachers hold about the value of pedagogical knowledge, the nature of teaching, and the knowledge content (e.g., subject matter) that is most essential for successful teaching. Future studies should explore in greater depth the interrelations of these constructs.

EXPLORING THE RELATIONSHIPS OF TEACHERS' EFFICACY, KNOWLEDGE, AND PEDAGOGICAL BELIEFS: A MULTIMETHOD STUDY

By

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DEDICATION

To my Mamacita, Ann B. Fives,

who funded this endeavor with

her heart and wallet.

and

To my Father, Robert E. Fives.

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Without the assistance and support of many people this dissertation would not be possible. First, I must extend thanks to my fellow graduate students who offered both their support and skills toward the completion of this document. Emily W. Fox generously offered her skills as transcriber and editor. Without this assistance I would still be listening to interview tapes in my basement. Wendy K. Richardson spent many hours in small rooms attempting to "think like me" in order to establish and implement successful scoring rubrics in this work. I also thank Michelle M. Buehl who has provided support, advice, and camaraderie throughout my doctoral experience. Moreover, Michelle established a standard for scholarship that I have strived to meet.

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I also thank my friends and family who put up with this unending project. I especially thank Gregg Ponitch, Jennifer Eller, and Rennae Kimbrough who offered extensive advice on the initial measures used in this document.

Above all I thank my mother, Ann B. Fives, for her love, support, and trust. She is the kind of educator and person I hope to be.

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CHAPTER I

INTRODUCTION

Teacher efficacy can be defined as teachers' beliefs in their abilities to organize and execute courses of action necessary to bring about desired results (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). Teacher efficacy is considered a future-oriented motivational construct that reflects teachers' competence beliefs for teaching tasks. The construct of teacher efficacy has become a pillar in the research on teachers' beliefs. The persistent interest in this construct lies in its continued predictive and relational power in research on teachers and teaching. Teachers' beliefs in their ability to perform tasks related to teaching have been and continue to be related to student achievement (e.g., McLaughlin & Marsh, 1978), student motivation (e.g., Midgley, Feldlaufer, & Eccles, 1989), teacher valuing of educational innovations (e.g., Cousins & Walker, 2000), classroom management skills (Woolfolk, Rosoff, & Hoy, 1990), and teacher stress (Greenwood, Olejnik, & Parkay, 1990). High efficacy teachers are also less likely to refer low socioeconomic status students and students with behavior problems for special services (Meijer & Foster, 1988; Podell & Soodak, 1993).

Research on Teacher Efficacy

Researchers interested in teacher efficacy have taken two paths in their investigation of this construct. These two paths include research on the development of a conceptual understanding of teacher efficacy (e.g., Gibson & Dembo, 1984; Guskey & Passero, 1992; Rose & Medway, 1981; Tschannen-Moran et al., 1998) and

research focused on how efficacy can be used to understand other relationships or outcomes in teaching situations (e.g., Allinder, 1995; Meijer & Foster; Midgley et. al., 1989). Researchers interested in the latter, seek to describe the power of teacher efficacy for understanding and improving teaching practice.

Conceptual Development of Teacher Efficacy

The first path taken in research on teacher efficacy has been followed by researchers interested in understanding the underlying theoretical nature of this construct. Researchers interested in understanding the nature of teacher efficacy have relied on two separate theoretical foundations. Therefore, the construct of teacher efficacy developed out of these two separate lines of research. The construct was coined by RAND researchers (Armor et al., 1976) who based their work on Rotter's (1966) locus of control theory. This led to an understanding of efficacy as: teachers' beliefs about their ability to control positive student outcomes in spite of circumstances external to the teacher or school (McLaughlin & Marsh, 1978). The second theoretical line of research that has guided the development of the construct of teacher efficacy is self-efficacy theory as proposed by Bandura (1977, 1993, 1997). Researchers have fluctuated between these theoretical conceptualizations as to the meaning of teacher efficacy.

Gibson and Dembo (1984) attempted to reconcile these views by creating a two-factor measure considered to reflect both conceptualizations of efficacy. The measure contained a general teaching efficacy factor, reflecting control beliefs, and a personal teaching efficacy factor, reflecting self-efficacy for teaching beliefs (Gibson

& Dembo, 1984). This measure found widespread use among the researchers interested in using efficacy as a means of understanding other phenomena. However, among the researchers seeking to understand the meaning of efficacy and its nature, debate ensued.

Guskey and Passero (1994) led the charge against the understanding of teacher efficacy suggested by Gibson and Dembo (1984). Specifically, Guskey and Passero (1994) demonstrated that the distinction between the two proposed factors of teacher efficacy may also be explained by means of internal and external control, as understood in Weiner's (1979) attribution theory. This demonstration led to renewed discussion over the meaning of teacher efficacy.

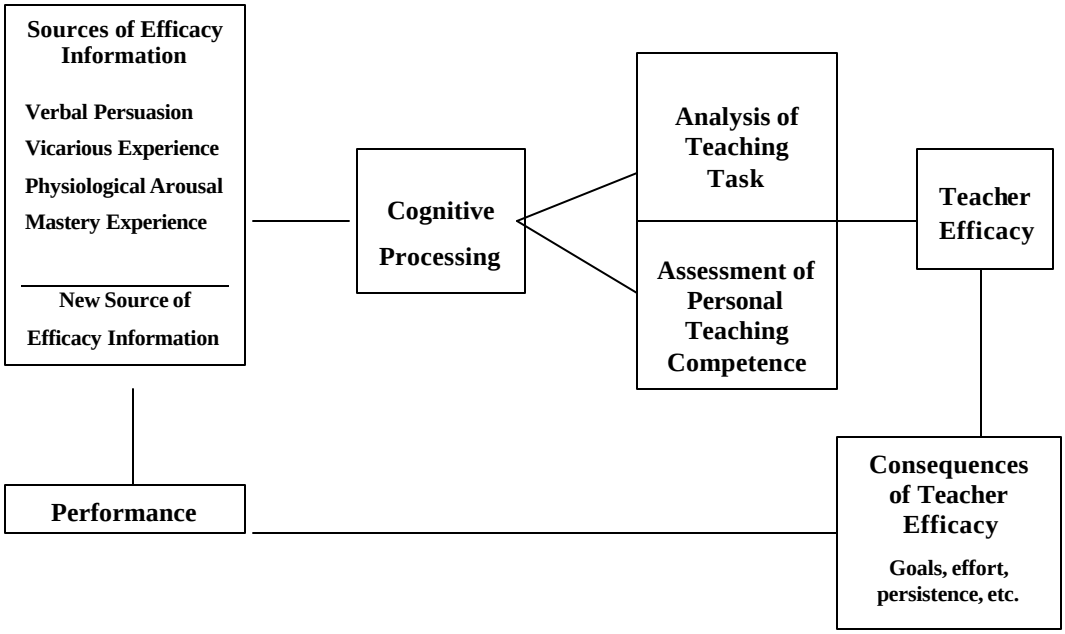
Tschannen-Moran, et al. (1998) offered an extensive review of the construct of teacher efficacy. This review closely outlined the development of teacher efficacy and the impact of the dual theoretical bases used to understand this construct. Further, Tschannen-Moran and colleagues made evident the importance of the measures used in assessing efficacy to the reported findings. This review concluded with a model that demonstrates the cyclical nature of a teacher efficacy model grounded in Bandura's self-efficacy theory (see Figure 1).

The Tschannen-Moran et al. (1998) model demonstrated the importance of mastery experiences, vicarious experiences, verbal persuasion, and physiological cues in influencing cognitive processing and, as such, teacher efficacy. Further, this model demonstrated the cyclical nature of teacher efficacy, as a belief that serves to aid in its own growth and development. However, this model did not provide explicit

information as to the nature of the efficacy sources that serve to impact efficacy beliefs and consequences. That is, what is the content and structure of mastery experiences, verbal persuasion, vicarious experiences, and physiological cues that influence teacher efficacy and, through efficacy, affect teacher actions positively?

Figure 1

The Cyclical Nature of Teacher Efficacy



Tschannen-Moran, Woolfolk-Hoy, & Hoy (1998, p. 228)

The Power of Teacher Efficacy

The second path of investigation that teacher efficacy researchers have followed relates to the power of teacher efficacy to explain desired outcomes. The power of teacher efficacy centers on its ability to guide the decisions that teachers make in the course of their instructional role. Specifically, teachers' level of efficacy

can guide their daily decisions, (e.g., selection of materials and amount of effort) and their willingness to use specific strategies and techniques.

Support for teacher efficacy as an influential construct in the teaching enterprise has relied heavily on the analytic methods of correlation, analysis of variance, multiple analyses of variance, and regression or multiple regression techniques. Regression analyses have demonstrated that teacher efficacy serves to explain the variance in teacher attitudes toward innovation (Cousins & Walker, 2000), degree of commitment to teaching experience (Coladarci, 1992), and student achievement (Anderson, Greene, & Loewen, 1988).

For example, Anderson and colleagues (1988) conducted a study in which two groups of teachers were compared based on their levels of personal teaching efficacy. The data collected were analyzed using correlation and multiple regression to determine which variables best accounted for student achievement. The analyses revealed that teacher efficacy contributed to student achievement in language arts and social studies, as well as to student levels of efficacy for achievement. Further, it was determined that the teachers' level of personal teaching efficacy held at the beginning of the year had a significant effect on the students' development of efficacy and their achievement.

This evidence demonstrates that teacher efficacy plays an important role in teachers' cognitive processes. However, the nature of this role has not been clearly defined. We know from prior research that efficacy is related to positive outcomes,

such as student achievement and teachers' persistence, despite adverse conditions. What we do not know is how this relationship is affected.

Knowledge and Efficacy

Raudenbush, Rowan, and Cheong (1992) suggested that teacher efficacy mediates the relationship between knowledge and action. The Tschannen-Moran et al, (1998) model echoed that position. The model, however, relied on general sources of efficacy rather than identifying the importance of the content of those sources in developing a teacher knowledge base that may impact efficacy and, through efficacy, teacher decisions and behaviors. Teacher efficacy and teacher knowledge, often considered independently, need to be considered in tandem (Raudenbush, et al., 1992). If teacher efficacy is a mediator between knowledge and action, we need to know more about what teachers know and how this knowledge affects efficacy.

A few researchers have looked at the extent to which teachers' knowledge relates to efficacy beliefs. Specifically, this body of work can be configured into three distinct categories based on the manner of knowledge assessment. The first category consists of studies in which formal education was used as proxy variable in understanding teacher efficacy. In these studies, teachers' knowledge was gauged by education level (e.g., Hoy & Woolfolk, 1993) or as courses taken (i.e., Enochs, Scharmann, & Riggs, 1995). The second category focuses on the learning experiences of teachers or teacher education students as measures for knowledge. These specific learning experiences are identified in such a way so as to convey an expectation of specialized knowledge (e.g., experience teaching in an inclusive setting: Minke, Bear,

Deemer, & Griffin, 1996). The final category includes investigations that assess participants' demonstrated knowledge through paper and pencil assessments (e.g., Emmer & Hickman, 1991) or their performance through supervisor ratings (e.g., Trentham, Silvern, & Brogdon, 1985). The focus of research relating knowledge to efficacy has been to compare levels of efficacy across groups of preservice or inservice teacher, or to identify correlational relationships between assessed knowledge and teacher efficacy.

A consensus has emerged across this research that individuals with higher levels of knowledge have higher levels of efficacy. One alternative to this finding was reported by Enochs and colleagues (1995) who found significant negative correlations between preservice teachers' science knowledge (assessed by number of science course taken in high school and college) and their efficacy for teaching science. In contrast, Schoon and Boone (1998) administered a paper and pencil test on alternative conceptions of core science principles and found that the students with the greatest number of correct answers also reported higher feelings of science teaching efficacy. Moreover, Schoon and Boone (1998) found that holding particular alternative conceptions in science was related to lower levels of science teaching efficacy. Thus, this contradiction and the limited amount of research that has been done in this area are evidence of the need for more specific and causal studies of knowledge and efficacy.

Statement of the Problem

The relationship between teachers' demonstrated knowledge and their teaching efficacy requires exploration. Teacher efficacy provides a powerful and unique tool for those convinced that one of the strongest routes to improving the education of individuals is through the improvement and development of teachers and teaching. The four sources of efficacy outlined by Bandura (1993, 1997) and included in the Tschannen-Moran et al. (1998) model identify possible sources for teachers' knowledge and knowledge beliefs. However, these sources do not identify the specific nature of those beliefs. Further, these sources do not specify what, if any, specific types or content of knowledge may lead to higher levels of efficacy and, as such, better performance. The consideration of the content of teacher knowledge and teacher pedagogical knowledge beliefs may provide direct links to teacher efficacy.

Additionally, the nature of teacher efficacy as it functions in the process of teaching also needs to be empirically investigated. Specifically, the role of teacher efficacy as a mediator between teacher knowledge, teacher knowledge beliefs, and performance should be analyzed. If this relationship emerges, it may offer clues to the structure and nature of teacher education programs and professional development activities.

Teacher efficacy emphasizes the power of individuals' self-judgments on decisions made and behaviors carried out. Through the development of an understanding of the role of efficacy in the teaching process and how it is related to the knowledge teachers hold we may be able to identify the means by which we can

improve the professional lives of teachers, and thereby in turn improve the educational experience of children.

Purpose

The purpose of the proposed study was to deepen our understanding of the relationship between teacher efficacy, teacher knowledge, teacher pedagogical beliefs, and intended performance. Further, this study investigated the potential of teacher efficacy as a mediator between teachers' knowledge, pedagogical beliefs, and subsequent actions. Toward this end, a series of research questions were devised and addressed through both quantitative and qualitative research methods.

Quantitative Questions

A quantitative research approach was employed to assess the relations between teacher efficacy, teacher knowledge, teacher pedagogical beliefs, and teacher performance. This approach garnered a descriptive understanding of the constructs of interest across a broad span of inservice and preservice teachers. Further, this approach allowed for some generalization of the research findings and explicit statistical analyses. These statistical analyses provided information as to the general themes and relations among the variables investigated in the study. Specifically, the eight questions addressed in the quantitative portion of the study were:

1. What relationships exist among teachers' knowledge, pedagogical beliefs, and efficacy?
2. Are teachers' task assessments and strategy awareness related to their levels of efficacy?

3. Does teacher efficacy mediate the relationship among demonstrated knowledge, knowledge beliefs, and performance?
4. In what ways do preservice and inservice teachers differ with regard to their levels of teacher efficacy, demonstrated knowledge, and pedagogical beliefs?
5. Do preservice and inservice teachers of differing levels of teacher efficacy demonstrate different levels of demonstrated knowledge, pedagogical beliefs and ability to assess teaching scenarios (i.e., task analysis and strategy awareness)?
6. Which strategies are more likely to be identified to address the pedagogical scenarios presented and to what degree do respondents have knowledge of teaching strategies that they are not likely to implement or consider best for the situation presented?
7. Are there any differences in the evaluation of strategies as "likely to use" or "best" based on respondents' demonstrated knowledge, pedagogical beliefs, or teacher efficacy?
8. What common groups of inservice teachers emerge based on demonstrated knowledge and teacher efficacy?

Qualitative Question

A qualitative research approach was used to illustrate the nature of the relations that exist between and among teacher efficacy, teacher knowledge, and teacher pedagogical beliefs in the context of individual teachers' practice. Qualitative research allowed for the pursuit of how and why questions (Greene, 2000). That is,

beyond the general understanding of how constructs interact across a broad range of participants that is afforded in quantitative methods, this qualitative approach provided a forum for developing an understanding of how efficacy influences teachers and teaching and why this construct plays such an influential role in the teaching process. Specifically, the question addressed in the qualitative portion of the study was:

1. What relations exist between and among teacher efficacy, knowledge and pedagogical beliefs in the practice of specific teachers?

Definitions

Teacher efficacy refers to "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran et al., 1998, p. 233). Bandura (1997) suggests that there are three context levels at which self-efficacy can be assessed: a domain general level, a domain specific level, and a task level. In this study, teacher efficacy was considered within the latter two context levels. Teacher efficacy was examined as an overall belief, as well as with respect to specific dimensions of the teaching process: instructional practices, classroom management, and student engagement.

Teacher knowledge refers to inservice or preservice teachers' personal store of information, skills, strategies, and experiences related to the teaching process. This conceptualization is based on Alexander, Schallert, and Hare's (1991) definition of knowledge as "an individual's personal stock of information, skills, experiences,

beliefs, and memories…whether or not it is verified in some external or objective way" (p. 317).

Pedagogical beliefs are conceptualized as a specialized class of beliefs that reflect teachers' understanding of teaching and the valences ascribed to that understanding. Three aspects of pedagogical beliefs were examined, including beliefs about knowledge, its form and content, and beliefs about the role of teaching as a skilled enterprise. Beliefs about knowledge refer to the value teachers place on specific forms of knowledge necessary for teaching (i.e., procedural, conditional, and declarative). Teachers' beliefs regarding the content of their knowledge are considered in terms of the importance they place on knowledge related to critical components of teaching, namely, instructional practices, classroom management, student motivation, and subject matter. Finally, teachers' beliefs as to the role of teaching as a skillful practice that requires training beyond talent or passion for teaching are also considered to be an integral part of pedagogical beliefs.

Performance refers conceptually to teachers' daily practice and decisions that occur within the school setting. In the proposed study, performance was considered through two sets of abilities: task analysis and strategic awareness. Task analysis refers to individuals' ability to identify a problem and generate a reasonable solution. Strategy awareness represents individuals' ability to identify strategies that could be implemented to resolve a problem situation successfully. In this investigation, I assumed that the skills and knowledge required for successful task analysis and appropriate strategy selection underlie teacher practice or performance.

Limitations

The current study sought to offer a new direction in the research on teacher efficacy, and to develop further understanding of the role of teacher efficacy in the teaching process. However, despite efforts to overcome shortcomings found in previous research, the proposed study was not without limitations. For example, the nature of the data collection relied on voluntary participation and self-report techniques. Teachers willing to participate in a research project such as this might be specialized in some way or the responses they gave might demonstrate aspects of social desirability or self-promotion.

Another concern regarding the sample was the need to constrain the participant pool. Some research on teacher efficacy suggests that teachers working at different grade level demonstrate different efficacy levels (e.g. Soodak & Podell, 1988). To prevent these potential differences among teaching levels from influencing the findings of the current study, attempts were made to constrain the participant pool to middle and high-school teachers. Despite these attempts to constrain the sample, several external factors impeded my ability to limit the collection of data to any particular grade level. However, tests of homogeneity of variance employed as part of multi-variate test found the data of practicing teachers to be homogeneous.

Further, efforts were made in the development of the pedagogical measure to create vignettes that reflected common instructional situations. However, a few teachers (n=6) commented on one vignette that the situation seemed to be for an "older grade" than the one presently taught. Therefore, there is a possibility that these

vignettes reflected situations that may be age-group or grade-level specific. If that is the case then the responses from teachers at those (higher) levels may have been biased by their increased ability to evaluate those situations.

This research sought to explicate the extent to which teacher efficacy mediates knowledge and action. However, in the quantitative portion of the study, teachers were given a simulated classroom situation and asked to respond to it, as the measure of teacher performance. Although this method has merits (i.e., similar situations across all participants; realistic problem situations), it is merely an approximation of actual teaching and as such limits the findings of this research.

Additionally, this study relied on path models for which the established sequence of relations among constructs was based on theory. Because the measures were given in a single sitting, the directionality of relations in the path model cannot be confirmed empirically. Such confirmation requires a longitudinal research design.

Another limitation of this study was related to the measures employed. Specifically, the demonstrated knowledge measure revealed a low reliability for the preservice teachers in this sample. It is not uncommon for assessments of knowledge to have low reliability for naïve or inexperienced samples (Alexander, Jetton, & Kulikowich, 1995).

Finally, the constructs investigated were largely cognitive in nature and did not explicitly address external factors that may influence the efficacy-knowledge relations under investigation. For example, this research did not include factors such as the socialization forces of the school environment, school or district dictates on teachers,

and the collective efficacy or climate of the school. Certainly these were all important influences on teachers' knowledge, efficacy and pedagogical beliefs. However, the current study sought to clarify the relations among efficacy, knowledge, and beliefs by focusing primarily on teacher-centered cognitive factors.

CHAPTER II

REVIEW OF RELEVANT LITERATURE

The purpose of this review was to provide a theoretical framework for the exploration of the role knowledge and pedagogical beliefs in teacher efficacy. In constructing this review, over 150 theoretical and empirical articles identifying teacher efficacy or the self-efficacy of teachers were identified for analysis. Those articles were critiqued and organized using several categories that included purpose, key findings, related variables, and definitions, in order to ascertain an overall understanding of teacher efficacy and its relationships to other psychological phenomena, such as knowledge and beliefs, as well as educational outcomes such as student achievement and teacher practices.

This review is divided into five major sections. The first section provides a historical overview of the development of teacher efficacy with regard to its meaning and measurement. The second section illustrates the importance of teacher efficacy as a motivational construct for teachers. This section reviews empirical research that has demonstrated the strength of positive teacher efficacy in enhancing the practice of teachers and the achievement of students. The third section of this review delves into the relationship between teachers' knowledge and beliefs about pedagogical knowledge and their sense of efficacy for teaching. Specifically, this section investigates what is currently known about the role of knowledge and knowledge beliefs in the development and maintenance of teacher efficacy. At the end of each of these sections, issues pertinent to the current study are highlighted.

In addition to these sections this review also describes an extended model of teacher efficacy that developed through working on this project. Specifically, this model extends the current model of teacher efficacy provided by Tschannen-Moran, Woolfolk-Hoy, and Hoy (1998) by including the constructs of knowledge and beliefs. A discussion of this model is provided following the exposition of the teacher efficacy literature. The review concludes with a brief review of the summary of the key points and an outline issues for future research in this field.

Teacher Efficacy: Tracing its Roots, Finding its Meaning

A teachers' sense of efficacy refers to "teachers' situation-specific expectation that they can help students learn" (Ashton & Webb, 1986, p.3). Pajares (1992) defined the same construct as "beliefs about confidence to affect students' performance" under an umbrella construct of "educational beliefs" (p. 316). Ashton (1985) stated that teachers' efficacy is "their belief in their ability to have a positive effect on student learning" (p. 145). While definitions of teacher efficacy abound, the history of this construct is rooted in the traditions of Rotter's (1966) locus of control and Bandura's (1977) social cognitive theory. Thus, two lines of investigation have been taken in the development and understanding of teacher efficacy, namely efficacy as locus of control, rooted in Rotter's (1966) work, and self-efficacy theory as defined and employed by Bandura (1997) and brought into the research on teachers by Gibson and Dembo (1984). Specifically, Gibson and Dembo (1984) sought to create a bridge between the understanding of teacher efficacy as known through the work on locus of control and self-efficacy theory.

From the time of its conception, the construct of teacher efficacy has been closely linked to the measures by which it is assessed, therefore, any discussion of its definition is also linked to measurement issues. The definition of teacher efficacy carries with it a few alternative understandings. Teacher efficacy was originally developed by the Rand researchers using Rotter's (1966) work on locus of control. This meaning was extended by Ashton, Olejnik, Crocker, and McAuliffe (1982), Guskey (1982, 1988), and Rose and Medway (1981), who kept the meaning and measurement of this construct close to these roots. Alternatively, a second strand of research emerged from the work of Albert Bandura (1977, 1986). Bandura's social cognitive theory and the construct of self-efficacy defined therein, served as the basis for the work that followed by Ashton et al. (1984), Gibson and Dembo (1984), and a host of other researchers. Finally, based on the understanding developed by those foundational theories and the work of many researchers, the construct of efficacy continues to evolve as we seek to understand its meaning and role in the teaching experience.

Given the theoretical and methodological confusion in this work, it is important to begin any investigation of teacher efficacy with a firm grounding in how this and related terms are defined in the research and operationalized in the literature. Specifically, developing a deep understanding of previous and current definitions of teacher efficacy, as well as the evolution of this construct in the research literature, will allow us to better understand the research findings that employ this term and to assess the meaning and importance of the findings reported.

Teacher Efficacy Definitions and Measurement

The development and agreement on the conceptual meaning and parameters of the construct, *teacher efficacy*, has been a theoretical discussion in the literature. Simultaneously, several measures have been created and used to assess these beliefs in teachers that reflect adherence to different conceptualizations of efficacy. In order to establish the meaning of teacher efficacy as investigated in the present study, it is important to outline the history of this construct and to ascertain salient features in evolving definitions and related measures.

Locus of Control and the RAND Research

The construct of teacher efficacy has been derived from two separate lines of research, Rotter's (1966) locus of control theory and Bandura's (1977) social cognitive theory. (See Table 1 for an outline of this development.) The term *teacher efficacy* was first employed by RAND (Armor et al., 1976) researchers when they included two items in a massive survey that reflected the locus of control constructs proposed by Rotter (1966). *Locus of control* refers to the degree an individual believes that the perceived cause(s) of an intended outcome are within his or her control (Rotter, 1966). That is, the extent that a person believes that events are determined by his or her actions (Parkay, Greenwood, Olejnik, & Proller, 1988). Because teacher efficacy was conceptualized in terms of locus of control, efficacy was seen as the extent to which teachers' believed that factors, which they could control, had a larger impact on teaching outcomes than beliefs that the environment held greater power (Tschannen-Moran et al., 1998). Specifically, some of the original RAND researchers

defined efficacy as “the extent to which the teacher believed he or she had the capacity to affect student performance” (McLaughlin & Marsh, 1978, p. 84). Thus, with the RAND researchers’ focus on locus of control and the teacher’s perceived role in effecting student outcomes regardless of environmental factors, two items were created to assess the impact of such control beliefs. The combined score on those items became the first assessment of teacher efficacy, and purported to identify the degree to which a teacher believed that the consequences of teaching were within the scope and ability of the teacher, or internally controlled.

The RAND researchers combined the score of the two items to determine one overall efficacy score. The first item asked: "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment" (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977, p. 137; McLaughlin & Marsh, 1978, p. 85). This item reflected an external control orientation. In effect it highlights the powerlessness of teachers in the face of students’ home experiences. The second RAND item asked: "If I try hard, I can get through to even the most difficult or unmotivated students" (Berman et al., 1977, p. 137; McLaughlin & Marsh, 1978, p. 85). This item reflected an internal control orientation, emphasizing the power of the teacher to reach students regardless of their environmental conditions (Tschannen-Moran et al., 1998, p. 204).

TABLE 1
The Development of Teacher Efficacy

Rotter		Bandura			
Locus of control: the degree an individual believes that the perceived cause(s) of an intended outcome are within his or her control (Rotter, 1966)		Theoretical Framework		*Self-efficacy:* the conviction that one can successfully execute the behavior required to produce outcomes (Bandura, 1977, p. 193)	
Teachers' beliefs in their ability to control factors in order to achieve desired outcomes.		Teacher Efficacy Conceptualization		Teachers' beliefs in their ability to organize and execute courses of action in order to achieve desired outcomes (Tschannen-Moran, et al., 1998)	
Research Trends					
Researcher(s)	Definition	Measurement	Researcher(s)	Definition	Measurement
RAND Researchers McLaughlin & Marsh, (1978); Berman & McLaughlin (1977)	"the extent to which the teacher believed he or she had the capacity to affect student performance" (McLaughlin & Marsh, 1978, p. 84)	RAND Items: Two item measure reflecting internals and external control, described as personal and general teaching efficacy	Ashton, Buhr, & Crocker (1984)	A teacher's belief in his or her ability to have a positive effect on student learning	Ashton Vignettes: Assessed outcome and efficacy expectations.

TABLE 1: *Continued*					
Research Trends					
Researcher(s)	Definition	Measurement	Researcher(s)	Definition	Measurement
Rose & Medway (1981)	The extent to which a teacher believes that he or she can control student outcomes.	Teacher Locus of Control (TLC) Scale: Assessed teachers feelings of an internal or external locus of control for student outcomes	Gibson & Dembo (1984)	"a belief that teachers can help even the most difficult or unmotivated students" (p. 569).	Teacher Efficacy Scale (TES): Two factor model of general and personal teaching efficacy.
Guskey (1981)	A teacher's belief or conviction that he or she can influence how well students learn, even those who are difficult or unmotivated.	Responsibility for Student Achievement (RSA) Scale: assessed general responsibility, responsibility for student success and for student failure.	Tschannen-Moran & Woolfolk-Hoy (2001)	"…a judgment of his or her capabilities to bring about desired outcome of student engagement and learning…" (p. 783)	Teachers Sense of Efficacy Scale: Assesses efficacy for student engagement, instructional practices and classroom management.

powerlessness of teachers in the face of students' home experiences. The second RAND item asked: "If I try hard, I can get through to even the most difficult or unmotivated students" (Berman et al., 1977, p. 137; McLaughlin & Marsh, 1978, p. 85). This item reflected an internal control orientation, emphasizing the power of the teacher to reach students regardless of their environmental conditions (Tschannen-Moran et al., 1998, p. 204).

The efficacy items in the RAND research study, seemingly buried in the midst of many others items, were surprisingly strongly related to reading achievement (Armor et al., 1976), student achievement, teacher behaviors known to foster achievement, a willingness to accept change proposals and an increased likelihood of successfully implementing innovation (Berman et al., 1977). In fact, this belief held by teachers, regarding the extent to which the teacher believed he or she had the capacity to affect student performance, ended up among the most powerful factors examined by RAND researchers in their investigation of teacher characteristics and student learning (Armor et al., 1976). These two RAND items served to identify the extent to which teachers' believed that affecting change in student learning was within their control, internal, or beyond their control, external. The sum of the two RAND items was called "teacher efficacy" and purported to identify the degree to which a teacher believed that the consequences of teaching were within the scope and ability of the teacher, or internally controlled.

Other researchers have followed Rotter's tradition and used this first definition and interpretation of the term teacher efficacy in their research on teachers and in the construction of additional measures of efficacy (see Table 1). For example, Rose and

Medway (1981) and Guskey (1981) developed measures to assess teacher efficacy from a locus of control standpoint. Rose and Medway proposed the Teacher Locus of Control Scale (TLC), which required teachers to determine responsibility for student success and failure as within or beyond the control of the teacher. Similarly, Guskey (1981) developed the Responsibility for Student Achievement Scale (RSA), which added to the locus of control framework by incorporating the specifics of Weiner's (1979) attribution theory.

Expanding on the RAND work and Rotter's theory, Guskey (1981) developed a 30-item instrument titled *Responsibility for Student Achievement.* Utilizing this scale, efficacy was defined as "a teachers' belief or conviction that he or she can influence how well students learn, even those who may be difficult or unmotivated" (Guskey, 1987, p. 41). Thus, self-efficacy became equated with a causal explanation for what an individual can do. Guskey's scale measured the amount of responsibility for student learning a teacher felt in general, as well as two subscale scores, which reflected the degree of responsibility felt for student success and student failure.

Guskey applied Weiner's (1979) four causes for success or failure to teaching practice. Those four causes were identified as teaching abilities, effort put into teaching, the difficulty of the teaching task, and luck. Those four causes were expected to represent differing consequences of levels of stability and controllability (Weiner, 1979). In this case, teaching abilities were considered to be an internal, stable, and uncontrollable cause for success or failure at teaching. Effort was considered to be internal, unstable, and controllable. Task difficulty and luck reflected external, uncontrollable beliefs, with task difficulty considered to be stable and luck unstable.

Based on scores from this measure, Guskey (1981) determined the amount of responsibility teachers were accepting for student success and failure and considered this to be synonymous with the meaning of efficacy, such that efficacy reflected "perceptions of personal control on the part of teachers" (Guskey, 1982, p. 70).

The understanding of efficacy described by these researchers remains deeply rooted in attribution theory (Weiner, 1979, 1992) and conceptions of locus of control (Rotter, 1966). Both theories reflect an individual's willingness to act based on perceived amounts of control over consequences. In this case the consequence referred to achieving positive student outcomes despite the impact of external sources such as home life, television violence and the media. However, this understanding is qualitatively different from a second line of theoretical inquiry, which is based on Bandura's (1977) social cognitive theory.

Bandura's Social Cognitive Theory

The second strand of the research on teacher efficacy comes as a result of Bandura's (1977) social cognitive theory. In social cognitive theory, Bandura (1977) introduced the concept of self-efficacy as the primary motivational force behind an individual's actions. *Self-efficacy* is one of the most consistently defined motivational constructs used in the research (Murphy & Alexander, 2001). As defined by Bandura (1977), self-efficacy is "the conviction that one can successfully execute the behavior required to produce outcomes" (p. 193).

Efficacy versus Outcome Expectancy. Bandura (1997) stipulated a distinction between self-efficacy and locus of control. In particular, Bandura (1977) identified locus of control as an "outcome expectancy" or "a person's estimate that a given

behavior will lead to certain outcomes" (p. 193). That is, outcome expectancies or locus of control represent an individual's estimate of the likely consequence of one's behavior in a specific situation (Bandura, 1977, 1986). As Bandura stated, perceived self-efficacy is "a judgment of one's capability to accomplish a given level of performance, whereas outcome expectation is a judgment of the likely consequences such behavior will produce" (p. 391). Thus, efficacy beliefs involve individuals and their beliefs regarding their ability to perform actions, whereas outcome expectancies involve the conviction that the performance of a given action at a particular skill level will result in a specific outcome.

For example, an outcome expectancy would be a teacher's belief that the implementation of cooperative learning at the appropriate level would result in a better learning environment for students. The focus is on the veracity of the strategy and its potential for improving students learning. However, an efficacy expectation would reflect the extent to which a teacher believed that he or she is capable of implementing this technique at the appropriate level in order to achieve the desired success. The distinction here is in the separate beliefs of, yes the strategy (cooperative learning) will work, and yes I think I can employ the strategy. Thus, efficacy beliefs reflect future-oriented beliefs regarding individuals' ability to act and outcome expectancies involve the conviction that given actions, regardless of the actor, will lead to specified outcomes. As researchers built on Bandura's work, they applied this construct of self-efficacy to specific domains such as teaching, which is the focus of the present study.

It is important to note that, according to Bandura (1997, pp. 21-24), there is a temporal relationship between efficacy beliefs and outcome expectancies. Specifically,

under this framework an individual first has efficacy beliefs about the ability to perform a given behavior and from those beliefs derives an outcome expectation. For example, doctoral candidate X may believe herself to have poor singing voice. Thus, she has a low level of efficacy for her ability to sing in public. Based on this perception of her own ability, candidate X will most likely develop an outcome expectation of a poor performance and public humiliation should she be dragged to the stage at the next departmental karoke night. Bandura (1997) stated that to reverse the order of this temporal process is illogical. That is to say, one does not expect to perform poorly and be publicly humiliated and then determine that they must not be able to sing. Bandura (1997) further advocated for the measurement of efficacy beliefs only rather than combining these beliefs with outcome expectancies. He argued that outcome expectancies are shaped by the individual in his or her context and will provide little if any useful information beyond what is learned from the assessment of an individual's efficacy beliefs.

Sources of Efficacy. Efficacy beliefs have four sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal (Bandura, 1977). Mastery experiences are those instances in which individuals actually perform the act under question. When one teaches a class, has a field experience, or tutors a child, these are instances that provide perspective or practicing teachers with source material for the formation and development of their efficacy beliefs. Efficacy beliefs are formed based on the degree of success or failure one feels in each of these direct experiences.

A mastery experience that results in negative consequences may lead to a decrease in efficacy for the task experienced. For example, if a field trip to the National Air and Space Museum ends with a visit to security because the teacher's students were caught shoplifting in the gift shop, this may severely decrease the teacher's efficacy for taking students on class trips. Similarly, a successful trip to the Art Museum that leaves the students actually excited about art and interested in returning to the museum on their own, may increase a teachers' efficacy for organizing and executing another field trip. In social cognitive theory, direct experiences, both positive and negative, are considered to be the most powerful sources of efficacy beliefs.

Another source of efficacy beliefs are vicarious experiences in which individuals observe others and use these observations as a source of information in the beliefs that are formed about the self (Bandura, 1997). The power of vicarious experiences is dependent on the similarity of the model observed to the observer and the actions observed (Bandura, 1997). For instance, while I am an avid fan of Dorothy Hamil, and watch ice skating competitions diligently every season, I have yet to strap on skates and attempt a triple axle. The models, professional ice skaters, are so far from my physical self-concept that I cannot even begin to connect these athletes to myself on the basis of these years of observation. In contrast, when one of my friends recently signed up to run the Marine Corps Marathon for the Walt Whitman Clinic, I was tempted to sign up myself the following year. The comparison to my friend, who at the time was pretty much a physical equal, was more realistic for me and had a deeper effect on my belief pattern.

The third source of efficacy beliefs is verbal persuasion. This is found in the voiced support of our friends and colleagues as they provide verbal support for our attempts to take on and complete tasks (Bandura, 1997). To illustrate, in my first year of teaching, I left school many afternoons with the intention of never returning. However, I would arrive at home and have dinner with my nine roommates (all of whom were also in their first or second year of teaching) and we would share our days. My blanket statement of "I'm not going back!" was often met with at least one "Me either!" from the group. Over the course of dinner, however, I would be reminded of the importance of what I was doing, how the students needed me, how I was doing such a great job. The dinner table became a forum for persuasion. Dinner was a time during which we re-convinced ourselves and each other of the importance of our work and recommitted ourselves to it. In contrast, however, verbal persuasion, like vicarious and mastery experience, can be negative as well as possible. Feedback from the parents of students, colleagues, and the students themselves, may work to convince teachers that they are not succeeding and should give up the effort.

The last source of self-efficacy beliefs is physiological cues. The human body can inform its owner of emotions that may not be evident on the surface (Bandura, 1997). Thus, sweaty palms and butterflies in the stomach serve to inform individuals of how they are doing in a mastery experience. If a student feels sick each time she must give a class presentation, then she may quickly come to believe that this is something that she cannot or should not do regardless of the actual performance. Similarly, another student may complete a presentation and feel an enjoyable adrenaline rush that confirms the positiveness of the experience.

Self-efficacy as Mediator. Self-efficacy beliefs, developed through mastery experiences, vicarious experiences, verbal persuasion, and physiological cues serve as a key motivational force in the cognitive system. Self-efficacy is considered to lead individuals from knowledge to action. Bandura (1986) posited that self-efficacy is the central mediator of effort. That is, increased efficacy beliefs will lead to increased persistence and high levels of performance. With regard to teachers, Dembo and Gibson (1984), Tuckman and Sexton (1990) and Woolfolk and colleagues (1990) have documented the relationship between teachers' efficacy and persistence in the face of difficulty. Similarly, researchers have found a relationship between teachers' efficacy and their performance. For example, Ashton and Webb (1986), as well as Berman and colleagues (1977), have documented the relationship of higher efficacy to the instructional practices known to foster academic achievement.

Raudenbush, Rowan, and Cheong (1992) extended the discussion of self-efficacy as a mediator between knowledge and action. Their research warned against the assumption that the mere possession of knowledge and skills is sufficient for effective teaching. Rather, Raudenbush and colleagues (1992) agree with Bandura's (1986) contention that self-efficacy mediates the relationship between knowledge and action. These researchers highlighted the importance of a teacher's beliefs and motivation in the teaching context, such that knowing the "what" and "how" of teaching does not ensure a successful learning experience. That is, the recognition that having knowledge and skills needed to perform actions, does not, in and of itself, guarantee that an actor will perform said action. In this conceptualization, the movement from knowledge to actions is mediated by the efficacy beliefs of the actor.

Most individuals have knowledge and skills that are not utilized on a regular basis. Therefore the knowledge alone does not ensure effective practice. Individuals must also be guided by a belief in their ability to effectively use their knowledge in a given context in order to be moved to action. For example, I have read numerous articles on portfolio assessments and I have even created one for myself. I know what such assessments would entail and their potential benefits for students. However, I have never used such an assessment with any group of students. I have doubts about my ability to implement these measures appropriately and effectively. As this example illustrates, there is a great deal of choice in any teaching experience that will be affected not only by teachers' knowledge, but also by their beliefs regarding their ability to use that knowledge effectively.

As a construct, self-efficacy beliefs are an integral aspect of the teaching process. While many authors refer to teachers' sense of self-efficacy for teaching, meaning their beliefs about their ability to perform the actions necessary to teach (e.g., Greenwood, Olejnik, & Parkay, 1990; Guskey, 1982; Lee Dedrick & Smith, 1991; Newman, Rutter, & Smith, 1989; Raudenbush et al., 1992; Ross, 1994; Smylie, 1988), many others have identified a specific form of self-efficacy pertaining to teaching (e.g., Ashton & Web, 1986; McLaughlin & Marsh, 1978; Tschannen-Moran et al., 1998). These have been called teaching or teacher efficacy.

Toward a Combined Model

Several researchers have drawn from the work of both Rotter and Bandura and in doing so have either attempted to reconcile these constructs or have simply ignored their differences. The first of these was developed by Ashton (1985) who defined efficacy as “teachers’ belief in their ability to have a positive effect on student learning” (p. 142). Ashton, Buhr, and Crocker (1984) generated a measure that employed a series of vignettes describing situations common to a teacher’s practice. Respondents were asked to judge how well they felt they could perform in each situation on a scale ranging from “extremely ineffective” to “extremely effective.” Two sets of vignettes were created those reflecting beliefs about teachers and teaching in general, an outcome expectancy, and those related to the personal ability of the respondent.

Gibson and Dembo. Among the first researchers to develop the link between teacher efficacy, as conceived under the influence of Rotter (1966) and implemented by the RAND researchers (Armor et al., 1976, Berman et al., 1977), and the theory of self-efficacy presented by Bandura (1977) were Gibson and Dembo (1984). Gibson and Dembo (1984) developed an interpretation of the RAND items that was considered more consistent with Bandura’s (1977) self-efficacy theory. They determined that each of the RAND items reflected a unique type of expectation: an outcome expectation and an efficacy expectation (Gibson & Dembo, 1984). Specifically, the first RAND item (i.e., "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment.”) was identified as an outcome expectation and

served as a measure of *general teaching efficacy*. That means this item measured the extent to which teachers in general could impact student learning regardless of environmental influences. The second RAND item ("If I try hard, I can get through to even the most difficult or unmotivated students.") was interpreted as an example of a *personal teaching efficacy* expectation. In effect this item assessed the individual's belief in his or her ability to reach students, reflecting an assessment of self-efficacy as described by Bandura (1977).

Using a combined conceptual framework from the foundation provided by the RAND researchers and Bandura's self-efficacy theory, Gibson and Dembo (1984) created a new instrument for measuring teacher efficacy. The measure was developed to assess what they perceived to be the two aspects of teacher efficacy, namely outcome expectations, labeled general teaching efficacy, and efficacy expectations, named personal teaching efficacy. These terms reflected those used by previous researchers to distinguish between the two Rand Items (e.g., Ashton & Webb, 1986).

General teaching efficacy has subsequently been defined as "teachers' expectations that teaching can influence student learning" (Ashton & Webb, 1986, p. 4). Gibson and Dembo (1984) referred to this factor as a teacher's "belief that any teacher's ability to bring about change is significantly limited by factors external to the teacher" (p. 574). Personal teaching efficacy, on the other hand, is considered to be a more specific individual belief of what the individual teacher can accomplish (Tschannen-Moran et al., 1998). Gibson and Dembo (1984) described this as a teacher's "belief that one has the skills and abilities to bring about student learning" (p. 573).

Common definitions. A longstanding tradition in the field of teacher efficacy has been built on the distinction of these two dimensions or factors of teacher efficacy, namely teaching efficacy or general teaching efficacy and personal teaching efficacy (Tschannen-Moran et al., 1998). This distinction separates beliefs about what teachers can do in general from what individual teachers believe themselves to be capable.

In discussing general teaching efficacy, researchers often refer to this construct as teacher efficacy. Thus, when efficacy of teachers is being discussed in terms of two factors, the term teacher efficacy is typically used to signify general teaching efficacy. General teaching efficacy refers to "teachers' expectations that teaching can influence student learning" (Ashton & Webb, 1986, p. 4). This belief centers on the notion teachers and teaching, overall, can impact student learning, regardless of students' situations including their home life or heredity (Greenwood et al., 1990; Hoy & Woolfolk, 1990, 1993; Midgley, Feldlaufer, & Eccles, 1988b; Ross, 1994; Soodak & Podell, 1997; Tschannen-Moran et al., 1998).

Definitions of general teaching efficacy tend to focus on the ability of teachers to help or reach students beyond the external factors that impact the learning process (e.g., Anderson, Greene & Lowen, 1988; Ghaith & Yaghi, 1997; Lin & Gorrell, 1998; Ross, 1994). Rich, Lev, and Fischer (1996) provide a definition that exemplifies this orientation when they describe teacher efficacy as "a teacher's general feeling that the education system is capable of fostering satisfactorily student academic achievement despite negative influences external to the teacher" (p. 1016). This definition, and others like it, have led to the suggestion that this construct is more an assessment of locus of control or outcome expectancy rather than self-efficacy, which is rooted in the

individuals' beliefs about their own abilities (Guskey & Passaro, 1994; Tschannen-Moran et al. 1998).

Definitions of personal teaching efficacy focus on two key component: the individual's ability to perform actions and the power of those actions to influence student learning (e.g., McLaughlin & Marsh, 1978; Meijer & Foster, 1988; Ross, 1994, 1992; Soodak & Podell, 1996, 1993). A typical definition of personal teaching efficacy was put forth by Soodak and Podell (1996). This definition states that personal teaching efficacy is "a teacher's belief about his or her ability to perform the actions needed to promote learning or manage student behavior successfully" (p. 406).

Personal efficacy focuses specifically on teachers' belief about their own ability to impact students rather than on the more distant notion of what teaching and teachers can do in general. As such, the perspective of personal teaching efficacy more closely reflects the meaning and understanding of self-efficacy as put forth by Bandura (1977, 1986, 1993, 1997) and avoids confounding teacher efficacy with locus of control. Therefore, some scholars have suggested that personal teacher efficacy and its subsequent measurement is a more accurate description of teacher efficacy than the construct called general efficacy or some composite of these two belief systems (Guskey & Passaro, 1994; Tschannen-Moran et al. 1998).

Factor structure. The original measure constructed by Gibson and Dembo (1984) contained 30 items. Several researchers used these items and found additional evidence for the existence of the two aforementioned factors, general and personal teaching efficacy (Anderson et al., 1988; Hoy & Woolfolk, 1993; Moore & Esselman, 1992; Saklofske, Michaluk, & Randhawa, 1988; Soodak & Podell, 1993). This

measure was eventually narrowed down to a 16-item instrument, which has enjoyed widespread use (Soodak & Podell, 1993; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990).

For example, the Gibson-Dembo instrument has been used to confirm that teacher efficacy consists of the two distinct dimensions described previously, general and personal teaching efficacy (Tschannen-Moran et al., 1998). Researchers have also investigated the relationship of this measure and its two factors to the original Rand items. The subsequent research found the first RAND item tended to load on the general teaching efficacy factor, where the second RAND item loaded on the personal teaching efficacy factor (Coladarci, 1992; Woolfolk & Hoy, 1990). Moreover, these two areas of efficacy have been found to be "only slightly related or not at all correlated" (Tschannen-Moran et al., 1998, p. 213). Many researchers interpret this finding to mean that teacher efficacy is comprised of two distinct constructs of efficacy (e.g. Anderson et al., 1988, Gibson & Dembo, 1984).

For example, Gibson and Dembo (1984) interpreted this distinction as reflecting the concepts of outcome expectancy and efficacy as described by Bandura. This conceptualization has received criticism from researchers and theorists in the field (Tschannen-Moran & Woolfolk-Hoy, 2001) that will be discussed in the next section. However, based on the Gibson and Dembo measure, and its widespread usage, the working definition of teaching efficacy came to be understood as the combination of general teacher efficacy (GTE) and personal teacher efficacy (PTE). Each teacher has a combined belief of what teachers can accomplish (GTE) and a personal perception of what her or she as a teacher can achieve (PTE). The two

dimensions of the teacher efficacy construct are perceived as unique and each is created over time simultaneously yet independently of the other.

Concerns Regarding the Gibson and Dembo Model

Dissension still remained in the interpretation of the Gibson and Dembo (1984) measure and the understanding of the efficacy construct. For example, Guskey and Passaro (1994) implemented a study with 342 prospective and experienced teachers to examine the difference between efficacy measurement and control interpretations. Upon close review of the items in the Gibson and Dembo (1984) scale, Guskey and Passaro (1994) questioned the true meaning of the factors found by Gibson and Dembo (1984). Specifically, Guskey and Passaro (1994) determined that the items that fell on the personal teaching efficacy factor "all use the referent *I*, all are also positive and have an internal locus (i.e., 'I can')" (p. 630). In contrast, the items that fell on the general teaching efficacy factor were found to "nearly all use the referent 'teachers' but also are negative and have an external locus (i.e., 'teachers cannot')" (p. 630). Given this analysis Guskey and Passaro (1994) questioned the extent to which the two factors confounded the type of efficacy with referent, positive or negative nature, and locus. Specifically, they questioned whether these factors actually identified two types of efficacy or if the dimension structure instead reflected internal and external locus of control.

For this study, Guskey and Passaro (1984) revised the altered version of the teacher efficacy scale (Gibson & Dembo, 1984) proposed by Woolfolk and Hoy (1990). The altered version included the 16-items from the Gibson and Dembo (1984) measure that were found to be constant, as well at the two RAND items and three

additional items which Woolfolk and Hoy (1990) found to yield significant factor loadings. The two subscales reflecting general or teaching efficacy and personal efficacy were each altered to reflect internal and external control dimensions. Thus, the existence of possible four dimensions of efficacy: personal internal, personal external, general internal and general external beliefs were investigated.

Guskey and Passaro (1994) randomly selected seven out of the 12 personal efficacy items from the Gibson and Dembo scale considered to reflect a personal internal orientation. The items were reworded to reflect either a general teaching-internal or a personal-external orientation. For example, Guskey and Passaro (1994) reworded the personal-internal item "I have enough training to deal with almost any learning problem" (Woolfolk & Hoy, 1990, p. 89) to reflect a personal external orientation (i.e., "I have *not been* trained to deal with *many of the* learning problems *my students have*" (Guskey & Passaro, 1994, p. 638). Similarly, Guskey and Passaro (1994) changed the personal internal item "When a student does better than usually, many times it is because I exert a little extra effort" (Gibson & Dembo, 1984, p. 581) to reflect a general or teaching-internal orientation (i.e., "When a student does better than usually, many times it is because *the teacher* exerts a little extra effort" p. 638). In this way the items thought to reflect a personal internal orientation either remained the same or were altered to reflect a general teaching-internal orientation or a personal-external orientation. Thus, both the referent and locus were altered.

Using the same method, Guskey and Passaro (1994) changed four of the nine general teaching efficacy items. Most of these items were considered to reflect a general teaching-external orientation. For example, Guskey and Passaro (1994)

changed an original item "A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her achievement" (Gibson & Dembo, 1984, p. 581) to reflect a personal-external item (i.e., "*I am* very limited in what *I* can achieve because a student's home environment is a large influence on his/her achievement" p. 638).

The personal internal and external items were written to reflect what individual teachers believe they are capable of achieving, along the dimensions of internal and external control, with regard to what they considered themselves able to influence. The general internal and external items were written to reflect the expectations of what teachers in general could accomplish given their perception of internal and external control.

Guskey and Passaro (1994) performed a principal components analysis on the responses of 283 inservice teachers and 59 preservice teachers. This analysis found that two dimensions of efficacy did exist. However, these factors fell along the lines of internal and external control orientations rather than along the dimensions of general and personal efficacy. Guskey and Passaro (1994) found that "whether the item referent was 'my influence' or 'teachers' influence' made no difference." (p. 637). Instead the factors fell along the lines of control attributions. However, Guskey and Passaro (1994) also noted that their findings are not in complete agreement with the theoretical understanding of the internal-external control component of attribution theory. In attribution theory, locus of control is seen as a bi-polar continuum. That is, the more one contributes to an internal cause, the less one explains outcomes based on external factors. Thus, locus of control should be understood as one factor with

responses falling along the internal to external continuum. In Guskey and Passaro's (1994) study, however, two separate, modestly correlated, factors were unearthed suggesting a slightly different interpretation from locus of control. Guskey and Passaro (1994) suggested that this distinction "more accurately represents teachers' perceptions of the strength of different and independent factors" (p. 639).

A concern regarding the acceptance of the external/internal findings put forth by Guskey and Passaro (1994) exists. This concern has to do with the positive and negative nature of the items, which they discussed at the introduction of their study, but then failed to address in their methodology. The items used by Gibson and Dembo (1984) and Woolfolk and Hoy (1990) were found to fall in two dimensions relating to personal and general teaching efficacy. However, it can also be noted that all of the personal efficacy items reflected a more positive outlook regarding the teacher's abilities (i.e., "When I really try, I can get through to the most difficult students," Gibson & Dembo, 1984, p. 581). In contrast the items assessing general teaching efficacy tended to reflect a more negative orientation regarding teachers abilities (i.e., "The hours in my class have little influence on students compared to the influence of the home environment," Gibson & Dembo, 1984, p. 581).

When Guskey and Passaro (1994) set out to challenge the current meaning of the factor structure using their modified measure, they altered the referent (from I to teachers and the reverse) as well as the locus (internal to external and the reverse). However, they did nothing to address the positive and negative orientation of these items. As a result, the two factors which they found and identified as internal and external can also be interpreted as positive and negative, such that all of the internal

items reflected a positive orientation to what teachers can accomplish (e.g. “When a student does better than usually, many times it is because *the teacher* exerts a little extra effort” p. 638). In contrast all of the external items in their analysis represented a more negative orientation (e.g. “When it comes right down to it, a teacher really can’t do much because most of a student’s motivation and performance depends on his/her home environment.” P. 638).

In conjunction with this concern regarding the positive and negative nature of the items, there was an issue of the placement of a seemingly internal item in the external factors. One item states: “When a student is having difficulty with an assignment, I *often have trouble* adjusting to his/her level” (Guskey & Passaro, 1994, p. 638). This item has a factor loading of .42 on the external factor. However, at face value and interpretation this item seems to reflect an internal, albeit negative, orientation. This situation highlights the concern that these factors may be more sensitive to the optimistic or pessimistic orientation of the responder than an internal/external or general/personal teaching efficacy.

The work of Guskey and Passaro demonstrated the important need to better clarify and understand the meaning of teacher efficacy from both a theoretical and a measurement perspective. Through this work these researchers started a movement toward a better understanding of teacher efficacy and the development of a new model and measure of this construct.

A Current Model of Teacher Efficacy

Tschannen-Moran and colleagues (1998) proposed a new model of teacher efficacy based on the previous work in the field. This new model is firmly rooted in Bandura's construct of self-efficacy (1977, 1986, 1997). The Tschannen-Moran et al. (1998) model is based on a five-step circular process through which efficacy beliefs are created, assessed, utilized, and then lead to new beliefs. Sources of efficacy beliefs in this model explicitly follow those proposed by Bandura (1977): mastery experiences, vicarious experiences, verbal persuasion, and physiological cues. These sources are considered to provide a backdrop for the mechanisms of cognitive processing, which lead to efficacy in teachers (Tschannen-Moran et al., 1998).

Cognitive processing in this model is referred to as the combined examination and evaluation of the task to be completed (i.e., task analysis) and the assessment of the individual's personal competence (i.e., personal competence). In this cognitive process, individuals identify a general or specific task to be accomplished. They break the task down to what they expect to be the essential steps to completing the task, and then weigh this against their own personal sense of competence. The resulting judgment regarding the ability to plan and execute actions necessary to achieve the desired outcome is the individual's teaching efficacy. This belief is then parlayed in to the goals and decisions teachers make which in turn impact their performance. The resulting performance then serves as a mastery experience in future efficacy judgments.

Using this model, Tschannen-Moran and Woolfolk-Hoy (2001) proposed a new measure of teacher efficacy. In this measure, both dimensions of the teacher

efficacy judgment (i.e., personal competence and analysis of the task) are tapped. Specifically, these researchers developed a measure of teacher efficacy that assessed the critical tasks associated with teaching: the domains of engagement, classroom management, and instructional practices. The measure was constructed with the aid of current teachers enrolled in a seminar on self-efficacy in teaching and learning (Tschannen-Moran & Woolfolk-Hoy, 2001).

The seminar group began considering possible formats for the new scale by reviewing those already in existence, eventually selecting Bandura's unpublished scale as the basis for their work (Tschannen-Moran & Woolfolk-Hoy, 2001). The seminar members each identified items from Bandura's scale, they felt reflected central tasks for teaching. In addition, the group developed additional items that reflected tasks not addressed in Bandura's scale. These items where considered to reflect the key tasks related to teaching and assessed efficacy judgments for those tasks across a range of contexts. The new measure (then called the Ohio State teacher efficacy scale, currently referred to as the Teachers Sense of Efficacy Scale) was tested in three separate studies. The first study served to reduce the original 52 items to 32. The second study reduced the scale to 18 items comprising three subscales. The final study involved the development and testing of 18 new items, resulting in an instrument that had two forms, a 24-item long form and a 12-item short form. The researchers assessed the factor structure, reliability, and validity of the scale for both preservice and inservice teaching populations (Tschannen-Moran & Woolfolk-Hoy, 2001).

Tschannen-Moran and Woolfolk-Hoy (2001) consider this new measure to be superior to previous assessments of efficacy for two reasons. First, this measure has

demonstrated a unified and stable factor structure. Second, this measure assesses a broad range of important teaching tasks without being so specific that it cannot be used to compare across subjects, levels, or school contexts (Tschannen-Moran & Woolfolk-Hoy, 2001). Additionally, the three-factor structure of the measure enables researchers to identify specific areas of concern in teachers and relationships between these domains of teaching tasks and teacher performance outcomes and student achievement.

The next step in the development of this model and measure of teacher efficacy is an investigation of the factors that affect task analysis and resulting efficacy beliefs. Specifically, to what degree does the role of the teachers' knowledge and prior experience play in analyzing the task, identifying possible solutions, and assessing teaching efficacy which ultimately affects the decisions and actions made by the teacher? The present study assessed those relations.

The Power of Teacher Efficacy

Pajares (1992), based on the works of Bandura (1986), concluded that "beliefs are the best indicators of the decisions individuals make throughout their lives" (p. 307). It follows that teachers' beliefs about their personal teaching abilities would be a key indicator of teacher behavior, decisions, and organization of their classroom environments. Pajares (1992) also remarked that while much research has been done on how teachers think, this has been fruitless in determining expectations of teachers' actions, while knowledge of teacher beliefs (teacher efficacy) has had powerful predictive powers.

Previous work in this area has used the Gibson and Dembo instrument (16 item) and variations on the RAND items. These studies have established that distinct dimensions of teacher efficacy, as discussed, and have found that the construct correlates to areas such as student achievement (e.g., McLaughlin & Marsh, 1978), student motivation (e.g., Midgley, Feldlaufer, & Eccles, 1989), teacher valuing of educational innovations (e.g., Cousins & Walker, 2000), classroom management skills (Woolfolk et al., 1990) and teacher stress (Greenwood et al., 1990). Additionally, research using these measures has identified specific relationships for the concepts of personal teaching efficacy and the general teaching efficacy to different behaviors and outcomes (Tschannen-Moran et al., 1998).

In effect, positive personal teaching efficacy is related to teachers who are more willing to experiment in the classroom with various strategies and curriculum ideas (Cousins & Walker, 2000) and have students with higher scores on language arts achievement tests (Podell & Soodak, 1993; Soodak & Podell, 1993; Tschannen-Moran et al., 1998). These teachers were also found to be less likely to refer low socioeconomic status students and or students with behavior problems for special services (Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1993; Tschannen-Moran et al., 1998). Further, teachers who were rated as having high general teaching efficacy were found to have students with high achievement in mathematics and a greater number of students interested in school (Tschannen-Moran et al., 1998). Finally, teachers with high general efficacy were found to be less likely to criticize students for giving an incorrect answer (Tschannen-Moran et al., 1998).

The existence and maintenance of high positive teacher efficacy in educators appears to be vital to the existence of successful classrooms and schools (Tschannen-Moran et al., 1998). People who believe in their own abilities as teachers (high personal efficacy) and in teachers as a significant influence on students (high general efficacy) tend to have classrooms that are well run (e.g., Ashton, Webb, & Doda, 1983), less stressful (e.g., Parkay, Greenwood, Olejnik, & Proller, 1988), and have students with higher achievement (e.g., Ross, 1992). The impact that positive teacher efficacy has on the school environment is likewise clear. Positive efficacy in teachers, general teaching efficacy or personal teaching efficacy, creates positive outcomes for students and an enriched learning environment (e.g. Ashton & Webb, 1984).

The following section serves to highlight the research to date that emphasizes the important role efficacy plays in teaching practice. However, when reading this section one must keep in mind three key elements. First, we need to attend to the theoretical base on which the research presented was predicated. Was the study designed from a locus of control understanding of efficacy or from a social cognitive approach? Second, and related to the first element, is the consideration of the measure used to assess efficacy. What is the measure asking and therefore what do the findings mean in light of it? Finally, one must consider the type of analysis that is employed. The majority of research on teachers' efficacy has utilized correlational research which precludes any claims of causality or direction of the relationships observed. Thus, as you read the following sections these elements should be kept in mind and considered as the studies are presented. Any causal tone related to correlational

research in the following descriptions is derived from the original authors, and the overall presentation of findings that is common in the teacher efficacy literature.

Teacher Efficacy and Positive Outcomes

This section of the review places into perspective the role of teacher efficacy as related to positive outcomes for students and teachers. As discussed previously in the chapter different definitions and measurements of efficacy exist in the literature. The focus here however, is to provide an overview of the work done under the umbrella of teacher efficacy and to highlight the important nature of this construct. Examples of specific studies will be provided to enhance our understanding of the relationship between teacher efficacy and desired outcome variables. However, it is important to remember that within the teacher efficacy literature one must keep in mind the definitions and measurements used for any specific study, and to evaluate each study within the larger conceptual framework from which it was developed. This type of detailed evaluation will be provided in the exploration of the relationship between teacher efficacy and teacher knowledge.

Student Achievement and Motivation

Student achievement. McLaughlin and Marsh (1978) were among the first researchers to put forth the extended causal chain from teacher efficacy to student achievement. Simply stated these researchers proposed that a teacher's level of efficacy will influence said teacher's behavior which will in turn affect the behavior of the students which leads to changes in student achievement levels (McLaughlin & Marsh, 1978). Several researchers have identified a link between student achievement

and levels of teacher efficacy (e.g., Allinder, 1995; Ashton & Webb, 1986; Tracz & Gibson, 1986; Ross, 1992, 1994).

Some researchers using the Gibson and Dembo (1984) measure have found that the proposed two dimensions of teacher efficacy have had differential effects on teacher practice and student outcomes. Specifically teachers with positive personal teacher efficacy have demonstrated an increased willingness to experiment in the classroom with various strategies and curriculum ideas, and have students with higher scores on language arts achievement tests (e.g., Meijer & Foster, 1988; Podell & Soodak, 1993; Tschannen-Moran et al., 1998). Further, teachers who were rated as having high general teacher efficacy were found to have students with high achievement in mathematics and a greater number of students interested in school (e.g., Tracz & Gibson, 1986; Ross & Cousins, 1993).

This research has often found links between teacher efficacy and specific content areas. One example is the work of Anderson and colleagues (1988) who conducted a comparison study in which two groups of teachers were compared based on their levels of personal teaching efficacy. Specifically, the groups were formed by classifying the teachers with the highest and lowest levels of personal teaching efficacy, as measured using the Gibson and Dembo (1984) Teacher Efficacy Scale. The data collected in this study were analyzed using correlation and multiple regressions in an attempt to determine which variables best accounted for student achievement. The analyses revealed that teacher efficacy contributed to student achievement in language arts and social studies, as well as to student levels of efficacy for achievement. Further, it was determined that the level of personal teaching efficacy

held at the beginning of the school year by the teacher had a significant effect on the development of efficacy in the students and their achievement.

Student motivation. Brophy and Good (1974) documented how teacher expectancies and beliefs influence student motivation and achievement. Teacher efficacy was found to be a belief that guides teacher actions and communication with students and, in turn, influences student motivation and achievement. Thus, teacher efficacy has also been related to non-academic student outcomes. Such outcomes include: increased motivation to learn in students, higher self-perceptions, and better self-management (Midgely, Feldlaufer, & Eccles, 1989; Rose & Medway, 1981; Saklofask, et al., 1988; Ross, 1994; Woolfolk, Rosoff, & Hoy, 1990). Anderson et al. (1988) found that teacher efficacy was related to student efficacy for achievement. Strong positive correlations were found between teacher efficacy and student perceptions of ability and student self efficacy (Ashton, 1984; Ashton, et al., 1983). Connections have also been made linking teacher efficacy to student levels of self-esteem (Borton, 1991). In essence, teachers with higher levels of efficacy for teaching tended to have students who demonstrate greater motivation for school and higher levels of academic self-efficacy (Duncan & Biddle, 1974; Dusek, 1985). Teacher efficacy has also been connected to student self-management or self-direction (Saklofske, et al., 1988). In a similar vein, Woolfolk et al. (1990) found a relationship between teacher efficacy and students' abilities for self-management.

Teacher Motivation, Actions, and Decisions

Teacher efficacy as a belief is expected to guide teachers in their behaviors, decisions, and motivation with regard to teaching. The power of self-efficacy is rooted

in its ability to guide the decisions that teachers make in the course of their role as teachers. If one begins with Bandura's (1977) proposal that self-efficacy "determines whether coping behavior will be initiated, how much effort will be expended and how long it will persist in the face of aversive experiences" (p. 191), one can see how this same construct can and does aid teachers in the course of their professional life. Specifically, teachers' level of efficacy for teaching affects their daily decisions related to teaching, (e.g., the selection of materials, or the amount of effort used to reach all students) and their willingness to invoke specific strategies and techniques.

This contention has been well supported in the research, where teacher efficacy has been related to high expectations for students (Allinder, 1995; Ashton et al., 1983; Dembo & Gibson, 1985; Ross, 1994), the use of behaviors known to foster academic achievement (e.g., Hoover-Dempsey, Bassler & Brissie, 1987; McKinney, Sexton & Meyerson, 1999; Vanek, Snyder, Hull & Hekelman, 1996; Ross, 1992; Woolfolk et al., 1990), a motivation to teach (Lin & Gorrel, 1988; Parkay, Olejnik & Proller, 1986; Trentham, Silvern, & Brogdon, 1985; Tuckman & Sexton, 1990; Shunk, 1985) and the types of decisions teachers make with regard to student needs (e.g., Emmer & Hickman, 1991; Kim & Corn, 1998; Kruger, 1997; Soodak & Podell, 1993, 1994; Saklofske et al., 1988; Shunk, 1985; Woolfolk et al., 1990).

Teacher motivation. There is an important relation between teacher efficacy and the motivation to teach found by many researchers (e.g., Ashton & Webb, 1986; Tschannen-Moran et al., 1998). Specifically, teachers with high levels of teacher efficacy also demonstrate a love or passion for teaching that impacts their practice as teachers (Dembo & Gibson, 1985; Tuckman & Sexton, 1990; Shunk, 1985; Woolfolk

et al., 1990). In addition, teacher efficacy has also been linked to a greater commitment to the teaching profession as well as job satisfaction (Parkay et al., 1986; Trentham et al., 1985).

Teachers' level of efficacy has also been related to a willingness to teach children with physical disabilities (Stephens & Braun, 1980). In an investigation of teacher characteristics on the placement recommendations of students with visual impairment, teacher's efficacy was found to be related to these decisions. Teachers with higher levels of efficacy were more likely to recommend that the child with a visual impairment remain at the local school rather than sending these students out for special services (Kim & Corn, 1998).

Teacher actions. Teachers with higher levels of teacher efficacy have been found to have higher expectations for their students than teachers with less efficacy (Allinder, 1994; Ross, 1994). Allinder (1994) working with special education teachers and implementing a new means of assessment in mathematics education, found that teachers with higher personal teaching efficacy and general teaching efficacy increased the end of the year goals for their students more than their less efficacious peers. Those teachers with higher general teaching efficacy also set more ambitious goals for their students. In addition to setting these more demanding goals for their students, it was found that those higher efficacy teachers also affected significantly greater academic growth in their students. Thus, efficacy has been linked to both more demanding goals and increased student achievement.

Teaching efficacy has also been related to specific instructional behaviors performed by teachers known to foster academic achievement (Ashton & Webb, 1984;

Berman et al., 1977). Such behaviors include maintaining on-task behavior in students, concentrating on academic instruction, and demonstrating "withitness" in the classroom (Ashton et al., 1983; Dembo & Gibson, 1985). Cooper and Burger (1980) investigated the relationship between teaching efficacy and intended teaching behavior in a group of preservice teachers. Using a free response methodology, the preservice teachers were asked to describe how they would respond to 12 possible reasons for student performance, and efficacy was measured by asking each participant to describe the extent of their perceived role in each situation. These researchers found that teacher efficacy was related to the intended behavior of these student teachers.

Teachers with a high sense of efficacy have also demonstrated persistence when faced with student failure and school difficulties and have also been identified as effective problem solvers with regard to classroom management (Dembo & Gibson, 1985; Tuckman & Sexton, 1990; Woolfolk et al., 1990). Similarly, teachers with high general teaching efficacy have been found to be less likely to criticize students for giving an incorrect answer (Gibson & Dembo, 1984).

While teacher efficacy is a belief in one's ability to teach, several researchers have also investigated the accuracy of these beliefs in comparison to a third party, usually a supervisor. Overall, levels of teacher efficacy were found to be associated with supervisor ratings of effectiveness of teachers (Hoover-Dempsey et al., 1987; Riggs & Enochs, 1990; Trentham et al., 1985). The findings of these studies lend support to the use of teacher efficacy as a tool in assessing the relationship between teacher actions and student achievement. Laundrum and Kauffman (1992) conducted a detailed study which investigated the relationship of teacher efficacy and the

perceptions of these teachers as determined by their peers using a sociometric format.

Interesting relationships were found by Laundrum and Kauffman (1992) between the peer perceptions of the teachers and the self-reported levels of efficacy using the Gibson and Dembo (1984) scale. Specifically, those teachers who were perceived by their peers as being more effective with students with behavior problems were also the teachers who reported higher feelings of efficacy. Further, those teachers who were perceived as less effective with students experiencing academic problems reported the belief that there was not much teachers could do given a child's background (low general teaching efficacy).

Additionally, with regard to these two dimensions of practice, behavior and academic, there was a unique clustering of the groups (Laundrum & Kauffman, 1992). In the behavior dimension, the teachers placed in the high group by their peers were relatively distinct from the average and low groups. Conversely, in the academic dimension it was the teachers placed in the low group by their peers that were distinct from the average and high groups. Thus, there seems to be some distinction of perceived efficacy given the task by which peers are assessed. In sum, the most distinct teachers seemed to be either those perceived as very good behavior managers or those considered to be very poor in addressing students' academic needs (Laundrum & Kauffman, 1992).

Teacher decisions. Teacher efficacy beliefs are related to the decisions teachers make with regard to use of time, classroom management strategies, and pedagogical techniques (Gibson & Dembo, 1984; Saklofske et al., 1988; Woolfolk et al., 1990). Emmer and Hickman (1991) investigated the role of teacher efficacy in classroom

management and found that efficacy beliefs predict preference for particular strategies to be employed in responding to the behavior problems presented in vignettes.

A series of studies have been done on the relationship between teachers' efficacy and the likelihood of their referring students for special education. Specifically, teachers with high personal teaching efficacy as determined by the Gibson and Dembo measure found to be less likely to refer low socio-economic status students and or students with behavior problems to special services (e.g., Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1994). Similarly, self-efficacy for resolving problems is predictive of teachers' intervention decisions (Hughes, Barker, Kemenoff, & Hart, 1993). Specifically, the more confident teachers are in their ability to solve the problem (i.e., the higher their self-efficacy), the less likely they are to refer the child to special education or to seek a consultation (Hughes et al., 1993).

Response to Innovation and Change

The valuing, adoption, and successful implementation of a new innovation or program are related to teachers' efficacy beliefs (Stein & Wang, 1988). Specifically, teachers who expressed higher levels of efficacy for teaching also tended to express a valuing of educational innovations (Cousins & Walker, 2000; DeForest & Hughes, 1992). More efficacious teachers also rated new practices as more aligned with their current routines, more important for student learning, and less difficult to implement than do teachers with less efficacy (Guskey, 1988). Kruse (1997) found that teachers who are able to practice focused reflection also reported a greater sense of efficacy. Additionally, these more efficacious teachers directed their searchers for innovations

and new pedagogical practices with a specific purpose or goal in mind, thus they used their reflective abilities to identify needed innovations and improvements (Kruse, 1997).

Positive teaching efficacy has revealed teachers who are more willing to experiment in the classroom with various strategies and curriculum ideas, (e.g., Meijer & Foster, 1988; Soodak & Podell, 1993;). These high efficacy teachers are more likely to adopt instructional innovations in the classroom (e.g., Berman et al., 1977; Ghaith & Yaghi, 1997; Guskey, 1988; Rohrbach, Graham, Hansen, 1993). Higher efficacy for teaching was also associated with successful implementation of adopted innovations (Berman et al., 1977). Dembo and Gibson (1985) reported that efficacy was one of the best predictors of "the percentage of goal achieved, amount of teacher change, improved student performance, and continuation of both project methods and material" (p. 173).

Teacher Beliefs

Teachers' ontological orientations have been related to their efficacy perceptions. Ontological orientations refer to how teachers perceive the world while capability beliefs (efficacy) influence how they will interact with it. With regard to teacher efficacy, a few studies have investigated the relationship between efficacy beliefs and teachers' orientations. Belief systems that have been investigated include pragmatism (Anderson et al., 1988) and teachers' degree of dogmatism versus open-mindedness (Payne, 1991). More narrow belief-systems associated with teacher efficacy include restorative versus preventative beliefs (meaning the extent to which teachers believe student problems reside in the student or the environment, Jordan,

Kircaaliiftar, & Diamond, 1993), pupil control beliefs (Woolfolk & Hoy, 1990), ability beliefs (Midgely et al., 1988), and concerns for specific teaching related activities (Martin, Linfoot, & Stephenson, 1999; McKinney, et al., 1999). This literature highlights the relationship between teachers' beliefs about issues related to schools and overall orientation to the world and teachers' efficacy beliefs. Specifically, there seems to be a qualitative connection between how teachers view the world, assign control, and interpret ability, and their efficacy beliefs.

Ontological Beliefs. Studies have investigated the relationship between teachers' orientations to the world and their degree of teacher efficacy. Two studies that will be discussed here investigated the relationship between teacher efficacy and pragmatism (Anderson et al., 1988), and dogmatism versus open-mindedness (Payne, 1994). Each of these studies will be briefly reviewed followed by a discussion of how efficacy is shaped by and shapes individuals larger belief orientations.

In a study designed to investigate the relationship between and among teachers' and students' sense of efficacy, thinking skills, and student achievement, Anderson and colleagues (1988), found a relationship between higher levels of teacher efficacy and the holding of a more pragmatic, philosophical orientation toward teaching. The 24 teachers in this study completed the Teacher Efficacy Scale (Gibson & Dembo, 1984), the New Jersey Test of Reasoning Skills (NJTRS, 1983), and 20-60 minutes interviews held at the beginning and end of the study. The teachers were divided into two efficacy level groups, based on their score for the personal teaching efficacy subscale. It was in the individual teacher interviews that the existence of a

pragmatic orientation to teaching began to emerge among those teachers considered to have higher levels of efficacy.

Teachers were asked to "describe their personal philosophic orientation to teaching, to describe the purposes of school as they saw them, and to comment on how they approached their roles as teachers" (Anderson et al., 1988, p. 162). Based on the responses to those questions teachers were sorted by the cohesiveness of their philosophical orientation. Cohesion here represented the extent to which this orientation reflected a particular philosophical position. With regard to cohesiveness, four teachers, three from the low efficacy group, were unable to articulate a philosophical orientation at all. Thirteen teachers presented a coherent philosophical view; eight of these teachers were from the high efficacy group. Thus, the authors suggested a tentative relationship between the cohesiveness of teachers' philosophical view and their level of efficacy.

Teachers who expressed a philosophical orientation were organized by the extent to which their orientation reflected a particular philosophical position (e.g. pragmatism or classical idealism). Six teachers expressed philosophies aligned with a pragmatic philosophy. Of those teachers, five were from the high efficacy group. In contrast, only two of the six teachers identifying with classical idealism were from the high efficacy group. Based on these observations the authors hypothesized that "It would appear that a 'practical' orientation was associated with a sense of being able to accomplish some thing–to make a difference" (Anderson et al., 1988, p. 162). They also suggested that further exploration should occur on the role of philosophical orientation might have in teacher efficacy beliefs.

Although Anderson et al.'s (1988) study was based on a small sample and relied on two interviews only, it provided us with some evidence as to the importance of beliefs in teachers' self-efficacy judgments. Both the importance of a coherent philosophical base and an emphasis on pragmatism among high efficacy teachers suggest that how one views the world and articulates such beliefs may be strongly linked to efficacy beliefs. Further, it may imply that another avenue for improving teacher practice may begin with larger belief systems, which are mediated by efficacy beliefs and which determine teachers' decisions and actions.

Payne (1994) sought to examine the significance of the teacher to African American and Hispanic low socioeconomic status and to analyze the teacher characteristics that create or limit this significance. Characteristics investigated included dogmatism, personal teaching efficacy, and years teaching in urban schools. One thousand six hundred junior high school students from urban school districts served as informants on 83 teachers with regard to the significance of those teachers. Teacher significance was measured using the Significant Teacher Survey (Payne, 1994), which identified a teacher's level of significance to his or her students on a continuum. Teachers then completed Rokeach's (1960) Dogmatism Scale Form E (DS-E) which served to ascertain open or closed belief systems in teachers and Gibson and Dembo's (1984) teacher efficacy scale, using only the personal teacher efficacy subscale in this analysis.

Of the initial 83 teachers, data from 35 was analyzed, due to permission requirements, and 13 teachers were selected for observation and interviews. Interviews and observations employed a strict coding framework to quantify observed actions.

This methodology was used to investigate specific teacher actions and behaviors that were found to be related to higher levels of significance to the students. Overall, the teachers in the sample were skewed toward positive ratings in significance and open-mindedness, which supports notion that more significant teachers are more willing to self-examine and volunteer to participate in research.

Regression analysis and analysis of variance demonstrated that dogmatism had little if any relationship to teacher significance (Payne, 1994). However dogmatism was related to teacher efficacy and efficacy in turn was related to teacher significance. Dogmatism and years teaching in urban schools had the strongest effect on personal teaching efficacy (Payne, 1994). Teachers with more years teaching in urban schools and who demonstrated more open-minded belief systems also had higher personal teaching efficacy scores. That is, efficacious teachers of minority students demonstrated open belief systems. This study provided evidence for the important role that efficacy may play in mediating the effect of ontological beliefs on teacher actions. Thus, this larger belief system may influence efficacy, which in turn affects teacher practices and student perceptions of significance.

The two preceding studies demonstrated the relationship between teacher efficacy and larger belief systems or orientations. Anderson and colleagues (1988) and Payne (1994) each provide evidence that teachers' larger belief systems are related to levels of teacher efficacy such that teachers with more pragmatic (Anderson et al., 1988) and open-minded orientations toward teaching (Payne, 1994) also demonstrate higher levels of teacher efficacy. Thus, how teachers view the world is related to the extent they believe themselves able to perform the actions necessary for positive

student learning outcomes to occur. The studies reviewed in the next section will further investigate this relationship with regard to the relationship between teachers' sense of efficacy and more narrow or specific belief systems.

Narrow Belief Systems. Researchers have also looked at the relationships that exist between teacher efficacy and more narrow belief systems that relate specifically to the role of teacher, such as restorative-preventative beliefs (Jordan, 1993), pupil control beliefs (Woolfolk & Hoy, 1990), ability beliefs (Midgely et al., 1988b), and concerns for specific teaching related activities (Martin et al., 1999; McKinney et al., 1999). Across these studies, we can see how the nature of teachers' sense of efficacy is related to specific beliefs about learners, learning, and teaching.

Jordan and colleagues (1993) investigated differences in beliefs for teachers of children traditionally labeled *at risk*. In this investigation, the researchers explored the validity of a restorative-preventive belief construct in teachers and the potential relationship those belief patterns have to teachers' sense of efficacy. These authors suggest that teachers can hold either restorative beliefs or preventative beliefs. Teachers with restorative beliefs assume that problems reside largely within the pupil. Therefore it is the teacher's duty to refer the pupil for confirmatory assessment as soon as possible (Jordan et al., 1993). In contrast, teachers holding preventative beliefs assume that the environment, including instruction, plays a part in students' problems and successes (Jordan et al., 1993). The dichotomy presented here seems to be similar to a locus of control measure and a belief orientation related to whether teachers see students' problems as within the teachers' control or not. Thus, this study allowed

some qualitative insight into the relationship between these types of beliefs and teachers levels of efficacy.

In order to validate the existence of these beliefs, Jordan et al. (1993) developed in-depth case studies of 26 teachers in Ontario based on the Elementary Teacher Interview (Wilson & Silverman, 1986, 1991), which assessed beliefs about the delivery of services to children considered at-risk or exceptional. Additionally, teachers responded to a questionnaire on teacher preferences for resource/support services that solicited the opinions of teachers about the services that they would like the resource teacher to provide. Finally, participating teachers completed the Gibson and Dembo (1984) Teacher Efficacy Scale.

Results from this study demonstrated a significant positive correlation between personal teacher efficacy and the restorative-preventative belief construct (Jordan et al., 1993). This relationship suggests that teachers who hold more preventative beliefs – beliefs that instruction is related to student problems and successes – tend to have higher levels of efficacy in their abilities to perform actions necessary to create a positive outcome in their students. In contrast, a negative correlation was found between general teaching efficacy and these beliefs. This negative relationship suggests that teachers with restorative beliefs, viewing student problems as residing within the child, tend to see parents and others as more influential than themselves in affecting learning outcomes (Jordan et al., 1993). Thus, these authors found that the beliefs teachers hold regarding the locus of students' problems is related to teachers' feelings regarding their own ability to impact student learning. Those teachers who felt that students' problems can be influenced by instruction also tended to believe they

were capable of performing the actions necessary to promote positive learning outcomes.

Investigating another form of control beliefs, Woolfolk and Hoy (1990) tapped into preservice teachers' self efficacy and pupil control beliefs. In this study, the researchers asked whether prospective teachers' efficacy beliefs were related to their orientations toward discipline, order, control, and motivation in schools. One hundred eighty-two undergraduate liberal arts majors enrolled in a teacher preparation program completed measures assessing teaching efficacy (Gibson & Dembo, 1984), pupil control ideology (Willower, Eidell, & Hoy, 1967), motivational orientations (The Problems in School Inventory– Deci, Schwartz, Sheinman, & Ryan, 1981), and preferences for the work environment (the Work Environment Preference Schedule; Gordon, 1970).

This study found that preservice teachers with high general teaching efficacy were more humanistic in their pupil control ideology (Woolfolk & Hoy, 1990). That is, preservice teachers who believed that teaching in general could impact student outcomes were also more likely to see the school as an educational community in which students learn through cooperative interaction and experience rather than as an institution that provides a rigid and highly controlled setting concerned primarily with maintaining order (Woolfolk & Hoy, 1990). There was no relationship found between motivational orientation and either dimension of efficacy (Woolfolk & Hoy, 1990). Both general teaching efficacy and personal teaching efficacy were significantly correlated with a bureaucratic orientation to the work environment, but in opposite directions. General teaching efficacy was found to be negatively related to a

bureaucratic orientation, which reflects commitment to the set of attitudes, values, and behaviors that are characteristically encouraged by bureaucracies or in this case schools. Thus, the preservice teachers who believed in the ability of teachers in general to overcome the adverse environments of students' lives, those had higher general teacher efficacy, were less likely to subscribe to a bureaucratic orientation. In contrast, preservice teachers with higher personal teaching efficacy were associated with higher levels of a bureaucratic orientation. Woolfolk and Hoy (1990) suggested that this difference may reflect preservice teachers' anticipation of becoming a loyal member of the school.

Across these relationships, Woolfolk and Hoy (1990) demonstrated that preservice teachers' beliefs about their own abilities, their efficacy, is also related to how they view pupil control and orientations toward the work environment. This work with preservice teachers informs us in two ways. First, preservice teachers were found to hold similar belief patterns of efficacy (personal and general teaching efficacy) that were found in practicing teacher populations. Second, preservice teachers' efficacy beliefs were related to other belief orientations related to school. This suggests that teacher training programs may be structured to target the development of belief systems that have been found to be related to higher efficacy levels. Similarly, it suggests that teacher preparation programs may need and to challenge prospective teachers' belief systems about school environments prior to their first teaching experience.

Midgely and colleagues (1988) investigated the extent to which teacher efficacy and ability beliefs of 107 sixth-grade elementary and 64 seventh-grade middle

school mathematics teachers were related to each other. These researchers found that the seventh-grade teachers were more likely to have fixed ability beliefs and that these beliefs were negatively related to efficacy. Thus, teachers who believe that ability is fixed and that students cannot achieve beyond a limited parameter were also found to have less teaching efficacy. The question that this study does not answer is the direction of this relationship. That is, does believing that ability is fixed limit the extent to which teachers can believe themselves able to make a difference? Or, do teachers through experience develop a low sense of efficacy, a belief that they cannot perform the actions necessary to produce student learning and, as a result, explain this failure as due to students' inability to improve beyond a certain point? The direction of those beliefs would inform us as to how and when to intervene in the development of teachers' professional philosophies.

Two studies investigated the concerns teachers hold for specific teaching related activities and how these concerns are related to teachers' feelings of efficacy (Martin et al., 1999; McKinney et al., 1999). Do teachers feel more or less efficacious about activities for which they are concerned? This general question has been investigated from two unique perspectives. Martin and colleagues (1999) looked at the degree of concern teachers had regarding misbehavior in the classroom and the amount of confidence (efficacy) these teachers had in their ability to resolve the problem. From another view, McKinney and colleagues (1999) investigated the role self-efficacy plays in teacher change and the types of concerns teachers express while involved in change.

Martin et al. (1999) surveyed 130 kindergarten through second-grade teachers in Australia. These researchers assessed how concerned teachers felt with regard to four kinds of classroom misbehavior: distractibility, disobedience, delinquency, and aggression. They also measured teachers' feelings of confidence for managing these types of misbehavior. The results revealed a negative relationship between concerns for misbehavior and teachers' feelings of confidence, such that the greater concern teachers had for student misbehavior, the less confident they were in their ability to manage this misbehavior. Again, this study did not address the direction of this relationship. Did the concerns arise out of a lack of confidence or does the lack of confidence in one's ability to perform these actions lead to greater concerns regarding classroom management? Regardless, this study highlights the relationship between teachers' confidence beliefs and the areas of concern that they focus on in their teaching practice.

McKinney and colleagues (1999) sought to test the Efficacy Based Change Model (EBCM, Ohlhausen, Meyerson, & Sexton, 1992) as a theoretical model of change in the teaching process. These authors sought not only to identify how and why teachers initiate a change in and/or development of their practices and belief systems but also to examine the factors that influence persistence in this process. The EBCM suggests that as participants are involved in an innovation, they move through stages of implementation. The EBCM is a based on the assumption that the change process is developmental in nature with changes in self-efficacy and levels of concern that relate to changes in personal and professional circumstances. Specifically, developing individuals are thought to pass through three levels of concern over the course of

implementing change. These three levels reflect concerns for the self, concerns for task, and concerns regarding the impact of the change.

One hundred-one teachers participating in graduate classes on whole language instruction over three semesters were monitored. The Stages of Concern Questionnaire (SoCQ; Hord, Rutherford, Hulling-Austin, & Hall, 1987) assessed the three levels of concern that related to the implementation of an educational innovation. The Educational Innovations Inventory (EII; Ohlhausen et al., 1992) measured perceived attributions, self-efficacy and factors thought to influence change.

Regression analysis revealed strong support for the role of self-efficacy in the change process (McKinney et al., 1999). Teachers' sense of self-efficacy was related to different levels of concern for the implementation of the innovation. Teachers with lower levels of self-efficacy focused on self concerns, the first stage in the process that addresses how this proposed change will impact the individual expected to make the changes. Individuals with higher levels of self-efficacy for implementing the innovation were more focused on concerns related to later stages, impact concerns. Impact concerns focus on the outcome of the intervention or change on the students and their learning process, whether the intervention is achieving the desired outcome. Further, at the end of the three semesters self-efficacy was the only predictive factor related to impact concerns. That is, teachers who believed they were capable of implementing the innovation appropriately were also most likely to have concerns regarding the impact of this innovation.

The role of self-efficacy in the process of change in teachers' practice is emphasized in this study (McKinney et al., 1999). McKinney and colleagues (1999)

demonstrated how the areas that concern teachers are related to their efficacy for achieving the task. This study demonstrated that teachers with lower levels of efficacy for implementing whole language instruction were more concerned with how this intervention affected their own experience and with attributes of the task itself. This can be compared to Martin et al.'s (1999) finding regarding the relationship between teachers' concern for student misbehavior and feelings of reduced confidence. In both of these studies, teachers with less efficacy were concerned more about the functional aspects of teaching, the "how to," rather than the deeper premises and meanings that underlie the teaching process. In the second study, McKinney et al. (1999) found that the teachers with greater efficacy were able to reflect on these deeper concerns and question the importance of their actions. Thus, it is only through the development of greater self-efficacy for the teaching tasks that teachers are able to free themselves of these low level concerns and begin to address the issues that are foundational to the teaching and learning process.

The preceding discussion outlined the relationships established between teachers' beliefs and their sense of efficacy for teaching. Specifically, the research demonstrated that teachers' larger beliefs about pragmatism and control, as well as the more specific beliefs relating to the teaching context are related to teachers' efficacy for teaching. What this work does not address are the processes by which such beliefs influence and are influenced by efficacy, and how efficacy may serve as a mediator between these beliefs and resulting courses of action. Further, this work does not include a specific assessment of how teachers' beliefs about teaching and or pedagogy are related to their practice. In work with middle school students (sixth and seventh

grades) we have found relationship between students beliefs about the domain of knowledge (i.e., science) and there knowledge and interest (Fives and Alexander, 2000). However, it seems that little attention has been given to teachers beliefs about teaching knowledge and how these beliefs are in turn related to their efficacy and performance. The present study investigated those specific relationships.

Factors Affecting Teacher Efficacy

Attempting to alter an individual's efficacy is an attempt to alter his or her belief system. To alter teacher-efficacy is to change what a teacher believes about his or her abilities, views on appropriate educational strategies, and expectations for the success of education in general. We begin forming our belief system from the time cognition begins (when this occurs in the life span is a debate for another author). Moreover, the educational beliefs we form are based on all of our experience in schooling. Teachers, in fact, begin training on their first day of school as a student. We spend years in classrooms, watching, noting, and making decisions regarding "good" and "bad" teachers and teaching from the view of the student (Pajares, 1992).

In fact, the observations of our "favorite" teachers often become the role model used when teachers are presented with their own classroom (Pajares, 1992). Thus, educational beliefs are formed long before students enter college and certainly before teachers enter classrooms. These beliefs are entrenched and often unreflective. The longer a belief has been held, the more difficult it is to alter. Consequently, much focus in the literature has been on preservice teachers, and creating a firm foundation for future beliefs and learning (Pajares, 1992). It is hypothesized that once a teacher

has direct experience in the classroom, altering the conclusions formed on the basis of these mastery experiences can be difficult (Bandura, 1977).

Effects of Interventions on Teacher-Efficacy

Ross (1994) conducted a study to determine if an inservice on cooperative learning would have any effects on teacher efficacy, personal and general, and on student behaviors as a result of increased teacher efficacy. Ross (1994) determined that it was the use of the inservice training that contributed to changes in teacher efficacy and not the mere exposure to the information. Further, the change in efficacy was in general (some would say locus of control) rather than personal teaching efficacy (Ross, 1994). It was suggested that personal teaching efficacy did not change, because with the increased general teaching efficacy, performance expectations of good teaching also increased. Thus, while their actual practice may have changed their personal efficacy beliefs as assessed through the measure given did not due to their new understanding of what teaching could be (Ross, 1994). This is an example of the cliché "the more you learn, the less you know." As these teachers learned more skills and strategies, they became aware of how much more there was to learn, thus, little change was revealed with regard to their personal efficacy. Ross (1994) also found that increases in teacher efficacy lead to changes in student behavior; namely in the seeking and giving of help to fellow students (a goal of the inservice).

Fritz, Miller-Heyl, Kreutzer, and MacPhee (1995) conducted a study similar to Ross's (1994) study. Fritz et al. (1995) assessed the effectiveness of a DARE to be You teacher training program, for enhancing feelings of personal teaching efficacy. The researchers found that teachers with initially high or relatively higher personal

teacher efficacy were more likely to risk new procedures and to attempt the usage of the new training in their classrooms (Fritz et al., 1995). The study used three groups in the sample, high efficacy teachers, low efficacy teachers (by comparison to each other), and a control group who did not receive the training. Results of the inservice found that the high efficacy teachers increased their sense of personal teaching efficacy. The low efficacy teachers maintained their initial level of efficacy and the control group dropped in feeling of efficacy over the nine-month period (Fritz et al., 1995). The participants in the sample were volunteers for the training and, as such, may have been a more efficacious group than a truly random sample of teachers may have been. Still, the study determined that positive changes in efficacy can occur. With regard to the low efficacy, I feel it is significant that teachers' feelings of efficacy did not drop in the course of the school year, as did those in the control group. This maintenance of efficacy most likely yielded benefits to the teachers and their students in areas beyond the scope of the study (Fritz et al., 1995).

Teacher efficacy can be altered, enhanced, or diminished, through inservices, direct experiences, interactions with staff, students, parents, and administrators. The need for teachers to maintain a high sense of efficacy is evident based solely on the impact of high teacher efficacy on student achievement and motivation.

Teacher Experience

Researchers have also investigated the differences in teacher efficacy beliefs across experience or expertise levels. Specifically, much work has investigated the differences between preservice and inservice teachers' levels of efficacy. Some work has confirmed the claim that teacher efficacy is highest among preservice teachers and

that this level of efficacy drops, often drastically, during the first year of teaching (Brousseau, Book, & Byers, 1988; Soodak & Podell, 1997). The work of Brousseau and colleagues (1988) suggested that this high level of efficacy continues to drop as experience is gained, a result that was also found in the work of Anderson et al. (1988). In contrast, Soodak and Podell (1997) employed a cross-sectional methodology and found that after the drop during the first year of teaching, there was a consistent increase in efficacy beliefs with experience. However, those beliefs never again reached the high, perhaps inflated, levels found in preservice teachers. Moreover, Soodak and Podell (1997) also found that these extreme highs and lows did not exist for the secondary teachers in their sample. In fact, these researchers reported that the secondary teachers were significantly more homogenous in their efficacy beliefs and were less efficacious overall as compared to elementary teachers (Soodak & Podell, 1997).

Other researchers have found that the relationship between efficacy and experience is more positive. For example, Gorrell and Dhamadasa (1994) found that preservice and inservice teachers have distinctly different levels of efficacy for particular tasks. Preservice teachers had higher levels of efficacy for the use of new techniques and implementing new methods of instruction. Inservice teachers, however, were found to have higher efficacy for classroom management, organization of instruction, and having a positive impact on students (Gorrell & Dhamadsa, 1994). Campbell (1996) found higher efficacy among teachers who were experienced, older, and who had higher education.

Organizational Effects on Efficacy

Beyond the utilization of inservice programs to enhance teacher efficacy, other factors in the school environment have been found to affect the amount of efficacy a teacher holds. Such factors include a perceived positive school atmosphere (Moore & Esselman), a sense of school community (Lee et al., 1991), engagement in joint work with other teachers (Rosenholtz, 1989), parental involvement, and school wide coordination of student behavior (Rosenholtz, 1989). Administrative support and actions of the principal are other forces that can work to increase teacher efficacy. Increases in teacher efficacy were found in schools where there was a perception that the principal made efforts on behalf of the teachers (Hoy & Woolfolk, 1998), involvement of teachers in decision making (Moore & Esselman, 1992), and positive, specific feedback on teacher performance (Rosenholtz, 1989). These increases in efficacy were also found when the administration provided "resources and buffers of disruptive factors but allowed teachers flexibility over classroom affairs" (Tschannen-Moran et al., 1988, p. 220).

Conversely, in their qualitative study of teacher's sense of efficacy, Ashton and Webb (1986) identified factors that contribute to a decrease in teacher efficacy. Factors leading to a diminished sense of efficacy include excessive role demands, poor morale, inadequate salaries, low status, lack of recognition, and a sense of professional isolation and alienation (Ashton & Webb, 1986). One can quickly compare this list of detractors to the enhancers described and observe that the two lists are essentially opposites. Thus, in the area of teacher efficacy, it seems that if you aren't helping (enhancing teacher's sense efficacy) then you are causing harm (detracting from

teacher's sense of efficacy). There is not much, middle ground where "doing nothing," will not effect a teacher's sense of efficacy, as was demonstrated in the Fritz et al. (1995) study, in which the control group of teachers had a decline in PTE beliefs over the course of the year.

The Role of Knowledge in Teacher Efficacy

Research Investigating the Relationship between Teacher Knowledge and Teacher Efficacy

Raudenbush et al. (1992) highlighted the important intersection between teachers' efficacy and the knowledge and skills that are necessary to be successful. They contend that neither knowledge nor efficacy alone can generate effective teaching. Rather, these researchers emphasize the role of efficacy as a mediator between knowledge and action, such that efficacy provides the impetus for teachers to utilize their knowledge and skills in new situations and with persistence (Raudenbush et al., 1992). In this light, Raudenbush and colleagues (1992) saw positive feelings of self-efficacy as necessary, but not sufficient, for effective teaching. That is, these positive feelings produce a generative capability that will allow teachers to develop new teaching strategies, increase their effort, and extend their persistence in the face of difficult or uncertain teaching situations. Thus, these authors conclude that "from this perspective feelings of positive self-efficacy cannot guarantee effective teaching, since teachers with high levels of perceived self-efficacy may lack the requisite knowledge or skills to be effective. But low feelings of self-efficacy almost certainly work against effective teaching by decreasing teachers' generative capability to cope with the uncertainties of classrooms" (Raudenbush et al., 1992, p. 151).

The vast majority of literature on teacher efficacy has focused on two areas. First, and to a greater extent, researchers have investigated the relationship between teacher efficacy and desired educational outcomes (e.g., student achievement and teacher behaviors). To a lesser degree, researchers have looked at school and teacher characteristics related to and possible contributing to teachers' sense of efficacy (e.g., organizational effects, inservice training). Among this second category of investigations, often embedded in larger questions, some researchers have looked at the extent to which teachers' knowledge is related to their efficacy beliefs.

The research that has investigated the relationship between knowledge and efficacy can be categorized by the manner in which knowledge is addressed, focusing on educational level, explicit learning experiences, and measures of demonstrated knowledge. Each of these categories of studies is based on what I interpret to be an assessment of knowledge. The first group, entitled "education" consists of those studies in which formal education was used as a proxy variable for knowledge in relation to teacher efficacy. In these studies, education was assessed as education level (e.g., Hoy & Woolfolk, 1993) or as courses taken (i.e., Enochs, Scharmann, & Riggs, 1995).

The second category, "specific learning experiences" outlines those studies that investigated specific, usually structured, experiences of teachers or teacher education students. These specific learning experiences were defined in such as way so as to convey an expectation of specialized knowledge (e.g., experience teaching in an inclusive setting, Minke, Bear, Deemer, & Griffin, 1996). The final group of studies, classified as demonstrated knowledge, include investigations that assessed

participants demonstrated knowledge through paper and pencil assessment (e.g., Emmer & Hickman, 1991) or teacher performance through supervisor ratings (e.g., Trentham et al., 1985). Each of these categories includes investigations that emphasized the importance of knowledge in understanding teacher efficacy.

Table 2 provides a skeletal outline of the studies that demonstrate the central features of each of these categories. The table includes the author(s) and title, as well as, the research question(s) that pertain to the relationship between knowledge and efficacy, the measures used, type of analysis, and related findings. The descriptions in this table are intended to provide the reader with an overview of the work done in this area. In many cases, this is but a snapshot of a larger study. However, this overview allows us to look closely at the knowledge-efficacy connection. Following the discussion of the tabled studies, unasked questions will be raised and areas for future research will be outlined.

TABLE 2
Articles Investigating Teacher Efficacy and Knowledge

Education Level						
Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Benz, Bradley, Alderman, & Flowers (1992) *Journal of Educational Research*	Personal teaching efficacy: Developmental relationships in education	Explored the differences between measures of PTE among several pre-professional groups: a) entering secondary teacher education students; b) students in professional education courses; c) secondary student teachers; d) practicing teachers; c) teacher education faculty; and f) non-college-faculty student teaching supervisors	Entering students=95; students in education courses=121; student teachers=47; inservice teachers=38; college faculty=29; supervisors= 29	Ashton vignettes (1984) measure of personal teaching efficacy	One way ANOVA	o Preservice teachers were more confident than experienced teachers with respect to vignettes involving student motivation. o In planning and evaluating lessons, experienced teachers were more confident. o College faculty had higher levels of motivation for classroom management than all other groups except for supervisors o For planning, college faculty had higher efficacy than student teachers. o For socialization, college faculty had greater efficacy than mid- and entering-students.
Hoy & Woolfolk (1993) *Elementary School Journal*	Teachers' sense of efficacy and the organizational health of schools	Explored the relationships between personal characteristics of teachers and their general and personal teaching efficacy.	179 elementary school teachers in NJ	Teacher Efficacy Scale - (Gibson & Dembo, 1984)	Descriptive data, correlations regression	o Education level was the only personal variable of the study that uniquely predicted personal teaching efficacy.

TABLE 2: *Continued*

Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Campbell (1996) *Education*	A comparison of teacher efficacy for pre and inservice teachers in Scotland and America	Investigated to the efficacy scores of Scottish and American preservice teachers, compared with the efficacy scores of inservice teachers?	Scottish: 39 inservice, 34 preservice; American: 35 inservice, 32 preservice. 3 groups: Pre-BS, BS and Post-Grad	Teacher Efficacy Scale (Gibson & Dembo, 1984) - 15 items; Questionnaire (Naring, 1984) perception of teachers' ability to execute a specific teaching task (PTE)	One-way ANOVA	o Teachers with graduate work in education or related experiences had more teaching efficacy than preservice teachers. o Teachers in the Post-Grad group had the highest levels of teacher efficacy
Specific Courses						
Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Enochs, Scharmann, & Riggs (1995) *Science Teacher Education*	The relation ship of pupil control to preservice elementary science teacher self-efficacy and outcome expectancy.	Explored the potential relationship between personal science teaching efficacy and other mediating variables: number of college science courses, number of years in HS science.	n=73 preservice elementary teachers	STEBI-B (Enochs & Riggs, 1990): measure of science teaching self-efficacy and outcome expectancy.	correlations	Significant negative correlations were found between personal science teaching efficacy and o number of college science courses taken, o number of years of HS science taken

TABLE 2: *Continued*

Learning Experiences Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Minke, Bear, Deemer, S. & Griffin, (1996) *Journal of Special Education*	Teachers' experiences with inclusive classrooms: implications for special education reform	Compared teacher efficacy across three professional groups: regular classroom teachers, regular classroom teachers in inclusive classroom, and special education teacher in inclusive classrooms.	Teachers: 185 regular education, 71 Regular Education in Inclusion classrooms, 64 Special Ed in Inclusion Classrooms	14 items modified from Gibson & Dembo's (1984) Teacher Efficacy Scale (Soodak and Podell, 1993).	ANOVAs correlations	o Regular and Special education teachers in inclusive classrooms reported higher levels of PTE than regular teacher in traditional classrooms. o Higher personal efficacy was found in regular education teachers in regular classrooms who had had experience in inclusive settings.
Reid, Vasa, Maag, & Wright (1994) *Journal of Research and Development in Education*	An analysis of teachers' perceptions of attention deficit-hyperactivity disorder	Gathered initial data pertaining to teachers' perceptions of instructional barriers and their self-efficacy in working effectively with students with ADHD. 2 perspectives: previous experience & previous training with ADHD students.	449 third grade teachers in Nebraska.	Confidence in attaining goals: 10 items reflecting activities that would be encountered in classroom practice – confidence=self-efficacy	2 x2 ANCOVA	o Both prior experience and training significantly affected perceived confidence. o Teachers with prior experience and training had higher perceived confidence in ability to determine when an intervention is required and when progress is made. o Teachers with prior training had more confidence to: set up behavior contract; adjust lessons; determine behaviors requiring intervention; determining when progress is made.

TABLE 2: *Continued*

Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Parameswaran, (1998) *Journal of Instructional Psychology*	Incorporating multi-cultural issues in educational psychology classes using field experiences	Explored the effectiveness of using short term site visits in enhancing sensitivity to diversity among students. Site visits were incorporated into the broader context of an undergraduate educational psychology class.	29 experimental 31 control	Teacher Efficacy Scale (Gibson & Dembo, 1984) Knowledge-issues important to Springfield adolescents; Efficacy in dealing with multicultural and adolescent issues in the classroom;	t-tests	o Field trips led to a more comprehensive understanding of the problems that adolescents in the region faced and community resources available to them. o Students who participated in the short visits perceived themselves as more confident in dealing with children from diverse backgrounds, as compared to those without the field experience.

Demonstrated Knowledge

Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Schoon & Boone (1998) *Science Education*	Self-efficacy and alternative conceptions of science of preservice elementary teachers.	Investigated the relationship between science teaching efficacy and the number of alternative conceptions held and determined the relationship between science teaching efficacy and the holding of specific alternative conceptions.	619 university students across 10 campuses	Science teacher efficacy: Elementary Science Teach Efficacy Belief Instrument (Enoch & Riggs, 1990); Alternative Conceptions Measure	Rasch model, t-tests	o The students with the greatest number of correct answers had significantly higher science teaching efficacy o There was no relationship between the number of alternative conceptions held and science teaching efficacy. o Holding certain alternative conceptions was associated with persons of low science teaching efficacy

TABLE 2: *Continued*

Authors	Title	Purpose/Research Questions	Sample	Measures	Analysis	Key Findings
Sciutto, Terjesen, & Bender Frank (2000) *Psychology in the Schools*	Teachers' knowledge and misperceptions of attention-deficit/hyperactivity disorder	Examined teachers' knowledge and misperception of ADHD regarding symptoms/diagnosis, treatment, and general information.	149 elementary school teachers.	Knowledge of Attention Deficit Disorders Scale; Self-efficacy for teaching ADHD child (1 item); Demographic Information	Correlations	o Teacher self-efficacy, prior exposure to ADHD child, and years of experience were all positively related to ADHD knowledge.

Education

Studies that assessed education focused on either educational level achieved or specific course work taken. Across the studies is the common reliance on participants (preservice and inservice teachers) self-report information regarding the extent of their prior learning. Additionally with these studies, it should be noted that education is being considered a proxy variable for knowledge. Of course, this approach relies on the potentially faulty assumption that higher education levels equate to higher levels of knowledge.

Education level. Benz, Bradley, Alderman, and Flowers (1992) conducted a cross-sectional study to assess the development of personal teaching efficacy in preservice students through college education faculty. Six groups were assessed, entering students (n=95), students in advanced education courses (n=121), student teachers (n=47), practicing teachers (n=38), teacher education faculty (n=29), and non-faculty student teaching supervisors (n=29). Each of these groups responded to the Ashton Vignettes (1984), which measure personal teaching efficacy. This measure presents participants with a detailed scenario of a teaching dilemma and asks how confident they would be in resolving this situation.

Several interesting differences were found across the groups assessed. First, there seemed to be a distinction between groups based on the task for which efficacy was measured. For example, the preservice teachers reported higher levels of efficacy for motivating their future students than did inservice teachers. In contrast, the inservice teachers demonstrated higher levels of efficacy for planning and evaluating

lessons, tasks that the authors felt involved a larger knowledge base (Benz et al., 1992).

Second, when all groups are considered, college faculty demonstrated some of the highest levels of efficacy. College faculty members had higher self-efficacy for motivation and classroom management than all other groups except the student-teaching supervisors. Similarly, with regard to planning, college faculty had higher efficacy than student teachers. Lastly, college faculty also demonstrated higher efficacy for socialization processes than entering students. It is interesting to note that college faculty had high levels of efficacy for these teaching tasks, even though the completion of such work was not part of their daily practice. Although these professionals are committed to training teachers and should, in turn, have extensive knowledge regarding the types of tasks assessed, they are not in reality, confronted–or expected to be confronted–with these dilemmas as part of their daily professional practice. It may be that the lower efficacy beliefs of preservice and inservice teachers are related to the reality of their future and current situations. Moreover, preservice and inservice teachers will have or do have their efficacy beliefs for these tasks tested on a regular basis and, as such, may receive more information with which to make these assessments.

Two other studies looked at the relationship between personal teaching efficacy and educational level (Campbell, 1996; Hoy & Woolfolk, 1993). Both of these studies assessed personal teaching efficacy using the Gibson and Dembo (1984) instrument. The first study, conduced by Hoy and Woolfolk (1993), investigated the

relationship between teacher efficacy and the organizational health of schools. In addition to this larger focus, these researchers explored the relationship between personal and demographic characteristics and teachers' sense of personal and general teaching efficacy. Data were collected from 179 practicing teachers. In addition to the efficacy measure, demographic information requested included age, gender, years of teaching experience, and education level. Among the personal variables, education level was the only factor that predicted personal teaching efficacy. Correlational analysis revealed a significant positive relationship between education level and personal teaching efficacy (r =.21, p<.01). In multiple regression analysis, education level was the only personal variable that had an independent effect on personal teaching efficacy (R^2=.03843, p>.05).

The final study to be assessed was conducted by Campbell (1996) and compared teaching efficacy of preservice and inservice teachers in Scotland (preservice=34; inservice=39) and the United States (preservice=32; inservice=35). Although the development of teacher efficacy was found to be the same across the two countries, differences in efficacy as related to education level differed. Specifically, three education levels were identified, pre-Bachelor's degree, Bachelor's degree, and post-graduate (these included Master's degrees, or other graduate certificates or diplomas). When teacher efficacy was compared across these groups it was determined that teachers with post graduate work both in Scotland and the United States, reported the highest level of teaching efficacy.

Each of these three studies demonstrated a relationship between educational level and teacher efficacy. Most often, higher levels of education were associated with higher levels of efficacy. This may seem like a logical relationship. People who earn more degrees, gain more knowledge about teaching, and feel more confident in their ability to teach successfully. However, these studies do not address two key concerns. First, there is no attention given to the personal characteristics that influence individuals' decisions to pursue graduate study. It could be that these individuals had higher efficacy prior to investing in graduate work, and it was this higher efficacy that pushed them to learn more so that they could fill their own expectations.

The second concern is the assumed link, between education level and knowledge. The actual knowledge base and abilities of these individuals was not tapped, so a true understanding that more education leads to more knowledge and eventually to higher efficacy cannot be verified by this work. There could be other events happening within the continuing education experience that are increasing efficacy unrelated to knowledge.

Specific courses. Enochs et al. (1995) explored the extent to which preservice teachers' sense of teaching efficacy for science instruction was related to the coursework they had received. Enoch and colleagues (1995) assessed 73 preservice elementary teachers' efficacy for teaching science using the Science Teaching Efficacy Beliefs Instrument-B or STEBI-B, (Enochs & Riggs, 1990), as well as the amount of science education these preservice teachers had received at both the college and high school levels. Significant correlations were found between personal science

teaching efficacy and the number of college science courses taken (r = -.21, p<.05) and years of high school science (r = -.22, p<.05). These negative relationships suggest that the more science classes taken in college and high school, the less personal science teaching efficacy was reported by these students.

Enochs et al. (1995) explained the negative relationship between science teaching efficacy and the number of science courses taken, by focusing on the manner in which sciences classes are taught at the secondary and college level. Namely, these courses are often taught in a traditional lecture format with a heavy focus on memorization, which is the antithesis of how preservice teachers are instructed to conduct science lessons in their methods courses. Thus, according to Enochs et al. (1995), the students with more science courses, also had greater exposure to poor models of how to teach science that, in turn, served as a source for efficacy beliefs (vicarious experiences).

I would offer a second explanation for this difference that is, the advanced level of these, courses, in conjunction with the way that they are delivered, may inhibit preservice teachers' beliefs in their ability to reconstruct this material for elementary school children. Further, these preservice teachers may not be able to see or make the connections between college level physics and a second grade unit on simple machines, because the two courses, while rooted in the same science, are at very different levels of understanding. The advanced courses in science may influence how these preservice teachers view the domain of science, such that their teaching efficacy beliefs are inhibited by their larger scope and understanding of the field. Because they

do know, supposedly, the field better, they may in fact be making more informed efficacy judgments, which may reflect their concern for and desire to provide conceptually sound lessons for their future students. Additionally this study also highlights the reality that there are a multitude of other variables embedded in any educational experience that can also influence teacher efficacy.

The preceding section highlighted those investigations that explored the relationship between education level and teachers' sense of efficacy for teaching. In large part, it seems that greater amounts of education are associated with higher levels of teaching efficacy, excluding the case presented by Enochs et al. (1995). However, hidden in these result are the unique reasons these preservice and inservice teachers chose to advance their education. Perhaps personal interest or aptitude led them to pursue additional education, and perhaps these individuals would have demonstrated similar levels of efficacy had they not furthered their education. Additionally, education level does not inform us as to the specific experiences that may have served to build and enhance participating teachers' sense of efficacy. In targeting education level, as a variable we seem be assuming knowledge. However, there may be something else in the educational experience that is increasing efficacy other than knowledge. Clearly, the Enochs et al. (1995) article suggested that the learning experience may serve to enhance or limit individuals' teaching efficacy. The next section outlines a variety of studies that address this issue, investigating the relationship between learning experiences and teaching efficacy of preservice and inservice teachers.

Learning Experiences

A few studies have investigated the relationship between specialized training or unique learning experiences and teacher efficacy. These studies have found that teachers (inservice and preservice) who are given explicit training or experiences with regard to unique teaching tasks tend to demonstrate higher levels of teacher efficacy for those tasks than their peers who did not have the same learning opportunity. One area where this work has been investigated is special education, specifically, teachers' feelings of efficacy for teaching special needs children (Minke, 1996; Reid, Vasa, Maag, & Wright, 1994). In another direction, however, Parameswaran (1998) investigated the extent to which specific learning experiences in an educational psychology class can influence students' feelings of general teaching efficacy and efficacy for meeting the needs of diverse students. Across these studies we will see the influential relationship that seems to exist between specific training or learning experiences and teachers' sense of efficacy.

Minke and colleagues (1996) investigated differences in teacher efficacy across three teaching groups: regular education teachers (n=189), regular education teachers in an inclusion setting (n=71), and special education teachers in an inclusion setting (n=64). Teacher efficacy was assessed using a modified version of the Gibson and Dembo (1984) measure (Soodak & Podell, 1993). Results from this study indicated that special education teachers and regular education teachers in an inclusion setting demonstrated higher levels of personal teacher efficacy than regular education teachers. Similarly, those regular education teachers, in regular classrooms, who had

prior experience in inclusion classrooms, also demonstrated higher levels of personal teaching efficacy. Thus, there seems to be a relationship between feeling more able to perform the actions necessary to create student learning, personal efficacy, and the unique experience of working in an inclusion setting. Perhaps, as the regular education teacher and the special educator work together to meet the needs of the children in the class learning takes place among these teachers. They are able to give and receive important feedback and to discuss potential methods of meeting their students' needs. Therefore, I would contend that teaching in this type of environment would provide the teachers with a unique learning experience that permits them access to a unique knowledge base and set of skills that may, in turn, enhance their overall teaching abilities and efficacy.

Reid and colleagues (1994) also investigated the extent to which teacher efficacy, assessed as confidence to attain goals pertaining to working with children having Attention Deficit Hyperactivity Disorder (ADHD), was related to prior experience or training. These researchers, in addition to gathering demographic data, asked 449 third-grade Nebraska teachers to describe the amount of confidence they felt for accomplishing 10 goals or activities directly relevant to the successful instruction of children with ADHD (e.g., "Teach in such a way that students with ADHD can learn in the classroom." Reid et al., 1994, p. 199). Comparisons were made between teachers with and without prior experience, and with and without prior training. Results of analysis of covariance found unique differences in confidence related to both prior experience and prior training. Specifically, teachers with prior

training felt more confident in their ability to teach in such a way that a student with ADHD can learn (F[1,444]=6.17 p=.013), to determine when a student manifests a behavior requiring intervention (F[1,444]=9.64 p=.002), and to determine when progress is being made in behavior (F[1,444]=5.10 p=.024). In contrast, teachers with prior training expressed greater efficacy than those without prior training in their ability to set up an effective behavior contract (F[1,444]-10.80 p=.001), to adjust lessons or materials for students with ADHD (F[1,444]=5.02 p=.026), to determine when a student requires an intervention (F[1,444]=9.65 p=.002), and to assess when progress in behavior is made (F[1,444]=3.87 p=.049). In essence, this investigation demonstrates the relationship between efficacy and prior training and the experiences in a specialized area of teaching.

A final study assessing a specific learning experience was conducted by Parameswaran (1998). This work investigated the impact of field experiences on educational psychology students' knowledge about problems facing adolescents in the local area and efficacy for meeting the needs of those adolescents. Twenty-nine experimental and 31 control students enrolled in two educational psychology classes. The students in the experimentation condition, in conjunction with the standard curriculum, also participated in a series of short term site visits to service providers in the community. Pre- and post-assessments of knowledge, general teaching efficacy, personal teaching efficacy, and specific areas of efficacy were gathered from students in both groups. Knowledge regarding issues important to the adolescents in the service area was assessed with a test constructed by the author. The Teacher Efficacy Scale

(Gibson & Dembo, 1984) was used to assess general and personal teaching efficacy. Areas of specific interest included efficacy for dealing with multicultural issues in the classroom and efficacy in dealing with classroom problems related to adolescents were also assessed with a measure generated by the author (Parameswaran, 1998). T-tests were used to assess differences between the groups. The experimental group demonstrated greater knowledge, higher levels of general teaching efficacy, and higher teaching efficacy with regard to cultural differences than the control group.

The previous studies have revealed that there is a relationship between specific types of training and experience that can enhance teachers' sense of efficacy. Moreover, the first two of these studies have shown that specialized training in the area of inclusion and ADHD can lead to greater feelings of efficacy overall. The final study demonstrated that positive changes in efficacy can be made in preservice teachers through specific changes in their educational experiences. I would contend that these learning experiences imbued these inservice and preservice teachers with greater knowledge which, in turn, aided them in developing these higher levels of efficacy. However, we still have the unanswered question of why these teachers choose to enter these fields and gain these unique experiences.

Additionally, using these specific learning experiences or educational level as a proxy for knowledge masks the specific content and structure of these teachers' knowledge base. What is this that teachers gained from extended education that allowed them to exhibit increased feelings of efficacy? What knowledge do they hold and how does it affect their efficacy beliefs? In teachers with lower educational

achievements, what knowledge might they be lacking that may be limiting their confidence in their ability to teach? The articles reviewed in the next section attempt to address some of these questions.

Demonstrated Knowledge

Two studies explicitly investigated the link between demonstrated knowledge and teachers' level of content specific efficacy. Schoon and Boone (1998) investigated the relationship between science teaching efficacy beliefs and the specific alternative conceptions of science they held. In a similar study Sciutto, Terjesen, and Bender Frank (2000) investigated the relationship between self-efficacy for teaching a child with ADHD and teachers' knowledge of ADHD. These two studies demonstrated the often assumed relationship between knowledge and efficacy. Moreover, each of these studies revealed, to some extent, the knowledge that is missing among some teachers with respect to these specific fields. Thus, it may be most appropriate to target interventions and instruction for preservice and practicing teachers at specific areas of knowledge and efficacy.

Schoon and Boone (1998) assessed the science teaching efficacy beliefs and knowledge regarding alternative conceptions of science for 619 university students. Efficacy beliefs were assessed using the Elementary Science Teaching Efficacy Belief Instrument (STEBI-B, Enochs & Riggs, 1990). Alternative conceptions were assessed with a 12-item multiple-choice test. Each of the items on this test was constructed so that there was one acceptable answer, one common alternative conception, and two distracters. These items covered three areas of science: life, physical, and earth/space.

The alternative conceptions were selected based on prior research that identified these conceptions as common among respondents. Examples of the alternative conceptions included, “summer occurs when the earth is nearer the sun,” “venous blood is blue,” “any mineral that scratches glass is a diamond” (Schoon & Boone, 1998, p. 559).

Schoon and Boone assessed the relationship between knowledge and self-efficacy in two ways. First, they compared levels of science teaching efficacy to the number of correct responses on the alternative conceptions measures. Results indicated that the student with the greatest number of correct responses (8 or more) had significantly higher (stronger) levels of self-efficacy than those students with fewer correct answers (3 or less). The second means of analyzing this data was to determine what relationship, if any, existed between having specific alternative conceptions and science teaching efficacy. Comparisons of science teaching efficacy were made per item between students’ responding to the item correctly and those who held alternative conceptions. It was determined that five specific alternative conceptions were associated with lower feelings of science teaching efficacy. These conceptions were: “Planets can be seen only with a telescope (p=.03), Dinosaurs lived at the same time as cavemen (p=.03), Rusty iron weighs less than the iron that it came from” (p=.07), electricity is used up in appliances (p=.03), and North is toward the top of a map of Antarctica (p=.00)” (Schoon & Boone, 1998, p. 563).

These results indicated a strong link between the role of knowledge in science and science teaching efficacy beliefs. With regard to the second finding that holding

specific alternative conceptions was more often associated with lower science teaching efficacy, Schoon and Boone (1998) offered a reasonable explanation. Specifically they reasoned that these five alternative conceptions are "fundamental barriers to a full understanding of their respective sciences; they are, using Hawkins's (1978) terminology, 'critical barriers'" (Schoon & Boone, 1998, p. 564). These alternative conceptions frequently interfere with the learning process. Thus, these preservice teachers may have to struggle to understand scientific concepts and as a result feel less able to interpret and present this information to others in a meaningful way.

Sciutto et al. (2000) examined teachers' knowledge and misperceptions with regard to ADHD. Specifically, they investigated the knowledge of 149 elementary teachers with regard to the symptoms, diagnosis, and treatment of this disorder, in addition to some other general information. This information was assessed using the Knowledge of Attention Deficit Disorders Scale (KADDS) consisting of 36 items to which respondents could answer true, false, or don't know. This measure was designed specifically for this study. In addition to this knowledge measure, teachers' sense of self-efficacy was rated along a 7-point scale that gauged the extent to which participants "felt they could effectively teach an ADHD child" (Sciutto et al., 2000, p. 118).

Correlational analyses indicate that teacher self-efficacy [r (145) =.29, p<.001], the number of ADHD children taught [r (128) =.22, p<.011], and years of experience [r (142) =.18, p<.29] were all positively related to ADHD knowledge

(Sciutto et al., 2000). Thus, those teachers who were able to demonstrate more extensive and correct information about ADHD also held stronger beliefs in their own ability to teach these children.

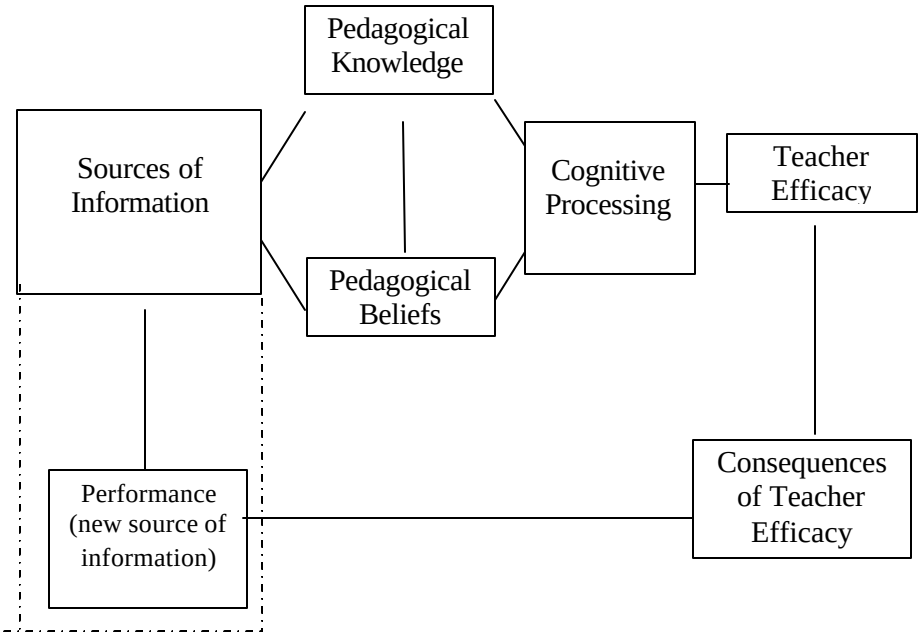
The work of Schoon and Boone (1998) and Sciutto et al. (2000) serve as a springboard for the present investigation of the relationship between knowledge and efficacy. Specifically, these studies have demonstrated that there exists a strong link between the demonstrated knowledge of teachers and their reported feelings of teaching efficacy. The next major step is to develop an understanding of how teacher efficacy serves to move individuals from knowledge to action. That is, what is the process by which knowledge is sorted, selected and employed within the confines of teachers' daily practice?

Extended Model of Teacher Efficacy

Tschannen-Moran and her colleagues (1998) provided a model of teacher efficacy (Figure 1) that describes the development of efficacy as a cyclical process including several components. Specifically, this model suggests that the sources of efficacy (i.e. mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal) influence cognitive processing in terms of task analysis and assessment of personal teaching competence, leading to efficacy beliefs. These efficacy beliefs then have consequences such as goals, effort, and persistence that affect actual performance. The actual performance, in turn, serves as a mastery experience and new source of efficacy information. However, what this model does not explore is the role of knowledge and beliefs, particularly pedagogical knowledge

and beliefs. If we accept that efficacy serves as a mediator between knowledge and performance, as suggested by Raudenbush and colleagues (1992) then it is important to understand how knowledge and knowledge beliefs fit into the efficacy model. Here I share my current conceptualization of an extended model of teacher efficacy that incorporates teachers' pedagogical knowledge and beliefs (Figure 2).

Figure 2:
Extended Model of Teacher Efficacy



The extended model that I propose incorporates pedagogical knowledge and beliefs into the existing cyclical model of teacher efficacy developed by Tschannen-Moran and colleagues (1998). Tschannen-Moran et al. (1998) suggest that the sources of efficacy information lead to cognitive processing. I would extend this to include all sources of information (Figure 2: Sources of Information), including mastery

experiences, vicarious experiences, verbal persuasions, and physiological arousal as well as any other form of information that may affect an individual's pedagogical knowledge and beliefs.

Next, I contend that these sources of information lead to teachers' knowledge and beliefs (Figure 2: Pedagogical Knowledge; Pedagogical Beliefs) about teaching. Because, I am working from the perspective of teachers and teaching, my primary focus is on the development of knowledge and beliefs about teaching. Thus, in the model I suggest that sources of information lead to pedagogical knowledge. By pedagogical knowledge I mean the teacher's personal store of information, skills, strategies, and experiences related to the teaching process. Additionally, I anticipate that sources of information also serve to directly influence the development of pedagogical beliefs. These are beliefs that reflect teachers' perceptions of teaching, and teaching knowledge, as well as the value ascribed to that understanding. Further, I expect teachers' knowledge and beliefs to be related to each other.

It is my contention that both knowledge and beliefs about teaching play an important role in the development of teachers' sense of efficacy and their resulting decisions and actions. Specifically, I anticipate that teachers' existing knowledge and beliefs have a direct relation to the cognitive processing that occurs in the formation of teacher's sense of efficacy (Figure 2: Cognitive Processing). In their model, Tschannen-Moran et al. (1998) identify two steps of cognitive processing: analysis of the teaching task and assessment of personal teaching competence. I hold that the ability to analyze the teaching task is directly affected by the content and expanse of

teachers' pedagogical knowledge and beliefs. That is, in any given teaching context, there exist multiple teaching tasks. However, not all teachers see the same tasks as relevant in the same classroom situation. I would suggest that the ability to identify and analyze teaching tasks is limited by existing pedagogical knowledge and pedagogical beliefs.

For example, two teachers (A and B) may be presented with the same group of students to teach: a class that has a high level of diversity with respect to students' cognitive abilities, including students in the gifted and talented program, average students, and several students with diagnosed learning disabilities. Teacher A, who *believes* that mainstreaming is an inappropriate practice and has not attended any of the current workshops or courses in diversified instruction, sees the teaching task as needing to maintain order and establish a system of tracking within her own classroom. In contrast, Teacher B *believes* that mainstreaming is an essential practice for the positive development and education of all students, has taken several of the district offered workshops on diversified instruction and has done additional reading in this area on her own. From this perspective, Teacher B identifies a very different teaching task, to maintain a collective classroom lesson with multiple levels of instruction incorporated to best meet all of the students' needs. Thus, the beliefs and knowledge that teachers have about teaching may have a direct impact on their ability to analyze teaching tasks and in turn evaluate their sense of competence.

With respect to the extended model that I am proposing, I also revert to a more general description of cognitive processing that includes, but is not limited to, the

components of analysis of the teaching task and assessment of teaching competence articulated by Tschannen-Moran et al. (1998). That is, I expect that other aspects of teachers' cognitive processing (e.g., selection of strategies, information seeking) are both influenced by teachers' knowledge and beliefs, as well as affect teachers' resulting sense of efficacy.

The remainder of the extended model remains close to the original model presented by Tschannen-Moran et al. (1998), with efficacy judgments resulting from individual's cognitive processing (Figure 2: Teacher Efficacy). Further, these efficacy judgments are then expected to impact specific consequences (Figure 2: Consequences of Teacher Efficacy), such as the goal teachers set for themselves, as well as ongoing regulators such as effort and persistence, all of which affect teachers' performance of teaching tasks. This performance then serves as a new source of information in the form of a mastery experience. Therefore, in my model, I extend the source of information to include performance (Figure 2: Performance). This is signified by dotted lines, to demonstrate that performance is both a separate component of the model as well as a new piece of information entering the system.

I believe this extended model provides a clearer picture of the developmental process though which teachers' efficacy is established and reinforced. Additionally, this extended model provides an explicit framework with which to consider interventions. That is, if teachers' knowledge and beliefs affect how teachers identify teaching tasks and evaluate their own confidence, it may be that this is area we can specifically target in teacher preparation courses, but helping preservice teachers to

articulate their knowledge and beliefs in order to better identify their needs as professionals. Additionally, this model highlights the expectation that knowledge alone will not affect performance. Rather, teachers must have both the knowledge of how to address the teaching task and belief in their ability, a sense of efficacy, to perform the actions required to address the task identified. Thus, there is a combined emphasis on both knowledge and efficacy development.

Summary of Findings

The preceding sections have outlined the research on teacher efficacy from its historical beginnings to the concepts of interest for this investigation. Considering the depths and breadth of this review, the following is a brief summary of the findings that have been demonstrated in each area.

Historical Overview

Based on the research reviewed in this text, the following observations and implications can be made with regard to the historical development of teacher efficacy:

- Teacher efficacy has lacked a cohesive definition over the course of its development.
- The analysis of all prior studies of teacher efficacy must give consideration to the underlying theoretical perspective of the researcher and the selection of measurement tool used.
- The current conceptualization of teacher efficacy, and the one relied on for the present investigation, is based on Bandura's self-efficacy theory and

research and seeks to develop an understanding of teacher efficacy nested in this work.

- The current conceptualization of teacher efficacy recognizes the cyclical nature of this construct and accepts that any teacher's efficacy is in a state of development at any time, as new experiences are encountered.
- Little focus has been given to understanding and demonstrating the process by which efficacy affects teachers' daily practice. Specifically, we must investigate the factors that affect teachers' abilities to analyze tasks as well as their efficacy beliefs, that is the roles knowledge and pedagogical beliefs play in the development of efficacy.

The Power of Teacher Efficacy

Many investigations have identified important relationships between teacher efficacy and desirable outcomes within learning environments. The following statements highlight the research findings and identify areas of omission or concern.

- Teacher efficacy has been related to many positive outcomes such as student achievement and teachers' openness to innovation and change. However, the majority of the empirical work looking as these and other relationships has been correlational or comparative in nature. Future research should include investigations of the process by which efficacy effects behavior.
- Research has demonstrated that teachers' philosophical belief orientations and beliefs about control are related to teachers' efficacy.

- The research exploring the relationship between teachers' beliefs and their efficacy does not address how this relationship works, nor does it explain the direction of this relationship or the role as efficacy as a mediator between beliefs and actions.
- Of the research reviewed for this text, there were no studies that looked specifically about teachers' beliefs about teaching, their pedagogical beliefs, as related to teaching efficacy. This was one of the goals the present study.

The Relationship between Teacher Efficacy and Knowledge

The third section of this review was dedicated to an exhaustive study of the research investigating the relationship(s) between teacher efficacy and knowledge. Several statements can be made about this work.

- Studies investigating the relationship between knowledge and efficacy can be organized based on how knowledge was measured. Knowledge was assessed by years of formal education, specific learning experiences which included special classes, instruction methods, or specialized teaching experience, and through the assessment of demonstrated knowledge by paper and pencil tests as well as by supervisor observations.
- The relationship that exists between knowledge and efficacy demonstrated in these studies suggests that higher levels of knowledge are associated with higher levels of efficacy. However this was not the case for one study

that found that preservice teachers with higher levels of science knowledge had lower levels of science teaching efficacy.

- The investigation of pedagogical knowledge in conjunction with efficacy beliefs was not addressed in any of the studies reviewed in this text or in preparation for this work.
- This research has relied heavily on correlational analyses and has established that a relationship between knowledge and efficacy exists. However, this work does not establish the direction of this relationship or the possible circular process through which efficacy and knowledge interact to affect each other. Further this work does not investigate the potential effects of knowledge and efficacy working in tandem or isolation to impact teaching outcomes.
- The next step for this work is to explore the process by which efficacy and knowledge interact, and to explore how this relationship manifests in teachers' practice.

Extended Model of Teacher Efficacy

The fourth section of this review presented an extended model of teacher efficacy. This model incorporates teachers' pedagogical knowledge and beliefs into the existing model of efficacy developed by Tschannen-Moran and her colleagues.

- The addition of these constructs helps to identify the combined importance of knowledge, beliefs, and efficacy in teacher practice.

- Further, this model provides a framework for better addressing the needs of pre-service and practicing teachers.

Implications for Future Research

Self-efficacy is a cognitive motivational construct, defined as an individual's belief in his or her capability to organize and execute courses of actions to achieve desired outcomes. This belief is based on prior experience, vicarious experiences, verbal persuasion, and physiological cues. Prior mastery experiences serves as the strongest influence on efficacy beliefs. This construct, however, is future oriented and is not only based on or tied to previous experiences. That is, this is a belief that individuals have regarding actions that they will take in the future and, as such, can serve to motivate individuals or move individuals to action. Individuals with efficacy beliefs that are higher than their actual ability are likely to engage in more challenging tasks and once engaged are likely to seek out and obtain the knowledge and skills necessary to achieve the outcomes they desire. Thus, ideally individuals' efficacy beliefs are higher than their present level of competency, this will allow them to continue to grow, learn and engage in more challenging and effective behaviors. For example, writing a dissertation was something I thought I could do when I began my graduate studies. However, this task was well beyond my abilities when I began the process. My efficacy beliefs enabled me to pursue the experiences and activities that I needed in order to acquire the competence to complete this task.

Researchers have investigated self-efficacy for a variety of tasks including efficacy for teaching. In fact, a large research tradition has developed around this

construct of teacher efficacy. Teacher efficacy has been found to relate to student achievement, specifically in mathematics and reading, motivation, and goal orientations. Researchers have also investigated the relationship of teacher efficacy to teacher behaviors and beliefs including their decision making, use of practices which foster student learning, willingness to implement innovation, goal orientations and decisions regarding the referral of students to special education. However, few researchers have looked at the relationship between pedagogical knowledge, the ability to identify problems or develop solution alternatives, and teachers' level of efficacy. Moreover, most efficacy interventions have focused on providing teachers with mastery experiences that undoubtedly add to their growing knowledge base of pedagogy, but do not explain the type of knowledge that is most necessary to increase efficacy beliefs. That is, do teachers need more declarative, procedural, or conditional knowledge with regard to instructional practices, classroom management, or student engagement in order to increase efficacy beliefs to a degree that actions will change? Further, are these knowledge needs different based on the experience and prior education of the teachers?

CHAPTER III

METHODOLOGY

The research presented in this document examined the relationship between teacher efficacy, teacher knowledge, and teacher pedagogical knowledge beliefs using a multimethod approach. Through the use of a specially-crafted test battery, a representation of the relationships between and among those constructs emerged. This quantitative test battery offered a panoramic view of how these constructs interact. The detail afforded by qualitative analyses of teacher interviews then provided greater definition to the depiction of the interaction of efficacy judgments, demonstrated knowledge, and knowledge beliefs in the lives and decisions of specific teachers.

The test battery data were collected and used to identify clusters of teachers demonstrating distinct levels of efficacy, knowledge, and beliefs. Provided in the first half of this chapter is a description of the quantitative portion of the study. Descriptions of the participants, measures, procedures, as well as the results of a discussion group and a pilot study intended to refine study measures and procedures are presented. The second half of the chapter outlines the qualitative methodology for this study. The selection method of participants for this facet of the study is described, in addition to the data collection and analysis procedures used.

Quantitative Methods

The quantitative portion of this study sought to identify how teachers with varying levels of knowledge and efficacy address specific classroom situations, to examine what they believe about the nature of pedagogical knowledge, and to assess

their demonstrated knowledge. Further, this investigation sought to understand the relationships among these variables and to explore the role of efficacy as a mediator between knowledge and action. This section of the document opens with a description of the methods for the current study, including descriptions of the participants, measures, procedures, and data analysis. The section then moves on to articulate the refinement of the instruments via a discussion group and the subsequent pilot study.

Participants

One hundred twenty preservice and 102 experienced teachers of K-12 students were surveyed. Preservice teachers were identified through required education courses at a large university in the mid-Atlantic region of the United States. Experienced teachers were solicited from a variety of sources in order to provide a broad and representative sampling from the teaching profession, increasing the generalizability of outcomes. Specifically, experienced teachers were identified through master's level courses, professional development workshops, contact via district wide content coordinators, and through professional contacts within specific schools. This approach to data collection allowed for the gathering of information from a broad spectrum of teachers relative to their teaching experience, context (i.e. urban, suburban or rural schools), content area, and grade levels

Table 3 provides detailed information regarding the participants of this study. The table details the following demographic information: ethnicity, gender, age ranges, and education level. With regard to education level, participants were asked to describe their level of education as specifically as possible. Reports of current grade

level (e.g. college sophomore) or highest degree earned (e.g. Bachelor's of Arts) were recorded. In addition several respondents described themselves as "enrolled in Master's program" or "first year of graduate school." In the table this level of education, between degrees, is noted with a plus (+) sign. For example, someone enrolled in a Master's program is identified as BA+; similarly individuals already possessing a Master's degree who are pursuing further courses are identified as MA+.

Table 3 also provides information about participants' targeted (for preservice teachers) or current (for experienced teachers) teaching environment. Elementary level is considered kindergarten through grade 5, middle school refers to grades 6 – 8, and high school is considered to be grades 9 – 12. There was a fairly even distribution of participants across these three school levels among the experienced teachers.

Both preservice and experienced teachers were surveyed in order to develop an understanding of how teachers' efficacy, knowledge, and beliefs about teaching change with education, experience, and time. Drawing on both of these groups allowed for in-group and between-group analyses. That is, I was able to determine what differences existed among experienced teachers and among preservice teachers, as well as distinctions between these two groups. Differences between preservice and experienced teachers have been demonstrated in past research (e.g., Soodak & Podell, 1993). The investigation of these populations provided more evidence as to the distinctions between these groups that may serve to improve teacher training and to understand the development of efficacy, knowledge, and beliefs in teachers

Table 3

Description of Study Participants

	Preservice (n=120)	Practicing (n=102)
Demographic Information		
Ethnicity	▪ 64.2% European American ▪ 13.3% Multiple Ethnicities ▪ 5.8% Asian American ▪ 3.3% European ▪ 2.5% Hispanic American ▪ 2.5% Hispanic ▪ 2.5% Other ▪ 1.7% Native American ▪ 0.8% each: o African o Asian o Caribbean o Middle Eastern o Middle Eastern American	▪ 77.5% European American ▪ 7.8% Multiple Ethnicities ▪ 4.9% European ▪ 2.9% Hispanic American ▪ 2.0% Asian American ▪ 1.0% each: o Asian o Hispanic o Native American o Middle Eastern American o Pacific Islander
Gender	▪ 17% Male; 83% Female	▪ 22.5% Male; 77.5% Female
Age Range	▪ 17-55 years	▪ 22-71 years
Education	▪ 0.8% College Freshmen ▪ 10% College Sophomores ▪ 42.5% College Juniors ▪ 33.3% College Seniors ▪ 1.7% Bachelor's Degree ▪ 9.2% BA + ▪ .8% Master's Degree ▪ 1.7% MA +	▪ 26.5% Bachelor's Degree ▪ 21.6% BA + ▪ 42.2% Master's Degree ▪ 9.8% MA +
Teaching Environment		
School Level	▪ 48.3% Elementary ▪ 18.3% Middle ▪ 33.3% High	▪ 35.3% Elementary ▪ 33.3% Middle ▪ 31.4% High
School Type	▪ 75% Public ▪ 5.8% Public – Magnet ▪ 1.7% Public – Charter ▪ 6.7% Private – Non-Religious ▪ 4.2% Private – Religious ▪ 6.7% Parochial	▪ 67.6% Public ▪ 2.9% Public – Magnet ▪ 1.0% Public – Charter ▪ 1.0% Private – Non-Religious ▪ 18.6% Private – Religious ▪ 7.8% Parochial

Materials and Measures

Participants were asked to complete a test battery consisting of a consent letter (Appendix A), a demographic form, four measures, and a request to participate in future research (see Appendices A-G). The following section explains each of those components.

Background Information

Participants provided relevant background information (see Appendix B). This information included: their current position, previous experience, educational level, the types and quantity of professional development pursued, as well as general demographic information (i.e., age, gender, and ethnicity).

Teachers' Sense of Efficacy Scale

Teachers' efficacy was assessed with the Teachers' Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk-Hoy (2001). This measure was chosen for the current study for two reasons. First, it closely aligns with the definition and conceptualization of teacher efficacy used in this study. Second, this measure was created to assess the multifaceted nature of efficacy, and provides a profile of efficacy beliefs in three domains of teaching: instructional practices, classroom management, and student engagement or motivation.

Tschannen-Moran and Woolfolk-Hoy (2001) began the development of this measure by asking practicing teachers enrolled in a graduate seminar on self-efficacy and teaching and learning to devise a series of task statements that they felt reflected

important components of the teaching process. From a larger pool of task statements a final set of items were identified as important and reliable in assessing teachers' efficacy. Two forms of the TSES have been created based on this work, a 12-item short form and a 24-item long form. The long form (Appendix C) was selected for this study based on the recommendation of the scale developers that this measure is best suited for preservice teachers. Previous work with this scale has revealed that the factor structure of responses for preservice teachers are often less distinct. Therefore, Tschannen-Moran and Woolfolk-Hoy (2001) suggest using the long form of the instrument when working with this population. This measure utilizes a nine-point Likert scale with anchors at 1 (nothing), 3 (very little), 5 (some influence), 7 (quite a bit) and 9 (a great deal).

Factor analysis of these 24 items has revealed a three-factor solution identifying the areas of efficacy in instructional practices, efficacy in classroom management, and efficacy in student engagement (Tschannen-Moran & Woolfolk-Hoy, 2001). Based on those factors, the subscale scores were determined by computing the unweighted means of the items that load on each factor. While the authors noted that slight variation in factor loadings may occur depending on the respondents to the instrument, the groupings generally occur as follows: eight items related to efficacy in instructional practices (items: 7, 10, 11, 17, 18, 20, 23, 24), eight items related to efficacy in classroom management (items: 3, 5, 8, 13,15, 16, 19, 21), and eight items related to efficacy in student engagement (items: 1, 2, 4, 6, 9, 12, 14, 22).

Tschannen-Moran and Woolfolk-Hoy (2001) reported means, standard deviations, and reliabilities for responses to the overall scale (*M*=7.1, *SD*=.94, alpha=.94), and the subscales (instructional practices: *M*=7.3, *SD*=1.1, alpha=.91; classroom management: *M*=6.7, *SD*=1.1, alpha=.90; and student engagement: *M*=7.3, *SD*=1.1, alpha=.87). These findings were based on the responses of 111 preservice teachers and 255 practicing teachers. Fives and Looney (2002) employed an altered version of the TSES to assess efficacy in college-level instructors. This investigation revealed the three independent dimensions of teacher efficacy as reported by Tschannen-Moran and Woolfolk-Hoy (2001). Alpha coefficients of reliability for the scale and subscales were .88 for the overall TSES, .77 for the instructional practice subscale, .64 for the classroom management subscale, and .84 for the student engagement subscale (Fives & Looney, 2002).

Factor analysis procedures were employed on the data collected in the current investigation in order to investigate the existence of the three-factor structure found in previous research. Principal component analysis orthogonal rotation was performed on the data for the total sample, and for each of the subgroups (preservice and experienced teachers). Previous work using this instrument with preservice teachers has found less distinction in the factor structure for preservice teachers' responses (Tschannen-Moran & Woolfolk-Hoy, 2001). Therefore, in this investigation, factor analysis procedures were run on each group of data in order to ascertain whether the preservice and experienced teachers' responses in this sample were comparable.

An examination of Cattell's scree indicated a three-factor solution across the three sets of analyses. Across the three-factor solutions, a criterion of .4 or higher was used to determine if the item should be retained on the factor. In cases where double loadings occurred (8 for preservice teachers, 3 for practicing teachers, and 4 for the total sample) items were allocated to the factor for which there seemed to be greater theoretical meaning. Factor loadings for each of these procedures are presented in Tables 4 (preservice), 5 (experienced) and 6 (total sample).

Although the preservice responses tended to be less distinct in their factor structure, as expected, the factor loadings across the three analyses were statistically comparable. Thus, the three-factor solution for the total sample was retained and used for the construction of the subscales for instructional practices, classroom management, and student engagement. Overall and subscale scores were created for each of the extracted factors by computing an unweighted average of the responses to each of the item loadings corresponding to that factor. Responses to the overall teacher efficacy scale yielded a mean of 7.05, standard deviation of .87, and a Cronbach's alpha of .93. The means, standard deviation, and reliabilities for responses to the subscales were instructional practices: *M*=7.12, *SD*=.91, alpha=.88; classroom management: *M*=7.26, *SD*=1.03, alpha=.90; and student engagement: *M*=6.64, *SD*=1.05, alpha=.83.

Table 4

TSES Factor Loadings for Preservice Teachers

Item No.	Item Statement	Component EN	CM	IP
4	How much can you do to motivate students who show low interest in school work?	**.747**	.114	.111
22	How much can you assist families in helping their children do well in school?	**.657**	.295	.267
14	How much can you do to improve the understanding of a student who is failing?	**.656**	.203	.352
6	How much can you do to get students to believe they can do well in school work?	**.564**	.469	8.13E-02
9	How much can you do to help your students value learning?	**.506**	.367	.384
17	How much can you do to adjust your lessons to the proper level for individual students?	**.499**	.339	.340
1	How much can you do to get through to the most difficult students?	**.403**	.147	.319
10	How much can you gauge student comprehension of what you have taught?	7.32E-02	**.704**	.276
13	How much can you do to get children to follow classroom rules?	.395	**.671**	6.31E-02
8	How well can you establish routines to keep activities running smoothly?	.161	**.661**	.298
3	How much can you do to control disruptive behavior in the classroom?	.412	**.618**	1.04E-02
5	To what extent can you make your expectations clear about student behavior?	.332	**.580**	.237
15	How much can you do to calm a student who is disruptive or noisy?	.571	**.563**	.232
16	How well can you establish a classroom management system with each group of students?	.496	**.503**	.312
19	How well can you keep a few problem students from ruining an entire lesson?	.274	**.499**	.545
21	How well can you respond to defiant students?	.389	**.479**	.378
24	How well can you provide appropriate challenges for very capable students?	.198	.114	**.783**
20	To what extent can you provide an alternative explanation or example when students are confused?	.144	.173	**.766**
11	To what extent can you craft good questions for your students?	.206	.440	**.629**
18	How much can you use a variety of assessment strategies?	.293	.228	**.556**
12	How much can you do to foster student creativity?	.478	.128	**.549**
7	How well can you respond to difficult questions from your students?	-4.02E-02	.520	**.524**
2	How much can you do to help your students think critically?	.314	.110	**.524**
23	How well can you implement alternative strategies in your classroom?	.563	.239	**.492**

Table 5

TSES Factor Loadings for Experienced Teachers

Item No.	Item Statement	Component CM	IP	EN
15	How much can you do to calm a student who is disruptive or noisy?	**.838**	.175	7.99E-02
3	How much can you do to control disruptive behavior in the classroom?	**.811**	9.99E-02	6.84E-02
16	How well can you establish a classroom management system with each group of students?	**.735**	.216	.233
13	How much can you do to get children to follow classroom rules?	**.711**	.121	.296
19	How well can you keep a few problem students from ruining an entire lesson?	**.683**	.388	.139
21	How well can you respond to defiant students?	**.637**	.362	.238
5	To what extent can you make your expectations clear about student behavior?	**.600**	.103	3.92E-02
1	How much can you do to get through to the most difficult students?	**.544**	.170	.484
8	How well can you establish routines to keep activities running smoothly?	**.519**	.228	.248
24	How well can you provide appropriate challenges for very capable students?	.140	**.800**	.135
11	To what extent can you craft good questions for your students?	.105	**.736**	.115
18	How much can you use a variety of assessment strategies?	.289	**.679**	.238
20	To what extent can you provide an alternative explanation or example when students are confused?	.338	**.665**	-.135
10	How much can you gauge student comprehension of what you have taught?	.324	**.629**	.218
2	How much can you do to help your students think critically?	3.32E-02	**.625**	.166
7	How well can you respond to difficult questions from your students?	.201	**.623**	9.64E-02
12	How much can you do to foster student creativity?	.130	**.579**	.366
23	How well can you implement alternative strategies in your classroom?	.212	**.579**	.509
17	How much can you do to adjust your lessons to the proper level for individual students?	.374	**.523**	.462
22	How much can you assist families in helping their children do well in school?	7.69E-02	5.15E-02	**.762**
6	How much can you do to get students to believe they can do well in school work?	2.64E-02	.197	**.760**
4	How much can you do to motivate students who show low interest in school work?	.307	.110	**.702**
14	How much can you do to improve the understanding of a student who is failing?	.413	.270	**.635**
9	How much can you do to help your students value learning?	.244	.387	**.508**

Table 6

TSES Factor Loadings for Preservice and Experienced Teachers

Item No.	Item Statement	Component CM	IP	EN
15	How much can you do to calm a student who is disruptive or noisy?	**.788**	.202	.249
3	How much can you do to control disruptive behavior in the classroom?	**.781**	7.64E-02	.144
13	How much can you do to get children to follow classroom rules?	**.727**	.103	.294
16	How well can you establish a classroom management system with each group of students?	**.719**	.259	.256
5	To what extent can you make your expectations clear about student behavior?	**.647**	.183	.155
19	How well can you keep a few problem students from ruining an entire lesson?	**.635**	.459	.168
21	How well can you respond to defiant students?	**.601**	.356	.283
8	How well can you establish routines to keep activities running smoothly?	**.592**	.274	.187
24	How well can you provide appropriate challenges for very capable students?	2.09E-02	**.775**	.253
20	To what extent can you provide an alternative explanation or example when students are confused?	.307	**.696**	-3.33E-03
11	To what extent can you craft good questions for your students?	.304	**.688**	.147
18	How much can you use a variety of assessment strategies?	.173	**.627**	.342
7	How well can you respond to difficult questions from your students?	.331	**.595**	3.82E-02
2	How much can you do to help your students think critically?	.104	**.580**	.211
12	How much can you do to foster student creativity?	.152	**.529**	.430
23	How well can you implement alternative strategies in your classroom?	.198	**.526**	.564
10	How much can you gauge student comprehension of what you have taught?	.394	**.501**	.221
17	How much can you do to adjust your lessons to the proper level for individual students?	.364	**.431**	.475
4	How much can you do to motivate students who show low interest in school work?	.197	6.57E-02	**.759**
22	How much can you assist families in helping their children do well in school?	.117	.131	**.756**
14	How much can you do to improve the understanding of a student who is failing?	.279	.277	**.686**
6	How much can you do to get students to believe they can do well in school work?	.210	.142	**.685**
9	How much can you do to help your students value learning?	.298	.382	**.516**
1	How much can you do to get through to the most difficult students?	.306	.193	**.493**

Pedagogical Measure

Purpose. In order to gauge how teacher efficacy works in the context of teaching, I designed a pedagogical measure consisting of three vignettes followed by a questionnaire assessing task analysis, task-efficacy, strategy awareness, and strategy-efficacy (see Appendix D). According to Tschannen-Moran et al.'s (1998) model, teacher efficacy is the judgment resulting from one's analysis of the task and assessment of personal competence. Thus, the vignettes and associated questionnaire provided teachers an opportunity to analyze and respond to common teaching situations and to rate their competence for the task identified. This measure assessed teachers' ability to identify problems, desired outcomes, strategies for achieving these outcomes and their own level of efficacy for those tasks.

The use of vignettes departs from most previous efficacy measures that provide respondents with task-specific statements about teaching and ask them to indicate their agreement with the statement. For example, a Gibson and Dembo (1984) item states, "When I really try, I can get through to most difficult students" (p. 581). Such measures identify the problem or area of concern for the respondent and assess efficacy for these common and important tasks. The current measure requires respondents to generate the task and assess their efficacy for it. Therefore, this measure allowed for the investigation of differences in teachers' efficacy based on their own evaluation of the problem and generation of solutions. That is, teachers were confronted with a situation for which they needed to assess the concerns in the event,

identify the ideal resolution, and identify and evaluate strategies for resolving the situation.

Vignettes. I designed the three vignettes to parallel the task categories identified in the Teacher Sense of Efficacy Scale (i.e., instructional practices, classroom management, and student engagement; Tschannen-Moran & Woolfolk-Hoy, 2001). The "Diversified Instruction" vignette assessing instructional practices describes a highly diverse classroom in which the teacher, Ms. McCormick, must address multiple student needs. The classroom contains students identified as gifted and talented, learning disabled, average, and some who receive services for English as a second language. To assess classroom management, participants are presented the "Undisciplined Class" vignette. This vignette describes Ms. Ramsey who will be taking over an undisciplined class in the middle of the year. The "Low Motivation" vignette assessing student engagement describes a student, Teresa, who demonstrates very little interest in school, high levels of absenteeism, and poor grades. These three vignettes served as the framework for measuring task analysis, strategic processing, and teaching efficacy for the task and for specific strategies.

Task Analysis. This investigation operationalized task analysis as individuals' ability to identify the central components of a given problem and to provide a desired resolution. Specifically, after reading each vignette, respondents were asked two questions. The first question asked for the problem to be identified: "What do you see as the key problem(s) or concern(s) in this situation?" Participants responded in writing to this query in the space provided . [How much space?] The second question

asked for the resolution of the problem: “What would be the desired resolution of this classroom situation?” Further, respondents were told not explain how that end would be accomplished but simply to describe the desired outcomes. Responses to the two items were scored using a 6-point rubric designed to assess the key components of these responses. Two general rubrics were applied for to all three vignettes, one for each question. Therefore there was a problem statement rubric and a desired resolution rubric. These two rubrics shared some common themes, and each was tailored to address the specific content each vignette addressed..

The first rubric I describe is to asses the problem statement, participants’ responses to the first question. Two parameters were employed to construct the problem statement rubric: elaboration and sophistication. Elaboration assessed the extensiveness of participant responses in terms of the number of ideas, themes, or concepts that were addressed. Responses including 2 or fewer themes were considered *limited,* those including 3 or more themes were considered *extensive*.

Three levels of sophistication were considered: simple, moderate, and sophisticated. Irrelevant, unsubstantiated statements with no clear relationship to the case were excluded from consideration. Simple responses identified less central issues; were tangential in nature, focusing on concerns that were less important to the case; included the restatement of givens; provided strategies rather than identified the problems; or included no or only minimal analysis of the situation, with a general sense of vagueness. Moderate responses may have contained both central and less central issues, were characterized as “just not 100% on target,” and may have

demonstrated some level of analysis. Sophisticated responses were characterized by statements that addressed central issues to the case, articulated an accurate analysis of the situation, and perhaps extended ideas beyond what was presented in the vignette.

To tailor the rubric to the content of each vignette and to assure greater adherence to the parameters of the rubric, three central issues were identified for each vignette. Those issues were determined through analysis of the vignette and discussion among a full professor of educational psychology, a doctoral candidate of educational psychology, and the researcher. Each of these sources has from three to six years of elementary and secondary teaching experience. While the issues identified for each vignette are not the only concerns that exist, it was my belief that these issues, listed in Table 7, reflected the most central and core concerns. These central concerns were used to help ground and add definition to the scoring of participants' responses.

The rubric then analyzed both elaboration and sophistication. The latter of these relied on the identified central concerns. The scoring of problem statements employed the following scheme:

0 = No responses/Unsubstantiated (irrelevant) statements
1 = Response is limited and simple
2 = Response is extensive and simple
3 = Response is limited and moderate
4 = Response is extensive and moderate
5 = Response is limited and sophisticated
6 = Response is extensive and sophisticated

Table 7

Central Issues for Each Vignette

Vignette		
Instructional Practices	Classroom Management	Engagement
▪ Teacher lacks knowledge or skills for effective instruction of this class of students, poor planning/instruction	▪ Established culture of disorganization, rules/enforcement, and physical classroom structure.	▪ Value of education – connection to future plans.
▪ Unattended differences in student abilities is leading to student frustration and perhaps other problems (behavior)	▪ Teacher – Student Relations: mutual respect, expectations for learning/success; approach to school/learning/one another.	▪ Necessary behavior changes: attendance and passing grades.
▪ Meeting all students' needs.	▪ New teacher as an unknown – coming in at mid-year.	▪ Sources for lack of motivation.

Table 8 provides a series of sample responses, the scores awarded each, and a brief explanation of the scoring.

Responses to the second portion of the task analysis measure, the desired resolution, were also scored using a 6-point rubric. The parameters for this were the elaborateness of the response and the reasonableness of the resolutions. As in the problem statement rubric, responses were considered limited if they included only one theme, and multiple if two or more themes were addressed. Additionally, I developed three criteria to assess the reasonableness of the resolutions. Resolutions were

considered reasonable if they: (a) addressed the central concerns of the case, as described previously; (b) were practical (e.g., the resolution would likely be achieved); and, (c) were pedagogically appropriate for the conditions of the case and for use in current educational practice.

Responses were ranked at three levels based on the degree to which the three criteria for reasonableness were met. If the response addressed only one or two criteria for reasonableness then it was considered to be *less reasonable.* If the response addressed all three criteria for reasonableness it was considered to be *highly reasonable*. Finally, each response could contain themes that were both less reasonable and highly reasonable. Responses falling into this category were designated as *more reasonable.*

Relying on the aforementioned parameters, scores were awarded. In cases of no response or no reasonable resolutions (i.e., did not fit any of the criteria), a score of 0 was given. If the resolution was limited (i.e., two or fewer ideas or themes) and less reasonable (i.e., adhered to only one or two of the criteria for reasonableness), a a score of 1 was awarded. Resolutions that were extensive (i.e., two or more ideas or themes) and less reasonable earned a 2. A score of 3 was given if the response was limited and contained both less and highly reasonable statements. A resolution rated as 4 if it contained an extensive number of ideas and both less and highly reasonable statements. Finally, highly reasonable statements that were limited in nature received a 5, while those that were extensive received a 6. Table 9 provides a series of sample responses, the score given, and a brief explanation of the scoring.

Table 8

Problem Statement Sample Items

Score	Response	Explanation
	▪ No response	▪ No response
0	▪ Depending on how related to information an accelerated student might bring up, I might try to connect it briefly with the current information I'm going over or simply say that we've not gotten to that point yet to the accelerated student.	▪ This statement gives a strategy for how to deal with the problem but it does not identify what the problem is.
1	▪ Students on different levels	▪ One idea. Statement simply describes the situation without explaining why it may be a problem
2	▪ The various levels of students in the classroom lead to different teaching speeds and techniques in one classroom.	▪ Three ideas. Statement describes the situation but does not identify a problem.
3	▪ Differentiation tactics or lack thereof.	▪ One idea. Addresses a key concern, but fails to articulate what occurred.
4	▪ Too great a mixture of abilities in a single class. Gifted and talented kids leaving learning disabled behind, all are frustrated.	▪ Three ideas. Response contains simple and sophisticated ideas. The first statement is simply a restatement of the situation. The final idea–all are frustrated, begins to address the central issues of frustration leading to other problems.
5	▪ Meeting the educational needs of students with varying levels of confidence/experience	▪ Two ideas. Statement addresses one of the key aspects of the case–meeting all students' needs.
6	▪ Finding the "middle ground" with the various levels of intellect in the classroom. Developing a lesson that will stimulate the bright students and give a serious challenge to the less learned (or disabled students) without 'losing' or confusing on group and boring the other.	▪ Six ideas. Statement focuses on the central concern of meeting all students' needs and articulates the potential outcomes of boredom and frustration that may occur.

Table 9

Desired Resolution Sample Items

Score	Response	Explanation
	▪ No response	▪ No response
0	▪ Teach ESL English, then bring them back to class where they can follow directions appropriately.	▪ Unsubstantiated/irrelevant response. Provides a strategy rather then the desired outcome for the situation.
1	▪ All students understand everything.	▪ One idea. Fails to meet the three criteria for reasonableness because it is neither practical nor possible for all students to understand everything.
2	▪ Everyone is happy and completely satisfied with the classroom decorum.	▪ Three ideas. None of these ideas are central to the case, practical, or pedagogically sound.
3	▪ An environment where all students can learn all the material, and each child's needs are met.	▪ Two ideas. The first statement is less reasonable, as it is impractical to believe that all students can learn everything. However the second statement is highly reasonable, that all students' needs are met is practical, pedagogically sound, and central to the case.
4	▪ All the classroom population would be engaged in meaningful activities; 'difficult to answer questions' would be addressed by the teacher in the form of anchor activities to find out extra information from related sources.	▪ Four ideas. The opening statement adheres to the three criteria for reasonableness. The following comments focus too closely on a less central issue of the vignette, and border on strategies instead of resolutions.
5	▪ To have all students learn at their own level.	▪ One idea. Meets the three criteria for reasonableness. It is possible, appropriate, and central to the class that all students learn regardless of their ability.
6	▪ For all the students to be getting the education that they deserve and require (for their level). And for the teacher to feel confident in meeting those needs.	▪ Three ideas. Each idea meets the three criteria for reasonableness.

An overall score for task analysis was created as the combination of individuals' responses to the problem statement and desired resolution items across the three vignettes. This resulted in a maximum score of 36 for the task analysis measure. I trained an experienced teacher, currently a doctoral candidate, on the use of these rubrics. For the purpose of training, a base rate of 75% agreement or higher was targeted. Once training was completed, 10% of all responses for each vignette were independently scored in order to ascertain interrater agreement. Further, for items in which disagreement occurred, conflicts were resolved through discussion. Levels of interrater agreement for the problem statements were: 92.5% for instructional practices, 85% for classroom management, and 97.5% for student engagement. Interrater agreements for the desired resolution scoring were 87.5% for instructional practices, 80% for classroom management and 90% for student engagement. The total task analysis scale comprised of the problem statement and desired resolution for each vignette (6 items) yielded the following descriptive statistics: M=18.18; SD= 5.45; a=.53.

Task-Teaching Efficacy. The third item on the vignette questionnaire assessed the teachers' efficacy for resolving the situation. This measure allowed for the investigation of teachers' efficacy for self-appointed tasks. Teachers were asked to rate the extent to which they felt capable of bringing about the resolution that they described in the previous question on a 1-9 scale. For this scale, a 1 indicated no efficacy and a 9 indicated a great deal of efficacy for resolving the situation favorably. A total score for task-teaching efficacy was calculated as the unweighted average of

efficacy across the three vignettes. The maximum score for task-teaching efficacy was 9. Responses to this measure yielded a mean of 5.94, a standard deviation of 1.09, and a Cronbach's alpha of .61.

Strategic Awareness. The fourth question related to the vignettes asked respondents to "List as many strategies, techniques, plans, or actions that you can think of for resolving the aforementioned situation." Participants were directed to write their responses in the middle of a three-column chart. This space comprised approximately three quarters of a page and had lines on which the respondents could write. Respondents' ability to generate and select strategies appropriate for the conditions provided in the vignette was assessed. This assessment provided a deeper reflection of how individuals may actually respond in teaching situations as well as a demonstration of their strategic knowledge.

The scoring of strategy responses was accomplished with a 6-point rubric focusing on the parameters of elaboration and strategy sophistication. First, responses that included four or fewer strategies were considered limited, while those listing five or more strategies were considered extensive. It is important to note here that strategies listed separately, but which reflected the same basic concept, were counted once for this assessment. For example, a pilot participant, in response to the student engagement vignette, stated: "Show her lots of statistics about how many people try to be entertainers and how many actually succeed, point out all the flash in the pans/one hit wonders who now have real jobs, and explain to her that she needs a backup plan if she doesn't succeed." These statements all reflect the underlying strategy of providing

the student with evidence demonstrating the importance of education, given her desired career. Therefore, although this pilot respondent perceived these as three separate strategies, they were considered as one strategy in scoring.

The second parameter in the rubric related to the sophistication of the strategies. Overall, strategies were considered simple, mixed/moderate, or sophisticated. Simple strategies included those strategies that responded to limited facets of the case (e.g., symptoms rather than the cause of the problem), were impractical, procedurally poor–less detailed in description (e.g., parent involvement), or were irrelevant to the case described. In contrast, sophisticated strategies referred to those strategies that responded to the underling problems of the case in depth and breadth, that is, they addressed the multiple core concerns that existed. Additionally, sophisticated strategies were practical (i.e., the strategy could be implemented and would most likely bring about desired results), pedagogically sound, procedurally rich (i.e., contained more detailed and specific description of what would occur (e.g., call parents and set up meeting to discuss absenteeism), and were very relevant to the case described. Strategies classified as mixed or moderate may have contained both simple and sophisticated strategies, or were multifaceted (i.e., addressed multiple aspects of the case), but procedurally limited in fashion. Mixed/moderate strategies may have provided a procedurally rich strategy for only one aspect of the case.

Scores were assigned using a 6-point rubric that was inclusive of the aforementioned parameters. A score of 0 was given if no strategy was provided. Responses that were limited and simple received a score of 1. A score of 2 was

granted to responses with extensive simple strategies. A response was rated 3 if it included a limited number of mixed or moderate strategies. A response rated as 4 if there were an extensive number of mixed or moderate strategies. Sophisticated strategies, limited in number, were scored as 5, and those extensive in number were scored as 6. Table 10 provides a series of sample responses, the score given, and a brief explanation of that scoring.

To establish interrater reliability, I trained the same doctoral candidate/experienced teacher used for the task analysis scoring on the use of this rubric to score the responses. For the purpose of training, a base rate of 75% agreement or higher was targeted. Once training was completed, 10% of all responses for each vignette were independently scored in order to ascertain interrater agreement. Further, for items in which disagreement occurred, conflicts were resolved through discussion. Levels of interrater agreement for the problem statements were: 87.5% for instructional practices, 80% for classroom management, and 85% for student engagement.

An overall strategic awareness score was calculated based on individuals' responses to the strategy section across the three vignettes (three items). This resulted in a maximum score of 18 for the strategic awareness measure. Responses to this measure yielded a mean of 8.59, a standard deviation of 3.76, and a Cronbach's alpha of .65.

Table 10

Strategy Sample Responses

Score	Response	Explanation
0	▪ No response	▪ No response
1	▪ Teacher's aid ▪ Practice homework for ESL students to learn English ▪ Gifted and Talented meeting group away from other students	▪ Three strategies – limited ▪ Seems to treat the symptoms of the problem without addressing the underlying causes.
2	▪ Try to use analogies the kids can relate to ▪ Have the brighter kids teach concepts in groups before you explain the answer to the question ▪ Do more assignments related to the questions ▪ Do a hands on experiment if possible ▪ Make the topic fun and interesting	▪ Five strategies – extensive ▪ Analogy and hands-on strategies seem to be irrelevant for the case as described here ▪ Relying on 'brighter' students to teach concepts is a risky decision and such an action needs to be taken with care rather than used as the rule
3	▪ When introducing a lesson have students jot down questions and address them after the lesson, either personally or as a class ▪ Ask 3 then me → students must ask 3 peers before asking the teacher ▪ Question box → students can write down questions and put them in a little box for the teacher to address at an appropriate time.	▪ Three strategies – limited ▪ Procedurally rich, but only addresses one facet of the case, how to handle challenging questions.

TABLE 10: *Continued*

Score	Response	Explanation
4	▪ Pair up talented and gifted (TAG) students with English as a second language (ESL) or learning disabled students ▪ Provide instruction in written and oral forms ▪ Make students express themselves so everyone understands ▪ Have the ESL students teach others their native language ▪ Have students (TAG) research on the learning disabilities of their classmates ▪ Have international lessons ▪ Sometimes group students for projects with a mixture or like abilities	▪ Five strategies-extensive ▪ Multifaceted, but procedurally poor. ▪ Some of these strategies are less practical and pedagogically weak (e.g. have TAG research the disabilities of their classmates).
5	▪ Set up a system by which the Gifted and Talented students can extend topics on their own – student led discussion, personal research, etc. ▪ Create centers that focus on the specific needs of the various groups of students ▪ Set up a question box for students who have extension questions: once a week meet with those students to discuss, ▪ or set up dialogue journals to facilitate discussion.	▪ Four strategies – limited ▪ Response is procedurally rich, pedagogically sound and addresses multiple aspects of the case (dealing with diverse needs, responding to student questions).

TABLE 10: *Continued*

Score	Response	Explanation
6	▪ Establish a list of objectives broken into categories, i.e., objectives/skills/ knowledge that all students should attain, vs. objectives for some. ▪ Assign extra problems/projects for bright students that all can attempt and succeed at in varying degrees ▪ Partner students in a peer tutoring models ▪ Utilize collaborative teaching techniques that would enable all student to assume roles and contribute in a positive way ▪ Hold regular review sessions, utilizing teacher aides ▪ Make sure students understand that the objectives will be met to varying degrees ▪ Class rules that encourage respect/not put downs ▪ Positive reinforcement for all	▪ Eight strategies – extensive. ▪ This response demonstrates several procedurally rich and pedagogically sound strategies. ▪ Further, these strategies address multiple central concerns.

Strategy Content Evaluation. I was interested in determining the content of participants' strategy responses: which strategies were most frequently listed and whether there were differences in responses related to efficacy, knowledge, and pedagogical beliefs. In order to manage the data, a multi-step categorization procedure was used for each vignette. First, all of the strategy responses were transcribed into a spreadsheet. After the first 30-40 responses were transcribed, I began to get a general conception of the emerging themes. At this point a handwritten list of the strategy themes was generated. From this point on, an exhaustive listing of new strategies was

recorded as transcriptions continued in lots of 10 to 20. When breaks in transcription occurred, the handwritten list was typed and used as a starting point for the next round of transcriptions. This process continued until all transcriptions had been completed.

The next step was to sort the strategies for each vignette into common themes. I removed all headings or titles used in the initial organization of the exhaustive lists; then the lists were printed out and cut into sort cards. I then sorted the individual strategies by grouping them into common themes, such that strategies tapping into the same area or concern relative to the case were grouped together. For example, all strategies related to responding to questions were grouped together. In cases where one term or strategy seemed to fit the intent of multiple strategies, these were collapsed into one category. For example, responses such as "implement a question box" and "ask three than me" were classified as routines or strategies for managing questions. New titles were then given to each of these groups of strategies. Strategies were collapsed into common themes until a minimum number of strategy themes that effectively described the data were identified for each vignette. Approximately three rounds of data collapsing were required for each vignette.

The themes identified were then applied to the first 25% of the data (half preservice and half experienced teachers); that was initially transcribed and used to develop broad categories. This was done to test the appropriateness of the category framework and to investigate the need for additional category combinations. Strategies with no or low frequencies were then combined into connected themes. This process

continued until the categories of strategies were deemed both reflective of the information provided and meaningful with respect to degree of specification.

The number of coded strategies for each vignette ranged from 55 to 60 individual strategies grouped into 9 to 13 themes. Appendix E contains the sheets used to code the data for each vignette. Table 11 provides a detailed list of the main themes for each vignette. Each of those main themes includes two or more specific strategies that emerged from the data. For example, the instructional practices strategies include a theme labeled *grouping.* This theme included all specific strategies related to student grouping techniques or strategies that teachers might use in that scenario. Common grouping strategies included grouping students by ability or tracking, separating the disparate groups of students into different more homogenous classes, using group activities, methods for managing groups, using independent activities, as well as implementing the specific grouping strategies of flexible grouping or mixed ability grouping.

All responses were coded using the scoring sheets developed. An experienced educational psychologist was trained on the coding system in order to determine interrater agreement for the coding of the specific strategies. It was stipulated that if a strategy was placed within the same theme by both scorers that agreement was achieved. That is, I considered the main themes to be the most salient aspect of the coding system; therefore, differences on the specific strategies in the same theme were considered less relevant. A minimum of 15% of the data for each vignette was dual coded in order to ascertain interrater agreement, with a minimum level of agreement

set at 80%. Across the three vignettes, interrater agreement stood at 80.1% for instructional practices, 88.5% for classroom management, and 86.5% for student engagement.

Table 11

Strategy Themes for Each Vignette

Instructional Practices	Classroom Management	Student Engagement
▪Teacher Characteristics	▪Behavior Management Plan	▪Interest
▪Grouping Practices	▪Rules	▪Value of Education
▪Differentiation	▪Teacher Actions/Responsibilities	▪Goal Setting
▪Meet all Students Needs	▪Physical Classroom Environment	▪Foster Motivation
▪Address Special Needs	▪Relationships	▪Classroom Management
▪Class Climate: Sharing Knowledge	▪Pedagogy: Student Needs	▪Instructional Practices
▪Class Climate: Student Interaction	▪Pedagogy: Content – Instructional Choices	▪Attendance
▪Class Climate: Teacher Approach/Attitude	▪Help outside classroom	▪Build Esteem/Social support
▪Questions	▪Unclassifiable	▪Evaluate
▪Instruction: Specific content		▪Conferencing
▪Instruction: Techniques		▪Unclassifiable
▪Case Specific – Sam and Jen		
▪Unclassifiable		

Strategy Selection. The next portion of the pedagogy measure asked participants to select from the strategies they listed those they would be likely to implement and those they thought were best. This assessment provided data on the

extent to which teachers have knowledge that they may not necessarily use. That is, knowing that a strategy exists and using it are not the same. This measure allowed me to separate these dimensions of teachers' thinking, and was used to determine if teachers' evaluation of strategies was related to their efficacy, knowledge, or pedagogical beliefs (Question 7).

Specifically, item five asked teachers to classify their own strategies with respect to the actions they would most likely use and the actions they considered best. Teachers were directed to place their responses in the first column of the three-column chart used for the strategy list. Specifically, they were asked to "make the following marks in the left-hand column: Place a check (✓) next to the actions you would most likely implement; place an X next to the actions you think are the best options." Thus, four options were available: (a) *unused*, listed but not selected or considered best; (b) *used*, strategies identified as something the respondent would use but didn't consider best; (c) *best*, strategies judged best, but not as likely to be used; and (d) *used and best*, strategies identified as being likely to use and judged best.

Strategy-Teaching Efficacy. The final assessment related to the pedagogical measure assessed teachers' sense of efficacy for the strategies they identified. This measure enabled me to analyze the relationship between teachers' self-identified strategies and their level of efficacy. The sixth component on this questionnaire asked teachers to assess their efficacy for each of the strategies they generated on 1 to 9 scale with descriptors provided at 1 (no confidence), 3 (very little confidence), 5 (some confidence), 7 (quite a bit of confidence), and 9 (a great deal of confidence).

Specifically, the item read "using the scale below, rate your confidence in your ability to carry out the listed actions, indicate your response in the right hand column."

Strategy efficacy was computed for each vignette as the mean of the participants' reported efficacy for the strategies provided, creating three variables: instructional practices strategy efficacy (*M*=6.82, *SD*=1.23), classroom management strategy efficacy (*M*=7.41, *SD*=1.27), and student engagement strategy efficacy (*M*=6.84, *SD*=1.39). Total strategy efficacy was computed as the mean of efficacy scores across the three vignettes (*M*=7.02, *SD*=1.02, a=.69). Factor analytical procedures were employed to ascertain whether these responses demonstrated the three dimensions of strategy-efficacy (instructional practices, classroom management, and student engagement), or if there was a single overall factor. Principal components analysis was employed to determine the number of factors to extract.

Although only one factor demonstrated an eigenvalue greater than 1, with all three items loading on that factor, examination of the scree plot indicated a clear three-factor solution. Principal components analysis with Varimax rotation was then employed to examine the potential of a three-factor solution. The factor loadings for both the one-factor and three-factor solutions are provided in Table 12. These suggest that strategy efficacy can be considered a composite made up of the three independent components

Table 12

Factor Loadings for Strategy Efficacy Items

Mean Strategy Efficacy	One Factor Solution	Three Factor Solution		
		1	2	3
Instructional Practices	**.818**	.216	.230	**.949**
Classroom Management	**.784**	.178	**.958**	.225
Student Engagement	**.767**	**.962**	.177	.209

Note: Bold font indicates item loading on the factor,

Pedagogical Knowledge Beliefs

Purpose. The pedagogical knowledge beliefs instrument (see Appendix F) assessed teachers' beliefs about teaching and pedagogical knowledge. The measure was intended to gauge three areas of teachers' pedagogical knowledge beliefs: the perceived importance of pedagogical knowledge, the perceived value of pedagogical knowledge types, and beliefs about teaching in general. First, three items (d, e, f) were designed to measure participants' perceived importance of distinct areas of pedagogical knowledge (instructional practices, classroom management, and motivation, e.g., "As long as teachers know how to manage a classroom, students will learn.") Second, four items (c, g, h, i) assessed the value participants ascribed to declarative, conditional, and procedural pedagogical knowledge. For example "Knowing how to use and implement teaching techniques is the hallmark of a good teacher" assesses the value participants placed on procedural knowledge. The final set of seven items (a, b, j, k, l, m, n) dealt with participants' overall view of teaching as a skilled, learned, and knowledgeable enterprise. A sample item is "Teaching is a talent. Some people have it, and some people do not."

Respondents indicated their level of agreement or disagreement with these 14 statements on a 9-point continuum where 1 represented no agreement and 9 indicated complete agreement. Higher scores reflected more sophisticated beliefs. Sophisticated beliefs in this study were those that reflected respondents' of diverse forms of pedagogical knowledge, and perceptions of teaching as a complex, demanding, and learned profession. To maintain this scoring pattern, four items (a, b, e, and k) were reverse coded. For example, for item k, **"**Expertise in teaching can be developed after only a few years of practice" 1 was scored as high and 9 as low.

Exploratory factor analysis was employed to ascertain whether the three expected factors emerged for this measure. Additionally, reliability analysis was used to evaluate this measure. Principal axis factoring using Oblimin rotation was implemented to ascertain whether the measure contained one or more belief constructs. Beliefs about teaching knowledge and the nature of teaching were considered to be latent components of individuals' belief systems, and the items created were intended as a means of tapping into those beliefs. Therefore, principal axis factoring was used. An oblique rotation was implemented because it was expected that, if there were separate belief factors, they would be related to one another. This technique allowed this relatedness to emerge.

Exploratory analysis suggested that a one-, two-, three-, four-, or five-factor solution might be appropriate, using the Eigenvalues greater than 1 rule. However, examination of the scree plot and the *a priori* expectations about the measure suggested the further exploration of the one-, two-, and three-factor solutions.

Examination of factor loadings indicated that a two-factor solution made the most theoretical sense for this measure. This solution allowed for the identification of two theoretically meaningful factors (Table 13). Items with loading .350 or higher were retained on each factor.

Table 13

Pedagogical Belief Measure: Principal Axis Factoring

Item			
Letter	Statement	1	2
H.	Knowing how to use and implement teaching techniques is the hallmark of a good teacher.	**.709**	-.129
G.	When I read a professional article, I am *most* interested in learning what new teaching techniques are available.	**.616**	-.081
F.	Knowledge about instructional practices is the most important knowledge a teacher can have.	**.541**	.055
I.	It is important to understand the theory behind teaching techniques.	**.524**	.137
D.	Knowledge about how to motivate students is essential for teaching.	**.513**	-.082
A.	Teaching is a talent. Some people have it, and some people do not.*	.077	**.954**
J.	Anyone can be a teacher.	-.006	**-.410**
B.	Good teachers get through most of their day on instinct.*	.051	**.369**
M.	It is easy to recognize quality teaching.	.328	.011
N.	The best teachers are passionate about their work.	.324	.136
C.	Expert subject-matter knowledge is necessary for effective teaching.	.298	.055
L.	Teaching is a skill that can only be learned and developed through practice.	.249	.154
E.	As long as teachers know how to manage a classroom students will learn.*	-.152	.011
K.	Expertise in teaching can be developed after only a few years of practice.*	-.127	-.041

*Indicates reversed coded items

The first factor, knowledge beliefs (items d, f, g, h, and i), reflected beliefs about knowledge related to teaching. This factor emphasized beliefs about the importance of declarative and procedural knowledge as well as the specific knowledge

content of instructional practices and student motivation. A score for knowledge beliefs was computed as the unweighted mean of responses for the five items, allowing a maximum score of 9. This subscale yielded a mean of 6.27, a standard deviation of 1.1, and a reliability of .72.

The second factor, teaching ability beliefs (items a, b, and j), reflects individual's beliefs about the nature of teaching abilities. This factor seems to emphasize the importance of a "talent," "instinct," or gift for teaching. A mean of these three items was calculated as the score for teaching ability beliefs, with a maximum score of 9. This sub-scale yielded a mean of 6.44, a standard deviation of 1.04, and a reliability of -.07. Given the extremely low reliability, scores on this sub-scale were not used in the analyses for this study.

While this measure did not yield the three factors anticipated, results suggest that teachers do hold unique beliefs about different aspects of their profession. Further, upon closer analysis of the items in light of the factor analyses, it seems that there are several issues that should be attended to in the development of a more reliable and effective measure of teachers' pedagogical beliefs. First, almost all of the reverse coded items tapped into the same theoretical area, teachers' beliefs about teaching. Second, two of the items (i.e., j and m) allowed for such broad leeway in interpretation that it is difficult to interpret what responses to these items meant. For example, item "m" states, "it is easy to recognize quality teaching." This could mean that quality teaching is such a frequent occurrence that one cannot help but find it. Or it can refer to teachers' beliefs about the ability to evaluate teaching, such that when one sees

"quality teaching," it is easy to identify it as such. However, in spite of these concerns two theoretically sound factors emerged, indicating that this is a fruitful area for future research.

Demonstrated Knowledge

Teachers' knowledge as an area of study came to the forefront of the teacher education literature in 1987 when Lee Shulman proposed seven categories that comprise the knowledge base of teachers. Those categories included: content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts, and knowledge of educational ends or purposes (Shulman, 1987). More recently, Verloop, Driel, and Meijer (2001) posited that the knowledge base of teaching can be "conceived as all profession-related insights, which are positively relevant to teachers' activities" (p. 441). The focus of this work is to develop an understanding of teacher knowledge that can better inform the preparation and continuing education of teachers. Thus, the term teacher knowledge lends itself to a broad array of understandings, conceptualizations, and purposes.

In the context of this study and this measure, I limited the conceptualization of teacher knowledge to respondents' demonstrated achievement on a paper and pencil measure assessing the areas of instructional practices, classroom management, and student engagement. Further, the content of this measure was limited to what Shulman (1987) would call general pedagogical knowledge. Schulman's (1987) conceptualization of general pedagogical knowledge includes those broad principles

and strategies that "appear to transcend subject matter" (p. 8). For the purposes of this study, I focused on this general knowledge in the three areas assessed in the TSES in order to best understand the relation between this type of knowledge and teachers' efficacy beliefs in those areas.

Thus, this measure (see Appendix G) was developed to provide a direct assessment of respondents' knowledge related to the instructional tasks examined in the TSES (Tschannen-Moran & Woolfolk-Hoy, 2001). Each item was created and then selected based on its ability to mirror a core theme from the TSES, as well as its quality as an assessment item (Tschannen-Moran & Woolfolk-Hoy, 2001). For example, item 3 of the TSES asks, "How much can you do to control disruptive behavior in the classroom?" An example of a specific knowledge question associated with that TSES efficacy item is:

> Katie and Michelle are best friends and sit next to each other. Usually this is not a problem in class, however today the girls have started giggling during silent reading time, and are distracting the other students. The best intervention for this situation would be
>
> a. send the girls to the timeout table in the back of the room
> b. separate the girls for the remainder of the week
> c. stand near the girls' desks (2 points)
> d. assertively tell the girls to stop (1 point)

Along with the content of the TSES, a response model was followed to assist in the construction of plausible options. Specifically, in addition to the correct response there is a close or common alternative choice, and two more implausible incorrect responses. The incorrect responses are written to either be equally incorrect

for the circumstances, or differ such that one reflects an inappropriate teaching practice. In the example above, c is the correct response, d is a common but less desirable alternative, a and b are incorrect but appropriate for some other situations. These response levels were confirmed in the pilot and discussion group (discussed later) and were verified by experts in pedagogy and educational psychology.

The items were scored based on their response type. A correct response was awarded a score of 2. Participants selecting the close distracter received a score of 1 and the two incorrect responses received a 0. Demonstrated knowledge was calculated as the sum of participants' scores on the total number of items.

Initially, 30 items were created to assess teachers' knowledge in the areas of instructional practice, classroom management, and student engagement. These items were pared down to a smaller selection of 16 items based on the comments from a discussion group described later in this chapter. Eight items assessed knowledge of instructional practice (e.g., "Which of the following teaching interventions will best allow a teacher to alter lessons to meet the needs of a student with ADHD?"), five items assessed classroom management knowledge (e.g., "How can you get students to cooperate and follow classroom rules?"), and three items assessed knowledge regarding student motivation (e.g., "Ms. Flower's class seems completely disinterested in her content area and focused primarily on their grade point average. Which of the following strategies may help to increase the interest of her students for this content?").

Means, standard deviations, and reliabilities were explored for this measure. Item analysis revealed that dropping items 1, 7, 10, 12, 13 and 14 from the measure increased the reliability (a=.59). I felt this reliability was acceptable for the experimental purposes of this study. The low reliability may be attributed to the overall low performance by the preservice teachers, which would be anticipated. Therefore the score awarded for demonstrated knowledge was the sum of participants' scores on items 2, 3, 4, 5, 6, 8, 9, 11, 15, and 16. This new scale also provided a more even distribution of items relative to instructional practices (items 5, 11, and 15), classroom management (items 3, 6, 9, 16), and student engagement (items 2, 4, and 8). The maximum score an individual could receive on this measure was a 20. The mean score for this measure was 15.009 with a standard deviation of 3.20. Participants' scores ranged from a low of zero to a perfect score of 20.

Procedures

Slightly different procedures were employed to collect data from preservice and experienced teachers. The sections that follow explain the procedures for these two groups of participants.

Preservice Teachers

Preservice teacher participants were identified in one of two ways. First, in three classes I gained permission from the course instructor and asked these participants to complete the test battery during class time. Second, several professors allowed me to request volunteers during class time (about five minutes), where I briefly announced the purpose of the study, participation requirements and times and

locations for participation opportunities. At that time I also passed around a sign-up sheet for interested parties to indicate when they could come, their name, and email address. Separate times were scheduled with individuals who could not attend one of those announced times. Additionally, prior to a data collection session, reminder emails were sent to potential participants. The test battery was administered to both individuals and groups in order to maximize participation. Some of these participants received extra credit for participating in this research; however, this decision, and the alternatives for the students, were left to the discretion of the course instructor.

Experienced Teachers

Experienced teachers were contacted in a number of ways: through the school district, personal contacts at individual schools; at district wide inservices; and, via university courses. Across these methods, all prospective participants were informed as to the purpose of the study and were asked to complete the packet in one to three weeks and return it to the distribution source (e.g., researcher, school office, inservice coordinator). Each test battery was given in an envelope that was returned sealed in order to ensure the confidentiality of completed forms. Each envelope also had my name and address, so that teachers could mail their responses directly to me.

Structure of Test Battery

The test battery consisted of seven parts, administered in the following order: background information, pedagogical measure, sense of efficacy scale (Tschannen-Moran & Woolfolk-Hoy, 2001), beliefs about pedagogical knowledge, demonstrated knowledge measure, and a statement about willingness to participate in future

research. The background information began the test battery in order to establish basic information about the respondent. The pedagogical measure and related questions were presented second. In this way, the free response task associated with this section was not influenced by information provided in the measures that followed. Further, the order of the individual vignettes was counterbalanced. This was done to limit any differences in responses related to the vignettes caused by fatigue or practice with the measure.

The TSES was given next. This placement was selected so that participants could assess their efficacy beliefs prior to reflecting on their pedagogical beliefs or concentrating on recalling demonstrated knowledge (which might inform efficacy judgments). The pedagogical beliefs measure followed the TSES. The test battery ended with the demonstrated knowledge test. This test was placed at the end of the battery because the questions contain information about teaching related concepts, ideas, and strategies, which could inform responses to other portions of the test battery. Each of the subsections was photocopied on different colored paper. This color-coding was done for two reasons. First, the colors served to cue the participants when they began a new measure. Second, this system allowed for ease in test monitoring, data coding, and data entry. Based on pilot testing, the test battery was estimated as taking between 30 and 45 minutes to complete. This estimation was confirmed with the participants in the study.

Data Analyses

A series of statistical procedures were conducted in order to answer the central research questions. The key variables of interest in these analyses were teacher efficacy (TSES), task analysis, task teacher efficacy, strategy awareness, strategy efficacy, pedagogical knowledge beliefs, and demonstrated knowledge. Descriptive statistics (e.g., means and standard deviations) and factor analyses were performed (described previously) to ensure that data met the assumptions for subsequent analyses and to ascertain the structure and overall reliability of measures. Additionally, a correlation matrix was generated, to explore the interrelations among variables.

Question One sought to examine the relations that exist between and among teachers' knowledge, pedagogical knowledge beliefs, and their efficacy. I examined the correlations for teacher efficacy, teacher knowledge, and teacher pedagogical knowledge beliefs to explore the relations among those variables.

The second research question asked "Are teachers' task assessments and strategy awareness related to their levels of efficacy?" Analysis of the correlation matrix was also used to examine the relations that existed among teachers' task assessments and strategy awareness, in relation to levels of teacher efficacy, task efficacy, and strategy efficacy.

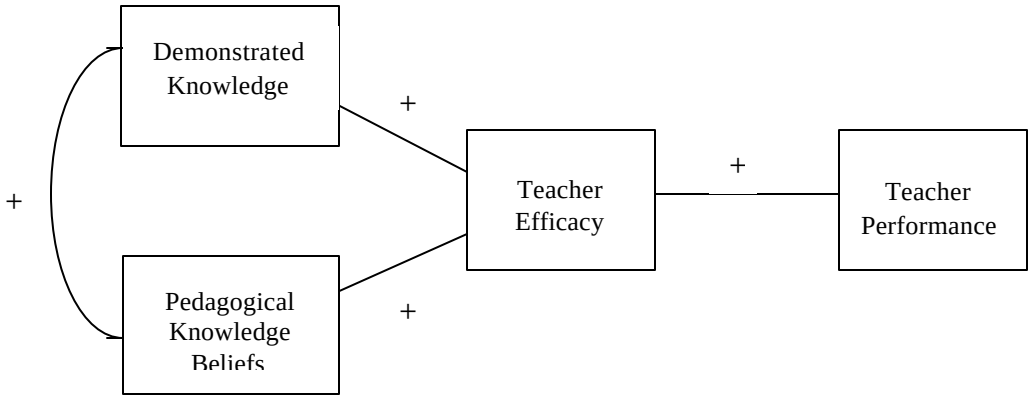
Question Three sought to determine whether teacher efficacy mediated the relations between demonstrated knowledge, knowledge beliefs, and performance. A path analysis was used to model teacher efficacy. The predicted model positioned teacher efficacy as a mediator in relation to demonstrated knowledge, pedagogical

knowledge beliefs, and performance. Baron and Kenny (1986) offered a distinction between moderator and mediator variables used in social psychological research, describing moderator variables as those variables that affect the direction or strength of the relation between a predictor and a criterion. A moderator variable is considered to co-occur with other predictor variables to affect the outcome. In contrast, mediator variables are considered to account for or explain the relation between a predictor and a criterion (Baron & Kenny, 1986). From this perspective the predictor or independent variable is considered to work though the mediator variable to impact the outcome of the system. The present study investigated the extent to which teachers' efficacy served to mediate or explain the relation between teachers' knowledge and performance, as well as teachers' beliefs and performance.

In this study teaching performance of participants was assessed using the strategy awareness measure. This measure served as a proxy for teachers' actions in classroom situations. Further, it is a measure of their performance on the analysis of a realistic classroom situation. The path model that was tested in this analysis is illustrated below (Figure 3). Specifically, teacher demonstrated knowledge and teacher pedagogical knowledge beliefs were hypothesized to influence teacher efficacy positively. Teacher efficacy was then expected to serve as a mediator and influence teachers' performance. In addition, it was expected that teacher demonstrated knowledge and teacher pedagogical knowledge beliefs would covary.

Figure 3:

Path Model of Teacher Efficacy as a Mediator between Knowledge and Performance



Question Four examined the ways that preservice and experienced teachers differ with regard to their levels of teacher efficacy, demonstrated knowledge, and pedagogical knowledge beliefs. First, data were analyzed with a t-test to assess differences in preservice and experienced teachers' overall efficacy as measured by the TSES (Tschannen-Moran & Woolfolk-Hoy, 2001). Next, data relevant to this question were analyzed via a one-way MANOVA. In this analysis, teaching level (preservice or experienced) served as the independent variable and the dependent variables were: efficacy for instructional practices, classroom management, and student engagement as measured by the TSES; demonstrated knowledge; and pedagogical knowledge beliefs.

A 2 (Experience Level: preservice and practicing) x 3 (Efficacy Level: high, moderate, low) MANOVA was employed to investigated Question Five, which asked: "Do preservice and inservice teachers of differing levels of teacher efficacy demonstrate different levels of demonstrated knowledge, pedagogical beliefs, and

ability to assess teaching scenarios (i.e., task analysis and strategy awareness)?" This procedure was used to look for any significant main effects between preservice and practicing teachers, between and among efficacy level groups (high, moderate, low), as well as any interactions that might occur. Fisher's Least Significant Difference (LSD) test was employed in the univariate analyses that followed (Hancock & Klockars, 1996). These analyses were conducted to determine if there were differences in demonstrated knowledge, pedagogical beliefs, and ability to assess teaching scenarios (i.e., task analysis and strategy awareness).

All participants (preservice and experienced respondents) were divided into three groups based on efficacy levels (high, moderate, and low). The three groups were formed based on the mean and standard deviation of overall efficacy as measured by the TSES. The high efficacy group was comprised of participants with overall efficacy scores greater than a half standard deviation above the mean. The moderate efficacy group included respondents with overall efficacy scores plus or minus one-half standard deviation above and below the mean. The low efficacy group consisted of participants with scores less than a half standard deviation below the mean.

A one-way ANOVA was conducted on the three efficacy groups to determine if these groups were significantly different. Results determined significant differences between the groups [$F(2, 219)$=354.074; p=.001]. Post hoc tests found significant differences between each of the groups as anticipated, that is, the low group had significantly lower efficacy than the other two groups, the moderate group had significantly higher efficacy than the low group and significantly lower efficacy than

the high group, and the high group had significantly higher efficacy than the low and moderate groups ($p<.001$). Therefore, the use of these high, moderate, and low efficacy groups was judged to be appropriate for the following analyses.

However, when these data were assessed for homogeneity of variance, they failed to meet this assumption. According to Stevens (1996) MANOVA is robust to homogeneity of variance when sample sizes are approximately equal; therefore, the sample size of the moderate group (n=150) was modified to approximate the values of the other two groups (high n=40; low=32). Specifically, 40 participants from the moderate group were randomly selected using SPSS to be included in the following analyses.

Question Six examined the content of participants' strategy selection. Specifically, this question sought to determine which strategies were more likely to be used to address the pedagogical scenarios presented and the degree to which respondents had knowledge of teaching strategies that they were not likely to implement or consider best for the situation presented. Descriptive statistics were used to examine the types of strategies most often identified by participants for each of the pedagogical vignettes and the extent to which respondents demonstrated knowledge of a range of strategies beyond those they would use or evaluate as "best."

Differences in participants' evaluation of strategies as "likely to use" or "best" relative to respondents' demonstrated knowledge, pedagogical beliefs, teacher efficacy, or task teacher efficacy were investigated in Question Seven. Participants' evaluation of strategies as "likely to use" or "best" was examined using descriptive

statistics for differences among participants grouped by demonstrated knowledge, pedagogical beliefs, teacher efficacy. In these procedures, the participants were divided into high, middle, and low groups for teacher demonstrated knowledge, pedagogical beliefs, and teacher efficacy.

Question Eight asked: "What common groups of inservice teachers emerge based on demonstrated knowledge and teacher efficacy?" Cluster analysis procedures were employed to profile experienced teachers based on their levels of demonstrated knowledge and teacher efficacy. These variables were selected for clustering due to the theoretical interest identified in this study. It was anticipated that the extent to which teachers can be profiled on the basis of their knowledge and efficacy may lead to a deeper understanding of the interdependence of these constructs. Clusters were formed using Ward's minimum variance hierarchical clustering technique (Ward, 1963). This technique is considered to be useful in recovering the underlying structure of the data (e.g., Atlas & Overall, 1994; Blashfield, 1976).

Multiple steps were used to identify the appropriate number of clusters. First, graphical representations of the data in the form of dendrograms were examined. Dendograms illustrate the largest gaps between cluster groups and suggest an appropriate number of meaningful clusters (Olson & Biolsi, 1991). Second, multiple analysis of variance was employed to explore significant differences among the groups. Third, discriminant function analysis, as suggested by Romensburg (1984), was used to validate the cluster solution. In this step, the original clustering variables were used to predict group membership. The extent to which these predictions were

correct corroborates the validity of the solution. The profiles that emerged were used to identify participants for the qualitative portion of this study.

Measure Refinement

The questions asked in this investigation required the creation of new measures in order to gather the data needed to address the areas of inquiry. Therefore, following the initial construction of the measures, they were further refined though the input from a discussion group of experienced teachers and a pilot study. The sections that follow describe the purpose, procedures, and subsequent refinement of the instruments prior to the advent of the dissertation study. The measures described earlier in this chapter are the results of the discussion and pilot studies described here.

Discussion Group

Purpose. I gathered a discussion group for the purpose of addressing questions pertaining to the content, format, and the procedures for the test battery. Specifically, I sought to collect information useful in answering the following questions:

1. How much time will be needed on average to complete the test battery?
2. How clear are the directions for each measure?
3. Which vignettes best reflect the efficacy areas of instructional practice, classroom management, and student engagement?
4. Which vignettes best reflect actual teaching experiences?
5. How well do the items on the pedagogical beliefs measure reflect this construct?

6. Which items from the larger pool should be retained for the demonstrated knowledge test?

Participants. The discussion group consisted of five classroom teachers selected on the basis of their experience, expertise, and range of teaching areas (see Table 13). I was acquainted with all of these teachers. Specifically, the discussion group included Ms. K., who is a sixth-grade teacher in a large public magnet school dedicated to the performing arts.

This school also houses a gifted and talented program. Ms. E. and Ms. L. hailed from the same K-8 Catholic School. Ms. E. maintains an eighth-grade homeroom and teaches history and literature to students in grades six through eight. Ms. L. teaches kindergarten. Ms. M. is an English as a second language instructor in a public elementary school. She provides language instruction for students in grades kindergarten through five. Mr. P. teaches geometry and algebra 2 to ninth and tenth-grade students in a private secondary school.

Procedure. I contacted seven teachers via telephone and asked them to participate in the discussion group. In this initial contact, I informed the prospective participants that this discussion was to help in the assessment and development of the research instruments. They were also told that the discussion would take approximately three hours and that dinner would be provided. Everyone contacted initially expressed interest and willingness to participate. However due to scheduling constraints, only five teachers were able to attend.

Each discussion group member received a packet of information upon arrival. Included in this packet were an agenda, questions for the discussion, and a test battery (see Appendices G-K). Space was provided at the beginning and end of each measure for participants to record starting and ending time. The number of vignettes (n=6) and items in the demonstrated knowledge measure (n=30) was more extensive than the number to be included in the final measure. The six vignettes were comprised of two vignettes for each area of efficacy assessed. For each area, one vignette contained an individual student situation and one vignette reflected a whole class situation. All six of these vignettes are provided in Appendix H. Because of time constraints, three teachers were randomly assigned individual student vignettes and two teachers received whole class vignettes. All vignettes were subsequently made available to all participants.

Once all of the participating teachers had arrived, I explained the purpose of the discussion group. I told the teachers that the first step in this process was to complete the test battery independently and to keep track of time. I also asked the teachers to complete the test battery without my assistance. If things were unclear, they should make note of them but use their best judgment in responding.

Table 14

Description of Discussion Group Participants

	Discussion Group Participants				
	Ms. K.	Ms. E.	Ms. M	Ms. L	Mr. P.
	Teaching Environment				
Type	Public performing arts magnet	Parochial	Public	Parochial	Private
Level	Elementary (K-6)	Elementary (K-8)	Elementary (K-5)	Elementary (K-8)	Secondary (9-12)
Experience					
Years	13	6	7	8	9
Current Grade	6th	Kindergarten	Esol K-5	6th-8th history/ literature	9th-10th geometry/ algebra 2
Previous Experience	4th-8th language arts; 1st grade	Pre-kindergarten	5th-8th Social Studies, Latin	Vocabulary, Religion	6th-8th Math, History, Reading
Education	M.ED. Education Administration Planning and Supervision	B.A. Psychology; ECED(nk-3)	M.Ed. TESOL	M.Ed.	MBA Finance; 28 credits Masters Education Courses
	Demographic Information				
Age	40	28	30	29	35
Gender	Female	Female	Female	Female	Male
Ethnicity	African American	European American	Italian American	European American	European American

Following a dinner break, the participants reconvened for discussion of the test battery. I informed them that the discussion would be audiotaped and gained permission from all members of the group. To facilitate participants' critical evaluation of the test battery and to ensure that they freely expressed their opinions, I remained an observer and recorded field notes. I randomly selected individual participants to facilitate the discussion on specific measures using the discussion questions in his or her packet as a guide (see Appendix I). I also asked the discussion leader to make notes of the overall group conclusions. Once the discussion began, I curtailed my comments except to respond to specific questions that arose.

Several forms of data were gathered from this discussion group. Those forms of data included: the completed test batteries, each discussion leader's written comments for the measure of interest, individual notes made by participants on the test battery forms and discussion forms, the field notes, and the audiotapes of the discussion.

Method. I reviewed and analyzed data related to each section of the test battery independently. That is, all data related to each portion of the test battery (e.g., demonstrated knowledge test) was analyzed separately in order to guide my decisions regarding changes made to portions of the test battery. I read and considered comments and suggestions from the discussion group in light of the purpose of the instruments. When suggestions coincided with the theoretical purpose of the measures, they were accepted.

Results. The first participant completed the test battery in 28 minutes, and the final participant completed the test battery in 46 minutes. The average time to complete the test battery for these participants was 35 minutes. This timeframe was considered to be an acceptable amount of time. I also made changes to each of the instruments based on results of the discussion group.

Specifically, I made three changes to the pedagogical measure (See Appendix J). The first two changes involved formatting and clarifying the instructions of the measure. First, the three column space for strategy responses was altered. Second, an additional directive was added to the first page of each vignette indicating that responses should be made on the next page.

The final change to this measure was the selection of the vignettes. The participants engaged in an animated and detailed discussion of which vignettes should be selected. Their comments during this selection process focused on the vignette that (a) would best reflect an actual teaching situation and (b) would best capture the efficacy area it assessed. There was some debate involving whether or not the vignettes reflected real situations. However, at least one teacher among the group had experienced the situations described in each vignette. A general conclusion among participants was that even if they had not personally experienced the situation, it was realistic and would allow them to use their prior experiences when responding. Two of the vignettes recommended by the group involved whole class issues (i.e., diversified instruction, and the undisciplined class), and one reflected an individual student concern (i.e., low motivation).

Group members raised two concerns about the pedagogical beliefs measure (Appendix K). First, there was some confusion with the directions. Group members were unsure as to whether they should respond with their own opinion or with their opinion of what most teachers would say or do. Based on this concern, I modified the instructions of this measure to highlight the intent of the question: "Indicate the extent to which **you agree** with each of the following statements."

The second concern involved item K: "Expertise in teaching can be developed after only a few years of practice." Participants seemed to agree that after the third year of their teaching experience they were filled with "a false sense of confidence" and would have agreed strongly with this statement. However, now as they enter their seventh to fourteenth year of teaching, their response would be very different. The concern raised by the discussion group focused on whether this item would be appropriate given these differences. I decided to retain the item in the measure, as the discussion that was held by the group raised an interesting question. That is, does this belief about teaching change with experience and reflect a developmental aspect of this belief system? Additionally, it would be interesting to see if the experiences described by the discussion group were mirrored in the empirical data.

The selection of items to be retained in the demonstrated knowledge measure was a primary reason for conducting the discussion group (see Appendix L for the full measure). The 30-item measure needed to be cut in half and still reflect the three areas of teaching knowledge that are the focus of the study. I employed a four-step process to select items for omission.

First, items were removed if the item was answered either correctly or incorrectly by all members of the group. This resulted in the deletion of nine items. However among those nine items, three assessed motivation, of which only four items existed in the entire measure. Therefore, changes were made to two of those items in order to keep them in the measure. Specifically, for one of these items all of the members selected the same, incorrect distracter. The distracters to this item were modified to provide better options. The distracters of a second item, which was answered correctly by all participants, were also modified to make the question slightly more challenging.

The second criterion by which items were deleted was based on a sorting activity performed by the discussion group. Group members were asked to sort the 30 items by the content area they assessed. Any items sorted by the group into a category different from the category identified during construction were deleted. In this step I omitted an additional three items. The third basis for omitting items was the clarity of the items in terms of wording or phrasing. The discussion group suggested that two items be dropped, because they found them to be highly confusing.

The final criterion for omitting items was based on the preference in item type. Many of the items were written such that a teacher or specific teaching example was the focus of the question. Discussion group members repeatedly commented on how they preferred this type of question. They stated that these items seemed more interesting and related more closely to their teaching practice. Therefore, in any instance in which the same content was covered by two items, the item that was

written with a teacher or teaching example was retained. Based on these four criteria the number of items was reduced from thirty to sixteen. Eight items assessed the area of instructional practices, three items assessed student motivation, and five items assessed classroom management.

Conclusion. The discussion group process helped me to better define and clarify the measures created for this investigation. The frank discussion of the measures by members of the profession to be surveyed provided insight into the validity of the measures, as well as highlighted problematic components of the test battery.

Pilot Study

Purpose

There were four goals of this pilot study.

1. Gauge the length of time the test battery will take to complete in general.
2. Identify any changes in the directions or formatting that needed to occur for clarity.
3. Allow for the preliminary exploration of factors as well as the consideration of items for refinement or elimination.
4. Provide data for the development of a coding scheme for the pedagogical measure items.

Participants and Procedures

Eighteen undergraduate students and two teachers seeking certification enrolled in a preservice reading course served as a pilot group for the adjusted measures. The measures in this study included all of the instruments to be used in the complete study, the vignettes, the TSES (Tschannen-Moran & Woolfolk-Hoy, 2001), the pedagogical knowledge beliefs measure, and the demonstrated knowledge measure. The pedagogical measure, pedagogical knowledge, and demonstrated knowledge measures reflected changes suggested by the discussion group.

Results

Completion Time. The amount of time needed to complete the entire packet by the participants was noted by the administrator of the test battery. The first packet was turned in after 30 minutes and the final participant was finished 15 minutes later. Thus, the test battery took between 30 to 45 minutes as anticipated. Most participants were finished within 35 minutes.

Clarity of Directions and Formatting. Analysis of pilot data yielded changes to four sections of the test battery. The background information page had been devised for experienced teachers. Changes were made to separate the information requested by professional level. The upper section of this form, to be completed by all participants, asked for basic demographic information, educational status, and participation in professional development (e.g., reading research journals, and member of professional organizations). The bottom portion, to be completed by experienced teachers only, requested specific information about the type of school at which they teach, years

teaching, and grades and classes taught. Additionally, instead of asking participants for their college degrees, I requested the level of education attained.

Changes were also made to the pedagogical measure to clarify instructions. Specifically, item 6 requested participants to use "the scale below, rate your confidence in your ability to carry out the actions listed above, indicate your response in the right hand column (#6)." However, one student simply circled the desired number on the scale provided, rather than listing the efficacy ratings for each strategy generated. In order to prevent this confusion, I added the word "each" to the first sentence of the directions, asking students to rate their confidence in their ability to carry out *each* of the actions listed. Additionally, the second statement directing participants to place their responses in the right hand column was also put in a bold font.

The directions for the demonstrated knowledge measure were modified to attend to an issue of multiple responses. One participant in the pilot study selected more than one response for a number of the items. In order to prevent similar responses in the future, the following sentence was added to the instructions: "Choose only one response for each item."

Initial Statistical Analysis. The third goal of the pilot study was to conduct a preliminary exploration of the factors revealed in the measures and to assess items for further refinement. The TSES (Tschannen-Moran & Woolfolk-Hoy, 2001), the pedagogical beliefs measure, and the demonstrated knowledge measure were subjected to exploratory statistical analyses. Given the small sample size (n=20), this

exploration was done to develop some preliminary expectations for the larger analyses to come and to identify any concerns that might develop with regard to specific items within the scales of interest.

Reliability and factor analyses of the TSES revealed similar findings to those reported by Tschannen-Moran and Woolfolk-Hoy (2001). Three factors were revealed through principal components analysis with orthogonal rotation. These factors resembled those reported previously (see Fives & Looney, 2002; Tschannen-Moran & Woolfolk-Hoy, 2001). However, the interpretation of the factors was not as strong. This ambiguity may reflect the findings reported by Tschannen-Moran and Woolfolk-Hoy (2001) that the factor structure of preservice teachers' responses is often less distinct. Cronbach's alpha for the overall scale was .84. Reliabilities were also conducted on the subscales based on the scale structure reported by Tschannen-Moran and Woolfolk-Hoy (2001). The reliabilities for the subscales were .58 (instructional practices), .72 (classroom management), and .74 for student engagement. These findings indicated that the TSES would be an appropriate measure for the proposed study.

The pedagogical knowledge beliefs scale was also subjected to initial statistical analyses. The reliability for the overall scale was .10. However, this value increased to .63 with the omission of three negatively scored items, A, E, and M ("Teaching is a talent. Some people have it and some people do not." "As long as teachers know how to manage a classroom students will learn." "It is easy to spot quality teaching."). Two decisions were made based on these findings. First, item M was changed to read, "It is

easy to recognize quality teaching." The term "spot" was considered to be ambiguous. Was the item asking if quality teaching is so common you can see it easily or was it easy to determine when quality teaching was observed? The term "recognize" should lead respondents to the latter understanding of the item. The second decision was to keep the measure intact for the proposed study. The small number of participants, virtually all preservice teachers, might have more effect on the reliability of the responses than the items themselves. Thus, these items were reviewed when the larger sample of the proposed study was analyzed.

The factor structure of the pedagogical knowledge beliefs measure was also investigated. The primary purpose of this exploration was to determine whether or not multiple factors were revealed in these data. Therefore, a principal components analysis was explored initially using the factor criterion of eigenvalues greater then 1. This analysis revealed a four-factor solution. However, examination of the scree plot suggested a three-factor solution that was also more in line with the theoretical makeup of this measure. The small sample used in this analysis limited the conclusions that could be made. Yet, this measure seemed promising and was reexamined with the larger, more varied study group.

The demonstrated knowledge measure was analyzed for two concerns: the appropriateness of the common distracters created as part of the response model, and the reliability of the measure. Responses were entered into SPSS as the letter answer given by the student. Frequencies were then generated based on these scores. The item frequencies were then compared to the coded responses for each item. That is, the

number of correct responses, near incorrect responses, and incorrect responses was compared to the scoring previously generated. It was determined that the initial coding scheme was in agreement with the responses revealed by the pilot sample. The measure was then recoded to reflect the 0-2 differential scoring. The Cronbach's alpha for these data was .51.

Development of Coding Scheme for Pedagogical Measure. The scoring rubrics for the problem statement, desired resolution, and strategy awareness items described in detail in the materials and measures section of this chapter were created and tested using the pilot study data. The creation of the rubrics began with an in-depth analysis of participant responses to each question in relation to the diversified instruction vignette. Through this analysis both specific and common themes of these responses were revealed. These common themes were then used to generate the scoring rubrics.

The scoring rubrics were then tested for feasibility on the remaining two vignettes (i.e., undisciplined class and low motivation). Fifty percent of the pilot data for each of the remaining vignettes were assessed. The rubrics worked well and seemed to be an appropriate scoring tool for the proposed study.

An additional change was deemed necessary to the pedagogical measure based on the responses of the pilot participants. Namely, the item assessing the problem statement was originally worded, "What do you see as the key elements or issues in this situation?" This wording was chosen so that respondents would not be primed to see a problem if they did not independently consider one to exist. However, the

responses to this question tended to be more observational or descriptive of the case rather than an assessment of the concerns. Therefore, I altered the question to be more reflective of the information I was attempting to ascertain. The item was changed to: “What do you see as the key problem(s) or concern(s) in this situation?”

Qualitative Methods

Qualitative research methods are “used in research that is designed to provide an in-depth description of a specific program, practice, or setting” (Mertens, 1997 p. 159). Researchers employing this methodology “study things in their natural setting, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denizen & Lincoln, 1994, p. 2). This approach provides researchers with an avenue for understanding phenomena, like teacher efficacy, knowledge, and beliefs, within the context in which they occur. In this way, qualitative methodology can be used to deepen understanding of complex psychological constructs through in-depth analysis focusing on the roles of these constructs in the lives of specific individuals.

Several researchers in teacher efficacy have called for the more in-depth analysis of this construct via qualitative procedures (e.g., Coladarci, 1992; Hoy & Woolfolk, 1990). Anderson et al. (1988) conducted teacher interviews in addition to administering the Gibson and Dembo (1984) teacher efficacy measure. In these interviews, teachers tended to verbalize much greater levels of variability in efficacy than were reported in their responses to the survey data (Anderson et al., 1988). In a similar vein, Ross and colleagues (1996) investigated the variability of teacher

efficacy within individuals using a quantitative methodology. However, from their research findings, they suggested that a more correct reading of the subtle differences in the relationships among the constructs investigated might have been found though interviews using open-ended questions.

The current study employed a multi-method research methodology to take advantage of the benefits of both quantitative and qualitative design. The qualitative portion of this study sought to address the limitations of quantitative analysis, such as losing the individual among the larger sample, by investigating three teachers' practice by means of instrumental case studies (Stake, 1994). Instrumental case studies "provide insight into an issue or refinement of theory" (Stake, 1994, p. 237). Through this approach, the case is considered to be supportive, providing an illustration that will facilitate understanding of the theory or construct under study. The current study explored the constructs of teacher efficacy, teacher knowledge, and teacher beliefs.

Purpose

The purpose of these case studies was to develop an understanding of how teachers' efficacy, knowledge, and beliefs contribute to or are visible in practice, through the use of instrumental case studies of teachers representing differing levels of knowledge and efficacy (Stake, 1994). Specifically, this portion of the study investigated one question:

> What relations exist between and among teacher efficacy, knowledge and pedagogical beliefs in the practice of specific teachers?

Participants

Three teachers were selected for case study analysis. Those individuals were identified from the knowledge and efficacy profiles that emerged from the quantitative data. As will be discussed in Chapter 4, teachers' demonstrated knowledge and teacher efficacy served to identify three groups of teachers. Across the three clusters, demonstrated knowledge was significantly different, while teacher efficacy was only significantly different between two groups. Thus, the three clusters emerged: high knowledge-low efficacy, moderate-knowledge, and low knowledge.

Given the negative relations that emerged in the path analysis (discussed in Chapter 4) and the negative but insignificant correlation between knowledge and efficacy that emerged in, I was interested in exploring the nature of efficacy in teachers with higher levels of demonstrated knowledge. The initial premise of this study was that greater levels of knowledge would be related to higher levels of efficacy. However, this hypothesis did not emerge. Therefore, I wanted to use case studies to better understand the nature of efficacy in the work of three high knowledge teachers.

I wanted to select teachers with higher knowledge for three reasons. First, I believe that there is much to be learned from examining the practices and thinking processes of teachers who are knowledgeable of their profession. Second, I felt that teachers with greater demonstrated knowledge might be better able to articulate their thoughts and decisions for pedagogical decisions. Finally, I thought that these teachers might be more willing to participate in this extension of the research project.

Additionally, by constraining these cases to one knowledge level, I was able to explore differences in with this group across levels of efficacy.

The high knowledge cluster that emerged in the cluster analysis contained teachers with significantly lower efficacy than was demonstrated by the other two cluster groups. In order to examine efficacy differences among high knowledge teachers I therefore needed to draw from both the high knowledge-low efficacy and moderate knowledge clusters, to obtain all three levels of efficacy at a relatively high level of knowledge. However, in considering teachers for participation in this study I only included those teachers from the moderate knowledge group who had scored within the same range (demonstrated knowledge score = 17) as members of the high knowledge group on the demonstrated knowledge measure. This way, each of the participants was similar with respect to knowledge.

In addition to the cluster analysis results, I was also interested in achieving maximum diversity among the teachers studied. Thus, every effort was made to select teachers who were different from one another relative to content area, grade level, years of experience, and background. This was done for two reasons. First, to limit the extent to which I as the researcher or readers of this work, might adopt an evaluative stance across the three teachers. That is, if I worked with three third-year, third grade teachers of differing efficacy levels I might, inadvertently, begin to compare the teachers' practice rather than focus on exploring their process and illustrating it in light of the current research questions. Additionally, this maximum diversity allowed

for a greater exploration of the manifestation of demonstrated knowledge and teacher efficacy in teaching practice.

It is important to note that in addition to using the cluster analysis as a selection criterion, participant selection was also constrained by access concerns. First, only teachers who had indicated on the test battery that they would be willing to participate in this extension research (n=30) were considered. Second, several events occurred in the region where the study took place that influenced school officials to limit access to schools. Therefore, selection was limited to teachers in schools (n=3) or districts (n=2) where permission to conduct this phase of the project was granted. Third, once potential participants (n=8) had been identified, they again had the option to rescind their offer to participate in this part of the study.

Procedures

Access to Site

Participants from the high knowledge cluster, with varying levels of efficacy, who had expressed a willingness to engage in continued research, were contacted. Specifically, from this cluster three teachers with high efficacy (efficacy > 7.5), three with moderate efficacy (efficacy > 6.7 and <7.5), and three with low efficacy (efficacy<6.7) were contacted by email. This email reminded participants of the study, explain the requirements of participating in this next step, and asked if they would be interested in going forward with the project. All teachers (n=4) who expressed a willingness to participate were included in the study. However, one of these teachers was willing for me to come and observe but didn't want to allocate the time to meet

with me for the interviews following the observations. Therefore, he decided not to participate at this time.

Thus, three high knowledge teachers were included in this portion of the study. Mrs. Gilbert and Ms. Roarke both demonstrated moderate levels of efficacy, although Ms. Roarke was on the cusp of low efficacy with a score of 6.79. Also included in the study was Mr. Lyons who demonstrated a high level of efficacy. These teachers spanned content areas, years of teaching experience, and grade levels taught. Table 15 provides a brief demographic description of these teachers; greater detail is offered in Chapter 5.

Table 15

Case Study Participants

Teacher*	Knowledge Score	Efficacy Score	Teaching Experience	Grade/Content	School Type
Mrs. Gilbert	27	7.42	3.5 years	8-12 French	Rural, Public Middle and High School
Mr. Lyons	26	8.79	18.5 years	9-12 English and Yearbook	Rural, Public High School
Ms. Roarke	27	6.79	11.5 years	5th All Subjects	Suburban, Parochial K-8 School

Note. Teacher names used here are pseudonyms

An initial meeting was be set up with each teacher. During this meeting, I discussed the goals and procedures for the case studies. We also scheduled the observation and interview sessions. All interviews were audiotaped and transcribed. In

addition, I recorded extensive field notes during both the observations and interviews. The classroom observations relied solely on field notes, due to the stringent requirements for videotaping in classrooms.

Role of the Researcher

In this segment of the study, my role as the researcher was to observe until the interview process began. I explained to each participant that I would not offer suggestions or evaluations of teaching observed. Rather, my goal was to record and interpret what happened in the teaching context. Following each observation, an interview took place. The observations served as a starting point for those interviews. I used the observations to bring up salient points without embarking on a personal opinion.

Data Types Collected

Three specific types of data were collected. These included classroom observations, participant interviews, and artifacts from the classroom including student assignments. Three observations/interviews were scheduled and performed with each teacher. The goal of these observations was to witness teaching events relevant to teachers' efficacy and the areas of knowledge under investigation (instructional practice, classroom management, and student engagement). These teaching events were then discussed with the teachers in terms of their efficacy, knowledge, and beliefs.

Throughout the observations, I looked for instances in which the teacher's efficacy or decision-making process was evident. It was expected that if efficacy

mediates the relationship between knowledge and action, as proposed by Bandura (1997), then the observation of teachers' actions in the naturalistic setting of their practice would provide data that would allow the teacher, through discussion and reflection, to identify how these actions came to pass and what, if any, role efficacy had in that process. The observations, therefore, were used to identify events in the teacher's practice that could then be explored in the interview process, in an attempt to make their situational decisions and thinking visible.

The interviews served as the primary data source for this exploration. The interviews were semi-structured in nature (Fontana & Frey, 1994). I identified a series of open-ended questions based on the class observations and the goals of the study, some of which were asked across all of the participants. However, the interviews maintained an open-ended structure. The questions were asked, revised, and added to, based on the flow of the discussion and the comments of the teachers. Specifically, across the participants the interviews focused on the same theme of investigation, namely, the role of knowledge and efficacy in each teacher's decisions. Guiding questions based on the unique observations of each participant were used to investigate this theme. These questions included some fact-based queries for verification of events, but were predominately open-ended and used to create a conversation about the teaching observed, specifically the strategies used and the motivation for implementing those strategies.

These interviews and observations were conducted across the three participants over a three week time span. The scheduling was modified such that interviews

occurred more or less in tandem. This afforded me the opportunity to employ questions that worked well with one teacher in interviews with the other two participants. Moreover, this assured that for particular lines of exploration I could ensure that data were collected from all three teachers. This staggered interview process was found to be a vital piece in helping me to best glean information from all three teachers.

Finally, class artifacts in the form of student assignments, and the teacher's lesson plans for the observed class day were collected from the teachers when possible. These data provided significant information regarding the materials used and time allotted to various activities throughout the day, and created a general picture of the classroom environment.

Data Analysis

Preliminary Work

Following each data collection, initial observer comments and questions raised with regard to the research questions being asked were recorded. Additionally, I reviewed my notes extensively and identified what seemed like fruitful lines of questioning, and areas that were unclear. I then generated two lists: a list of follow-up questions, if necessary, to explore with the teacher interviewed, and a list of salient questions to pursue with the other two participants.

The interview audiotapes were transcribed by a professional transcriber with no analysis included in this step. I then reviewed all transcripts while listening to the audiotape. During this process any errors in transcription were noted, as well as any

points of inflection or other communication cues that seemed to be relevant to the participants' comments. Additionally, all of the field notes were transcribed verbatim, with new reflections added in a different font type to make clear the distinction between the notes and reflections. The goal of this preliminary work was to recreate the research events (observations and interviews) in writing as clearly and objectively as possible.

Additionally, immediately following the interview or observation, I occasionally used the audio recorder to provide a commentary on my experience. In previous research, I found that the time spent in the car driving from the research site to my work place allowed for an opportunity to retain and organize the experience or to distance myself from it and lose vital information. Therefore, using the audio recorder in the car allowed me to have a stream of consciousness reflection on the experience. This reflection was also transcribed and added to the data.

Analysis

Initially, the data from each participant were considered in isolation. In this analysis each independent concept found in the data collected was considered independently and labeled with phrases or words that best represented the type of information presented. Concepts have been defined by Sands and Pinkey (1959) as words or clusters of words that group together to form meaning, which may be representative of the psychological constructs used as variables in a study. Open coding of the field notes and interview transcripts began after the compilation of an extensive literature review of teacher efficacy and the analysis of the quantitative data

in this study. Therefore, as open coding commenced I held several theories and these pieces of information in mind that served as both guide and obstacle in the ensuing veracity of my coding procedures.

Given these conditions I followed the coding guidelines suggested by Strauss (1987, p.30): 1. ask the data a specific set of questions; 2. analyze the data minutely; 3. frequently interrupt coding to write a theoretical note; 4. don't assume the analytical relevance of any traditional variables such as sex, age, or socio economic status.

Thus, as I began open coding, I kept in mind the research question as well as a series of follow up queries to best direct my analytic process. These questions were derived based on my awareness of all the data from this study as well as my recollection of the interviews themselves. These questions were pursued:

- What relations exist between and among teacher efficacy, knowledge and pedagogical beliefs in the practice of specific teachers?
    - Do these teachers refer to efficacy in their discourse on teaching and teaching decisions, and if so, how?
    - How do these teachers describe teaching knowledge and its importance to teaching practices?
    - Are teachers' beliefs about pedagogy manifested in their discourse on teaching, and if so, how?

I randomly selected the data from one of the three participants to begin open coding. As I read the data I began coding conceptual units by their specific content as well as by their potential connections to the research question, utilizing terms relevant

to the overall study, when possible, as code labels. For example, any comments forming a conceptual unit about the teachers' pedagogical knowledge were coded as "knowledge-pedagogy," whereas comments about teachers' knowledge of students were coded as "knowledge-of-students." These initial identifiers were kept fairly narrow, allowing for specific categorization of the data. Codes were generated as the data was read and analyzed. Additionally, any one statement or conceptual unit was allowed to be coded by multiple codes at this time.

Following the coding of this first case, the codes were read through, analyzed, and assessed for relevance to both the particular participants' data set and to the import of the overall study. Codes considered less important were noted, but retained, until the data from all participants had received an initial coding. This process was repeated for the next two cases using the coding scheme developed with the first participant and adding to it as necessary. Following the coding of each subsequent data set, the coding scheme was reviewed, and the previously coded data set(s) were recoded in light of any new codes that emerged. At the completion of coding each data set, notes were made on salient points of comparison and differences among the participants. Finally, the introductory descriptions of the teachers, found in Chapter V, were written following the coding of each teacher's data set, in order to take advantage of my awareness of each participant.

Following this specific labeling, data were organized into themes. All comments related to a similar theme were pasted together in a table using a word processing program. The data within each of these themes were then reviewed and

common ideas were collapsed to provide more meaningful or salient description of the data. This process was repeated for the data from each participant.

Cross Participant Analysis

Themes across participants were sought, using the coding schemes. At this time, similar codes were collapsed across participants, creating one overall scheme to best explain the research. All data were then organized by theme across the individuals, demonstrating the importance of some themes over others by the sheer quantity of items.

Final Analysis

Assertions were then generated based on the commonality and repetitiveness of themes across data forms and in relation to theory base. Specifically, the general themes that cut across the data provided the foundation for assertions made. Further, assertions related to the research questions were pursued in depth. Generated assertions were then weighed and evaluated. A critical evaluation of these findings was conducted by the researcher in which alternative explanations and understandings were entertained. Finally, an assessment of data with regard to accepting of assertions made was conducted and those assertions deemed most appropriate and salient were included in the results of this research.

Spanning Methodologies

Two paradigms of research methodologies were employed in this study. The use of these different approaches is rooted in a recognition that each, quantitative and qualitative, offers distinct information and responds to unique questions. However, the

overriding quest of this work was to understand teacher efficacy, teacher knowledge, teacher beliefs, and the ways in which these phenomena interact. Therefore, it was important not only to employ these approaches independently within this study, but also to look across the findings of both pieces to develop a larger understanding. The findings from the quantitative section of this research were used to identify and select specific teachers for the in-depth qualitative analysis. In turn, the findings from the case studies were used to both illustrate and interpret the quantitative findings.

CHAPTER IV

QUANTATITIVE RESULTS AND DISCUSSION

The purpose of this study was to explore the relations that exist among teachers' efficacy, knowledge, pedagogical beliefs, and performance. Additionally, I explored the potential for efficacy to serve as a mediator between teachers' knowledge, pedagogical beliefs, and their performance. Several statistical procedures were employed, including correlational analyses, analysis of variance, multiple analysis of variance, path modeling, and chi square tests. This chapter consists of five major sections, each one corresponding to specific research questions and employing similar statistical procedures.

Prior to analyzing the data with respect to each question, steps were taken to prepare the data. First, for two of the measures (TSES, pedagogical beliefs), if participants were missing less than one-third of their responses, the item mean was used to fill in missing data. If more than one-third of the data were missing, then the participant was dropped. Second, analyses were conducted to ensure that the data met the assumptions required for the various procedures. While some concerns arose with respect to the internal reliability of the measures, I decided to continue with the analyses, albeit with an eye to caution in interpreting results.

Correlational Relations between Belief and Knowledge Constructs

The first two research questions explored a series of correlational relations. Table 16 presents the correlation matrix demonstrating the relations among variables of interest for the total sample and for the experience and preservice groups

individually. Specifically, the first research question examined the relationships observed among teachers' knowledge, pedagogical knowledge beliefs, and their efficacy. The second research question extended this exploration to include participants' task efficacy, task analysis, strategy efficacy, and strategy awareness.

Table 16

Correlation Matrix of Teachers' Efficacy, Knowledge, and Beliefs

	1 Total Exp. Pre.	2 Total Exp. Pre.	3 Total Exp. Pre.	4 Total Exp. Pre.	5 Total Exp. Pre.	6 Total Exp. Pre.	7 Total Exp. Pre.
1. TSES	1.00						
2. Pedagogical Knowledge Beliefs	.31** .32** .33**	1.00					
3. Demonstrated Knowledge	-.09 -.24* -.03	-.16* -.12 -.09	1.00				
4. Task Efficacy	.13 .15 .10	.04 .05 .06	-.06 -.12 -.08	1.00			
5. Task Analysis	-.03 -.10 .03	.04 -.08 .13	-.16* -.25* -.07	.01 .10 -.05	1.00		
6. Strategy Efficacy	.20** .01 .30**	.08 .05 .10	-.02 -.05 -.03	.04 .11 .01	-.07 .05 -.13	1.00	
7. Strategy Awareness	.14* .08 .17	.09 -.04 .27**	.16* -.03 .23*	.03 .01 .02	.06 .13 .01	.23** .15 .29**	1.00

n=222; *p=.05; ** p=.01 (two-tailed)

Relations Among Teacher Efficacy, Pedagogical Beliefs, and Demonstrated Knowledge

Analysis of the correlation matrix indicated that, as explored in Question One, relationships seemed to exist among participants' pedagogical beliefs, teaching efficacy, and demonstrated knowledge. Looking at the total sample, there was a positive correlation between teachers' overall sense of efficacy and their beliefs about pedagogical knowledge (r=.31). Sophisticated beliefs about pedagogical knowledge indicated a belief that specific knowledge content (e.g., motivation and instructional practices) and procedures (e.g., how to use techniques) are essential to quality teaching. Thus, this relation indicated that teachers with higher levels of efficacy also demonstrated more sophisticated beliefs about pedagogical knowledge. This relation was mirrored in the significant correlations found for both experienced (r=.32) and preservice (r=.33) teachers.

A second relation emerged with regard to this question. Teachers' pedagogical beliefs were significantly negatively correlated with demonstrated knowledge (-.16). This outcome suggested that more sophisticated pedagogical beliefs were associated with lower scores on the demonstrated knowledge measure. This could indicate that teachers who had less declarative and procedural knowledge, as assessed in the demonstrated knowledge measure, were more likely to recognize the salience of their knowledge base. In contrast, teachers with higher levels of demonstrated knowledge might take this knowledge for granted and fail to see the importance knowledge plays in their daily practice. For example, most of us do not consider the ability to walk as a

vital aspect of our daily lives; that is, until we sprain an ankle. When the ability to walk is unimpaired, we focus on other aspects of our life as being more important. It could be that the same is true for teachers with higher levels of knowledge: their knowledge base is a stable aspect of their daily practice, to the extent that they no longer focus on it in the same way that a person attempting to acquire or lacking that knowledge might.

Relations Among Task Assessments, Strategy Awareness, and Teacher Efficacy

The second research question explored teachers' task assessments and strategy awareness in relation to their levels of efficacy. Analysis of the correlation matrix for the total sample indicated three significant relationships with respect to this question. Teachers' strategy awareness was significantly related to their strategy efficacy (r=.23). Respondents' ability to provide strategies appropriate for the vignette presented was significantly related to their efficacy for accomplishing those self-identified tasks for a given vignette. Participants' strategy efficacy (r=.20) and strategy awareness (r=.14) were significantly related to their overall teaching efficacy. This suggests that overall efficacy may be related to participants' ability to assess the vignettes and their efficacy for these self-identified tasks.

One should note that a similar relation did not emerge for participants' task analysis and task efficacy beliefs. Neither of these responses related to each other or to overall teaching efficacy. A potential explanation for this lack of relation may lie in the level of specificity at which these questions were asked. To assess task analysis, teachers were asked to identify the overall problem presented in the vignette, the

desired resolution (often interpreted as an ideal), and their efficacy for bringing about this resolution. In contrast, the strategy awareness and efficacy items were far more specific in nature, requiring participants to generate specific strategies, techniques, or actions that they might implement, given the vignette, and to assess their efficacy for those strategies. This is similar in focus to the TSES, which provides a specific listing of teaching-related tasks and asks teachers to identify their ability for each. Thus, these latter two measures seem to be more closely aligned with respect to the level of specificity assessed.

The correlation matrix also revealed a significant relation between strategy awareness and strategy efficacy for preservice teachers (r=.29) but not for experienced teachers. It may be that preservice teachers who have not had experience in the classroom rely more strongly on their awareness of strategies when making efficacy decisions, whereas experienced teachers may determine their efficacy beliefs based on previous mastery experiences rather than their knowledge of strategies.

Further exploration of the correlation matrix revealed other interesting relations. Respondents' strategy awareness was significantly and positively related to demonstrated knowledge (r=.16). Thus, teachers who demonstrated higher levels of demonstrated knowledge also demonstrated higher levels of strategic awareness for the vignettes presented. There was also a significant but small negative relation (r=-.16) between task analysis and demonstrated knowledge. This finding suggested that higher levels of knowledge were associated with lower scores for identifying the problem and potential solution for the target vignettes.

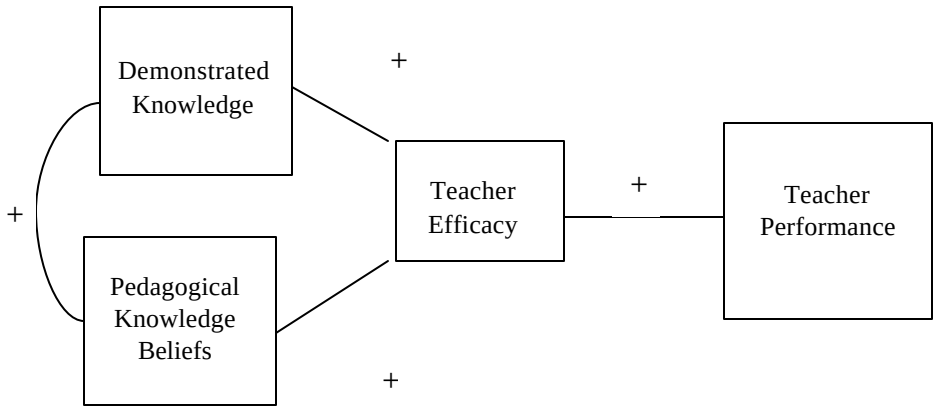
Modeling the Relations among Knowledge, Beliefs, Efficacy, and Performance

Question Three sought to determine whether teacher efficacy mediated the relations between demonstrated knowledge, knowledge beliefs, and performance. Path analysis was used explore this relation for both the preservice and experienced teacher groups. The predicted model positioned teacher efficacy as a mediator in relation to demonstrated knowledge, pedagogical knowledge beliefs, and performance. The present study investigated the extent to which teachers' efficacy served to mediate or explain the relations between teachers' knowledge and performance, as well as teachers' beliefs and performance.

In this study, teaching performance was assessed using the strategy awareness measure. This measure served as a proxy for teachers' actions in classroom situations. Further, it measured their analysis of a realistic classroom situation. The path model proposed and tested in this analysis is illustrated in Figure 4. Specifically, teacher demonstrated knowledge and teacher pedagogical knowledge beliefs were hypothesized to influence teacher efficacy positively. Teacher efficacy was then expected to serve as a mediator and influence teachers' performance. In addition, it was expected that teacher demonstrated knowledge and teacher pedagogical knowledge beliefs would covary.

Figure 4:

Path Model of Teacher Efficacy as a Mediator Between Knowledge and Performance



The proposed model was fit to the data for preservice and experienced teachers using path analysis. I chose path analysis in this study because it provided a means to test the overall proposed model. Because I was concerned with the overall fit of the model, as well as the influences of the individual path, I elected to use moderately conservative fit values. Specifically, the fit criteria used were Comparative Fit Index (CFI) and Goodness-of-Fit (GFI) = .95, Adjusted Goodness-of-Fit (AGFI) = .90, Standardized Root Mean Square Residual (SRMR) = .10. Further, the Root Mean Square Error of Approximation (RMSEA), which measures the difference between the hypothesized covariance matrix and the actual sample covariance matrix, should approach zero. To obtain these indices of fit, as well as the other analyses that follow I used EQS Version 5.7b. This is a program specifically designed to test path models and structural equation models.

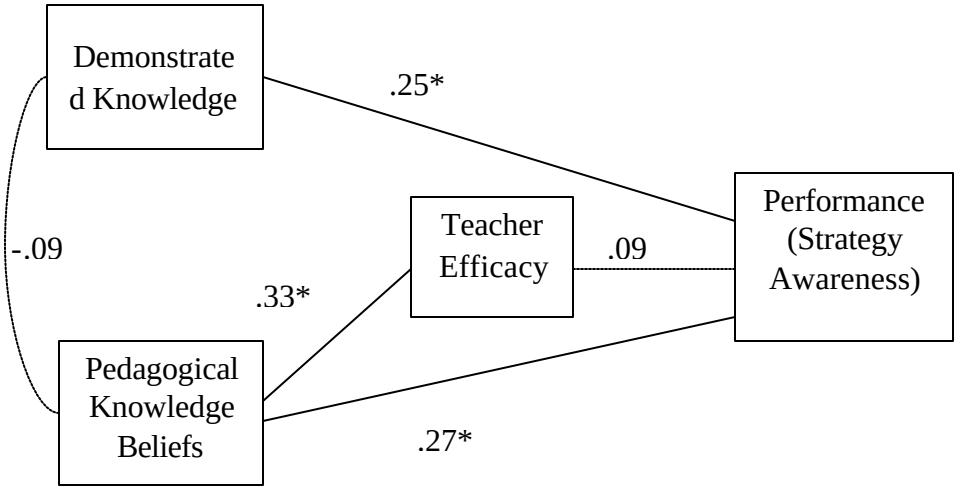
The statistical significance of specific paths in the model was also of interest in this study. The paths in the model were estimated using Maximum Likelihood (ML). This estimation procedure is robust for multivariate normal data (Bollen, 1993). The EQS program provides a test statistic that functions as a Z score when conducting the ML procedure (Bryne, 1994). Therefore, to conclude that a path estimate is significantly different from zero, the test statistic would need to be greater than ±1.96.

I chose to test the hypothesized model separately for preservice and experienced teachers. This was done to take into account the potential differences these two groups of participants may have relative to the manifestation of these constructs. Inclusion of the two groups in a combined model could potentially mask the differences related to experience level..

For preservice teachers, I first fit the proposed model. However the fit was poor (i.e., CFI=.53). To improve the model fit, I used the Lagrange Multiplier Test to identify new paths to add to the model. Based on this test, I iteratively added paths from demonstrated knowledge to teacher performance and from pedagogical knowledge beliefs to performance. Additionally, I dropped the paths from demonstrated knowledge to teacher efficacy based on Wald's test. After making these changes the fit was acceptable (CFI=1; GFI=1; AGFI=1; SRMR=.002; RMSEA=0). The final path model for preservice teachers is displayed in Figure 5.

Figure 5

Preservice Teachers' Path Model



Note. *p<.05

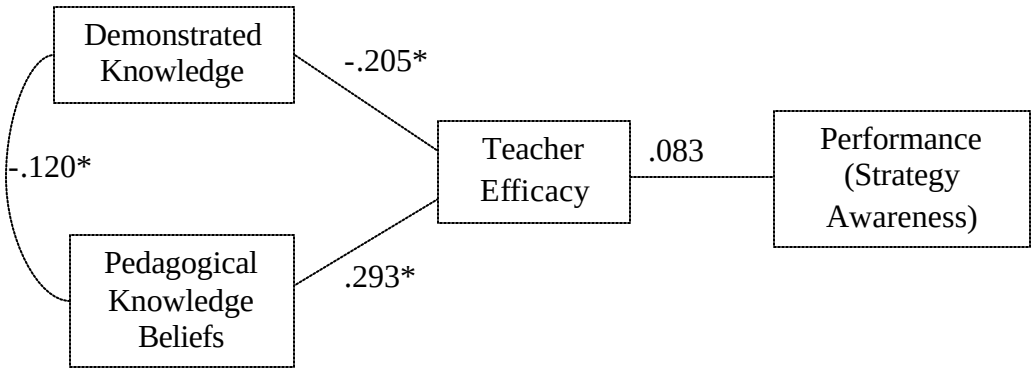
The final path model for preservice teachers displayed in Figure 5 illustrated the relations that exist among these variables in the preservice teachers sampled. First, this model demonstrated a significant direct relation between demonstrated knowledge and performance for preservice teachers, such that for every unit increase in demonstrated knowledge there is a .25 unit increase in performance. Second, there was a significant direct path from pedagogical knowledge beliefs to performance such for a unit increase in beliefs there would be a .27 unit increase in performance. Third, there was significant a path from pedagogical knowledge beliefs to teacher efficacy, such that a unit increase in beliefs would bring about a .33 unit change in efficacy. The path from efficacy to performance was non-significant.

Because the hypothesized path from demonstrated knowledge to efficacy was not significant, based on the Wald test, it was dropped from the model. Thus, for these data, efficacy neither mediated nor moderated the knowledge-performance relationship. There are two potential reasons for the lack of relationship. First, there are measurement issues, particularly the low internal reliability of the demonstrated knowledge measure for preservice teachers, due to the limited variability on this measure among preservice teachers. Such an occurrence is not unexpected with a knowledge measure administered to a naïve or inexperienced population (Alexander, Jetton, & Kulikowich, 1995). Second, it could be that efficacy does not mediate the relation between knowledge and performance.

The proposed model was also fit to the data for experienced teachers. The fit for the hypothesized model was acceptable (CFI=1; GFI=.998; AGFI=.988; SRMR=.021; RMSEA=0). Figure 6 displays this model. This figure indicates that there is a significant negative relation between demonstrated knowledge and pedagogical knowledge beliefs. Thus, a unit increase in demonstrated knowledge would predict a .12 unit drop in beliefs in the value of pedagogical knowledge for practicing teachers. It may be that as these experienced teachers gain declarative knowledge, as assessed on this measure, they recognize that this is not enough to fulfill their role as teachers appropriately. Thus, their belief in its import decreases slightly.

Figure 6

Experienced Teachers' Path Model



Note. $*p<.05$

As illustrated in Figure 6, there was a significant negative path from demonstrated knowledge to teacher efficacy. As with pedagogical beliefs, a unit increase in demonstrated knowledge is associated with a .21 decrease in teacher efficacy. Thus, as demonstrated knowledge increased, experienced teachers' efficacy decreased. Others have reported similar outcomes. For example, Roberts and Moreno (2003) found that as teachers in a science teaching training program gained knowledge of better ways to teach science, their overall efficacy decreased. Specifically, prior to training, these teachers held significantly higher levels of teacher efficacy then they did at the end. This drop in efficacy could be attributed to the teachers' changed perspective on how to teach and what each of the teaching tasks on the efficacy instrument meant in light of their newly acquired knowledge. Following this same line of reasoning, the current findings may indicate that higher levels of knowledge provide experienced teachers with a different, perhaps more conservative, perspective

on the teaching tasks assessed in the efficacy items. This potentially more stringent understanding of the efficacy items may in turn lead to lower reports of efficacy.

The experienced teacher path model also identified a significant positive path from pedagogical knowledge beliefs (.29) to teacher efficacy. This path indicates that a unit increase in the belief that pedagogical knowledge is important leads to a .29 unit increase in teacher efficacy. Thus, the more experienced teachers believed that pedagogical knowledge was important the higher their reported levels of efficacy.

There were no significant paths, however, to performance as assessed by the strategy awareness measure. Thus, efficacy was unrelated to teachers' performance on this measure. Additionally, alternative models were explored allowing direct paths from demonstrated knowledge and pedagogical beliefs to performance, as seen with the preservice teachers. However, these paths neither improved the fit of the model nor were they statistically significant.

Overall, this model suggests a relation among demonstrated knowledge, pedagogical beliefs, and teacher efficacy that was not anticipated prior to the analysis of this data, and offers an interesting paradox for future research. That is, these data suggest that the more an individual knows, the less capable they are likely to feel, and that this greater level of knowledge is associated with lower beliefs in the value of that knowledge. This perhaps suggests that in addition to educational experiences, which increase teachers' knowledge of pedagogy, we also need to incorporate experiences that increase their efficacy. Increasing knowledge alone may not be the key to improving efficacy. Instead, it may be that as we add to teachers' knowledge of

pedagogy, there also need to be increases in their ability to implement that knowledge effectively in their teaching practice. It is conceivable that an individual may have knowledge of how to perform a task, but not feel able to achieve it; these findings suggest that this may be the case for practicing teachers.

Experience and Efficacy Level Comparisons

Comparing Preservice and Experienced Teachers

Question Four examined the ways that preservice and practicing teachers differ with regard to their levels of teacher efficacy, demonstrated knowledge, and pedagogical knowledge beliefs. This question was addressed through a series of statistical procedures. First, to explore whether preservice or practicing teachers differed with respect to their total efficacy score, as measured with the TSES, a t-test was employed (Tscahnnen-Moran & Woolfolk-Hoy, 2001). This test revealed no significant differences between preservice teachers (M=6.99; SD=.88) and experienced teachers (M=7.12; SD=.85) with respect to their total teaching efficacy [$t(220)$= -1.08; p=.28]. This finding was surprising, in that the majority of previous research has found preservice teachers to have significantly higher efficacy then practicing teachers (e.g., Soodak & Podell, 1998).

The second analysis conducted explored differences in the sub-components of teacher efficacy (i.e., efficacy for instructional practices, classroom management, and student engagement), demonstrated knowledge, pedagogical beliefs, strategy awareness, and task analysis. Data for the first portion of this question were analyzed via a one-way MANOVA. In this analysis, teaching level (i.e., preservice or

experienced) served as the independent variable and the dependent variables were efficacy for instructional practices, classroom management, student engagement, demonstrated knowledge, pedagogical knowledge beliefs, strategy awareness, and task analysis. The multivariate test (Wilks' Lambda) indicated that significant differences existed between the two groups relative to the dependent variables [F (7, 214)=14.172; p<.001]. Table 17 presents the F values, and significance levels of the follow up univariate tests, as well as the means and standard deviations for the dependent variables by experience level: preservice (pre) and experienced (exp) teachers.

The follow-up univariate tests demonstrated five significant relationships. The first two significant differences related to the efficacy scales. Efficacy for classroom management was significantly higher [F(1, 220)=16.245; p<.001] in experienced teachers (M=7.55; SD=.93) than for preservice teachers (M=7.01; SD=1.05). In contrast, preservice teachers (M=6.78; SD=1.00) held significantly higher [F(1,220)=4.994; p<.05] efficacy beliefs for student engagement than did experienced teachers (M=6.46; SD=1.09). However, no significant differences between preservice (M=7.10, SD=.86) and experienced (M=7.16; SD=.97) teachers were found with respect to efficacy for instructional practices.

Table 17

Results of the One-Way MANOVA Comparing Preservice and Experienced Teachers

Dependent Variables	*F*(1,220)	*p*	Observed Power	Score Range	Level	
					Pre (n=120) *M (SD)*	Exp (n=102) *M (SD)*
Instructional Practices Efficacy	.225	.635	.076	1-9	7.10 (.86)	7.16 (.97)
Classroom Management Efficacy	16.245	.000**	.980	1-9	7.01 (1.05)	7.55 (.93)
Student Engagement Efficacy	4.994	.026*	.605	1-9	6.78 (1.00)	6.46 (1.09)
Demonstrated Knowledge	6.889	.009*	.743	0-20	13.82 (2.92)	16.32 (3.02)
Pedagogical Knowledge Beliefs	36.940	.000*	1.000	1-9	6.45 (1.04)	6.06 (1.14)
Strategy Awareness	6.368	.012**	.710	0-18	8.01 (3.63)	9.28 (3.86)
Task Analysis	.478	.490	.106	0-36	17.88 (5.64)	18.39 (5.25)

Note. * $p<.05$; ** $p<.001$

These results suggest that differences exist between preservice and experienced teachers levels of efficacy. However, these differences are specific, relative to the content of the efficacy beliefs being tapped. These results echo, to some extent, the findings of Benz and colleagues (1992) who explored efficacy for student motivation, planning and evaluations, classroom management, and socialization of students among multiple levels (e.g., beginning students, student teachers, practicing teachers, student teacher supervisors, and college faculty). Benz et al. (1992) also found that efficacy

for specific tasks differed across the groups assessed. As found in the present study, preservice teachers demonstrated greater levels of efficacy for student motivation than experienced teachers. However, Benz and colleagues (1992) found that only college faculty felt significantly greater efficacy for classroom management than the other groups. Additionally, their work also revealed that experienced teachers held greater efficacy for planning and evaluation, whereas the present study found no differences in efficacy for instructional practices between the two groups. Together the present study and the work of Benz and colleagues (1992) underscore the importance information that can be gleaned when efficacy is assessed at a more task-specific level.

Additionally, the results of the present study may serve to direct the attention and focus of educational experiences for preservice and experienced teachers. Preservice teachers may benefit from more explicit training in classroom management practices that incorporate mastery and vicarious experiences in addition to the construction of a knowledge base. In contrast, experienced teachers may benefit from more educational experiences in student motivation, which may lead to their developing greater motivation in the students with whom they work.

This analysis also demonstrated significant differences between preservice and experienced teachers with respect to their demonstrated knowledge, pedagogical beliefs, and strategy awareness. Experienced teachers (M=16.32, SD=3.02) were found to have significantly [$F(1, 220)=6.889$, $p<.05$] higher demonstrated knowledge than preservice teachers (M=13.82, SD=2.92). With respect to pedagogical beliefs,

preservice teachers (*M*=6.45, *SD*=1.04) held significantly [*F*(1,220)=36.940*;* p<.001] more sophisticated beliefs than experienced teachers (*M*=6.06, *SD*=1.14). This indicated that the preservice teachers in this study were more likely to report greater value for beliefs about the importance of knowledge in education than experienced teachers.

Last, this analysis indicated a significant difference with respect to strategy awareness [*F*(1, 220)=6.368; *p*<.05]. Thus, experienced teachers (*M*=9.28; *SD*=3.86) demonstrated significantly greater strategy awareness than preservice teachers (*M*=8.01*; SD*=3.63). Collectively, we see that experienced teachers demonstrated greater knowledge, strategy awareness, and efficacy for classroom management. In contrast, preservice teachers held high efficacy for student engagement and pedagogical beliefs. It is interesting to note that the individuals who placed greater value on teaching knowledge (preservice teachers) also demonstrated significantly less of that knowledge.

Comparing High, Moderate, and Low Efficacy Groups

A 2 (Experience Level: preservice and experienced) x 3 (Efficacy Level: high, moderate, low) MANOVA was employed to investigate Question Five, which asked: "Do preservice and inservice teachers of differing levels of teacher efficacy demonstrate different levels of demonstrated knowledge, pedagogical beliefs, and ability to assess teaching scenarios (i.e., task analysis and strategy awareness)?" For this analysis, I identified any significant main effects between preservice and experienced teachers, between and among efficacy level groups (high, moderate, low),

and any interactions that occurred. Fisher's Least Significant Difference (LSD) test was employed in the univariate analyses that followed (Hancock & Klockars, 1996). These analyses were conducted to determine if there were differences in demonstrated knowledge, pedagogical beliefs, and ability to assess teaching scenarios (i.e., task analysis and strategy awareness; Question 5). Chapter 3 provides an explicit description of how the high, moderate, and low efficacy groups were formed. Chapter 3 also notes that the assumption of homogeneity of variance was addressed by reducing the number of participants in the moderate efficacy group, though random selection, from n=150 to n=40 in order to better match the group sizes of the low (n=32) and high (n=40) efficacy groups. MANOVA is robust to homogeneity of variance when sample sizes are approximately equal (Stevens, 1996).

The multivariate tests indicated that significant differences were found at the experience level [$F(6, 101) = 3.802$, $p = .002$]. However, the results described in the previous section relative to Question Four best describe the data relative to these findings, as I was able to utilize a larger sample size for those comparisons. Therefore this section will address the analyses assessing differences in the variables of interest by efficacy group.

The multivariate tests also indicated significant differences by efficacy group [$F(12, 202)=2.988$; $p=.001$] and for the interaction between experience level and efficacy group [$F(12, 202)=2.180$; $p<.05$]. Follow-up univariate tests and post hoc analyses were conducted. Significant differences for efficacy group were found for pedagogical knowledge beliefs [$F(2, 106)=4.454$; $p<.05$], and strategy efficacy [$F(2,$

106)=9.847; $p<.001$]. Table 18 details the means and standard deviations for those variables. Based on post hoc analyses, pedagogical knowledge beliefs were significantly different across the three groups. These differences revealed that participants in the high efficacy group reported more sophisticated knowledge beliefs than participants in the other two groups. Also, participants in the moderate group reported more sophisticated beliefs than those in the low group, and less sophisticated beliefs than participants in the high efficacy group. These findings suggest that these individuals' beliefs about the nature of teaching knowledge related to their level of efficacy. Interestingly, there were no significant differences in demonstrated knowledge across the three efficacy groups. It may be that individuals' beliefs about teaching knowledge may be more relevant to teacher efficacy than the actual knowledge they hold. However, the moderate reliability of the knowledge measure makes any more definitive interpretations of these findings ill-advised.

Table 18

Means and Standard Deviations for Efficacy Group Comparisons

Variable	Efficacy Level					
	Low (n=32)		Moderate (n=40)		High (n=40)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Pedagogical Knowledge Beliefs	5.88 [c]	1.23	6.40 [b]	0.88	6.67 [a]	1.24
Demonstrated Knowledge	15.16	3.03	15.53	2.83	14.40	3.94
Strategy Awareness	7.15	3.34	8.22	3.81	9.35	4.02
Strategy Efficacy	6.51 [c]	1.20	7.06 [b]	0.91	7.64 [a]	0.97
Task Analysis	18.16	4.39	17.78	5.79	17.05	5.23
Task Efficacy	5.85	1.08	6.07	1.04	6.15	1.13

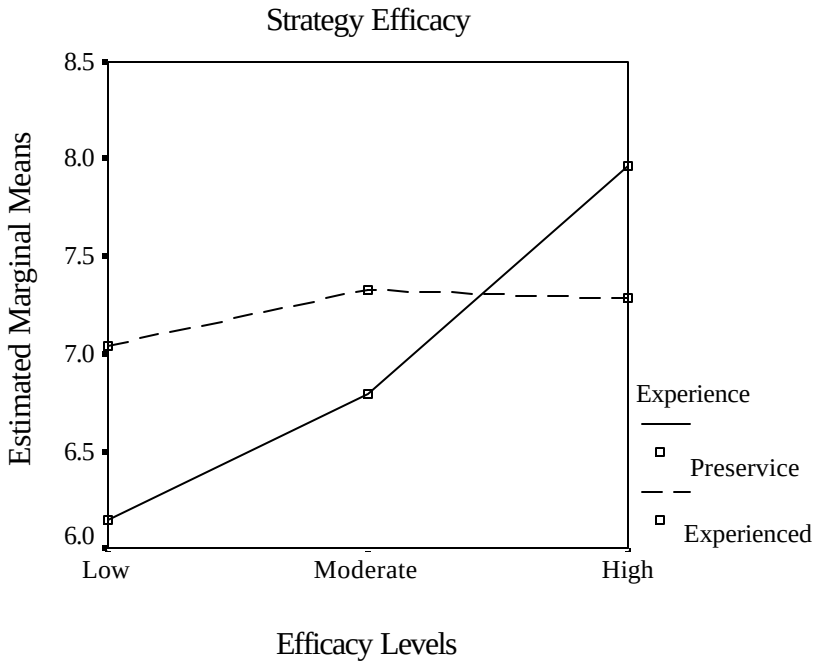
Note. Superscripts represent significant differences between means

Significant differences were also found between groups for strategy efficacy. Low efficacy teachers demonstrated significantly lower strategy efficacy than the other two groups. Moderate efficacy teachers demonstrated significantly greater strategy efficacy than low efficacy teachers, and significantly less strategy efficacy than high efficacy teachers. One would expect these findings to occur, as the strategy efficacy measure examined participants' responses to specific strategies relative to the three vignettes. This level of task is very close to that used in the TSES, the scores from which were used to create these groups.

The 3x2 MANOVA also revealed two significant interactions for strategy efficacy [$F(2, 106)=6.647$; $p=.002$] and for task efficacy [$F(2, 106)=3.223$; $p<.05$]. Figure 7 illustrates the efficacy by experience interaction findings for strategy efficacy. This plot demonstrates different patterns of strategy efficacy reported by preservice and experienced teachers in the low, moderate, and high efficacy groups. First, experienced teachers demonstrated only moderate differences in their mean strategy efficacy across the three efficacy groups, remaining within the mean of 7 to 7.5. That is, across the three levels of efficacy there is little change in the mean strategy efficacy. However, one can note a small drop in strategy efficacy from the moderate to the high group.

Figure 7

Plot for Experience by Efficacy Interaction for Strategy Efficacy



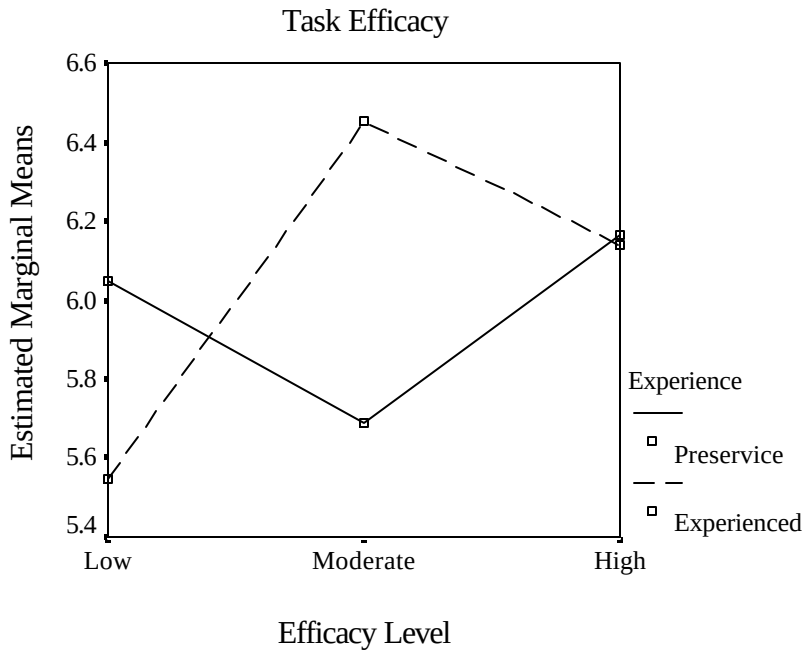
In contrast, the preservice teacher reported consistently higher levels of strategy efficacy relative to their overall efficacy level, such that preservice teachers in the high efficacy group report strategy efficacy close to eight on a nine-point scale. Overall, these findings suggest that while different levels of efficacy emerge for both preservice and experienced teachers, the preservice teachers may have more exaggerated efficacy beliefs (high and low). Experienced teachers, by comparison, may be more temperate in their self-reports of efficacy beliefs.

A significant interaction was also identified for task efficacy, illustrated in Figure 8. Task efficacy assessed participants' efficacy for achieving the desired resolution they identified for each vignette. This is a more general level of efficacy in

that the tasks identified were often less detailed in nature. For example, typical responses to the desired resolution question for the instructional practices vignette were: “All students achieving at their level, with significant understanding of material” or “All students receive appropriate instruction at their level.” Thus, efficacy assessed in this measure was at a more general level of specification.

Figure 8

Plot for Experience by Efficacy Interaction for Task Efficacy



The preservice and experienced teachers demonstrated different patterns with respect to their task efficacy and overall efficacy level. For preservice teachers, the low efficacy group reported higher task efficacy than the moderate efficacy group, while for high efficacy preservice teachers, task efficacy was highest. This pattern was inverted for experienced teachers, with the highest level of task efficacy occurring in

the moderate efficacy groups. Compared by experience level, preservice teachers in the low efficacy group demonstrated higher task efficacy than experienced teachers in the same group. However, at the moderate efficacy level we see that experienced teachers held higher task efficacy beliefs than the preservice teachers. Finally, within the high efficacy group, preservice and experienced teachers held similar task efficacy levels. Thus, in the moderate efficacy group we see opposing responses from the preservice teachers and practicing teachers.

These patterns may be related to the level at which task efficacy is reported. It could be that tasks at a level this general were interpreted differently by preservice and experienced teachers, such that they had different understandings of the steps it would take to achieve the task. For example, a desired resolution of "All students learning at their own level," carries with it an array of interpretations for the steps required to bring this resolution about. It could be that experienced teachers had a better understanding of those steps. Therefore, they felt more capable of bringing about that resolution. Conversely, preservice teachers might be able to identify such a goal, but not have a clear understanding of how to reach it. Thus their efficacy for such a goal would be lower. Because this difference occurred among the moderate efficacy level of teachers, it may suggest that with respect to task efficacy, participants' responses may be more unstable relative to their overall efficacy, assessed at a more task-specific level.

Strategy Content and Evaluation

Question Six examined the content of participants' strategy selection. Specifically, this question sought to determine which strategies were more likely to be suggested for the pedagogical scenarios presented in this study and the degree to which respondents have knowledge of teaching strategies that they are not likely to implement or consider best for the given situation.

Content of Participants' Strategies

Descriptive statistics were used to explore which strategies were most frequently identified by participants for each scenario. Table 19 presents the six most frequently identified strategies out of the 55-56 total strategies generated per vignette. The first column provides the general content of the strategy. Next is the number of times each strategy was identified, followed by the percent of total participants who provided that strategy.

The next section of the table provides information on participants' evaluation of these strategies with respect to the likelihood of their use. Presented here is the frequency for each evaluation type and its percentage relative to the total number of times the strategy was selected. This information allows us to see the proportion between each of the selection categories. The column, "not used" refers to the instances in which participants provided the strategy but didn't rate it as something they would use or considered "best." The next column, "used," counts the individuals who felt they would use the strategy only. "Best" gives the frequency with which the

strategy was rated as best only. And the final column presents the number of times the strategy was evaluated as one that would be used and was considered best.

Table 19

Frequency of Strategy Identification and Selection by Participants

Strategy (total strategies provided for each vignette)	Total Identified		Proportions from total listed (*n*)							
			Not Used		Used		Best		Used and Best	
	n	%	n	%	n	%	n	%	n	%
Instructional Practices (917)										
6 – Group by Ability/Track	61	27.5	7	11.5	22	36.0	7	11.5	25	41.0
30 – GT (TAG) students tutor/lead others	61	27.5	9	14.8	18	29.5	6	9.8	28	45.9
9 – Mixed Ability Grouping	56	25.2	4	7.1	12	21.4	5	8.9	35	62.5
10 – Use Group activities	46	20.7	3	6.5	10	21.7	5	10.9	28	60.9
40 – Routines/ Systems for managing questions	43	19.4	3	7.0	18	41.9	5	11.6	17	39.5
15 – Differentiate Assignments/ Materials	42	18.9	6	14.3	11	26.2	6	14.3	19	45.2
Classroom Management (1266)										
26 – Clean the classroom organize	96	43.2	1	1.0	29	30.2	8	8.3	58	60.4
9 – Create new rules with students	82	36.9	3	3.7	20	24.4	6	7.3	53	64.6
31 – Establish rapport with students	78	35.1	4	5.1	15	19.2	10	12.8	49	62.8
8 – New rules/ expectations	53	23.9	2	3.8	19	35.8	2	3.8	30	56.6

TABLE 19 – *Continued*

Strategy (total strategies provided for each vignette)	Total Identified		Proportions from total listed (*n*)							
			Not Used		Used		Best		Used and Best	
	n	%	n	%	n	%	n	%	n	%
25 – Better Environment/ Make Classroom Inviting	61	27.5	2	3.3	23	37.7	10	16.4	26	42.6
35 – Raise Expectations/ Goal Setting/ Motivation	47	21.2	3	6.4	13	27.7	7	14.9	24	51.1
51 – Consultations/ Help seeking	47	21.2	3	6.4	19	40.4	3	6.4	22	46.8
Student Engagement (1150)										
52 – Parents/ Guardian/Home	123	55.4	5	4.1	31	25.2	11	8.9	76	61.8
3 – Connect her interests to content	88	39.6	8	9.1	32	36.4	11	12.5	37	42.0
19 – Systems/Strategies for getting T's School-work Done	53	23.0	5	9.4	10	18.9	1	1.9	31	58.5
7 – Need for education in entertainment – future	48	21.6	5	10.4	19	39.6	7	14.6	17	35.4
34 – Assignments: Autonomy/Preference	47	21.2	6	12.8	18	38.3	5	10.6	24	51.1
37 – Address via conference/contact	47	21.2	3	6.4	10	21.3	3	6.4	31	66.0

The information in Table 19 was considered at three levels. First, I highlighted some broad findings of interest across the three vignettes. Next, I explored the content of the specific strategies for each vignette, and finally, I outlined the differences that emerged relative to participants' evaluations of these popular strategies.

One of the first patterns observed was the number of responses for each vignette. Participants listed 1,266 strategies for classroom management, 1,150 for student engagement, and only 917 for instructional practices. Examination of these totals demonstrated that participants provided 349 strategies for the classroom management than for the instructional practices vignette. That is participants provided approximately 28% more strategies for classroom management then they did for instructional practices.

Further, with respect to the classroom management and student engagement scenarios each of the most frequently selected strategies were identified by 21.2 – 43.2% (classroom management) and 21.2 – 55.4% of the participants. These rates are higher than those for the instructional practices vignette (19.9-27.5%). This indicates that there was greater consistency among respondents with regard to the identification of strategies for classroom management and student engagement than there was for instructional practices.

These findings suggest that when given classroom vignettes to analyze, teachers were able to provide more strategies for classroom management related issues than for student engagement or instructional practices. In contrast, teachers also

provided fewer instructional practices strategies than for the other two vignettes. This may indicate that classroom management practices are more salient to preservice and experienced teachers, so that they have a greater store of strategies related to classroom management upon which to draw. It could also be that the content of the vignettes contributed to these differences. In the classroom management vignette, the classroom is described as messy, with outdated bulletin boards, and a ragged list of classroom rules taped in the corner. These issues may have been easier concerns for participants to address. In contrast, the instructional practices vignette describes a highly academically diverse classroom, requiring the teacher to address the multiple needs of students identified as gifted and talented, learning disabled, and as second language learners. Strategies addressing these issues may be less pronounced in teachers' minds and more challenging to identify than strategies for cleaning the classroom and implementing behavior management plans. Still, this difference remains important. If the primary purpose of teaching is instruction, then it is reasonable that teachers (preservice and experienced) should be able to articulate at least as many strategies for instruction as they do for classroom management. Perhaps this difference highlights an emphasis on classroom management over instruction in the minds and experiences of these respondents.

I will now turn to an exploration of the content of the strategies selected most frequently for each vignette. Among the top strategies for instructional practices, three (6, 9, 10) dealt with grouping activities. This suggests that one of the most common approaches to dealing with a diverse group of students may be to place them into

smaller groups. It is interesting to note that 27.5% of the respondents suggested grouping by ability, while another 25.2% chose mixed ability grouping. Of course, these options were not mutually exclusive. Participants may have indicated both techniques for grouping.

The remaining three of the top six strategies identified for the instructional practices vignette addressed sharing knowledge, responding to questions, and differentiating instruction. Tied for most frequent was the strategy that involved having the gifted and talented students tutor their less able classmates. Additionally, another popular strategy addressed systems for responding to student questions. The vignette described a class situation in which the gifted students tended to ask high level questions that led to confusion in their classmates. Almost twenty percent of the participants provided a strategy that dealt specifically with establishing a routine for dealing with questions in class. Common responses included a question box or time set aside for questions from each level of students. The last strategy in the top six addressed differentiated instruction, where these strategies dealt specifically with altering assignments or materials to meet students' needs. In the process of data analysis, I identified 12 strategy themes for the instructional practices vignette. It is interesting to note that the top six strategies were from only three of these themes: grouping, differentiation, and sharing knowledge.

Strategies relevant to the classroom management vignette were related to four themes. Specifically, two strategies (8, 9) were related to the generation of new rules for the classroom. Strategy 8 suggested the creation of new rules, with 23.9% of the

participants offering this strategy. Strategy 9, suggested by 36.9% of the participants, specified that the new rules be created by or with the students. Additionally, Strategies 25 and 26 dealt with the physical classroom environment. Nearly 28% of the participants offered strategies that would improve the overall classroom environment, such as re-doing the bulletin boards or decorating the room (item 25). The most popular strategy for this vignette was to clean and organize the classroom (item 26, 43.2%). Again, these items are not mutually exclusive, which makes the difference in these two frequencies interesting. While 43.2% of participants suggested cleaning the classroom, only a third of them suggested making the room more inviting.

Two strategies related to classroom relationships were also popular with these participants. Specifically, 35.1% of participants suggested establishing a rapport with the students, and 21.2% suggested raising expectations or goal setting. The final strategy addressed getting help from outside the classroom. Specifically 21.2% of the participants suggested that the teacher seek help or consultation from within the school, from other teachers, administrators, and specialists.

Responses to the student engagement vignette spanned a greater number of strategy themes than was found for the previous two vignettes. Themes focused on interest (item 3), the value of education (item 7), classroom management (item 19), choice/autonomy (item 34), attendance (item 37), and conferencing (item 52). Thus, there was a greater range in the types of strategies frequently selected with regard to this vignette. It could be that to best address this situation (i.e., a student who wants to

be an entertainer and is chronically absent), participants felt a need to use multiple avenues of attack. The most common response to this vignette was to contact or conference with the student's parents (item 52, 55.4%). The next approach was to help the student develop interest in the class by connecting her interests to the content (item 3, 39.6%). Twenty-three percent of the participants suggested developing plans or routines (e.g., checklists, reward systems, tutoring) for ensuring that the student completed her class work. Helping the student to perceive the value of education was suggested by 21.6% of respondents, who emphasized the need of education for the student's future. Finally, offering choice or preference in assignments given (item 34) and addressing the student's attendance problem via conferencing or contracts (item 37) were each suggested by 21.6% of the participants.

The diversity in these responses underscores the need for teachers to be flexible and adaptive in their teaching endeavors. While the purpose of the vignette was to assess participants' knowledge of strategies related to student engagement, it became evident that few actions are made in isolation. That is, while increasing interest in the content and enhancing the value for education were popular responses, so, too, were ensuring that the work was completed and that attendance was maintained.

Participants' Evaluation of Identified Strategies

I was also interested in exploring the extent to which teachers had knowledge of teaching strategies that they did not select, or did not consider the "best" option. The theory that efficacy mediates knowledge and performance rests on the assumption

that individuals have more knowledge than they use. If this is so, then the decision to use knowledge may mediated by teachers' efficacy for the task at hand. Here I wanted to develop an understanding of the degree to which participants have knowledge of strategies that they would not use. To address this question the strategies provided were looked at descriptively. Table 20 provides the number of strategies for each vignette that were evaluated as Unused, Uses, Best, and Used and Best. Following the number of strategies provided is the proportion of this evaluation to the total provided for each vignette.

Table 20

Descriptive Information for the Evaluation of Strategies

Evaluation	Instructional Practices	Classroom Management	Student Engagement
Total	917	1266	1150
Unused	100 (10.9%)	66 (5.2%)	105 (9.1%)
Used	260 (28.4%)	330 (26.1%)	348 (30.3%)
Best	113 (10.6%)	135 (10.6%)	122 (10.6%)
Used & Best	444 (48.4%)	735 (58.1%)	575 (50.0%)

Examination of Table 20 reveals that overall participants in this study tended to evaluate the strategies that they provided as ones they would both use and considered best about 50% of the time. With regard to the instructional practices vignette this occurred slightly less frequently (48.4% of responses). However, participants rated their classroom management strategies as used and best more frequently (58.1% of responses). Again, looking across the three vignettes, participants tended to evaluate their instructional practices strategies as "unused" more

frequently (10.95) then they would the strategies for classroom management (5.2%) and student engagement (9.1%).

This descriptive information underscores the findings from the previous section, highlighting differences in knowledge of strategies relative to classroom management and instructional practices. The teachers in this study reported a greater number of strategies for classroom management over all. Of those strategies, respondents were most likely to consider them best and use them. Again, this could be an indication of these teachers' training and experience, with the methods and techniques of classroom management potentially emphasized in preparation and practice. With regard to the question about the extent to which teachers have knowledge of strategies that they are unlikely to use, we see that this does occur to some degree and more often in the area of instructional practices than in classroom management.

Evaluation of Strategies with Respect to Efficacy, Knowledge, and Belief Levels

Differences in participants' evaluation of strategies as "likely to use" or "best" relative to respondents' demonstrated knowledge, pedagogical beliefs, or teacher efficacy were investigated in Question Seven. Participants' evaluation of strategies as unused, used, best, and used and best, was examined with regard to participants' levels of demonstrated knowledge, pedagogical knowledge beliefs, and teacher efficacy. For this analysis, participants were divided into high, middle, and low groups for teacher demonstrated knowledge, pedagogical knowledge beliefs, and teacher efficacy. Group levels were determined by the mean and standard deviation for each variable.

Individuals were classified as low if they scored greater than ½ standard deviation below the mean, as moderate or middle if they were within one standard deviation (½ below and ½ above) the mean, and high if the score was greater than ½ standard deviation above the mean. The strategy evaluations made by members of these groups were collapsed across the vignettes.

These analyses explored the extent to which participants in the high, moderate, and low groups provided similar evaluations of the strategies. Table 21 provides the total and proportionate number of strategies provided by each grouping variable (i.e., teacher efficacy, demonstrated knowledge, and pedagogical knowledge beliefs).

Participants in the low efficacy group were proportionately more likely to evaluate the strategies provided as ones that they would not used than participants in the moderate or high efficacy groups. In contrast, high efficacy teachers were less likely to evaluate their strategies as unused that participants in the other two efficacy groups. Based on this data it seems as though moderate efficacy teachers were less likely to evaluate their strategies as best when compared to the other groups and high efficacy teachers in particular. Finally, low efficacy respondents also demonstrated the lowest tendency to evaluate their own strategies as used and best (45%) where as the moderate (54.5%) and high efficacy (51.1%) groups tended to make this evaluation more frequently.

Participants were also grouped by knowledge level (see Table 21). An examination of participants' responses revealed that teachers in the low and moderate knowledge groups rated their strategies unused at nearly the same rate 8.8% and 8.6%

respectively. However, teachers in the high knowledge group make the evaluation almost half as often (4.6%). In contrast, teachers in the high knowledge group rated their strategies as used and best to a greater extent (60.3%) than did teachers in the moderate (52.3%) and low (48.2%) knowledge groups.

Table 21

Strategy Selection across High, Moderate, and Low Efficacy, Knowledge, and Pedagogical Belief Groups

Variable	Strategies Provided				
	Total	Unused total (%)	Used total (%)	Best total (%)	Used & Best total (%)
Teacher Efficacy (n)					
Low (32)	442	51 (11.5)	135 (30.5)	57 (13.0)	199 (45.0)
Moderate (150)	2280	187 (8.2)	641 (28.1)	209 (9.2)	1243 (54.5)
High (40)	611	33 (5.4)	162 (26.5)	104 (17.0)	312 (51.1)
Demonstrated Knowledge (n)					
Low (36)	523	46 (8.8)	166 (31.7)	59 (11.3)	252 (48.2)
Moderate (159)	2400	206 (8.6)	671 (27.9)	268 (11.2)	1255 (52.3)
High (27)	410	19 (4.6)	101 (24.6)	43 (10.5)	247 (60.3)
Pedagogical Beliefs (n)					
Low (30)	425	42 (9.9)	122 (28.7)	18 (4.2)	243 (57.2)
Moderate (153)	2290	177 (7.7)	646 (28.2)	269 (11.8)	1198 (52.3)
High (39)	618	52 (8.4)	170 (27.5)	83 (13.8)	313 (50.6)

Note. Proportions represent percent of strategy evaluation of total strategies provided by members of each group.

Participants were also divided into groups based on their level of pedagogical knowledge beliefs. Participants with low pedagogical knowledge beliefs were less likely to believe in the value of knowledge in teaching, whereas those with high levels of those beliefs tended to report greater valuing of teaching knowledge. The final section of Table 21 illustrates the number of strategies provided by each teacher group in total and by evaluation option. Across the groups and evaluation options teachers seem to have fairly consistent ratings of strategies as unused, used, and used and best. However, teachers in the low pedagogical beliefs group evaluated far fewer of their strategies, proportionately, as best (4.2%) than did teachers in the moderate (11.8%) or high (13.8%) belief groups.

Cluster Analysis

Question Eight asked: "What common groups of inservice teachers emerge based on demonstrated knowledge and teacher efficacy?" Cluster analysis procedures were employed to profile experienced teachers based on their levels of demonstrated knowledge and teacher efficacy. Another goal of this analysis was to guide selection of cases for in-depth qualitative analysis.

The variables of teacher efficacy and demonstrated knowledge were selected for clustering due to their theoretical interest. Specifically, I wanted to see how the performance of this array of variables was configured among experienced teachers. Initial clusters were formed using Ward's minimum variance hierarchical clustering technique in order to minimize the within-cluster differences (Ward, 1963). This

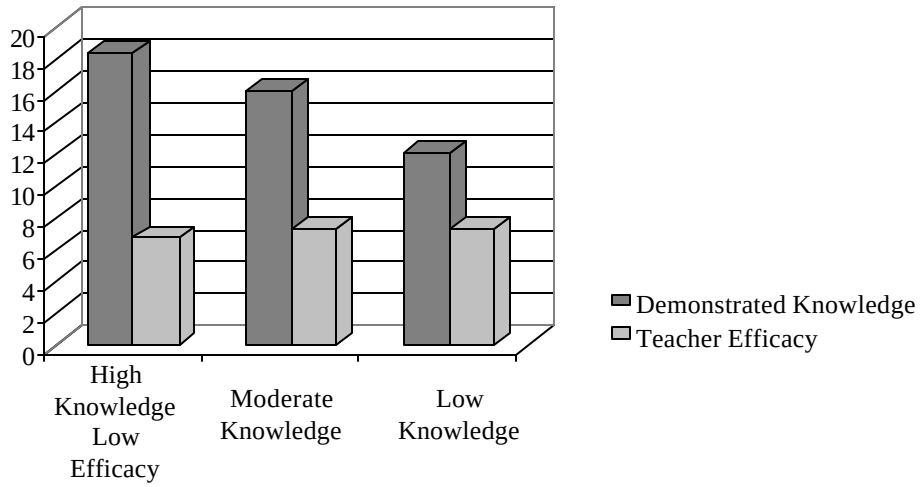
technique is considered to be useful in recovering the underlying structure of the data (e.g., Atlas & Overall, 1994; Blashfield, 1976).

Multiple steps were used to identify the appropriate number of clusters. Graphical representations of the data in the form of dendograms were examined. Dendograms illustrate the largest gaps between cluster groups and suggest an appropriate number of meaningful clusters (Olson & Biolsi, 1991). The initial examination of the dendogram for this data set identified one participant who acted as an outlier due to a low knowledge score (8). Thus, this participant was dropped from the analysis. The cluster analysis procedures were applied to the remaining data set (n=101). The resulting dendrogram suggested three, four, or five cluster solutions to best represent the data.

Next, factors for each of these potential solutions were created so that each cluster solution could be assessed. Multivariate tests indicated that significant differences existed among the clusters for each solution. Therefore, the between-subjects effects were examined. These tests revealed significant differences in demonstrated knowledge and teacher efficacy across the three solutions. Further, the post hoc tests for each solution indicated significantly different levels of demonstrated knowledge for each cluster across the three solutions. Differences in efficacy were not as consistent across the three solutions. However, within each cluster solution one group consistently had significantly lower efficacy than the others. Figure 9 illustrates this information

Figure 9

Teacher Efficacy and Demonstrated Knowledge of Cluster Groups



I used discriminant function analysis to validate the cluster solutions (Romensburg, 1984). In this step, the original clustering variables (demonstrated knowledge and efficacy) were used to predict group membership. The extent to which these predictions were correct corroborated the validity of the solution. The three-factor solution successfully predicted cluster membership 98% of the time. Under the same conditions cluster membership could be successfully predicted 100% of the time for both the four-factor and five-factor solutions. Thus, each of these solutions could have been selected based on this criterion. For the purpose of this study, the three-factor solution seemed to offer the most parsimonious description of the unique profiles that emerged. Table 22 lists data for those cluster profiles.

Table 22

Cluster Profiles of Practicing Teachers Based on Demonstrated Knowledge and Teacher Efficacy

Cluster Profiles	Clustering Variable Descriptives				
	Demonstrated Knowledge maximum = 20		Teacher Efficacy maximum = 9		Cluster Size
	M (SD)	Range	M (SD)	Range	
High Knowledge Low Efficacy	18.43[a] (0.79)	17-20	6.80[a] (0.83)	4.83-8.67	49
Moderate Knowledge	16.06[b] (0.87)	15-17	7.37[b] (0.71)	5.88-9.00	35
Low Knowledge	12.12[c] (1.41)	10-14	7.31[b] (0.74)	6.00-8.71	17
Total Sample	16.54 (2.46)	10-20	7.09 (0.82)	4.83-9.00	101

Note. Superscripts represent significant differences between group means.

I performed a one-way MANOVA with cluster membership serving as the independent variable and demonstrated knowledge and teacher efficacy as the dependent variables. A significant multivariate effect was identified [$F(4, 194)=94.95$; $p<.001$]. Examination of the univariate tests indicated significant differences between the groups relative to demonstrated knowledge [$F(2, 98)=288.128$; $p<.001$] and teacher efficacy [$F(2, 98)=3.776$; $p=.003$].

Fisher's LSD was then used in the post hoc analyses to examine how the clusters differed on each variable. Each of the cluster groups differed significantly

($p<.001$) with respect to the others on demonstrated knowledge. Those differences occurred such that the first cluster, high knowledge-low efficacy, had significantly higher knowledge than the other two groups.

Similarly, the second, cluster moderate knowledge, had significantly lower demonstrated knowledge than the first cluster and significantly higher demonstrated knowledge than the third cluster. Finally, the third cluster, low knowledge, had a significantly lower mean for knowledge than the other two groups. Thus, three groups were identified relative to participants demonstrated knowledge.

Examination of the post hoc test on teacher efficacy also revealed differences in efficacy between these groups. Specifically, teachers in the high knowledge-low efficacy cluster had significantly lower efficacy than teachers in the moderate knowledge ($p=.001$) and low knowledge ($p<.05$) groups. There were no significant differences between the moderate and low knowledge groups relative to efficacy.

Examination of the identified clusters revealed that demonstrated knowledge provides the clearest distinction among these groups of teachers. However, while the mean scores for demonstrated knowledge differed significantly between these groups, the moderate knowledge group contained some members who scored as high on the demonstrated knowledge measure as teachers in the high knowledge-low efficacy group. Thus, in addition to the knowledge difference the first two clusters also differed significantly relative to efficacy.

CHAPTER V

QUALITATIVE RESULTS AND DISCUSSION

The purpose of this research investigation was to develop an understanding of the relations among teachers' efficacy, knowledge, and pedagogical beliefs. Toward that end I sought explore these relations in the practice of three specific teachers through the development of a descriptive instrumental case study. This chapter is organized to represent the qualitative data gathered to address the relations that emerged among teacher efficacy, knowledge, and pedagogical beliefs. Therefore, I begin with a description of the analysis and code development. This discussion includes both the process of the code development, as well as the content of those codes and decisions that aided in combining or blending codes into more relevant emerging themes. This is followed by an introduction to the case study participants. In those introductions, I attempted to describe each teacher relative to their responses to the quantitative measures, my observations of their teaching practices, and our interview discussions. The final section offers comparisons across the three participants.

Additionally, throughout the presentation of these findings I have followed the suggestion of Wolcott (1990) to "let the readers 'see' for themselves" (p. 129). Wolcott described this effort as a means of providing readers with access to the data. Further, he stated his own bias that in the debate over providing too much data or too little, he preferred to err on the side of the former, as do I. By providing extensive data

in this document, I invite readers to seek their own interpretation of these data, as well as give voice to the participants of the study.

Analysis and Code Development

A uniform process was implemented to analyze the data collected from each of the three case study participants. This process began with an initial transcription of the audiotapes of all data collected in that form (interviews and additional reflections). Next, I reviewed the interview transcripts while listening to the audiotapes. At that time I made some general notes. Then data were coded by emergent themes, themes were analyzed, and common trends identified. I used a constant-comparative process across the three case studies. This was done to ensure that analytical decisions were not based on one participant's responses and simply applied to the others.

Analysis was conducted at the concept level. Interview transcripts and field notes were reviewed and each unique concept was given a label and associated letter. One of the case participants was randomly chosen to be used in the development of the initial codes. As the data from this participant were reviewed, concepts were identified and labeled. During this process, I maintained a list of the concepts and their code letter. I also maintained a separate list of any notes made during this process.

Prior to moving on to the second case, the code list was typed and reviewed for parsimony. For example, at one point, the code list included concepts for "student developmental stage" and "knowledge of students' abilities," which seemed to be tapping into the same concept of knowledge about students. Next, this code list was used and expanded as data from the second participant were reviewed. Following the

coding of the second participant, the code list was updated and applied to the data from the first participant. This pattern was followed so that all of the data were reviewed using a complete listing of codes that emerged from the data of all three participants.

A list of 50 codes resulted from the initial coding process applied to all three interviews. A copy of this complete list can be found in Appendix M. Themes emerged based on the data that were collected. However, given the research question, concepts relevant to these teachers' sense of efficacy, knowledge of pedagogy and content, and beliefs about teaching and pedagogy were sought. Thus, three important categories of codes included concepts about efficacy/confidence, knowledge, and teaching beliefs/theories. Other themes that emerged included: reasons/explanations for decisions, evaluation of success and learning; affective responses; motivation of students and self; strategies; and teaching goals. In the presentation that follows, I focus on the information that best describes the individual participants and exposes their remarks relative to efficacy, knowledge, and pedagogical beliefs.

Introduction to Case Participants

The purpose of these introductions is to provide a descriptive backdrop of the practice of the case participants based on the observations I made. These introductions are not intended as an evaluation, nor do I suggest that they are an accurate representation of the teachers. Rather, they are a representation of my observations of these teachers, based on the occasions I observed them teaching and our discussions. Further, in these introductions I offer narrative descriptions of teaching events based

on my field notes, for the purpose of providing the reader with a glimpse of each teacher's instructional practices. These narratives serve to describe the participants' teaching practices, classroom environment, and student interaction style. The purpose of these narratives is to provide the reader with an image of the experience of each teacher's class *in situ.* Thus, these sections are written as an elaboration of the field notes, with limited liberty taken as to the exact wording of direct quotations.

Following the narrative of each participant's teaching processes, I offer a description of what seemed to be the overriding themes or tendencies expressed by each teacher during the interviews. This description of tendencies is not a listing of each teacher's comments. Rather, I attempted to use the teachers' own words to reveal the common responses or ideas that seemed to underscore these teachers' comments. In the cases that follow pseudonyms are used to identify the participants and school names

Ms. Roarke

Introduction

At the time these data were collected, Ms. Roarke was a 34-year-old fifth-grade teacher. She taught her class all subjects except science. Ms. Roarke had a Bachelor of Arts degree in elementary education and was pursuing a Master's degree in administration and supervision from a well-known college of education. Ms. Roarke had taught fifth grade for the past 11 years in the same K-8 Catholic, parochial grade school. This school was located in a suburb of a major metropolitan city and served primarily middle-income Catholic families who belonged to the parish with

which the school was affiliated. The student population was fairly diverse, including students of African, Asian, European and Hispanic descent. Additionally, a few students were multilingual and were the first in their family to be schooled in the United States.

With respect to the quantitative measures used in this study, Ms. Roarke was positioned within the high knowledge-low efficacy cluster. She displayed a high level of demonstrated pedagogical knowledge by scoring a 19 on the demonstrated knowledge measure. However, she was below the mean with respect to efficacy, receiving a mean score of 6.79 for overall teacher efficacy, 5.80 for instructional practices, 8.25 for classroom management, and 6.50 for student engagement. Additionally, Ms. Roarke reported that she belonged to the Association for Supervision and Curriculum Development and that she read research articles, books on or about teaching, teaching/teacher magazines, and books related to her subject matter on a regular basis. However, she also reported that she did not generally attend any professional conferences or workshops.

When asked why Ms. Roarke decided to pursue her Master's degree, she responded: "I don't really know what motivated me to do it. Just something to do. And then I just, I don't know, I liked it. So you know, I got into the program" (Interview transcript, May 19, 2003). She also described surprise that "a lot" of the content she was learning was on teaching strategies and being a better teacher. Further, she acknowledged that due to this focus in many of her classes, the program helped her to become a better teacher.

Narrative

It was 8:15 on a Monday morning when I first entered Ms. Roarke's class. The students, in varying stages of readiness for the day, stood, fidgetless, facing a crucifix hanging above a statue of Mary. In concert, the students prayed, the Our Father, followed by a Hail Mary. As the students concluded with the Sign of the Cross, they turned in tandem to the United States flag and recited the Pledge of Allegiance. Once this morning ritual was completed, the students returned to the business of unpacking book bags, putting bags and lunches in the cloak area, a partitioned closet-type area located on the hall side of the classroom opposite a row of windows, about 5 feet long, open at either end, with hooks on one side and a shelf above.

Spelling homework was taken out, with little fuss. Students seemed to get ready at their own pace, neither rushing nor dawdling. The spelling homework was checked as a class. Ms. Roarke stood at the front of the room to the right of the white dry erase board, at a podium, with a copy of the teacher's manual in front of her. Ms. Roarke read each question from the book and looked up at the class expectantly. She waited until at least half of the students had raised their hands to respond to the question. When students answered correctly, she would nod, reply, "That's good," or offer some other form of feedback. Students who offered incorrect answers were pressed. The question was reworded, made simpler, or redirected for the student to be able to achieve a correct response.

The 28 students in the room offered color and dynamics to what might otherwise have been a blank slate. The walls of the classroom were painted a crisp

white and the classroom carried an overall feeling of cleanliness that came from being new. The classroom was part of a newly-constructed addition to the school, and the students and teacher moved into the classroom mid-year from a portable classroom trailer in the school parking lot. The walls were sparsely decorated with pre-made signs. The wall of windows was broken in the middle by a solid column. In front of the windows was a built-in bookshelf that spanned the side of the room. In the center of the bookshelf, a prayer table was established. The students sat in flat-topped desks with freestanding chairs arranged in six tables across the room. Each table had four or five students seated at it. Not all of the desks were the same height, making the overall tables uneven.

A white dry erase board hung at the front of the room, with an exit to the outside of the school at the right of the room. On the rear wall of the classroom a more traditional, but equally as new, green chalkboard hung near the exit to the hallway. The teacher's desk was situated in the rear corner of the room near the windows, angled outward. Below the chalkboard sat a simple folding table and chairs, where I resided during my observations. Next to the table was a small bookshelf housing a variety of reading materials appropriate for fifth-grade students. Ms. Roarke's desk, the bookcases along the windows, the table at the back of the room, and the room in general were neat, tidy, and free of clutter. During one of my conversations with Ms. Roarke in the hallway, she remarked that after moving from the portable classroom mid-year that she never felt like decorating "a whole lot."

At 8:20, Ms. Roarke asked the students to clear their desks except for their copy of *The Cay,* the book they were studying in reading class. Additionally, the group captain was expected to take out a piece of paper and a pencil. These instructions were given in a calm, even tone, and repeated as Ms. Roarke watched the class and took out her own book. As the students put away their materials for spelling and gathered their things for reading, a gentle hum was emitted from the room. Students talked among themselves; a few got up from their seats to go to the cloak area and came back with books. One student got up and collected a tissue, and another two sharpened pencils. The instructions were repeated as a reminder, and Ms. Roarke told the class that they would "play reporter" again.

The groups were to take on the role of a news reporter covering a story on the adventures of the two main characters in the book. Ms. Roarke announced that each table had two minutes to write four questions, two for each main character. She reminded them that in previous episodes of this game, the class had already addressed questions like, "Are you scared?" and "Do you want to go home?" Therefore, those questions should not be repeated today. Ms. Roarke repeated the directions four times (i.e., "Four questions, two for Phillip and two for Timothy.") almost as a gentle litany to remind the students of the task at hand.

The students huddled up at their tables and began discussing the assignment. The noise level of the classroom slowly increased as the groups discussed, debated, and offered potential questions to be asked. Ms. Roarke circled the room, listening in on group discussions, reminding them to stay on task when necessary. When the two

minutes for question creation ended, Ms. Roarke called the class to order. She stated a few more rules: questions could not be repeated, the table captain asked the questions, and the questioner needed make it clear to as to which character they were asking the question of, that is, Timothy or Phillip. In turn, Ms. Roarke took on the role of the characters and responded to the students' questions.

Ms. Roarke is not an actress, nor did she pretend to be in her responses as Timothy and Phillip. Rather, while speaking in the first person as each character, she relied on the information from the text and her response to convey the characters to the students. Each table asked one question of Ms. Roarke as she took on the guise of either Timothy or Phillip. Then Ms. Roarke announced that they were going to, "Switch things up!" Instead of her acting as Timothy and Phillip, each table would have an opportunity to take on a character and respond to a question from their peers. Each table took a turn asking and answering a question, with each group allotted thirty seconds to form their replies.

Ms. Roarke led the class with only a copy of the tradebook in hand. She seemed to rely on her own memory of the text and previous experiences of teaching this book to other classes. Likewise, the students did not take notes, but did refer to their books in order to create and respond to questions. Further, as questions were asked among the groups, Ms. Roarke took this as an opportunity to get the students to consider the reasons behind the characters' actions. For example, one of the questions asked of Timothy was, "Why did you hit Phillip?" When the students seemed to be off

in their response, Ms. Roarke referred them to the text, and read aloud the passage that preceded Timothy's hitting of Phillip. She then asked the class what they thought.

As the class came to an end, Ms. Roarke assigned the next two chapters and asked the students to get ready for their art class. Again, students began talking among themselves, cleared their desks, and gathered the materials needed for the next class. Ms. Roarke engaged in gentle banter with some of the students, as everyone prepared for the next lesson. When the art teacher came into the room, the students lined up, and filed down the hall, with a quiet murmur, a few bumps, and one or two giggles.

Following this, Ms. Roarke and I sat down for our first interview. A main focus of our conversation was on the implementation of the "Reporter Game" and her decision in using it, how it should be implemented, and future plans. One of her primary concerns was the quality of the questions the students were asking. As she stated: "I need for them to ask better questions, so next time, I think, I'll probably ask the questions, so they can role play the response. That way, they'll see what kinds of questions they could ask" (Interview transcript, May 13, 2003).

Additionally, when I asked her about why she chose to use this activity and the modified version in which the students responded to the questions, she offered three reasons. First, Ms. Roarke remarked that she had used the activity multiple times with this book already and that she felt they could handle responding to the questions themselves at this point. Second, she liked to choose activities that would "switch things up" and that she thought the students would like (Interview transcript, May 13, 2003). Finally, Ms. Roarke stated: "I also do this to take some of the pressure off

them and put it on me. They ask the questions and I give the answers for a change" (Interview transcript, May 13, 2003).

As I continued to visit Ms. Roarke's class I felt a consistency in the same calm, even, atmosphere that permeated the class on my first visit.

Prevailing Disposition: Responsibility

As I reviewed my interviews with Ms. Roarke, I noticed an overriding theme in each set of transcripts: responsibility. Throughout our discussions, Ms. Roarke continued to vocalize that she was responsible for student progress, behavior, and learning in her class. For example, in our first interview Ms. Roarke described a time when she attempted to implement a hands-on math activity with her class.

> It was a complete failure…well actually, I don't think anything's a complete failure, because they still got something out of it. But in this activity I wanted them to use these blocks to build a hotel. And I wanted them to uses multiplication to figure out how many blocks they needed. And instead they were actually building the hotel. They kept asking me for more blocks. And eventually, at the end, I was able to bring them around, to see how the multiplication worked. So if I do this again, next year, I'll definitely have more rules. You know. Only 20 blocks. Because I guess I was helping them to be off-target because I kept giving them the blocks (Interview transcript, May 15, 2003).

In this short description, Ms. Roarke reflected on the experience of attempting a strategy that did not work as she had planned. Moreover, at the end of this reflection, we see that she accepted responsibility for the lack of success of the activity. In our second interview, Ms. Roarke reiterated this theme. The following is an excerpt of her response to my query of how she improves her own teaching.

> I guess just always trying to find new ways to do things. You know, like if I give them a quiz, or even if I just ask them a question in class, and like they have no idea what the answer is. I mean that's, that's, I'm able now to see that that's my doing. You know. I need to do more. Or I need to get them to come up with this answer in a better way. I need to change. Whereas, I think, when you first start teaching, it's more, why don't they know this? You know, you know. Whereas now I take more responsibility for it. You know. Like, well, obviously I didn't do something, that's why they don't know it (Interview transcript, May 19, 2003).

This theme of accepting responsibility for "failure" or less desirable outcomes of her pedagogical decisions continued throughout our discussions. Another example occurred when Ms. Roarke described implementation of the Jigsaw cooperative group technique. The first time she used this technique she felt that it really did not work. Yet, she attempted the technique again. When I asked why she would try a strategy that did not work the first time, she replied:

> I guess it was just because of the reason why it didn't work. And like I knew it was a good strategy, cause I had heard, you know, read about it and seen other

> people do it. So I knew it was good. So I just needed to use it a different way (Interview transcript, May19, 2003).

She continued to explain why she felt the technique did not work well in her first attempt, and concluded with, “So, once again, it was, I didn’t do what I should have done” (Interview transcript, May 19, 2003).

Despite this perceived failure, Ms. Roarke attempted to implement the strategy again in another content area and was met with success. I asked her what she would have done if the strategy had not worked the second time, to which she replied, with a small laugh:

> I probably, I don’t know, I probably wouldn’t have done it again for a while. I would have had to re-think it over. But, yeah. But I was, it wasn’t so much that it failed so badly in reading, I didn’t do what I was supposed to do. And I figured that out, and I did it. You know. So I guess, if I would have tried it again, and it wouldn’t have worked, I would have said, “Ok, well, what could I change again,” (Interview transcript, May 19, 2003).

In the preceding statement, we see Ms. Roarke reiterate a belief that success or failure of a strategy was due to her own actions. Ms. Roarke’s reflection on her practice is also visible in the preceding excerpts. If the strategy had not worked the second time, she stated that she would have to “re-think it,” demonstrating her tendency to reflect on her teaching practice.

Efficacy, Knowledge, and Beliefs

Efficacy. Ms. Roarke expressed her efficacy beliefs most clearly when describing why she would not engage in a particular activity. In describing the various teaching strategies that she had learned in her Master's program, she admitted that there were some strategies that, despite their perceived usefulness, she would not use. For example, Ms. Roarke stated that she would not want to try to "…things that I don't think I'm any good at" (Interview transcript, May 13, 2003). She went on to explain:

> For example, multiple intelligences, that seems liked a really good idea, but there are areas that I'm so weak in myself, like music or that environmental one, that I just can't see how I would bring it into the classroom. I see other people using them and I think that's really good, but I just don't see how I would do it (Interview transcript, May 13, 2003).

These statements demonstrate how Ms. Roarke's belief in her lack of ability led her to make decisions about what she would not do in class. However, in the previous section, I described Ms. Roarke's sense of responsibility for the classroom activities. In those statements it seemed that a certain amount of efficacy existed despite her lack of articulating efficacy beliefs. For example, Ms. Roarke described a persistent approach to continuing with strategies that did not originally achieve the results she wanted. This persistence seems to be supported by a belief in her ability to evaluate the situation, rectify any problems, and try again. For instance, with regard to the Jigsaw technique Ms. Roarke stated, "…I would have tried it again, and if it

wouldn't have worked, I would have said, 'Okay, well, what could I change again?'" (Interview transcript, May 19, 2003).

Still, Ms. Roarke spoke with hesitation relative to her abilities. On my second day of observations, there was an incident in class in which two students were using their English grammar statements to pass barbs back and forth. Ms. Roarke worked with the students, redirected them, refocused their attention on the content and substituted a new sentence. Yet, the student continued to press the issue. Finally, Ms. Roarke turned to the student, and simply stated "T---, that's enough," and returned to the lesson. The student stopped immediately, without complaint, and class continued. In our discussion later, I asked Ms. Roarke how confident she was that her asking the child to stop would put an end to it. She responded "He, he kno-, he usually does, if I put it like that, he usually stops. I just hoped that he would – he usually does" (Interview transcript, May 19, 2003).

This situation was handled smoothly, with little effort. Yet, Ms. Roarke seemed hesitant in voicing her belief in her own ability to manage the situation. There seemed to be a theme in Ms. Roarke's statements of her own ability, a theme of hesitancy. This hesitancy might also lead her to avoid challenges or tasks for which she was not confident in her ability to bring about a desired resolution. For example, Ms. Roarke expressed a desire to use group activities more with the class, but she felt constrained by the desks in the classroom. She would rather have tables so students could better move around. Then, after a few moments of reflection, Ms. Roarke stated:

> I think, if I started in the beginning of the year, having them break into different kinds of groups and move around, then they would be able to do it. But to try now, in May or March, would just be a disaster" (Interview transcript, May 13, 2003).

Thus, while she felt able to work with the students and teach them how to move in and out of groups, she was hesitant in her belief that it would be something she could do this late in the school year. This statement might well be a reflection of her knowledge and understanding of fifth-grade students and her class in particular. However, it might also reflect a lack of confidence in her ability.

A final example that reflected this hesitancy dealt with the challenges Ms. Roarke would undertake. Ms. Roarke had taught fifth grade in the same school for her entire career. Her only other teaching experience was as a student teacher of third-grade students. Yet, when asked what other grade she would like to try to teach, her response was fourth or sixth. But she added that she would really rather stay with fifth. "I don't think I'd really be happy with any other grade right now. Like, I like fifth grade, you know" (Interview transcript, May 21, 2003). When prodded as to why she would choose fourth or sixth, the reason was, "Because it's just a little off of fifth. …I love fifth graders. So, I like that age group. And then also, you know, the content area, I would feel comfortable with" (Interview transcript, May 21, 2003). These responses suggested that Ms. Roarke preferred to be comfortable rather than challenged. However, intertwined with what appeared to be efficacy beliefs were Ms. Roarke's preferences, specifically her love of the fifth-grade students.

Knowledge. Ms. Roarke spoke of knowledge as knowledge of content matter and pedagogy. With regard to content or subject matter, there were two key ideas that Ms. Roarke expressed. First, that knowledge of content was important to teaching, and, second, that her own comfort with content matter was related to the subjects she most enjoyed and wanted to teach.

Ms. Roarke stated that she felt her knowledge of the content area had a large impact on the actions she performed in the classroom. Specifically, she felt that the more comfortable she was with the content, the better she was at teaching. She further elaborated that, "You can kind of branch out a little bit more. You're just more comfortable. You don't have to worry about the content. You can, you know focus more on ways to teach it" (Interview transcript, May 19, 2003).

Ms. Roarke extended this discussion to reveal that the subjects she felt most comfortable with were also the ones she was more motivated or interested in teaching. She stated that she felt her knowledge influenced her motivation, "…because, like for instance, reading, math, social studies, like, I really, I like to teach those subjects a lot more than I do some of the other subjects. Just because, again, I know more about it…" (Interview transcript, May 21, 2003). However, she also acknowledged that the converse was true, in that subjects she knew less about, she would spend less time on with class:

> So, like even in math, for instance, like things that I, you know, know really well, we get more into in class, and like when we get to, you know, converting – you know – quarts to gallons, and all, pints to whatever, I mean that stuff, I

> still have a problem with it, so we don't get into it nearly as much, and it is because I'm not as comfortable with it, so that's [the impact of knowledge on motivation] a definite thing. I definitely think that it goes hand-in-hand. I never really thought of that (Interview transcript, May 21, 2003).

Ms. Roarke also expressed the belief that knowledge of pedagogy might help to make up for a lack of content matter knowledge. She stated that if one were not familiar with the content then knowing the different strategies was "…definitely helpful. Because, again, some of the strategies put a little more on the students to learn things. So it's kind of, some of the pressure is taken off of you, if you know the different strategies to use…" (Interview transcript, May 19, 2003).

Beliefs. Throughout the dialogue, Ms. Roarke expressed many statements that could be defined as beliefs. However, in this section, I elaborate on those beliefs that are related to pedagogy or teaching practices. Ms. Roarke stated that three skills or areas of knowledge a teacher must have were classroom management, the ability to teach different levels, and knowledge of development for the students with which you are working. She further elaborated that management was critical because "…you could know all these great strategies…how they're [students] supposed to learn and everything, but if you can't control the room, it's of no use" (Interview transcript, May 19, 2003). She also disagreed with the premise that if a teacher used great strategies there would be no classroom management problems. She conceded that sometimes "…good teaching does solve a lot of those problems. But not always" (Interview transcript, May 19, 2003).

Another salient belief Ms. Roarke expressed was related to the identification and evaluation of good teaching in general and her own practice in particular. Ms. Roarke articulated a belief that good teaching occurred when students used what they learned. Ms. Roarke stated that she felt she taught mathematics or social studies best. This belief was based on her observation that the students seemed to be most interested in those classes and because she could "tell if they really learned it" (Interview transcript, Tuesday May 19, 2003). In this instance, "really learned it" meant "...some of the stuff is just memorization, but then I could ask them questions, that maybe we didn't really go over in that class, but I can kind of relate it to something, and see if they've really learned it" (Interview transcript, Tuesday May 19, 2003).

When asked how she would identify good teaching in process, Ms. Roarke identified two parameters: the amount of student learning and the type of interaction between the teacher and students. She stated that she would identify good teaching by the extent to which "…the students can use what they learned… because they can use it in a real life situation" (Interview transcript, May 19, 2003). The second parameter of evaluation for Ms. Roarke was the interaction between students and teacher. She felt that good teaching occurred when the teacher did more than simply provide students with information, that is, when the teacher guided the students to develop their own answers and construction of knowledge. Thus, for Ms. Roarke, we see some very specific, self-identified and self-imposed standards by which teaching was evaluated. Further, we see that she applied these standards to her own work.

Summary

Ms. Roarke demonstrated: a sense of responsibility for the events that occurred in her classroom; varying degrees of confidence that might influence her pedagogical decisions; persistence in re-evaluating her own teaching and in implementation of strategies; and, beliefs in the importance of the relation between knowledge and motivation. She demonstrated a willingness to try new strategies, along with a hesitation or avoidance of strategies about which she felt she had little knowledge or could not implement herself. Additionally, Ms. Roarke identified her own criterion for evaluation of good teaching as the extent to which students learned, where learn meant to transfer or apply information to another area or real life situation. Ms. Roarke described her teaching with the statement: "I don't always, you know, consider myself a good teacher, but sometimes I'm pretty pleased with what I do, and that they learned it" (Interview transcript, May 19, 2003).

Mrs. Gilbert

Introduction

At the time of data collection Mrs. Gilbert was a 48-year-old French teacher. This was Mrs. Gilbert's fourth year as a full-time teacher. However, she had substituted extensively prior to becoming a teacher, had taught English as a Second Language for adults, and had developed and implemented an after-school program for elementary school children entitled, "French is fun." Her current position as a French teacher required her to work in three separate schools each day. She taught three

classes of eighth-grade French in two middle schools, as well as French 3, 4, and 5 in a large high school.

Mrs. Gilbert's typical teaching day began at 7:20 a.m. with a combined French 4 and 5 class. The French 5 class was designed to prepare students to take the Advanced Placement French exam held each spring nationwide. This was followed by her French 3 class. Then she enjoyed her planning period of 30 minutes from 9:00 am to 9:30, after which she would hold her French 3 class from 9:30 to 10:30. Next she drove across county to the first of the two middle schools at which she taught. Here she would teach a class of 33 advanced eighth-grade students French 1, from 11:00 to noon. Then, while enjoying her lunch, she would drive to the second middle school, where she held two separate French 1 classes for the advanced eighth-grade students for the final two periods of the day, ending at 2:45 in the afternoon. Mrs. Gilbert had maintained this schedule for the first three years of her full time teaching practice. While disliking the travel time throughout the day, she stated that she enjoyed working with the middle-school students.

Mrs. Gilbert was employed by a rural county with a fairly homogeneous student population relative to socioeconomic status and ethnicity. The county office had determined that foreign language in eighth grade was for advanced students. Thus, all of the middle school children in her classes, with the exception of a few, were considered by their schools to be at an advanced level.

With respect to the quantitative measures used in this study, Mrs. Gilbert was positioned in the moderate knowledge cluster, although her score (17) on the

demonstrated knowledge measure was equal to that of some participants who were placed in the high knowledge cluster. Thus, she is considered to hold a high level of knowledge. Additionally, she responded to the efficacy measure such that her overall mean was 7.42, with 8.38 for instructional practices, 7.63 for classroom management, and 8.38 for student engagement.

Mrs. Gilbert held two Master's degrees, one in Administrative Science, her first career, and a second, more recent, Master's of Education. She had pursued a continuing education program in reading in the content area, and was a member of the American Association of Teachers of French, the local conferences of which she attended annually. Further, Mrs. Gilbert reported that she read a variety of professional educational publications annually, including research articles (5 per year), books on or about teaching (2 per year), school or district newsletters (5 per year), teacher or teaching magazines (5 per year) and books related to her content area (2 per year).

Narrative

It was one in the afternoon, as I positioned myself in the rear of what was Mrs. Gilbert's third classroom and school of the day. Here at East-West Middle School, Mrs. Gilbert had two French 1 classes for advanced eighth-grade students during the last two periods of the day.

Mrs. Gilbert's classroom was a portable building that had become a permanent part of the school and grounds. Of the three schools at which she worked, this was the one location Mrs. Gilbert was allowed to make her own. This was her classroom, and was not used during the day by any other teachers or classes. Her classroom took up

half of the building. However the other half was seldom used. The classroom space was just large enough to contain the 33 desks and chairs, arranged in single-file rows with little space to pass through. A support beam stood in the center of the room. Although the ceilings were low, the room, with windows on three sides, was bright and well lit.

The perimeter of the room was rimmed with low bookshelves about 14 inches high, and loaded with books stacked in all directions. The entrance was at the rear of the classroom, and Mrs. Gilbert had an overhead projector and screen set up at the front of the room, directly in line with the support pole in the middle of the room. The smaller green chalkboard was hidden behind the overhead screen. On each wall in the classroom was a bulletin board, decorated in a French theme. The board at the rear right of the classroom displayed several monuments and famous buildings of Paris. The board at the front of the room displayed pictures of the seasons labeled in French. A third board at the rear of the room seemed to have articles on geography and current events from French-speaking countries. Any remaining space on the walls or bulletin boards displayed student work. The theme during my visit seemed to be maps and rivers of France. These colorful images were hung throughout the room in an apparently random fashion.

Mrs. Gilbert's desk was located at the front of the room, in the right corner, angled out toward the students' desks. Her desk was piled with textbooks, teachers' editions, overhead slides, and what seemed to be piles of student work. However, when Mrs. Gilbert sat down at the desk she seemed to know exactly where everything

was, reminding me of one of my former mentor teachers, who described her workspace (and mine) as "organized-creative clutter."

I arrived at the classroom before the students and took my seat at the rear. Mrs. Gilbert moved about the room preparing for her first of two classes. She quickly scanned her planbook, sorted through overhead transparencies until she found what she was looking for, searched momentarily before finding an overhead marker, while informing me of the events to come in the classroom. The bell, a loud electronic monotone, sounded from the main school building, and Mrs. Gilbert looked up with anticipation and turned on the portable compact disc player located on the shelves behind her desk.

Cajun music filled the room, which was quickly populated by 33 chattering eighth-grade students. "Come," called Mrs. Gilbert, "Vite, Vite, Vite! We have much to do today!" This command was repeated several times as Mrs. Gilbert met the students at the door, ushered them in, and offered personalized welcomes to many of the students, in French.

Mrs. Gilbert then took her place at the front of the crowded room standing before the overhead, moving quickly about, turning off the music, and continuing an open conversation with the class as the last few students entered the room. The county was in the process of administering a system-wide high school assessment exam for each major subject area. Some of the students in the eighth grade class had sat for the Algebra assessment that morning. All of those students would sit for the French exam in the coming weeks. Mrs. Gilbert, called out to the room, "Who took the Algebra

assessment today? How was it?" The students who had taken the exam, about half the class, shared their opinions of the test with her. One student expressed concern that there were things on the test never covered in class. Mrs. Gilbert offered support and attempted to allay their fears.

Mrs. Gilbert then switched to a mixture of French and English, with an emphasis of modeling the French pronunciation of words. She asked, first in French, stating the words slowly and distinctly with some pantomime to help convey the meaning of her statement, before repeating it again in English, "Did any of you see American Idol last night?" This was a popular television phenomenon in its second season at the time of this observation, and the previous evening, the winner of this year's competition had been announced.

The students gave an immediate response: "Yes!" They had indeed seen the final episode of the program. Mrs. Gilbert then took about five minutes to discuss the show with the students in French. Specifically, she asked the students to use the adjectives they had learned to describe the final two contestants who had performed on the program. Hands shot up as students vied for an opportunity to share their thoughts. When a student stumbled over the pronunciation or phrasing, Mrs. Gilbert offered support by repeating what the student had said up to the point of their difficulty, or by asking if another student could offer help.

Mrs. Gilbert, looking at the class, queried, "Don't we have a birthday today?" With a muffled, "Oui!" one of the male students acknowledged that it was his birthday. Mrs. Gilbert offered felicitations in French, and together the class sang the

French version of “Happy Birthday.” At the beginning of the school year, Mrs. Gilbert had the students fill out three by five index cards with some personal information on it. In addition to this information, the students were invited to ask her any question they wanted, and she would respond to this question on the students’ birthday. On this day, Mrs. Gilbert was called on to describe her favorite French location.

Mrs. Gilbert moved to the overhead, turned the machine on, and in blue ink listed the agenda for the day’s class activities: 1) Review time/seasons; 2) Ma ville exercise; 3) “Re” verbs; 4) Giving directions. As she went down the list of the day’s activities, Mrs. Gilbert gave brief explanations and elaborations on each topic. For example, she reminded students that they would soon be taking the French high school assessment exam, so they as a class would begin reviewing all that they had done this year, a little each day, hence the seasons. Students were then directed to a page in their textbook to begin reviewing the seasons.

Together the class went through the text exercise on the seasons aloud. Students around the room had their books open, but there remained a quiet hum in the room. A female student toward the front right of the room sat with her knees up against the desk top and tilted her chair back. In the midst of directing the text exercise, Mrs. Gilbert told the girl to put her feet down, because, “I don’t want you to fall back, land in Jamie’s lap, and roll out the door!” The student dropped her feet down and joined her classmate in a chuckle over Mrs. Gilbert’s remark.

Next the students were told to partner up with someone next to them and complete the second exercise aloud. The students promptly paired up and began the activity. Even those students who were more playful and slower to start seemed to remain on task. However, as students finished the task assigned, the level of chatter increased as things of interest to eighth-graders became the topic of conversation. Mrs. Gilbert, after passing out some papers, called the class to order again, and asked several of the pairs to recite examples from the task recently completed. When appropriate, Mrs. Gilbert corrected pronunciation and vocabulary.

Mrs. Gilbert moved on to the next agenda item, "Ma Ville" or "My Town" vocabulary. She displayed a colored, preprinted overhead that showed a cartoon town with a variety of French terms for the stores written on each storefront. Mrs. Gilbert pointed to each store, pronounced its name, asked the class to repeat, asked for volunteers to identify the type of store, and, depending on the type of store, asked the students to name their favorite version of the store. For example, when students repeated the word "restaurant" in French, they were asked for the name of their favorite restaurant in French.

Students were then given an opportunity to share their assignment from the previous school day when Mrs. Gilbert had to be out of class. The students had completed creative maps of "Ma Ville" or "My Town." About four students took turns coming to the front of the classroom and sharing the maps they had created with their classmates. Some of those maps were elaborately colored. One girl had created a

three-dimensional map on which the buildings folded up from the paper. Other students had simple line drawings.

The next item on the agenda was to learn the conjugation of "re" verbs. Mrs. Gilbert asked the students which "re" verb they wanted to learn, *attendre*, to wait, or *vendre*, to sell. Students called out their preferences and vendre was identified as the verb for the day. Mrs. Gilbert worked with the class on how to conjugate this type of verb. She reminded them to find the stem of the work (vend), and then simply add on the ending. Then she introduced the verb endings (i.e., *je vend<u>s</u>, tu vend<u>s</u>, il/elle/on vend_, nous vend<u>ons</u>, vous vend<u>ez</u>, ils/elles vend<u>ent</u>*).

Mrs. Gilbert shared with the class that she had an easy way for the students to remember these endings. She then repeated the verb endings, while pointing to them on the overhead, "S, S, Nothing, Ons, Ez, Ent! S, S, Nothing, Ons, Ez, Ent! See, isn't it easy? Now with me, everyone!" The class began repeating those verb endings in unison. Mrs. Gilbert would call out faster, and "S, S, Nothing, Ons, Ez, Ent!" got faster and louder. Then she called, "Boys only! Girls Only! Everyone! Faster! I don't think they can hear you in the office!" The students kept up, chanting the verb endings, faster, and louder. Then, the question was posed to the class, "Who could recite them the fastest?" Several students attempted. One girl was deemed the fastest. Mrs. Gilbert began to redirect the class to the next topic, reminding students that they would learn more "re" verbs tomorrow, but that they must now move on to directions.

Mrs. Gilbert projected a cartoon street map and invited a student volunteer to come up and "drive." The volunteer was given a small toy car and told to stand at the

projected map and drive the car around town based on the directions she would be given. Mrs. Gilbert called out the direction in French, “Begin, stop, turn to the right, reverse, stop, begin, go left.” The student attempted to keep up with the direction as they came faster and faster. About five students were given an opportunity to “drive” the car. While these student drivers manipulated the turns of the town, and followed the directions shouted out, several joking comments were called out, especially as corners were cut by the drivers, and stop signs ignored.

This activity continued until we again heard the muted monotone of the schools electronic bell sounding the end of the school day. At that time, students gathered their belongings, shouted goodbyes to Mrs. Gilbert, and left in a loud roar that often accompanies the end of a school on a warm spring day. Calm seemed to once again reign in the classroom as Mrs. Gilbert said, “Au revoir” to the last of her students and began to gather her belongings and the student assignments to be graded.

Prevailing Disposition: Enthusiasm and Motivation

Throughout my interviews and observations of Mrs. Gilbert, two themes were prevalent. First, she demonstrated a great deal of enthusiasm for teaching in general and French in particular. Second, her comments revealed a focus on student motivation.

Mrs. Gilbert’s discussions of her class activities, students, and content area were infused with a sense of enthusiasm and excitement. In our second interview, I asked Mrs. Gilbert what she found most enjoyable to teach. Her initial response was,

"I love teaching stuff about culture." This was elaborated on to include a host of topics, and clearly demonstrated the enthusiasm she has for French:

> Most enjoyable? I love teaching stuff about culture. You know, related to art, related to history, related to ways of life. I like teaching vocabulary. I like, you know, I love teaching like talking, dialogue, speaking…The thing I don't enjoy teaching as much is grammar, although I've learned how to make it fun at this level, like the S, S, Nothing, Ons, Ez, Ent and then you say it, SS, you know, say it the way we said it, real fast. (Interview transcript, May 22, 2003).

Thus, Mrs. Gilbert demonstrated enthusiasm for multiple components of French instruction. Further, even the content that she felt was less enjoyable to teach she described with enthusiasm, and she focused on developing an entertaining means for her students to learn the material.

What seemed to underpin her approach to the classroom was a desire to instill in her student the same love of the French language that she held. In fact, in our first interview she stated "…I want them to love French, and love my class, because if they do, they're gonna do better…" (Interview transcript, May 20, 2003). Her responses further indicated that this need to motivate her students was a prevailing force in her classroom decisions. Mrs. Gilbert said that for her, one of the hardest things to learn about teaching was "…No matter how hard you work and how much you try to motivate them and make them like it, there are gonna be some kids who still don't like it" (Interview transcript, May 22, 2003). This goal of motivating students was highlighted in her elaboration of the previous statement with the following comments:

> It's not whether they do well or not, 'cause some, some have more ability than others, some work harder than others. But I really want them to like French more than anything, and like, and love learning French. And when some still don't, I find that, that makes me sad. (Interview transcript, May 22, 2003)

Mrs. Gilbert's desire to instill a joy of learning French in her students also guided several of her pedagogical decisions. For example, to help her middle-school students best learn the vocabulary for directions (e.g., right, left, stop, etc.) she employed games. One afternoon she took each of her French classes outside to the field adjacent to her portable classroom, and took on the role of Napoleon leading the troops. The students marched, turned, stopped as Mrs. Gilbert called out and mimed the instructions. When I asked why she chose to incorporate this activity, Mrs. Gilbert responded that in addition to addressing students' kinesthetic skills, that "the concept, was fun…it was not much time… but it got them motivated about it… today was to keep them coming back. They want to do more of it now, I'm sure…" (Interview transcript May 20, 2003). Therefore, this belief that if the students enjoyed the class they would want to learn more seemed consistent throughout Mrs. Gilbert's responses.

At the time of my interviews with Mrs. Gilbert, the French 5 class (5 students) had already sat for the Advanced Placement test. Thus, she was left with an interesting conundrum of how to fill the remainder of the year. Mrs. Gilbert decided to collaborate with an elementary school near the high school and have her students teach three 45-minute French lessons to the second grade. She stated that she planned this

activity because "I wanted, after our AP exam that we've worked so hard,…I wanted an activity to keep 'em motivated and interested to the end of the year, and also to make them feel confident and show off what they know" (Interview transcript, May 23, 2003).

Mrs. Gilbert offered some qualifiers that suggested that making it "fun" was not always the critical factor. In particular, when describing her upper-level French classes she acknowledged, "I just haven't had time to make complicated grammar fun….and they're really supposed to be an independent study course…They're very mature students, and it's supposed to be like a college course, and you don't have to make it all fun…But I still try" (Interview transcript May 22, 2003). Mrs. Gilbert also recognized that some of her activities, like marching with Napoleon or driving the car on the map, needed to be "saved" until the end of the year. "You don't want to use up all your best tricks at the beginning" (Interview transcript, May 20, 2003).

Efficacy, Knowledge, and Beliefs

Efficacy. Mrs. Gilbert exhibited a moderate to high sense of efficacy on the quantitative measures that was echoed in her responses and comments throughout the interviews. Mrs. Gilbert voiced her confidence in her teaching abilities in more evaluative terms than what would typically be classified as efficacy statements. For example, I asked Mrs. Gilbert what topics she felt she taught the best. She responded, "Ah, boy. I think, I think I teach everything well, and that when they test, they seem to do really well on all parts of it" (Interview transcript, May 22, 2003). Mrs. Gilbert elaborated on this statement and averred, "I think what I do that's better maybe then

some other teachers is the speaking part, 'cause I'm so comfortable speaking French fluently that I probably do that better than a lot of people" (Interview transcript, May 22, 2003). This extended statement provides some efficacy information, if "I'm so comfortable" can be interpreted to mean "I'm able to." That the part of French instruction Mrs. Gilbert considered herself best at teaching was also an area that she was able to do and was comfortable with suggests efficacy beliefs.

Mrs. Gilbert's enthusiasm appeared to be intertwined with her efficacy beliefs. For example, we discussed at length the project she was conducting with her French 5 students and the local second-grade class. I was particularly interested in how Mrs. Gilbert was confident of her ability to orchestrate this activity during her first year working with this particular class and group of students. I asked about this specifically in our third interview:

> HF: So, what made you think that you would be able to pull it off?
>
> Gilbert: I didn't even think about it. [pause] I mean, I mean, I figure, I mean, I've been in the elementary school, and, I mean, they know these kids are not, I mean, they know that they're not, I mean, that they're students and that they haven't taught before. But second graders are very nice little people, and happy-go-lucky, and their own teacher's gonna be in there too, and I just, I know it'll be okay.
>
> HF: So it didn't even occur to you that it might be a problem?
>
> Gilbert: No, I didn't even worry about it. I didn't even worry about it. Because it's, you know, the teach-, the other teacher will be in there, … they can

> help. And anything the kids learn, I mean, it's gonna be something new to them, … It's more of just an activity for fun, an extra kind of thing, so I'm not that worried like we're, we're wasting their time totally, and it's the end of the year over there, too, … I think the teachers are glad to have something as a diversion. So it's not like … we have to meet those objectives. It's, it's an experiment for everybody, and some of it may go really well and some of it may not, but everybody will learn something from it. (Interview transcript May 23, 2003).

I was surprised at Mrs. Gilbert's opening response, "I didn't even think about it," to my question of how she was so confident that this project would work. She quickly explained the various reasons why she felt she did not need to feel concern. However, I think her initial response was probably the most telling: "I didn't even think about it." Mrs. Gilbert thought of an idea that she felt her students would enjoy (two student in this class were planning on becoming teachers) and benefit from and began planning. Mrs. Gilbert contacted the principals in each school, wrote a proposal for the activity to the county, trained her students on how to write a lesson plan, state objectives, and employ multiple intelligence theory. She had them give mock lessons in class prior to going to the elementary school, and she planned to be there on the first day of this three-day adventure. Each of these steps was important to ensuring that this activity was successful and safe. Yet, it never occurred to Mrs. Gilbert that it might not work out.

Even when the mock lessons were scheduled for senior cut day and one of the students was an hour late and one pair was clearly ill-prepared for the upcoming week, Mrs. Gilbert remained confident. She reflected:

> It's pretty much what I predicted. The two who haven't prepared are the ones who always have problems, the one who was late and all, who's been problems all year. … I'm more concerned about them. The other three, the two of them, the blond girl, M-----, and the one who went last, H----. They both want to be teachers. … And the last one, too, she has taught in summer camp, so she's familiar. But K---, the redhead, she's younger than they are. She's only a junior, but she has such an ebullient personality…she's just gonna be able to pull it off, …The other two I'm not so sure about. But they're gonna be with a very experienced teacher, … so that if things get low or something, I'm sure the teacher will find something. (Interview transcript, May 23, 2003).

Mrs. Gilbert's confidence seemed to rest on her belief that most of the students would be fine and in the abilities of the second-grade teachers should anything go wrong. She stated previously that it did not matter if the second graders met the objectives. This was just a diversion for the end of the year that might well have some really good educational outcomes. This type of disposition toward the project might have helped to strengthen her overall confidence. The expectations described were easily met, so Mrs. Gilbert's confidence could easily remain high. It is also important to note that she tended to focus on the strengths of the situation (e.g., the three students

who were going to be fine) and gave less attention to the problems (e.g., two who were not prepared).

A similar pattern was observed in her discussion of the Napoleon marching activity. She conducted this activity with only two of her French 1 classes. When I asked why she chose to do this activity during the last three minutes of each class, she stated that it was a motivating activity and that the students would learn from it. But, she also made clear that she did not do this activity at the other middle school where she teaches, because it was a long walk to get outside and "they're [the students] not really well-behaved, and I know I would have had kids off-task and stuff like that" (Interview transcript, May 20, 2003). She concluded that she based her decision to use the activity on her knowledge of her students, that it would be a motivating activity, and that she knew they would learn from it.

Mrs. Gilbert evaluated the activity based on her observation of her students, stating:

> …the second group, even more, was following exactly what I said. People were smiling. The first group, someone said, "Oh, this is gonna be fun, I can't wait." … I knew I wasn't gonna get much learning in. We only did it for, what, three minutes. … So it was kind of like more motivational ... I knew I wasn't going to get a lot of learning in, in three minutes, but. But they're pretty bright. Some of them will remember some of that. And the more you hear it, the better it is (Interview transcript, May 20, 2003).

Thus, even while Mrs. Gilbert conceded that completing the activity that afternoon was more motivational than instructional, she still maintained that the students were bright and some would remember the experience. Also, she chose not to conduct the activity with her less-disciplined class. Perhaps she had less efficacy to successfully work with that group of students in this way. Thus, it could follow that her confidence was linked to specific students or classes.

Mrs. Gilbert also expressed a desire or willingness to accept challenges. For this school year, Mrs. Gilbert had been offered an opportunity to continue to teach French 1 at three middle schools or to change her schedule and take French 3, 4, and 5 in the high school. Despite the problems she anticipated having with grammar, she felt confident about literature, reading the students' work, and speaking. Moreover, she was certain she knew more than her potential students, and stated "I wanted the challenge. 'Cause I knew I'd get more from it, too" (Interview transcript, May 20, 2003).

This willingness to accept challenges was also borne out in her acceptance of a full time high school position for next year. She agreed to give up her advanced homogeneous middle school French 1 classes, which she has taught for three years, in exchange for heterogeneous high-school classes of French 1 through 5. Mrs. Gilbert expressed some concern about her ability to meet the needs of a group of diverse learners, but had already established a game plan. She had made arrangements with a Spanish teacher at the high school to "drain her brain" this summer. Mrs. Gilbert

planned to quiz this highly experienced and successful teacher on how to best work with these students.

Underscoring Mrs. Gilbert's willingness to accept challenge seemed to be interest in the topic and curiosity. If given the opportunity to teach any class any subject other than French, Mrs. Gilbert expressed an interest in teaching history or reading, stating how much she loved both subjects. "I love history. It was always my best subject in school" (Interview transcript, May 23, 2003). She also stated that she could not teach mathematics, art, music, or most sciences. Interestingly, she agreed that she could teach business, in which she had a Master's degree, but that she had no interest in it, "…I think it's boring. I don't think I'd want to do it" (Interview transcript, May 23, 2003). Mrs. Gilbert's curiosity was revealed when she described her interest in working with special education or really low ability students.

> … I would like just the experience of working with special ed, I don't think I'd be really good at it, maybe, but I'd like the experience of it, to see, and I wouldn't mind working with a very low ability class, too, on something, I'm not sure a foreign language is the right thing, but something, just to get a feel for that, to get some experience. I guess I'd want to do it more for the experience, to see what it's like. Because I've never worked with really low kids before (Interview transcript, May 23, 2003).

From these remarks, Mrs. Gilbert revealed that she was willing to accept challenges and that she was often guided by her interests despite her knowledge level. For instance, she stated that she had no desire to teach business, a topic for which she

knowledge but no interest. In contrast, she was very interested in working with a special needs population, despite her lack of training and belief that she might not be good at it. Thus, her responses revealed curiosity, confidence, and a willingness to engage in pedagogical risk-taking.

Knowledge. Mrs. Gilbert expressed the belief that organization, child psychology, and subject matter knowledge were vital to successful teaching. Specifically, she stated that planning well and being organized are crucial components of teaching, but did not elaborate on this point. Instead, she turned her attention to knowledge of students. Throughout our discussion, Mrs. Gilbert referred to her students, their talents, needs, and common traits as the basis for her decisions. When she articulated knowledge of children as a necessary component of a teacher's knowledge base, this fit well with the presentation of information she offered. Mrs. Gilbert stated, "I think you have to know something about child psychology, and how kids operate. I mean, if you're clueless towards children, and what motivates them and what they like and what they don't like, I don't think that's gonna work" (Interview transcript, May 22, 2003).

Knowledge of subject matter was articulated as important by Mrs. Gilbert and was often a recurring theme in her discussion. The lack of knowledge, specifically of sophisticated French grammar, often seemed a source of trepidation, while having knowledge was considered an asset. Mrs. Gilbert revealed that teaching grammar to the higher ability levels was harder, and that she did not always have the answer to some of the more involved questions. She stated her belief: "So that's, that's why it's

harder, I guess. 'Cause I don't know it 100%" (Interview transcript, May 22, 2003). However, Mrs. Gilbert also contended that lack of knowledge was not the real problem; instead, she felt it was a lack of time. "I wish I had more time to like, say, [study] some particular points of grammar, just study them myself, more. But I put in like 2 to 3 hours a night, anyway, on all my work and I just can't do any more" (Interview transcript May 20, 2003). These comments do not offer a clear view of how Mrs. Gilbert interpreted the meaning of the word knowledge. She claimed that she wanted more time to study the grammar, but that the problem was not a lack of knowledge. It could be that she discriminated between knowledge as understanding the content, which she most likely did have, and knowledge as being able to articulate the content freely without hesitation. Regardless, she only made these types of statements relative to her knowledge of complex grammar necessary for the upper-level classes. In fact, she expressed the belief that she was quite confident teaching all areas of French 1: "Gosh, I know so much more than they do." (Interview transcript, May 20, 2003).

When asked which area of French she most enjoyed teaching, Mrs. Gilbert responded, culture, and gave the following reason. "Because I know a lot about French culture, because I, I lived in France a year and a half, I traveled all over Africa for my past career" (Interview transcript, May 22, 2003). Additionally, Mrs. Gilbert shared with me that her students have also been impressed with her knowledge of culture. "The kids have said to me, they, like at the upper levels, 'You know culture a lot, Mrs. Gilbert.' They remarked that to me. They felt I was very strong in that area"

(Interview transcript, May 22, 2003). So for Mrs. Gilbert there seemed to be a connection between the subject she most enjoyed teaching, her estimation of it as something she did well, and her knowledge of that particular content area.

Beliefs. Mrs. Gilbert articulated two clear sets of pedagogical beliefs relative to the importance of student-teacher rapport and the use of class time. First, Mrs. Gilbert asserted the belief that students will perform if they think the teacher cares.

> 'Cause I really feel that one of the things that helped me be very successful with these kids, that they work hard for me and, and they want to learn, is that they, they know I care about them and I like them and they like me, and they want to please me. I mean, they do really good work 'cause they want to please me (Interview transcript, May 22, 2003)

Thus, Mrs. Gilbert endeavored to establish a common ground with the students, to be sociable and to build a rapport. Her belief in the importance of this relationship was furthered by observations of her own son and his responses to teachers. "I see with my own son, the classes that he works the hardest in, are the one where he likes the teacher the most, and who's motivated him the most (Interview transcript, May 22, 2003).

Mrs. Gilbert also forwarded a belief in the importance of direct instruction in her French classes. She explained how important she felt her time with the students was, and that she could not imagine having the students come in and just do written work. Instead, Mrs. Gilbert declared, "I want to take advantage of them [students] being in my presence to, to practice speaking, listening, share what I know, and to be

evaluating them instead of just writing" (Interview transcript May 20, 2003). Mrs. Gilbert also discounted group activities as a common practice in her classroom, stating:

> …in my education, they talked a lot about using cooperative learning groups and all. And I find that a lot of times when they do that, they get off-task, someone's not working as hard. Even if you do all the things you're supposed to do with groups, I just found sometimes I don't think they get as much out of it as if it's direct instruction, or just with a partner. The quick thing with a partner. So I do it sometimes, 'cause it's good to vary, but I don't do as much of that. Because I just don't think it works as well (Interview transcript, May 20, 2003).

In conjunction with a focus on direct instruction, Mrs. Gilbert also contended that, "I find the best thing is a busy lesson plan" (Interview transcript, May 20, 2003). Together these statements reflect that for her teaching purposes, Mrs. Gilbert believed that a busy, active class in which the students were verbally engaged with the teacher was the preferred teaching environment. Additionally, cooperative grouping techniques should be used rarely as students tended to get off task and did not learn much from the experience.

Mrs. Gilbert also reflected on the nature of teaching itself. Particularly, she questioned whether teaching was a skilled profession that could be learned or a gift you were born with. This question came to her when her mentor teacher told Mrs. Gilbert, "I think you're a born teacher" (Interview transcript, May 22, 2003).

Reflecting on this question, Mrs. Gilbert acknowledged that there might be truth to both sides. She contended that a born teacher was someone who was "curious … and enthusiastic about learning. And that you have good interpersonal skills" (Interview transcript, May 22, 2003). Mrs. Gilbert suggested that these were traits a person was born with that would enable them to be a good teacher. However, she did not discount that teaching also involved a set of learned skills. For example:

> I had to learn how to make a lesson plan. You know, how to make a unit plan. I had to learn about different theories of intelligence, I didn't know that. I had to learn about classroom management, what works best, what doesn't, time management. I had to learn about the special ed laws, and, I don't think I could have done as good a job without my training at W------- (Interview transcript, May 22, 2003)

These comments demonstrate Mrs. Gilbert's belief in the importance of the training and education for teaching that she experienced. These comments as well demonstrated the reflection Mrs. Gilbert routinely engaged in, with regard to the teaching process.

Mrs. Gilbert also offered a description of good teaching. She stated that good teaching was to make someone want to learn and explore something, to set examples, to model things, and to have the learners repeat it back. She also described a good teacher as fair, flexible, creative, hard-working, and able to adjust to meet student needs.

Mrs. Gilbert described a Spanish teacher in the high school as "very successful" and was therefore going to seek this teacher's advice. When I asked her how she knew this teacher was successful, Mrs. Gilbert responded: "Because, well, they show the test scores…it's the results on the tests" (Interview transcript, May 22, 2003). Here she was referring to the students' scores on the National Advanced Placement test as the means to evaluate successful teaching.

In another conversation, Mrs. Gilbert evaluated herself as a good teacher, stating, "I already know I'm a good teacher. I've been evaluated like 25 times, 'cause I'm in the school system, and I've always gotten Excellents, and, so I know I'm a good teacher" (Interview transcript, May 20, 2003). To summarize, for Mrs. Gilbert, successful teaching was determined by students' performance on a national exam and the quality of teaching was determined by official evaluations of teaching practice.

Summary

Ms. Gilbert's excitement and enthusiasm for teaching might be rooted in the fact that this was her fourth year of practice after waiting 27 years to fulfill this dream. Teaching was something Mrs. Gilbert wanted to do when she first graduated college in 1976, but she was told the market was glutted and, therefore, did not go into the field. Five years ago, after working at many jobs such as: a bilingual secretary, a full-time mother, a real estate agent, and an adult English as a second language instructor, Mrs. Gilbert decided to go back to school to become a classroom teacher. The result of this decision to teach was clear in her statement, "And I love it! I love it more than

anything I ever did. It's like oh my gosh…My whole life is teaching. You know, that's my life right now" (Interview transcript, May 20, 2003).

Mr. Lyons

Introduction

When I met Mr. Lyons, he was a 53-year-old high school Yearbook and English teacher, as well a Chair of his school's English department. This was Mr. Lyons's nineteenth year of teaching, during which time he had taught a number of courses at the high school (e.g., English 1, Advanced English 1, American Literature, the Bible as Literature, and Yearbook) and middle school level (English, Social Studies, Mass Communications and Yearbook). Mr. Lyons, like Mrs. Gilbert and Ms. Roarke, attained a high score (17) on the demonstrated knowledge measure of the quantitative test battery. However, Mr. Lyons reported a high overall efficacy score (8.79) with equally high response for instructional practices (8.90), classroom management (9.00), and student engagement (8.33). Based on the cluster analysis procedures he was in the moderate to high knowledge group with Mrs. Gilbert.

Mr. Lyons held a Bachelor's degree in English and a Master's of Science in Curriculum and Instruction. He reported having pursued continuing education in real estate and property management, and attended at least one or two professional conference or workshops a year. He described these conferences as "anything on brain-based learning." Mr. Lyons also reported that he regularly read research articles, books on teaching, school district newsletters, and books related to his content area.

The high school at which Mr. Lyons taught was located in a rural community approximately one and a half hours from two major metropolitan centers. This high school was one of three that served this community and had a large student population. The school served a fairly homogeneous group of students with respect to their ethnic backgrounds. However, these students did vary relative to socioeconomic status.

Mr. Lyons taught two classes at this school and was Chair of the English department. He taught a semester course on Yearbook for students in grades 10-12. In conjunction with this, Mr. Lyons also supervised several students on an independent study for the purpose of creating the school's first-ever interactive CD, yearbook supplement. Mr. Lyons also taught one section of Advanced English 1 for freshmen.

Narrative

I entered Mr. Lyons's classroom for my first observation at 8:20 on a Thursday morning. His classroom was located on the first floor of the sprawling high school building. Mr. Lyons's classroom was at the end of a hallway across from the school library. This was his domain, as the Yearbook moderator, the epicenter of all things yearbook-related. The rear portion of the room, blocked off by a partial wall, housed several computers for the yearbook staff. Across from this area, just to the right of the only door to the classroom, sat Mr. Lyons's desk, which was streamlined to the bare essentials, his plan book open to this week's lessons, folders containing handouts he would use later in class, and a neat stack of papers. The larger portion of the room contained student desk-chair combinations. There was a floor-to-ceiling blue

chalkboard in front of the students' desks, and on the adjacent wall was a typical-size green chalkboard. On this second board, written in neat block letters, was information for each of Mr. Lyons's classes: the data, materials needed for class, outcomes, and homework. Just inside the door to the left, was a wall-mounted telephone.

When I entered the room, Mr. Lyons's first class, Yearbook, was already in session. Students had placed themselves around the room. Some worked in pairs, or triads. Others worked alone. Some were in the back area working on the computers; some sat on the floor. The students working in groups talked quietly. As students worked, they approached Mr. Lyons or called him over for assistance. Mr. Lyons addressed the length of one pair's paragraph, asking them how long they thought it would be once it had been typed. The students determined they needed to write more. Another student, working alone, looked up and asked Mr. Lyons for the correct spelling of "frenzy," to which Mr. Lyons replied, "I wonder, if I wanted to spell a word, where could I find out how?" The student, with a typical adolescent sigh, got up walked to the shelves in the back of the room and began flipping through the dictionary.

Mr. Lyons roamed the room, listening in on student pairs, checking progress. He stopped by where I sat next to the door, and filled me in on the current events of the class. First, there was a sophomore class meeting that morning, so the overall class size was depleted. Second, the students were writing practice spreads for the yearbook,

with a focus on using the active voice. He then returned to addressing student questions and offering advice.

At 8:37, Mr. Lyons called the entire class to attention. The students remained where they were, but ceased talking and turned toward Mr. Lyons. Students in the back of the room got up from the computers and moved to where they could see their teacher. Mr. Lyons reminded students that as journalists they need to break a "bad habit." He asked the class how many sentences there should be in a paragraph for literature. A student replied with the standard, five to seven. Mr. Lyons then followed with, "How many paragraphs should there be in a news article?" This question was met with silence; some looks back and forth, until the same student offered, "One or two?" Mr. Lyons responded in agreement and discussed in detail for about five to seven minutes the need for shorter paragraphs in journalistic writing, using examples from the students' work on the yearbook to emphasize his points.

A short time later, the sophomores joined the class. With the infusion of these students the activity increased. Students who had been waiting for their partners now located yearbook passes, filled them out, asked for them to be signed. Then they grabbed cameras from the cabinet and took off to interview and photograph. As each pair or a representative from the pair approached Mr. Lyons with their pass to be signed, he quizzed them, "You're going where? …Does she know you're coming?...What will you do when you get there?..OK." He seemed able to keep track of which students were going where, why, and when they should be back. Later, when these students returned, each offered a brief report of the success of their mission.

The students remaining in class continued with their work, bringing copy up to be checked. At 9:10 a student brought up a new layout design for Mr. Lyons to approve and offer input. Mr. Lyons looked it over and asked a series of questions about the design, to which the student answered. Skimming his hand over the page, Mr. Lyons offered advice and praise on the different aspects of the layout, then ended by telling the student to just put it away for now and look at it again tomorrow.

At 9:12, it was time to clean up. Students were directed to put their folders away, as well as any sections of the yearbook they had out. Many students continued to work, talking and finishing up last minute details. After a moment, Mr. Lyons whistled, to gain the students' attention. "Listen up!" He then reiterated the directions for the assignments they had been completing. Each group was to decide which copy to turn in for grading. He stopped talking and waited. "Am I talking? Yes, I am." Silence and attention from the class followed. The same points were restated. In addition, he reminded students to put their folders away. "Make sure your folders are away. My Mod 2 kids find your stuff all the time and I tell them, 'Throw it away!' That's mean, isn't it? No. If you leave it, then you don't regard it." Pause. "Actually, if it looks valuable, then I'd probably save it, and let you buy it back." The students put their things away and prepared to leave the room.

At 9:20, the bell rang, heralding the start of Mod 2. The yearbook students filed out, and the freshman of Mr. Lyons's Advanced English 1 trickled in. Mr. Lyons stood outside the classroom door and greeted students, both coming into class and just passing in the hall. As one female student entered, she mentioned the difficulty she

had in reading Shakespeare, (the previous night's homework) so that she finally had to just read it out loud. Mr. Lyons responded by agreeing with her that it could be a challenge and that the reading it aloud was exactly what he did as well. Further, he asked the student to remember this point, so that it could be brought up later with the class as a whole.

The class filed in, students read the board, gathered their materials, gained their seats, and waited for class to begin. The class followed the progression of outcomes listed on the board: *Odyssey* essay materials, vocab review, discuss end of Act I (of *Macbeth*), begin scene re-write. Mr. Lyons opened class with explicit instructions on how students should organize their *Odyssey* materials in their folders (i.e., final copy, graphic organizer, rough draft, and peer evaluation.) Students were told to keep the assessment rubric in their reader's journal with their Shakespeare materials. This rubric, Mr. Lyons explained, would be used for every response the students wrote until the end of the year. Mr. Lyons then walked them through the rubric and explained why he would be using it as an assessment tool for their future work.

At this time, 9:30, I needed to meet with another teacher, so I slipped quietly out of the room. When I returned thirty minutes later, I found a uniquely different class from the one I had observed previously. Now, Mr. Lyons sat, with the chair turned backwards, at the front of the room, a copy of *Macbeth* in hand, and led a discussion of the three witches with the class. The class was quiet, tentative, and Mr. Lyons watched them closely. When he asked a question, students replied softly, and his attentiveness was necessary in order to capture nods of agreement or dissent. With

a little prodding and encouragement however, the students shared ideas, but they seemed to need the support and guidance that was being provided. Comments from the students received feedback that included an explanation of why their responses were on target or not. Often students were called on to respond to each other's remarks. For example, Mr. Lyons restated one student's comment and asked another's opinion on it.

The next step in this unit was to move on to Act II. The students were told that for Act II, they would work in groups, and each group would re-write a scene from Act II into modern English. Mr. Lyons had the directions for the assignments written out for the students, and he also went over them step by step, offering examples when appropriate. Specifically, the students were to re-write the scene, translating, not condensing it, prepare to act it out for the class, and plan on using appropriate props for their performance in class tomorrow. They did not have to memorize the parts, but neither could they just stand and read it dryly; they were to read their scripts with feeling. The students were told that they could move to wherever they wanted in the classroom, and one group – not the same one as yesterday – could go into the hall. The remainder of class was spent with the students working in groups and Mr. Lyons moving from group to group, offering support and advice.

At 10:25, after assisting several groups Mr. Lyons remarked to me, "This is tough, it might take a little longer." After this comment he moved on to assist one of the students with a question. Mr. Lyons asked the students to stop at ten-forty-two, to gather their books and return to their seats. He announced, "Class isn't over. I just want to talk to you." He used this time to inform the students that they would

continue working on this tomorrow and to bring their props into class. Additionally the students were advised to read the play aloud, that Shakespeare must be heard, be seen, not read.

Prevailing Disposition: Confidence

Mr. Lyons exuded the confidence born from almost 20 years' experience in teaching. He had worked with middle school and high school students as an English and Mass Communications teacher for the majority of his adulthood. Whether discussing teaching, his teaching process, or the learning of his students, Mr. Lyons revealed a deep level of confidence and motivation for his ability to successfully fulfill his role as teacher based on his own experience and lessons learned. In our first meeting together Mr. Lyons described his motivation and attitude towards teaching and life.

> I'm an extremely motivated person. I get here at five o'clock in the morning, and I don't leave until four or five. Why? Because that's what you have to do. I don't do it because, I'm not bragging, that's not, that's not it, you know. What I'm saying, it's, I'm stating it to you factually. If it's what you have to do, if it's what you perceive has to be done, then that's what you have to do, period. And it's as simple as that. You know, I base my whole, I base my whole reasoning of anything I do on exactly that. (Interview transcript, May 6, 2003)

This statement revealed the commitment Mr. Lyons had to his position as a teacher. Moreover, it reflected Mr. Lyons's general disposition toward his work. If there was a need, something you saw needed to be done, then you filled it, and did

whatever it took to do it well. As Mr. Lyons discussed teaching in general and his own work in particular, two themes emerged: first, the overriding conviction that perceived need should guide instruction and second, a sense of confidence that he could meet the needs that appeared before him.

When asked what guides the pedagogical decisions he makes in the classroom, Mr. Lyons answered succinctly, "Perceived need" (Interview transcript, May 6, 2003). He explained that what guided his choices in the classroom was not the curriculum guide or a formula identified by the state, although he did refer to these sources. Rather his decisions were based on the needs of the students he was teaching. For example, Mr. Lyons explained that his advanced English 1 students were very strong in grammar (e.g. parts of speech and sentence structure). So at the beginning of the year, he skipped that content area. Instead, he focused on their analytical skills and interpretation of texts.

This was Mr. Lyons's first year as the Yearbook teacher/moderator, and he had made many changes in how things were done, again based on what he perceived as the needs of the students and to prepare them for the future. For example, he garnered funds from the administration to replace all of the computers with new personal computers. Additionally, he decided to institute a new component to the yearbook–an interactive CD supplement. He gave two reasons for this decision. The first reason was that the interactive CD was the wave of the future, was more economical than the traditional yearbook supplement, and it allowed for as many as 1,800 screens. Mr. Lyons also provided a second answer.

> …because it's there, because it's like a mountain, you know, you climb it. You know, if you have ability as a climber then, you know, you should be looking at things that are gonna refine your abilities, and that are gonna challenge you, they're gonna challenge me as a teacher, they' re gonna challenge these kids. Kids who are challenged, kids who are engaged, truly engaged at something, are going to learn something (Interview transcript, May 6, 2003).

These examples revealed the marriage between pedagogy and confidence in Mr. Lyons's teaching process. He described himself as motivated, as a challenge-seeker. But, for every challenge he identified that affected his classroom practices, there also existed a logical, thought-out pedagogical purpose. Further, Mr. Lyons's comments revealed a deeply rooted belief that people are in a constant state of formation, and that we must continually seek to improve ourselves. He stated that he did not want to feel comfortable because comfort or complacency "…is an academic killer. I think it's an intellectual killer. I think it's a psychological killer" (Interview transcript, May 20, 2003). The statements he made about himself as a teacher, looking for new challenges, changing schools or subject matter every five years, demonstrated his commitment to ensuring that he would not experience complacency. Mr. Lyons described how these beliefs were manifested in his life.

> You know, you're a work in progress, until you close your eyes. You know, and that's it. That's what I believe. So I just act in accordance with what, I act

> in accordance with what I believe. That's pretty much how I govern myself. It's what governs everything (Interview transcript, May 20, 2003).

Efficacy, Knowledge, and Beliefs

Efficacy. Of the three teachers I observed and interviewed, Mr. Lyons demonstrated the highest efficacy on the quantitative measures (M=8.79). Thus, the prevailing disposition of confidence and challenge seeking described in the previous section seemed to coincide with his reported efficacy beliefs. One of Mr. Lyons's most telling efficacy statements was quoted above, "…you know, if you have ability … then … you should be looking at things that are gonna refine your abilities, and that are gonna challenge you …" (Interview transcript, May 6, 2003). With this statement, Mr. Lyons seemed to highlight the traditional view of self efficacy: if you can do it, if you are able, then you identify and seek challenging tasks. Here Mr. Lyons couched the efficacy statement with "should." However, the strength with which this statement was made, in concert with Mr. Lyons's other statements, supports the interpretation of "you should" as "you do," or at least as something he did.

Throughout our conversations, we talked about Mr. Lyons's recent pedagogical decisions, long -term plans for the students, and goals for his own career. During these conversations, Mr. Lyons's efficacy for fulfilling his role as teacher was evident. His classroom decisions were based on what he felt would work best for his students, regardless of the challenge, effort, or flexibility he needed to exert in order to make the experience effective for his students. This belief was demonstrated in his Advanced English 1. First, Mr. Lyons decided to have the students translate Act II of

Macbeth themselves in small groups. Mr. Lyons described his reason for implementing this activity.

> …learning takes place across a broad range of situations and contexts, and that this, today, was probably more of a learning experience than the three or four days we've been looking at *Macbeth* than they've had up to this point. And that for them to put together Act II, scene by scene, act it out for one another, you know, in the manner in which they're doing it, is gonna have a lot more power (Interview transcript, May 15, 2003).

What this statement did not reveal was the effort Mr. Lyons exerted during class to assist the students with this assignment. For the 30 or 40 minutes the students engaged in this activity, Mr. Lyons never sat down, responded to the same question from different students multiple times, and maintained an awareness of the each groups progress. Observing this class, I was reminded that for success in cooperative group activities the teacher must be involved. Certainly, given his expertise in the content, it would have been a simple matter for him to lecture on Act II, rather than endeavor to manage these multiple groups and ensure that each developed an accurate understanding of the scenes.

Second, about 20 minutes into the activity, Mr. Lyons realized that he would need to adjust his schedule, because the assignment was going to take longer than he had planned. What he had intended to be a two-day activity (i.e., translate one class and act out in the second class) ended up taking four days to complete. Mr. Lyons could have chosen to end the activity early. Instead, he persisted and continued to help

the students to develop a deep understanding of the play. I felt his persistence was rooted in two beliefs. First, he believed that this activity was an important opportunity for the students' learning. Second, he recognized his own ability to alter plans, make adjustments, and provide the extra support the class seemed to need.

Mr. Lyons expressed a low-efficacy belief only once in our conversations. I asked him to contemplate how he would respond to the hypothetical situation of being assigned to teach first grade in the fall. Mr. Lyons offered a quick and decisive response.

> I won't do it. I'm not trained to do it, number one, I have no desire to do it, number two, don't have the expertise to do it, and I think all those things put together would conspire to make me not have a very successful experience in doing it (Interview transcript, May 27, 2003).

This response demonstrated the integration of interest (desire) and ability (expertise) in formulating Mr. Lyons's reaction. What is unclear is which, if either, held greater sway over Mr. Lyons's decision. If Mr. Lyons had expertise but not interest, or the reverse, would his response have been different? Mr. Lyons's addendum to his refusal to teach first grade suggested that he was open to change if it was within his area of expertise.

> …if they came to me and said, well, you know, you've taught yearbook and Advanced English 1 for the past three years, what we need you to do is teach yearbook, but we want you to teach Brit Lit, or we want you to teach a Survey of American Lit, I'll do that. Matter of fact, I am doing it next year. So I'm not

> averse to change, but that's, that's just – it doesn't make sense. It would go beyond my training. The classes that I have taken, the studies that I have undertaken were all about the adolescent mind, and not about the pre-adolescent mind (Interview transcript, May 27, 2003).

Thus, his decision to take on new tasks was framed within his existing areas of expertise, areas for which he had knowledge, training, and experience. Moreover, when stating that he would not teach first grade, Mr. Lyons commented that his lack of desire, training, and experience would conspire together to ensure a less than successful experience. In contrast, teaching an alternative course in his area of expertise was a welcome and sought-after experience. This demonstrated the importance of knowledge of content and students for Mr. Lyons's feelings of efficacy and, in turn, his likelihood to engage in particular teaching tasks.

Knowledge. Mr. Lyons articulated three areas of knowledge that were necessary for successful teaching: knowledge of students, knowledge of content, and conditional knowledge or timing. Mr. Lyons expressed the belief that knowing one's students well was a critical component in teaching. He described this as knowledge of the particular learners in the classes to be taught rather than a more general sense of the students' developmental stage. He cautioned that knowledge of students was something that changes every year. However, he argued that the means by which you learn about those students did not have to change. Mr. Lyons suggested that there were instruments in place (e.g., preassessments) that could be used to identify what the students need.

The second knowledge area Mr. Lyons felt was critical in teaching was knowledge of subject matter. He stated, "… I think it's very important. You know the more specific your knowledge can be the more effective you can be as a teacher" (Interview transcript, May 27, 2003). Mr. Lyons also expressed the belief that the more knowledge he had of a subject, the better able he was to teach it. As he stated, "…the more one understands something, the more approaches there could be to, you know, help someone else gain an understanding of it…" (Interview transcript, May 20, 2003). Mr. Lyons did caution, however, that an extensive knowledge base was good, providing it was not used as "fancy foot work or something to impress someone." Instead, extensive knowledge was good to the extent it was used to "…help someone gain a better understanding of it themselves, so it's a matter of how you use the knowledge" (Interview transcript, May 20, 2003). Thus, Mr. Lyons identified subject matter knowledge as critical to learning, but also cautioned that how one used that knowledge was also important to the teaching endeavor.

> The final area of knowledge Mr. Lyons described as important was timing.
>
> …knowing when to keep going with something, when something is really going well and it's really, you know, continuing, or when to stop, cut bait, and go on to another thing. Even if it's, even if it means you abandon something you made great plans to do, … that's something very difficult to learn, but, again, very essential (Interview transcript, May 27, 2003).

Mr. Lyons described this notion of timing as "everything." He highlighted the importance of a teacher being willing to change plans and adapt to the needs of the students. This was a belief he himself demonstrated in practice with his own class, when he extended the translation of Act II to meet the abilities of his students. Mr. Lyons also acknowledged that this was not an easy skill to learn and was probably something that could not be taught in school. Still, it was essential for successful teaching.

Beliefs. Mr. Lyons expressed three themes related to pedagogy that could be described as: a) interest is necessary for learning; b) assumptions can be detrimental to effective teaching, and c) teaching is an ability you are born with. Each perspective was articulated throughout our discussions; further, Mr. Lyons often spoke of them as intermeshed beliefs that worked cohesively with one another.

Mr. Lyons expressed the view that the realization that "..all learning is sparked by interest…" was one of the most important things he had learned about the teaching process (Interview transcript, May 27, 2003). He elaborated on this belief.

> …the extent to which any person learns something is the extent to which he or she's interested in it, that's an immutable truth. It goes from, it goes probably from the age of two, when we become cognizant of what we learn, maybe and why we learn it, all the way up until we close our eyes. … And the extent to which any student is going to learn something is the extent to which you can draw him into it, you know, the extent to which you can interest him in learning it. …

> When I started looking at the learner, finding out what their strengths and weaknesses are, what their interests, and where their interests lay, and then just kind of selecting things that enfranchise their interests more, I saw the level at which they participated, the quality of the work that they did, you know. It all increased (Interview transcript, May 27, 2003).

Mr. Lyons described this revelation as an epiphany. He revealed that during the first five or six years that he taught, he allowed himself to be guided by the curriculum rather than what he perceived to be the interests or needs of his students. However, when he began to consider the learners' interests, strengths, and weaknesses, he observed that they participated more and that their quality of work increased.

Mr. Lyons expressed the belief that it was his responsibility as the teacher to motivate students to want to learn about his subject area. Mr. Lyons quoted a colleague (i.e., "You gotta bring it to them") to describe his belief that motivation was a necessary component to teaching, especially in this English class (Interview transcript, May 15, 2003). He elaborated on this statement, using his own practice that day as an example:

> You know, you bring *Macbeth* to these kids. And that's what I was doing. You know, trying to make it something a little more, snappy. Trying to be a little funny with it, but at the same time, say, okay, let's look, let's go back. Let's revisit the psychological implications of this (Interview transcript, May 15, 2003).

Mr. Lyons also expressed the belief that assumptions about students, their abilities, and what they might have gained from a lesson could be detrimental to teaching. For example, Mr. Lyons stated that to assume what students could do or had learned based on the classes they have taken previously was "foolhardy." He described learning as akin to going to a restaurant, where the learner selects things off of the menu and those selections are what the learner remembers. Given this understanding, Mr. Lyons assumed that students came with varying skill levels and that, as the teacher, he must first ascertain what those levels were and what needs the students had.

Mr. Lyons also cautioned against assuming that all students gained the same learning from the same experiences. Specifically, he stated, "…you can't make assumptions about what someone's going to take away from something, or how quickly that person's going to learn it" (Interview transcript, May 27, 2003). Additionally, Mr. Lyons stated that it was the teacher's responsibility to ensure that all students learned the content. He stated that teachers could not avoid responsibility with claims that most of the students learned the material. Rather, teachers must attend to the needs of their students, adjust their practices to meet those needs, and accept that not every methodology will work equally well for each student or student group.

Mr. Lyons also expressed the belief that teaching was, "…something that someone is born with an ability to do. I don't think you can learn that." (Interview transcript, May 15, 2003). He did acknowledge that this was a craft that could be perfected, that there were tricks and skills to be learned over the course of time;

however, the central aspects of teaching were ingrained. Mr. Lyons contended that, "…going to school to learn about how to teach is relatively worthless. It's the experience of teaching that has the greater worth" (Interview transcript, May 20, 2003). Additionally, Mr. Lyons stated that, "Teaching has to be something you love, and the entertainment and the being up in front of the class. I mean, I, truly, like what I do" (Interview transcript, May 15, 2003). Thus, teaching from Mr. Lyons's perspective was more like a talent that could be honed or trained, but not learned. Further, to pursue this talent as a career, teachers needed to love, enjoy, and want to engage in this work.

According to Mr. Lyons, a good teacher was one who knew his or her learners and based instruction on that knowledge. Mr. Lyons evaluated good teaching based on the extent to which students were engaged and paying attention to the class proceedings. He described a list of specific, observable behaviors he would look for as a classroom observer. That list included looking at the students' posture; the extent to which the students were on task, the age-appropriateness of the lesson, how well aligned the class was to the curriculum goals, and the teacher's online assessment of student understanding.

Mr. Lyons expressed the belief that he taught poetry best out of all the content he covers. When asked how he knew that he taught this area well, he responded:

> Because I can get people who aren't interested in it to be interested in it. … teaching is like sales, you know, you're selling past the objection. … And, if you know that people are reluctant to look at something, or they're reluctant to

> pick it up on their own, the fact that you could get them interested in doing something like that on their own is a good thing. You know, you're having a lot of success (Interview transcript, May 20, 2003).

Thus, in the evaluation of his own teaching, Mr. Lyons relied on the extent to which he could get students interested in a topic (e.g., poetry), despite their lack of initial interest in it. He also articulated another method of assessing his own practice. Mr. Lyons contended that one should get feedback from one's own students. He believed that student feedback, when given honestly by the students, was constructive and helpful to the teacher. Additionally, he contended "You know, I think if you're not eliciting feedback from your students, then you're missing a great deal of opportunity to experience professional growth" (Interview transcript, May 20, 2003).

Summary

Of the three teachers interviewed Mr. Lyons had the most experience and demonstrated the greatest degree of confidence in teaching. He was not only willing to take on challenges but often sought them out, guided by the belief that complacency was a killer of his professional growth. Further, Mr. Lyons expressed the belief that if he perceived a need and had the ability, then he had no choice but to step in and complete the task. This was why he became the yearbook moderator and the department chair. At the time of our interviews, he was interviewing for assistant principal positions.

However, in the face of this confidence and practical approach, one should not ignore Mr. Lyons's genuine love of teaching. He expressed enjoyment of what he

does, anticipation for going to school each day, and a willingness to put in the hours he believed necessary to teach his students well. While Mr. Lyons was looking for an assistant principal position, he also acknowledged that he had some minor reservations rooted in his love for his present position. He expressed that he really liked working with these students and that, if he did not find an administrative position, it would be fine with him. Mr. Lyons expressed this enjoyment of his work as a combined achievement of challenge and appreciation of the results.

Mr. Lyons described his experiences in working on the yearbook as multifaceted, fast- paced, and full of decisions. Moreover, he described working on the yearbook as empowering, that anticipating and dealing with the numerous problems that could crop up on any given day provided excitement. Specifically, he stated, "It [yearbook] makes you feel, … great, because you were able to … figure out some way of dealing with it, and ultimately, you conquer it…I get a rush out of that" (Interview transcript, May 15, 2003). Mr. Lyons also expressed an enjoyment of teaching English. Specifically, he underscored his own belief in the importance of engaging students in the topic. He stated, "…the extent you can find things that all kids would be interested in, yeah, it's great. There's a lot of magic there" (Interview transcript, May 15, 2003).

Emergent Themes

Each of the teachers interviewed and described here offered unique perspectives on teaching, motivation, knowledge, and pedagogical beliefs. These case studies were intended to provide rich detail for this investigation and offer insights

into teacher efficacy, knowledge, and pedagogical beliefs. These teachers each expressed and also demonstrated in their practice beliefs about their efficacy, knowledge, and pedagogy. Here I briefly highlight some of the patterns that emerged across these teachers that may afford a better understanding of these constructs.

Verbalizing Efficacy Beliefs

- Efficacy beliefs were most clearly verbalized when these teachers offered reasons for not engaging in particular practices.

The current understanding of self-efficacy theory anticipates that self-efficacy, or in this case teacher efficacy, serves as a motivator that pushes individuals to action and supports persistence once a task has begun. In my interviews with these teachers, I repeatedly identified specific classroom events and asked the teacher to explain the reason for the decision made. The most frequent response to those inquiries was that their decision was based on the best instructional opportunity for the students. For example, when I asked Mr. Lyons why he chose to do the translation activity with his English class, he explained that it was the best way for them to understand the content. When I asked Mrs. Gilbert why she took the class outside to follow direction from Napoleon, she explained that she thought it would be fun and motivating. Ms. Roarke explained that she used the reporter activity because it gets the students thinking in a different way. Thus, for the most part, the reasons *for* engaging in particular tasks were not attributed to efficacy or ability beliefs.

However, when I altered the questions to address why these teachers would *not* implement particular tasks or take on specific classes to teach, efficacy beliefs seemed

to come to the forefront of their responses. Ms. Roarke explained that while she believed that teaching to students' musical intelligence was important, she would not attempt to do this. She stated that she would not attempt this because music is an area of weakness for her, and that she could not successfully incorporate it into her class.

Mrs. Gilbert rejected the possibility of ever teaching mathematics to middle school students stating: "Forget it. No way. I can't do math like that. I'm not prepared at all. I can't do it. …No way absolutely not. I'd have to quit" (Interview transcript, May 23, 2003). We see in this statement how Mrs. Gilbert's beliefs about her ability to "do math like that" directly influenced her willingness to teach this content area. Her reason for not agreeing to teach eighth-grade math was that she "can't do it;" she did not feel capable of the task.

We saw a similar pattern in Mr. Lyons's response to teaching first grade. He promptly rejected the possibility of his teaching this level of students. Mr. Lyons asserted that he did not have the training, experience, or interest in teaching that level of students. He underscored this statement by explaining that all of his experience and expertise was with adolescents, that teaching preadolescents was not in his repertoire of expertise or experience.

Thus, efficacy beliefs became clearly stated in these teachers' rejection of potential teaching situations. However, these teachers rarely, if ever, voiced an ability belief as the reason for engaging in practice. It may be that efficacy guided the initial phase in the decision-making process, in that without efficacy, a teacher will not engage in a particular activity. However, ability beliefs may not determine which

activity will be pursued. Once the teacher has identified a task as something he or she is able to do, then the decisions related to achieving the task are guided by other aspects of the situation (e.g., students' needs, interests, or abilities). In contrast, if one looks at a task and determines that it is not within one's range of abilities, then the decision process does not continue. Thus, once these teachers determined that the task (e.g., teaching fifth-grade, yearbook, or French 5) was within their abilities, their decisions regarding how to achieve the task were based on their perceptions of the situation.

The interviews with these teachers did not unearth the relation of their efficacy to the selection and rejection of specific teaching strategies for use with their current classes. I asked each teacher to explain the extent to which they weighed multiple options when creating their lesson plans. All three teachers responded that they tended to go with their first idea, that they did not spend much time considering alternatives. Efficacy belief may be at work in teachers' decisions regarding lesson planning, such that the options teachers generate are already within their ability level. The quantitative portion of this study revealed that teachers are least likely to identify strategies they would not use, or for which they have low efficacy. Thus, there may be a connection between teachers' consideration of pedagogical options and their efficacy beliefs that was not revealed in this investigation.

- Efficacy beliefs were demonstrated through these teachers' responses to potential challenges.

Each teacher expressed differing degrees of willingness to accept challenge that seemed related to their level of efficacy. Mr. Lyons seemed to be the most vocal of the three in his desire to seek out and accept challenge. He described complacency as a "killer," believed that everyone is a "work in progress," and that if you have the ability you must accept the challenge in order to hone your skills. He likened himself to a mountain climber, who climbs the mountain "because it's there."

Mr. Lyons also demonstrated a great deal of confidence in his teaching ability. With almost 20 years' experience, he had had ample opportunity to learn and perfect his craft as a teacher. He demonstrated persistence in staying with the translation of *Macbeth*, but also described a willingness to change activities if he perceived the students needed it.

Mrs. Gilbert also accepted challenge or created challenging activities. First, she expressed a desire to work with special needs students. She stated that she was not sure if she would be good at it, but that she wanted to know and to have the experience. It seemed like the push behind her acceptance of challenge was not to succeed, to reach the mountaintop, but rather to learn from the process. Additionally, Mrs. Gilbert also created challenges. For example, developing a project for her French 5 class to teach in the local second grade could be considered a brave undertaking. However, Mrs. Gilbert had the idea and ran with it. She even expressed that she did not consider the possibility that the activity would be unsuccessful. It did not occur to her. This could help to explain her efficacy beliefs. If she does not consider the challenges inherent in pedagogical choices, then believing in her ability to accomplish

the task may be easier. In much the same way, new doctoral students are unaware of the challenge of the dissertation process and yet blithely state that they will finish without problem.

Ms. Roarke reported the lowest efficacy score of the three case study participants. Throughout her conversations with me, she expressed a sense of responsibility for the outcomes that occurred in her class. For example, when the Jigsaw technique did not work in her reading class, it was because she did not implement it correctly. Or, if her students performed poorly on a test or quiz, if was because she did not teach it well. Neither Mr. Lyons nor Mrs. Gilbert expressed this degree of ownership for the lack of classroom success. This perspective of responsibility on the part of Ms. Roarke may help to explain her reported low efficacy score. By accepting responsibility she assumed that she had control of the classroom situation and student learning. If students did not succeed, she was responsible. Then when she evaluated her class and saw that students were not all succeeding, her efficacy dropped.

Ms. Roarke never made any direct statements about either seeking or avoiding challenge. When asked what other grade she might like to teach, she first pointed out that she would rather stay with her fifth grade. She was comfortable there. But, if she had to change, she would pick either fourth or sixth, because they were close to fifth. In contrast to this statement, Ms. Roarke was enrolled in a master's program and frequently tried new strategies in her class, a practice that may be perceived as a challenge.

Ms. Roarke also demonstrated persistence in spite of setbacks. For example, she described how the Jigsaw technique did not work out the first time she tried it. Still, she modified her use of the technique and tried again. She stated that if it failed a second time, she would have still tried again, because she knew it was a good technique and that she must have been implementing it incorrectly. In contrast, Mr. Lyons only stated that he erred early on in his career, and Mrs. Gilbert never expressed the sentiment that she might inappropriately implement a strategy. For example, Mrs. Gilbert stated that she did not think that cooperative learning strategies were useful for her classes. Even though there was a lot of research on it and attention given to it in her education program, she did not find it valuable in practice. She also offered the caveat: "Even if you do all the things you're supposed to do with groups, I just found sometimes I do not think they get as much out of it as when it's direct instruction" (Interview transcript, May 20, 2003).

The interesting contrast between Ms. Roarke and Mrs. Gilbert is that Ms. Roarke assumed that if the technique did not work, she had implemented it wrong, whereas Mrs. Gilbert assumed that it was the technique that did not work, despite the research and attention it had received in her education program. These different perspectives may help to explain some of the differences in the efficacy between these two knowledgeable teachers. That is, efficacy may be related to how teachers interpret events in addition to their perceptions of their own abilities.

- Perceptions of teaching as an innate ability may serve to enhance efficacy beliefs of teachers who see themselves as so endowed.

Mrs. Gilbert and Mr. Lyons both explicitly discussed whether teaching is an ability one is born with or if it could be learned. However, this topic did not emerge in my conversations with Ms. Roarke. One might extrapolate from her comments, however, that Ms. Roarke believed individuals could learn to teach or at least learn how to improve their teaching. I draw this interpretation based on her comments regarding the knowledge she had acquired in her Master's program and the extent to which she expressed the idea that these classes helped her to become a better teacher.

Mrs. Gilbert took a moderate stance on teaching as ability. She felt confident that she had learned a great deal in her preservice course work that helped her to become a better teacher. She stated that her education was worthwhile to her current practice and really helped to prepare her for teaching. She asserted that while many people claim that teaching is common sense she really felt there was valuable information to be learned, especially when put in the context of being a teacher. However, Mrs. Gilbert also felt that there might be some basic traits that would make someone a good teacher. Those traits included curiosity, enthusiasm, and good interpersonal skills.

Mr. Lyons stated point blank that he felt teachers were born, that there was an innate talent for and love of teaching that could not be taught. He did acknowledge that teachers could perfect their craft. Referring to teaching in this way, as a craft,

suggests that teaching is more like an art (e.g., acting, writing, and painting) than a science. He argued that the use of a formulaic curriculum guide would not necessarily lead to student learning and that lessons and technique needed to be adapted to each student or group of students. We see this tendency to view teaching as an art when he described the skills or knowledge that teachers must have as encompassing "timing." Knowing when to push students forward, to stop an activity, to let it go were the aspects of timing of which Mr. Lyons spoke.

These varying perspectives on teaching as ability or learned, raise the traditional debates on ability beliefs in general and Weiner's (1979) attribution theory. Mr. Lyons believed he was a born teacher. Therefore, he needed to pursue challenges and hone his abilities. It was what he was born to do. From his perspective, taking classes on how to teach was a waste of time. You honed your skills in the classroom. Mrs. Gilbert was told by her mentor teacher that she was "a born teacher." However, Mrs. Gilbert was hesitant to take on that belief. Instead, she contended that there might be particular traits one was born with that would help one to be a better teacher, but there was still much one could learn. Both Mr. Lyons and Mrs. Gilbert expressed a belief to some degree that they had a talent or gift for teaching. This belief may have served as a defense mechanism when they faced challenging situations.

- Teachers' identification of good teaching seemed reflective of their own strengths and served as the basis of self-evaluation.

Each of these teacher described different means for assessing teaching, their own in particular and good teaching in general. Ms. Roarke assessed teaching based

on the student-teacher interactions and the extent to which students demonstrated learning. She described learning as being able to apply content, skills, or strategies learned in class to another related but unfamiliar task or to the real world. Ms. Roarke made no reference to her students' test scores or the evaluation of her own teaching by an outside authority. Instead, she focused on successful teaching as assessed by student learning.

In contrast, Mrs. Gilbert stated that she knew she was a good teacher. She based this claim on the results of many formal evaluations that had been conducted on her teaching practice and the fact that she always received an "Excellent" rating. Mrs. Gilbert also felt that successful teaching could be identified by students' performance on exams such as the Advanced Placement Exam, as well as on local high-school assessments. Mr. Lyons reported a third means of evaluation, the amount of student engagement he perceived while teaching, that is to say, the extent to which he could get student interested in content that they would normally avoid.

Knowledge and Knowledge Beliefs

- Knowledge was most often interpreted to mean knowledge of students or subject matter, rather than pedagogical knowledge.

Each of the teachers interviewed expressed beliefs about the importance of knowledge in their teaching practice. Specifically, they focused on their understanding of knowledge relative to students and content. All three of these areas were reported by these teachers to be vital to successful teaching.

Knowledge of students was explicitly identified by all three participants. Each teacher described a need to know your students on multiple levels. Ms. Roarke, Mrs. Gilbert, and Mr. Lyons each addressed the need to be aware of students' developmental levels. One of the primary reasons Mr. Lyons gave for not accepting the hypothetical first-grade position was that all of his training and experience had been on and with the adolescent mind, not the preadolescent mind. In a similar vein, Ms. Roarke identified knowledge of human development for education to be an important course for preservice teachers to take.

In addition to this more generic knowledge of learners, each teacher expressed a need to know the specific students in your classroom. Mr. Lyons spoke specifically about identifying the academic needs, strengths, and weaknesses of the students in his class so that he could best teach them and provide them with assignments that were worthy of their abilities. Mrs. Gilbert described how important it was for her to get to know her students and for them to know that she cared about each of them. She believed that, if the students knew she cared, they would be more likely to perform well in her class. Toward that end, Mrs. Gilbert greeted her students at the door, discussed current events with them at the beginning of class, and attended their dances and other school events to demonstrate her caring.

Ms. Roarke expressed similar beliefs about the importance of knowing her students and establishing a relationship with them. She took advantage of the K-8 setting in which she teaches to get to know not only the students in her class, but also

the families in the school. Additionally, she used her classroom and class activities to help build community among her students.

Each of these teachers also expressed the belief that their ability to interact with their students was one of their better skills as a teacher.

Knowledge of content matter was also identified as an important component of teaching across the three participants. Each participant asserted the belief that extensive knowledge of the subject matter being taught would lead to better instruction. Ms. Roarke expressed this belief, revealing that she was able to go more deeply into the content that she was most comfortable with than she was with other areas. Mr. Lyons agreed that one could never have too much knowledge. Still, he cautioned that how one used that knowledge was equally important. Mr. Lyons contended that as long as the knowledge was not used for the teacher to show off or be arcane, then it was highly valuable.

Mrs. Gilbert also expressed the view that she valued content knowledge. Both she and Ms. Roarke reported that they taught the material (speaking and mathematics, respectively) best that they knew best. In contrast, these teachers also reported that they found the material they had the least knowledge of (grammar) to be the most challenging to teach.

Each of these teachers expressed the belief that knowledge was a valuable commodity to have with respect to teaching and one that enabled them to feel more successful. However, the quantitative portion of this study revealed a negative relation between teachers' demonstrated knowledge and their efficacy beliefs. Thus, there

seems to be a confound between these two components of this study that may be understood when one looks at the type or meaning of knowledge described in each aspect of the study. Here, the teachers interviewed interpreted knowledge to mean knowledge of students and knowledge of subject matter. In the quantitative portion of this study the knowledge assessed was for pedagogy, teaching strategies and declarative knowledge relative to the practices of instruction, classroom management, and student engagement.

Two possible explanations of these differences can be articulated. First, it may be that there are differences in the relation between knowledge and efficacy that are unique to specific knowledge content. Second, in the qualitative portion of the study, these teachers speak of knowledge of student and knowledge of subject matter as being important. However, the knowledge of these teachers for these areas was not assessed, Thus it may be that perceived knowledge has a different relation with efficacy than exists with demonstrated knowledge as assessed in the quantitative study.

- The fragility of Ms. Roarke's pedagogical knowledge may explain her low efficacy beliefs.

Based on the quantitative data, Ms. Roarke was identified as having high knowledge and low efficacy, and was included in a cluster of teachers who demonstrated a similar profile. Ms. Roarke had taught fifth-grade for 10 years. She enrolled in a Master's program approximately 9 months before participating in this study. She described her experience in the program very positively, and volunteered

that the focus of most of her courses was on becoming a better teacher and learning research-based teaching strategies. Further, Ms. Roark explained that she was learning a great deal about how to become a better teacher and that she was really enjoying this process.

Although Ms. Roarke demonstrated high knowledge on the quantitative measure, this knowledge could be characterized as *fragile* (Alexander, 2003). That is, the knowledge was new to her and while she retained the meaning of the information she might be less facile in her ability to employ that knowledge or more hesitant in her beliefs about those abilities.

In contrast, both Mrs. Gilbert and Mr. Lyons had completed their advanced study years ago. Both had had the opportunity to implement and shape the knowledge gained from their course work in their classrooms. Thus, the knowledge of these teachers was less fragile, which may be related to greater confidence in their ability to wield that knowledge appropriately.

Meeting All Needs

- The task of meeting all students' needs was raised by these teachers as an area of concern that harkens back to the quantitative findings of this investigation.

When asked what they found most challenging in their role as teacher, each teacher expressed a concern for meeting the needs of all their students. Mrs. Gilbert repeatedly expressed mild concern and anticipation for the French 1 classes she would be teaching next fall. Her French 1 teaching experience had only been with advanced eighth-grade students who had been selected for her class. Now she would be teaching

a class of diverse learners for the first time and she expressed concern for her ability to do this successfully.

Additionally, both Mr. Lyons and Ms. Roarke stated that making sure everyone was learning was a challenge they faced in the classroom. Ms. Roarke described the frustration of discovering that her students did not understand the material, while grading the exam. Mr. Lyons explained how he evaluated student comprehension and engagement in class as a means for making sure everyone was following along. But he, too, acknowledged that this was a challenge in teaching.

It is particularly interesting that this was a challenge recognized by each of these teachers, in light of the quantitative results. One of the three pedagogical vignettes assessed teachers' ability to evaluate a teaching situation that involved a highly academically diverse class. This vignette had the fewest number of strategies associated with it, and teachers reported lower levels of efficacy for being able to bring about a successful outcome. That the three teachers interviewed would express concerns for this aspect of teaching without the prompt of the vignette suggests that this may be an area that needs more attention in teacher preparation programs.

Conclusion

The descriptions offered here are intended as portraits of the relations of efficacy, knowledge, and beliefs in the practice of three teachers. Each of these teachers represented a unique compilation of efficacy, knowledge, and beliefs. What is evident from this research is that these constructs are present in each of these teachers, yet seem to hold unique relations in each teacher's cognitive system. Ms. Roarke

demonstrated the greatest amount of pedagogical knowledge and the lowest efficacy. In her, we see a teacher who was dedicated to improving her practice, accepting of responsibility for classroom practices, and willing to reflect and try again when necessary. Ms. Roarke's criteria for evaluating teaching were based on the extent to which students learned and were able to transfer that learning to new settings.

Mrs. Gilbert also demonstrated high knowledge, but this was combined with a moderate level of efficacy. Mrs. Gilbert can be characterized by her enthusiasm for teaching. She was willing to try anything if she thought it would bring about a good learning experience for her students. However, she based her success on student interest, performance on an end-of-year exam, and official evaluations of her teaching. She did not seem to ponder, as Ms. Roarke might, how well her students would fare in France. Nor did she express a willingness to persist with a strategy if it was unsuccessful. Mrs. Gilbert based many of her classroom decisions on what she thought the students would like and she believed would work. She stated that she did not do cooperative activities because the students just got off task. Although she was willing to try new things, it was unclear how she would respond if those new techniques did not work. For example, would she have her French 5 students teach second grade again next year, if there was a problem with the activity this year?

Finally, Mr. Lyons demonstrated both high knowledge and high efficacy. As a veteran teacher of 18 years, he had numerous opportunities for mastery experiences. Thus, he had firm beliefs in his ability to teach. Mr. Lyons also expressed strong beliefs about the process of teaching and the knowledge and skills needed to be

successful. As I observed Mr. Lyons teach, I was able to recognize how his combined knowledge of pedagogy and skill enabled him to coax an analysis of *Macbeth* out of some very quiet ninth-grade students. Mr. Lyons seemed able to recognize whom to push for more responses and whom to let off the hook. He was also able to adjust his plot diagram of the play when offered a better one by a student. It seemed to me that Mr. Lyons's efficacy, knowledge, and beliefs worked in concert to guide his practice.

CHAPTER VI

SUMMARY, IMPLICATIONS, AND FUTURE RESEARCH

Summary and Conclusions

This study was designed to explore several issues and address unanswered questions in the existing literature on teacher efficacy. Among those issues were the inclusion of knowledge and pedagogical beliefs in the current model of teacher efficacy, testing the relations among teachers' efficacy, knowledge, and pedagogical beliefs, and the intervening role that efficacy might play between knowledge, pedagogical beliefs, and teachers' performance. Additionally, this study explored differences in these constructs between preservice and experienced teachers as well as differences by efficacy level and in the content and evaluation of strategies generated by participants in response to pedagogical vignettes. This study also investigated the formation of teacher profiles based on efficacy and demonstrated knowledge. This summary addresses the ways in which the results reported in Chapters IV and V contribute to our understanding of these issues.

Inclusion of Knowledge and Beliefs in the Efficacy Model

Tschannen-Moran and colleagues (1998) offered a cyclical model of teacher efficacy that was rooted in the understanding of self-efficacy theory as articulated by Bandura (e.g., 1997). The present study offered an extension of this model to include the constructs of knowledge and beliefs in the process of efficacy development. This theoretical addition to the teacher efficacy literature allowed for empirical testing and a deeper understanding of teacher efficacy. Additionally, this extended model offers a

framework to be used in better addressing the needs of preservice and experienced teachers.

Chapter V described the comments of three teachers relative to their efficacy, knowledge and beliefs. Each of these teachers articulated a belief that knowledge was an important aspect of their teaching practice. Mr. Lyons, for example, demonstrated that extensive knowledge of his subject-matter enabled him to make pedagogical decisions that might be perceived as involving greater risk, because he could rely on his subject-matter expertise.

Additionally, each of the case study teachers articulated salient beliefs about the nature of teaching that seemed relevant to their efficacy beliefs. Ms. Roarke, for example, stated that her belief in the effectiveness of a particular teaching strategy often enabled her to pursue the implementation of that strategy despite setbacks that might occur. The incorporation of beliefs about the nature of pedagogical knowledge into the efficacy model offers another avenue by which teachers' efficacy beliefs may be shaped and molded to ensure more effective and successful teaching practice.

Relations among Teacher Efficacy, Knowledge, and Pedagogical Beliefs

One limitation in the teacher efficacy literature was a lack of examination of the interrelations among teachers' efficacy, pedagogical knowledge, and pedagogical knowledge beliefs. Although some research had been conducted on the relations of teachers' efficacy to a variety of proxy measures for knowledge (i.e., education level, specific courses), only two studies utilized measures of demonstrated knowledge (Schoon & Boone, 1998; Sciutto et al., 2000). Schoon and Boone (1998) focused on

subject-matter knowledge and assessed preservice teachers' efficacy for teaching science, as well as their science content knowledge. Sciutto and colleagues (2000) explored elementary school teachers' knowledge of and efficacy for teaching students with ADHD. Both of these studies found a positive relation between knowledge level and teacher efficacy.

In contrast, the present study did not find a significant relation between respondents' demonstrated pedagogical knowledge and teacher efficacy. Although measurement concerns need to be acknowledged, this lack of a significant relation should be considered in light of the type of knowledge that was assessed: pedagogical knowledge. The previous studies that assessed demonstrated knowledge explored either subject-matter knowledge (i.e., science; Schoon & Boone, 1998) or knowledge of learners (i.e., ADHD topics including its symptoms and treatment; Sciutto, 2000). In contrast, the present study looked at knowledge of selected areas of pedagogy. It may be that knowledge of teaching practice is not highly salient in the development of teachers' efficacy, with knowledge with some different nature holding greater sway. The case study teachers articulated the importance of knowledge for their practice. However, they tended to interpret knowledge to mean subject-matter knowledge or knowledge of their students. These teacher described knowledge of pedagogy as important, but only when prompted during the interviews.

Although teacher efficacy was not related to teachers' demonstrated knowledge as assessed in the multiple-choice knowledge measure, there was a significant positive relation between teachers' efficacy and their ability to provide

sophisticated and appropriate strategies in response to pedagogical vignettes. This suggests that teachers' (preservice and experienced) efficacy is related to their ability to analyze a classroom situation and identify possible strategies for bringing about a successful resolution. Again, this indicates that it may be important to articulate better the nature of the knowledge to be assessed and to identify its theoretical relation to teachers' efficacy.

Given the interest in epistemological beliefs as components of students' motivational learning systems (Buehl, 2003), it seemed that teachers' beliefs about the knowledge of pedagogy may serve as an important component of teachers' efficacy systems. However, an exploration of the teacher efficacy literature identified few studies that explored teachers' beliefs (e.g., Anderson et al., 1988; Payne, 1991) and of those studies, none investigated teachers' beliefs about teaching in general or teaching knowledge in particular. Thus, in this study I explored the potential relations that existed among teachers' pedagogical beliefs, efficacy, and demonstrated knowledge. A significant positive relation was found between teachers' pedagogical knowledge beliefs and teacher efficacy. Higher teacher efficacy was associated with more sophisticated knowledge beliefs, indicating that teachers who believed pedagogical knowledge to be important and valuable to teaching also demonstrated higher levels of teacher efficacy.

Buehl (2003) suggested that students' beliefs about the nature of knowledge influence their motivational processes; in this way, perceptions of knowledge form part of the basis for knowledge. The present study demonstrated that teachers' beliefs

about the importance of pedagogical knowledge are related to their beliefs about their ability to implement that knowledge in the classroom.

The present study also found a small, yet significant, negative relation between teachers' beliefs about the importance of pedagogical knowledge and their score on the demonstrated knowledge test. This inverse relation suggested that the participants of this study valued pedagogical knowledge more when they demonstrated less pedagogical knowledge. Thus, it may be that, as teachers gain the type of pedagogical knowledge that was assessed in this study, their valuing of that knowledge decreases, whereas teachers with less knowledge tend to value that knowledge more.

Overall the significant correlations found in this study were relatively small, indicating, weak relations among these constructs. The relations between teacher efficacy and pedagogical beliefs, and teacher efficacy and strategy awareness were .31 and .14. This suggests that there may be other factors that help explain these constructs and their relation to one another. For example, the relation between efficacy and strategy awareness is only moderately related, it may be that other factors such as effort and persistence on tasks or the value participants felt for completing the tasks presented may also be related to their strategy awareness and efficacy. It may be that these intervening factors help to better explain the relations that do emerge.

Modeling the Relations among Teacher Efficacy, Knowledge, and Pedagogical Beliefs

One of the main goals of this study was to fit the data collected to the theoretical model that establishes teachers' knowledge and pedagogical beliefs as precursors to efficacy which, in turn, influences performance. Although Tschannen-

Moran and colleagues (1998) forwarded their model of teacher efficacy five years ago, no studies were identified in the research literature that tested the veracity of this or any other model of teacher efficacy. Additionally, the model tested here was a subset of the extended efficacy model established by Tschannen-Moran et al. (1998). Thus, this exploration offered a crucial first step to exploring the role of efficacy in teachers' practice.

The data for preservice and practicing teachers were independently fit to the theoretical model using path analysis procedures. However, to achieve an appropriate level of fit, the model for the preservice teachers needed to be modified. Additionally, there were unique relations demonstrated in each model suggesting that the relations among these variable are unique for these preservice and experienced teachers. First, for preservice teachers, the path from demonstrated knowledge to teacher efficacy was dropped. This suggests that for preservice teachers, their knowledge of pedagogical practices does not affect their sense of efficacy for teaching. Additionally, two significant direct paths emerged from demonstrated knowledge to performance and from pedagogical beliefs to performance. This implied that for preservice teachers, demonstrated knowledge and pedagogical beliefs are related to performance, and efficacy does not serve as a mediator as hypothesized. Finally, the path from pedagogical beliefs to efficacy was also significant; however, the path from efficacy to performance was not significant. Thus, for these data, it seems that for preservice teachers, efficacy does not serve as a mediator, given these measurements of knowledge, beliefs, and performance.

The hypothesized model was also fit to the data for practicing teachers and was found to have good fit without any modifications. Additionally, three significant paths were found in this model. First, teachers' demonstrated knowledge and pedagogical beliefs were found covary, with a significant negative path between these two factors. Second, the path from demonstrated knowledge to teacher efficacy was negative and significant. This was in contrast to the hypothesized positive path from knowledge to efficacy.

However, a similar negative relation was revealed in the quantitative and qualitative data provided by Ms. Roarke. Ms. Roarke demonstrated high knowledge and low efficacy on the quantitative measures. In her interview comments, she revealed that she was a relatively new graduate student and that she was constantly learning new strategies in her courses. Thus, her knowledge of pedagogy was quite high. Still, her belief in her ability to perform those strategies was low. It may be that although she had 10 years of teaching experience, the information she was learning in her graduate school classes had changed her perception and understanding of what teaching is and what is required to effectively meet the tasks identified in the TSES. Thus, her new perspective may have caused lower reports of efficacy.

The negative relation between knowledge and efficacy may suggest that teachers who demonstrate higher knowledge are also evaluating teaching scenarios differently and basing their efficacy judgments on a more informed or differently informed knowledge base.

The third significant path in the model extended from pedagogical knowledge beliefs to teacher efficacy. This path is similar to the one found in the preservice teacher sample. Thus, it seems that teachers' (preservice and experienced) valuation of pedagogical knowledge is related to their efficacy beliefs.

Also similar to the preservice model, the experienced teacher model did not have a significant path from efficacy to performance. In fact, for the experienced teachers, none of the variables tested resulted in a significant path to performance. However, the model suggested that the path from teacher efficacy to performance was appropriate for the data. This lack of relation may be due to methodological factors (outlined in the limitations section) or theoretical ones.

These results of the path analysis inform the further development and refinement of a model of teacher efficacy. The key difference in the model offered by Tschannen-Moran and colleagues (1998) and the one I present here is that the new model includes the constructs of pedagogical knowledge and belief as a link between sources of information and cognitive processing. The present data for experienced teachers suggests that pedagogical beliefs and general pedagogical knowledge seem to be informative components to consider in conjunction with teachers' sense of efficacy. However, the negative relation between knowledge and beliefs, and between knowledge and efficacy suggests that there may be more to this process than is illustrated in these models. It may be that in the conceptualization of the development of teachers' efficacy we must also consider the existence of efficacy drops or doubts due to knowledge increases.

Additionally, believing that pedagogical knowledge is important had a positive relation to efficacy, suggesting, perhaps, that teachers who saw knowledge as being of value and something that could be acquired were more likely to have high levels of efficacy as well.

Comparisons between Preservice and Experienced Teachers

Previous research had explored differences in preservice and experienced teachers' levels of efficacy (e.g., Soodak & Podell, 1988). However, the research that explored these relations relied on the Gibson and Dembo (1984) Teacher Efficacy Scale that assessed teachers' efficacy at a general level. The present study was one of the first full-scale empirical investigations to employ the TSES (Tschannen-Moran & Woolfolk-Hoy, 2001) with preservice and inservice teachers. This measure assumes that teacher efficacy is task-specific and may vary both within and across teachers with respect to the tasks assessed.

The present study found that efficacy judgments differed by experience level. However, those differences related to the specific subscales used to assess efficacy for instructional practices, classroom management, and student engagement. When overall efficacy for preservice and experienced teachers was compared, no significant differences were found. However, examination of the subscales revealed that experienced teachers held higher efficacy beliefs for classroom management and lower efficacy beliefs for student engagement than preservice teachers. There was no significant difference between the two groups relative to instructional practices. These findings counter previous research that has found that preservice teachers have

significantly higher efficacy beliefs than practicing teachers (e.g., Soodak & Podell, 1988).

The difference between preservice and experienced teachers efficacy for classroom management and student engagement may be related to their experiences as well as the philosophical paradigms that they hold. Preservice teachers, with little or not actual classroom experiences demonstrated significantly lower efficacy for classroom management than did experienced teachers. It may be that preservice teachers see classroom management as an unknown factor in their future teaching experience, and as such this may contribute to a sense of fear or concern for their own abilities to successfully manage a classroom.

In contrast, the experienced teachers assessed in this study demonstrated significantly higher levels of efficacy for classroom management. These practicing teachers have had direct experience with classroom management. One could even argue that they have had success as classroom managers, evidenced by the fact that they remain in the teaching field. For experienced teachers, classroom management is far from an unknown factor affecting their teaching practice, rather it is an integral part of their daily work, and as such they have most likely developed a set of skills and strategies for successful classroom management.

That the two teacher groups differed with respect to student engagement in reverse directions may also speak to these different paradigms for teaching. Preservice teachers in response to a lack of classroom experience must rely on their own experiences in the classroom. As such, they may look at student motivation from a

more narrow and naïve perspective. That is, preservice teachers rely on what motivated them as students and may believe that this is all that is needed to increase the motivation of all students. Experienced teachers, in contrast, have experienced the need to meet the motivation needs of many students, recognize the challenges to student engagement in classroom content, such as student interest in the content, students' goals, part time jobs, and extra curricular activities. Further, experienced teachers may have experienced success and failure in their efforts to increase student engagement which serves better inform their efficacy beliefs.

All case study participants discussed the importance of engaging and motivating students. Each teacher independently offered information as to how they accomplished this and why they felt it was important. However, none of the case study teachers articulated concerns about classroom management. Ms. Roarke acknowledged at one point that classroom management was necessary for successful instruction, but she did not express any concern for achieving it. Mrs. Gilbert offered her contention that a busy lesson plan was the best means of assuring appropriate classroom demeanor and that if the students are interested and motivated in class that they tend to behave. Further, Mr. Lyons spoke of keeping students on task and was focused on getting his students interested in texts that they would ordinarily avoid. Thus, we see in these three teachers of varying efficacy levels, a similar focus on and goal of motivating students, with little concern for classroom management.

It may be that each of these teachers had sufficiently mastered classroom management skills and that issues of student behavior were no longer of concern. That

is not to say that issues did not occur in their classrooms. Rather, these teachers seemed to have ample skill and strategies for dealing with situations as they arose. By comparison, the need to motivate students and keep them engaged in class so that they learn seemed to be a more salient issue among the case study teachers, one that they highly valued.

Strategy Identification and Evaluation

The existing research on teacher efficacy relied on measurements that asked respondents to describe their confidence for specific tasks (e.g., Teacher Efficacy Scale, Gibson & Dembo, 1984; TSES, Tschannen-Moran & Woolfolk-Hoy, 2001). These measures constrained participants to the tasks and strategies that were identified by the researchers. The present study sought to explore teachers' abilities to provide strategies for classroom scenarios and then to assess their efficacy for those self-identified tasks. Through the use of the pedagogical vignettes, participants were asked to generate, evaluate, and describe efficacy for strategies they considered relevant for the situations described in each event. This process attempted to more closely assess how efficacy beliefs behave in a more realistic setting.

One of the key outcomes that was found using this measure was that these respondents were able to articulate substantially fewer strategies for the instructional practices (differentiated instruction) vignette than they did for the classroom management and student engagement vignettes. Further, when the frequency of evaluating strategies as unused, used, best, and used and best was tallied, respondents evaluated the strategies for instructional practices as unused more frequently than they

did for the other two vignettes. Thus, not only did these teachers report fewer strategies for addressing the instructional practices vignette; they were also more likely to say that they would not use the strategies they did identify. In contrast, these participants offered substantially more strategies for the classroom management vignette. Additionally, participants evaluated those classroom management strategies as ones they would use and considered best more than anticipated by chance.

The case study discussions highlighted these differences. When asked what they felt to be most challenging in their teaching, each teacher expressed a concern for meeting the needs of all their students. The instructional practice vignette described a highly academically diverse classroom that required a great deal of differentiated instruction on the part of the teacher. Mrs. Gilbert shared her specific concern for teaching a heterogeneous group of students next year. Her experience had been with advanced students, and she had accepted a high school position that will require her to work with students of multiple ability levels. In our discussions, she explained that she was unsure of how she would handle those classes. Further, Mrs. Gilbert stated that she had already made arrangements with an experienced teacher at the high school who would serve as her mentor.

Ms. Roarke and Mr. Lyons also articulated that one of their primary concerns in the classroom was to ensure that all students received what they needed instructionally. Ms. Roarke described how she was always concerned that she might be leaving someone behind, and the frustration of not realizing it until after a test had

been given. Mr. Lyons outlined specific strategies he used to keep himself informed about his students' progress.

That each of these teachers articulated concerns about addressing the needs of their students and that the larger quantitative study revealed that teachers reported fewer strategies for dealing with an academically diverse classroom emphasize the importance of these findings. There seems to be a lack of knowledge (identified in the quantitative study) for this component of teaching that also seems to be a focus of concern (identified in the qualitative study) for teachers. Thus, respondents offered fewer strategies for dealing with an academically diverse class yet articulated in interviews that this was one of their key concerns as teachers.

Profiles of Experienced Teachers Relative to Teacher Efficacy and Demonstrated Knowledge

The formation of teacher profiles based on knowledge and efficacy has not been explored in the literature. The present study sought to explore what teacher profiles might emerge based on experienced teachers' demonstrated knowledge and efficacy beliefs. The cluster analysis procedure revealed three distinct groups of teachers. Most interesting was the emergence of the high knowledge-low efficacy teacher group. Participants in this group demonstrated significantly higher knowledge and significantly lower efficacy than teachers in the other two groups. Thus, these teachers who seemed to know the most about pedagogy held the lowest beliefs in their ability to employ that knowledge. The case study teacher, Ms. Roarke, was identified as a member of this group. Because of her recent enrollment in a graduate program, it

is suspected that while she may have learned the terms and concepts of current pedagogy, she may not have had the opportunity to explore and gain confidence in her ability to wield that knowledge.

However, this cannot be the explanation for all of the teachers in the high knowledge-low efficacy group. It is also important to consider that teachers with higher knowledge of pedagogical practices may hold higher criteria for evaluating their own abilities. For example, I have heard many people not associated with the field of education express the opinion that kindergarten must be easy to teach. These people often contend that kindergarten is just playing games, painting pictures, and singing songs. However, educators might counter that kindergarten is one of the most challenging grades to teach. Thus, the extent of individuals' knowledge must affect their evaluation of the situation and, in turn, that evaluation becomes the basis of efficacy beliefs.

The other two clusters that emerged differed from each other only with respect to knowledge. That is, there was a group that demonstrated moderate to high knowledge and a broad range of efficacy beliefs. And there was a low knowledge group that also demonstrated a broad range of efficacy beliefs. That these groups did not differ from the others with regard to efficacy emphasizes the unique relation of knowledge and efficacy in the first group.

Implications

The purpose of this study was to deepen understanding of the relations among teacher efficacy, knowledge, and pedagogical beliefs. For this reason, multiple

measures were chosen to examine these constructs and their relations to one another, as were the target populations of preservice and experienced teachers. The results of this investigation have implications for research and practice.

Research

Modeling Efficacy

This study identified teachers' knowledge and pedagogical beliefs as potential contributors to their sense of efficacy. Teachers' pedagogical knowledge beliefs were found to have significant paths to teachers' efficacy for both preservice and experienced teachers. Thus, as researchers continue to examine teachers' sense of efficacy and how this belief is formed, the role of pedagogical knowledge beliefs should also be investigated.

In this study, an initial measure of knowledge beliefs was generated. This measure defined two factors of knowledge beliefs, the value of pedagogical knowledge and perspectives on teaching in general. Further, the teachers in the case studies articulated both of these belief sets. Thus, this multimethod approach created an opportunity to explore teachers' beliefs about teaching in new and effective ways. Although the pedagogical beliefs measure needs to be fine-tuned, the importance of those beliefs to efficacy has been established for participants of this study.

Further, this study took an initial step toward empirically investigating a model of teacher efficacy. The results of this study did not confirm the role of efficacy as a mediator between knowledge and action, as suggested by Raudenbush and colleagues (1992). However, the findings reported here do offer a basis for an extended line of

research on the process of teacher efficacy development as assessed through path analysis and structural equation modeling. Moreover, the different models that emerged for preservice and practicing teachers suggest that the developmental path of efficacy may change significantly as individuals move from teacher training into practice.

Measuring Efficacy

In this study, efficacy was assessed at several levels and, as such, offers several implications for research practice. Specifically, this study demonstrated that the TSES developed by Tschannen-Moran and Woolfolk-Hoy (2001) was an appropriate means for assessing efficacy in preservice and experienced teachers. Further, this study demonstrated the importance of investigating teacher efficacy at the task-specific level. Significant differences were found between preservice and experienced teachers only when the sub-scales of the TSES were examined. This supports Bandura's (1997) contention that efficacy is task-specific in nature and that measures of efficacy at the task level offer valuable information.

Teacher efficacy was also evaluated through the use of a new pedagogical measure that required teachers to provide strategies in response to the pedagogical vignettes. Participants were asked to assess their efficacy for each of the strategies they generated. Statistical analyses found that strategy efficacy was significantly related to efficacy scores on the TSES, as well as to participants' strategy awareness. The latter relation is of particular interest for research. A significant positive relation emerged for efficacy expressed and the quality of strategies given. This indicates that

respondents who provide better strategies also tend to have higher levels of efficacy. Thus, when teachers are asked to provide the strategy and evaluate it, they are likely to assess their efficacy in a way that is commensurate with the quality of the strategy.

Qualitative Approaches to Exploring Efficacy

This study offers one of the few teacher efficacy investigations to employ qualitative research methods. Here I constructed instrumental case studies to provide portraits of three experienced teachers with high knowledge and differing levels of efficacy. From those cases, I determined that these teachers rarely verbalized efficacy beliefs as a reason for engaging in particular teaching practices. In contrast, efficacy beliefs were the most frequent response when these teachers identified why they would *not* engage in practice. The process by which teacher efficacy works in teachers' practice has been largely ignored in the research on teacher efficacy. Here I offer a glimpse into that process for three selected teachers. Moreover, this study established that salient understanding of how efficacy works can be explored through qualitative methods.

Additionally, this study demonstrated how quantitative and qualitative methodologies could be used in conjunction with each other to provide a rich understanding of the concepts under study. For example, the negative path from demonstrated knowledge to teacher efficacy that was identified in the quantitative study seemed counterintuitive based on my reading of the research base. However, through the qualitative study I was able to speak extensively with Ms. Roarke, a high

knowledge-low efficacy teacher. Through her comments and my resulting analysis, several possible themes emerged that served to better explain the data.

The connections between qualitative and quantitative components of the study served to highlight areas of particular importance. For instance, in both aspects of the study, teachers' beliefs about teaching and pedagogy emerged as salient components in teachers' cognitive systems. In the qualitative study, teachers' beliefs emerged repeatedly in their discussions of practice and classroom decision making. In the quantitative study, a direct path from pedagogical beliefs to teacher efficacy was demonstrated for preservice and practicing teachers. Through these two methodologies, then, the importance of teachers' pedagogical beliefs became evident.

The use of qualitative methods in this study suggested that while traditional measures of teachers' efficacy are often associated with desirable academic outcomes, that teachers may not rely on efficacy beliefs or be cognitively aware of them in practice. Efficacy beliefs may exist under the surface, and while positive efficacy is necessary for teachers to engage in specific practices, it may not be the only determinant of which actions are chosen.

Educational Practice

The research findings of this study also offer implications for educational practice. Specifically, the findings speak to teacher educators and school administrators who have influence over the educational and learning experiences offered to preservice and inservice teachers.

Content Emphasis in Learning Experiences

The findings in this study suggest that preservice and experienced teachers demonstrate differential efficacy beliefs that may serve to highlight areas for which they would benefit from specific training. Preservice teachers demonstrated low efficacy for classroom management. This suggests that teacher educators may need to address this topic in their coursework. That is, in addition to providing the content information about different classroom management techniques, it may be beneficial to provide preservice teachers with opportunities to have mastery experiences with these techniques and to observe effective classroom management practices. Low efficacy is associated with a decreased likelihood of implementing strategies and an increased likelihood to give up easily. If there are particular classroom management strategies that have been demonstrated by research to be effective and appropriate, then teacher educators have a responsibility to provide preservice teachers with effective, efficacy-enriching learning experiences from which these strategies can be ascertained.

In a similar vein, experienced teachers demonstrated significantly lower efficacy for student engagement practices than preservice teachers did. Thus, this identifies an area of practice that may need to be addressed through professional development opportunities. However, as with preservice teachers, these developmental experiences need to enrich efficacy beliefs in addition to providing knowledge. Opportunities that allow teachers to experience mastery or to view models of these techniques may prove vital in improving teachers' ability and ability beliefs for student engagement.

There were no significant differences between preservice and experienced teachers with respect to efficacy for instructional practices. However, when the participants were asked to articulate strategies for working with an academically diverse group of students, they provided significantly fewer strategies than expected for this vignette. Thus, the data demonstrated more limited knowledge of strategies for the instructional practices vignette, and an over-reporting of those strategies that respondents stated they would not use. Further, each of the case study teachers identified meeting the needs of their students as an area of concern. This suggests that this issue may require additional attention in preservice and experienced teacher training.

Countering Potential Low Efficacy Associated with Increased Knowledge

The present study demonstrated a negative path from demonstrated knowledge to teachers' efficacy for experienced teachers. This indicated that teachers in this study with higher demonstrated knowledge were likely to have lower efficacy beliefs. Thus, an interesting paradox exists. If these findings are accurate, then increasing teachers' demonstrated knowledge alone may cause decreases in efficacy, which, according to previous research, leads to lower performance. However, to increase efficacy beliefs without increasing teachers' knowledge may result in unsubstantiated beliefs that may cause harm. There are perhaps two plausible interpretations of this conundrum.

First, it may be appropriate to expect a drop in efficacy as new knowledge is acquired. It may be that this drop is a natural part of the developmental process of teachers, and a consequence of the cyclical nature of teacher efficacy. In this case, no

further concern or action would seem warranted. Second, the way in which teachers are prepared for the classroom may provide them with knowledge that they feel unable to use. If this is the case, then how teachers acquire new knowledge and the learning experiences they are given during knowledge acquisition would need to be designed to enrich efficacy beliefs in conjunction with increasing knowledge of pedagogy.

For example, Ms. Roarke revealed that in her graduate courses, her instructors and classmates modeled the strategies and techniques. She stated on several occasions that she knew the strategies worked because she had seen them in class. Ms. Roarke also recognized that there might be some additional fine-tuning of the strategies when implemented with students. Together, this conviction that the strategies were important and awareness that they may need modification for the developmental level of the student contributed to Ms. Roarke's persistence in using these strategies.

Additionally, the modeling of these strategies and techniques in her graduate school classroom provided her with both mastery and vicarious experiences, two of the sources of efficacy articulated by Bandura (e.g., 1997). She herself was given the opportunity to model new techniques for her classmates, a mastery experience. Further, with her classmates serving as models, she was able to have vicarious learning experiences as well. In this way she was able to see how this knowledge worked in practice, which afforded her with a desire to attempt these tasks in her own classroom.

Influencing Pedagogical Beliefs as a Means of Altering Practice

Preservice and experienced respondents' pedagogical beliefs were significantly related to efficacy. There was also a significant direct path to teacher efficacy from pedagogical beliefs. This suggests that another important means of affecting teacher efficacy and, potentially, practice is by addressing teachers' beliefs about pedagogical knowledge. Pedagogical beliefs that reflected a positive evaluation of the importance of pedagogical knowledge were associated with higher teacher efficacy. Specifically, participants who felt that knowledge of pedagogy was important and useful for effective teaching also demonstrated higher efficacy. Thus, it may be helpful to change teachers' beliefs about the importance of pedagogy in order to increase efficacy beliefs.

One means of increasing teachers' beliefs about the importance of pedagogical knowledge may be to make such knowledge relevant to their teaching practice. Mr. Lyons contended that going to school to learn how to teach was a waste of time, and that you learned how to teach by teaching. This suggests that his teacher preparation experience did little in his estimation to prepare him for the classroom. Thus, pedagogical knowledge, as he perceived it, was of little use to him.

In contrast, Ms. Roarke demonstrated how valuing pedagogical knowledge influenced her willingness to engage in new instructional practices despite setbacks. Ms. Roarke described her multiple attempts at implementing the Jigsaw technique in the classroom, stating that it did not work the first time she tried it. However, she *knew* it was a good strategy. So she adjusted her approach and tried again. She added that

had it failed a second time she would have made some more adjustments and tried again, because she *knew* it worked. She had seen Jigsaw used effectively in her graduate school class. Ms. Roarke demonstrated that beliefs about pedagogy, specific strategies in particular, could have a powerful impact on teachers' willingness and persistence in implementing new techniques. Thus, if the research community and teacher educators want teachers to change practice in accordance with empirical evidence, it seems important to first convince teachers that there is value in the knowledge of these practices, as such beliefs seem to be related to teachers' motivation for classroom practices.

Future Research

Measure Development

This study employed two new measures (i.e., pedagogical vignettes and pedagogical beliefs instrument) that provided unique insights into the constructs of interest. Each of these measures requires fine-tuning in order to better understand the constructs assessed. First, the pedagogical vignette measure provided a detailed means by which to assess participants' ability to analyze an instructional problem and formulate an appropriate response. However, the open-ended nature of this instrument made scoring and interpretation of the results challenging. Thus, in the future it may be useful to refine this measure to provide greater control in the assessment of these constructs.

Specifically, the vignette measure can be tailored by using the responses gathered in this study. For example, rather than providing future participants with

open space to write their own responses, specific options that were common in the data collected can be provided for participants to select among. Additionally, the list of options can be given and participants can be asked to specify their likelihood of using each approach or strategy to the problem as well as their efficacy for that solution. Alterations such as these would create a more consistent measure that would gain similar information from all respondents.

The pedagogical beliefs measure used here was found to tap into respondents' beliefs about the importance of pedagogical knowledge. Moreover, data collected using this instrument were found to have significant relations with preservice and experienced teachers' efficacy, demonstrated knowledge, and with preservice teachers' performance on the strategic awareness task. Thus, this instrument was able to capture important cognitive constructs that have not been investigated in conjunction with efficacy previously.

Still, the pedagogical beliefs measure would benefit from further attention. First, negatively worded items tended to fall on a similar factor regardless of their intent. Thus, in redeveloping this measure it might be beneficial to have all of the items worded in the same way. Or if extensive measure development is undertaken, series of items assessing the same construct should be created that are both positively and negatively worded. Second, item analysis procedures should be employed to ascertain which items provide the most salient information regarding respondents' beliefs. Third, deep exploration of the current items in addition to any new ones

generated should be conducted through extensive think-aloud procedures with both preservice and experienced teachers in order to ensure the validity of each item.

Moreover, the dialogue about beliefs that emerged in the case studies suggests that there are more constructs to be considered than those currently included in this instrument. Constructs that emerged in the case studies that warrant further examination include beliefs about the nature of teaching as an ability or learned skill, beliefs about subject-matter knowledge, and beliefs about knowledge of students. Additionally, it may be advantageous to explore with teachers (preservice and experienced)[which types of teachers – preservice and experienced?] the basis of their pedagogical decisions and sources of motivation in order to ascertain other underlying beliefs that may be at work in the teaching process.

Further, a more systematic development of a pedagogical beliefs instrument should be followed beginning with a series of open-ended interviews with teachers, focus groups, and multiple renditions of a piloted measure. By taking advantage of open-ended interviews and focus groups, the language and content of teachers' beliefs may emerge free of preexisting researcher bias. Thus, the resulting measure, while reflective of existing theory, would also be grounded in the experiences of teachers. The significant results yielded by the pedagogical beliefs instrument in its current form underscore the need for its further development.

Assessment of Teacher Knowledge

The original conceptualization of the extended model of teacher efficacy, described in Chapter II, focused on pedagogical knowledge, or knowledge of teaching

practices. However, the teachers interviewed for the case studies most often discussed knowledge of content or of their students as critical to teaching practice. It may be, then, that when considering the role of knowledge in teacher efficacy, greater specificity as to the type or nature of that knowledge must be taken into account. To recall, Shulman (1987) identified seven categories of teacher knowledge (i.e., knowledge of: content, general pedagogy, curriculum, pedagogical content, learners, educational contexts, educational ends and purposes). These categories may serve to direct the development of future measures assessing preservice and practicing teacher knowledge. Even with the use of such categories, future researchers must also consider the type of knowledge assessed. In such investigations, is teachers' knowledge of declarative information such as the "Jigsaw" technique more or less informative than their knowledge of how to appropriately intervene in classroom situations?

Future studies should explore the relations of different types or forms of knowledge to teachers' efficacy and performance. In the current study, we saw there was a direct path from demonstrated knowledge to performance for preservice teachers. However, this relation did not emerge for experienced teachers. Thus, there may be differential relations among knowledge, efficacy, and practice for preservice and experienced teachers relative to the means by which knowledge is assessed. The improvement of teaching may benefit from the identification of what knowledge has the most influence on teachers' practice. In the current study, the assessed pedagogical knowledge was unrelated to performance for experienced teachers. However, had

subject-matter knowledge or knowledge of students (developmental information and strategies for learning about one's own students) been assessed, these forms of knowledge might have been related to performance.

Longitudinal Investigations

The present study fit a hypothesized model of teachers' efficacy as a mediator between knowledge, beliefs and performance to the data collected. However, theory guided the direction of the model, and an unfolding developmental process did not shape the relations of these data, all collected in a single sitting. In order to understand the process by which teachers develop efficacy, and the roles of knowledge and pedagogical beliefs in that on-going process, it is necessary to conduct longitudinal investigations.

It is of particular importance to explore these constructs during key periods of teachers' professional development. For example, it would be highly informative to investigate these constructs before, during, and after preservice teachers' initial student teaching experiences. In addition, previous researchers using older efficacy measure have found that efficacy drops drastically during the first two years of teaching and then slowly increases (Soodak & Podell, 1988). This suggests that the first three to four years of teaching may also be a critical time for the development of teachers' sense of efficacy (Tschannen-Moran et al., 1998). Another critical time to investigate teachers' knowledge, belief, and efficacy would be when experienced teachers engage in systematic professional development, such as entering a graduate program as Ms. Roarke has done, or during extensive training experiences.

Reaffirmation of the Importance of Efficacy

A brief scan of the literature review in Chapter II reveals a gap in the current literature on teacher efficacy that must be addressed before researchers continue to assess this construct. Repeatedly in the teacher efficacy literature, the links between efficacy and student achievement and other aspects of positive practice are articulated (e.g., Ashton & Webb, 1986; McLaughlin & Marsh, 1978; Woolfolk et al., 1990). However, the research evidence that supports those claims was conducted, for the most part, over fifteen years ago and employed a conceptualization and assessment of efficacy that is not considered theoretically appropriate by most modern teacher efficacy researchers (e.g. Tschannen-Moran et al., 1998). Thus, given more recent conceptualizations of efficacy and newer instrumentation for assessing this construct, it seems important to take a step back before moving forward. That is, it seems essential to engage in research activities that will confirm that teacher efficacy, as currently measured, is related to positive outcomes such as student achievement and teacher practice. For example, do teachers with higher levels of efficacy for classroom management have better classroom management practices? Are they more persistent in the face of failure? Do they make better decisions? Do their students show higher achievement?

Investigations of this type would require multiple forms of data collection and research methodology. Going into schools and observing teachers in action, exploring with teachers the relation of efficacy beliefs to practice are crucial to understanding this motivational process.

Appendix A

Consent Form

INFORMED CONSENT FORM
- SURVEY -

Date

Dear Participant:

We are conducting a study focused on understanding how teachers think about their teaching. We are interested in identifying ways in which beliefs about teaching are related to prior experience, levels of expertise in the subject matter, and pedagogical knowledge. The purpose is to use this information to aid in the understanding and development of teachers' pedagogical practice.

The study is open to adult members in the educational community who are currently working directly with students as teachers, specialists, or media personnel. Additionally, this study is also open to adult students enrolled in a pre-service teaching program. Participants in the study are asked to fill out a questionnaire, which should take approximately 45 minutes to an hour to complete. Also, individuals willing to participate in an individualized interview and observational component of this study will be solicited. However, these added components are not required for the current investigation.

We hope that you will allow us to include your responses in our study. There are no foreseeable risks to the individuals who participate in this study. Participation in this study is entirely voluntary and we will include your responses only if it meets with your approval. We assure you that all of the information collected in the study is treated confidentially and that your identity will never be revealed in the reporting of any results. There are no costs to you in any way. This project has been reviewed according to The University of Maryland procedures governing student participation in research.

As the principal researchers of the projects, Helenrose Fives, MAT, Doctoral Candidate at the University of Maryland we will happy to answer any questions you might have about the study. She can be reached at 301-405-1304 in the Educational Psychology Research Laboratory, Department of Human Development, University of Maryland, College Park, Maryland, if you have any questions or concerns. This work is being conducted under the advisorship of Patricia A. Alexander, Professor at the University of Maryland, College Park.

Please indicate if you are willing to give permission for your responses to be included in this study by completing the section below.

Thank you for your cooperation,

Helenrose Fives
Doctoral Candidate
The University of Maryland
Department of Human Development
3304 Benjamin Building
College Park, MD 20742
301-405-1304
Helfives@aol.com

Patricia A. Alexander
Professor
The University of Maryland
Department of Human Development
3304 Benjamin Building
College Park, MD 20742
301-405-2821
pa34@umail.umd.edu

I have read the attached letter and decided that:

_____My responses may be included in this study.

_____My responses may not be included in this study.

Print Name _____ School _____

City_____

Signature _____ Date _____

Appendix B

Background Information

Background Information

Demographic Information

Age _____

Gender _____

Ethnicity (You may check more than one if appropriate)

☐ African American	☐ African	☐ Pacific Islander
☐ Asian American	☐ Asian	☐ Native American
☐ European American	☐ European	☐ Carribean
☐ Hispanic American	☐ Hispanic	☐ Other (Please Specify)
☐ Mid-Eastern American	☐ Mid-Eastern	_____

Education

Please describe your current educational status, including highest level attained, and the related subject areas (e.g., Sophmore, Mathematics or B.A. Science)

Have you pursued any non-degree continuing education program or courses? Yes No. If yes, please describe:

Professional Development

Do you belong to any professional education related organizations? If yes, please list:

How many professional conferences or workshops do you attended on average each year?

Name the conferences or workshops that you generally attend.

On average, **how many** of the following professional education publications do you read annually?

_____ Research Articles	_____ Teacher/Teaching Magazines
_____ Books on or about Teaching	_____ Books related to your subject matter
_____ School/District newsletters	_____ Other (please describe)

School Setting (preservice teachers identify the setting you want to work in)

School Level (circle one):	Elementary	Middle	High
School Type (circle one):	Public	Public – Magnet	Public – Charter,
	Private – Non-religious	Private – Religious	Parochial

Practicing Teachers Only

School Name _____

Experience

Number of years you have taught _____

Grade(s) and subjects you currently teach _____

Grades and subjects you have taught previously _____

_____

Appendix C

Teacher Sense of Efficacy Scale

Teachers' Sense of Efficacy Scale[1] Teacher Beliefs	**How much can you do?**								
Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activates. Please indicate your opinion about each of the statements below. Your answers are confidential.	Nothing		Very Little		Some Influence		Quite a bit		A great deal
1. How much can you do to get through to the most difficult students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2. How much can you do to help your students think critically?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3. How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4. How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5. To what extent can you make your expectations clear about student behavior?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6. How much can you do to get students to believe they can do well in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7. How well can you respond to difficult questions from your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
8. How well can you establish routines to keep activities running smoothly?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9. How much can you do to help your students value learning?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10. How much can you gauge student comprehension of what you have taught?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
11. To what extent can you craft good questions for your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
12. How much can you do to foster student creativity?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
13. How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
14. How much can you do to improve the understanding of a student who is failing?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15. How much can you do to calm a student is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
16. How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
17. How much can you do to adjust you lessons to the proper level for individual students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
18. How much can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Teachers' Sense of Efficacy Scale[1] **Teacher Beliefs *Continued***	**How much can you do?**								
	Nothing		Very Little		Some Influence		Quite a bit		A great deal
19. How well can you keep a few problem students from ruining an entire lesson?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
20. To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
21. How well can you respond to defiant students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
22. How much can you assist families in helping their children do well in school?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
23. How well can you implement alternative strategies in your classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
24. How well can you provide appropriate challenges for very capable students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

[1]Tschannen-Moran & Woolfolk-Hoy (2002)

Appendix D

Pedagogical Measure

Please read the following scenario.

Teresa, having been retained, is in your class for the second year. Her retention was due to failing grades in three major subject areas as well as high absenteeism. (She missed 60 days of school, approximately one-third of the school year). Teresa rarely does assigned work. However, when she applies herself she is able to earn passing marks. In class, rather than taking notes or following along, she prefers to flip through an entertainment magazine, planning her future career as an entertainer. Teresa has made it clear that school is of little interest to her and that the subjects have little value for her future. Her interest is occasionally sparked when music, dance, or drama is somehow incorporated into class content or an assignment. However, this often fails to make a real difference in her performance for two reasons. First, she often misses large parts of the work due to lateness or absenteeism. Second, she tends to withdraw from the projects early on claiming that the music is "out of date" or the dance style is "funky" (meaning a bad thing) and that memorizing lines is unessential because in "real-life they have tele-prompters anyway."

Respond to the questions on the next page by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Please read the following scenario.

Ms. McCormick teaches in a very diverse school and her class includes a range of students including several identified as gifted and talented, learning disabled and ESL. She is deeply concerned about meeting the learning needs of all of her students. Specifically, she is often flustered when the gifted and talented students ask difficult but highly interesting questions which the majority of the class does not seem to understand. She is unsure how to deal with the potential confusion those questions often create in other students. Yesterday, for example, when Sam asked about singularities in Science, Jen groaned and gave her, the "not again!" look.

Respond to the questions on the next page by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Please read the following scenario.

Ms. Ramsey was ecstatic when the principal called and offered her a teaching job halfway through the school year. Having just relocated to the area, she was sure she would not find a position until the fall. She was so excited she accepted the position over the phone and agreed to start in one week. When she visited the school the next day she realized just what she had gotten herself into. The classroom was a mess, with books on the floor that had not been swept in months, unwashed chalkboards, piles of papers covering what she suspected was the teachers' desk, and a bulletin board that reads "Welcome Back to School." Finally, in the corner of the room she noticed a small sheet of paper with "Classroom Rules" printed across the top. The rules are as follows: "No calling out, No hitting or shoving, No getting out of your seat without permission." Under those rules, there was a second sheet of paper containing additional rules written in a variety of ink colors. These rules were: "No getting a drink, No changing seats, No leaving the classroom, NO TALKING!" Despite the litany of stated rules, Ms. Ramsey observed a room in disorder. She watched 2 students actually get up and switch places while the teacher, Mr. Jones, was turned to the board. Five minutes later when Mr. Jones finally noticed the switch he shouted, "Tina and Sharise go back to your assigned seats, NOW!" In response Tina crossed her arms and said, "No, I don't want to." Mr. Jones, obviously frustrated and annoyed responded "Fine Tina do what you want, this is my last day, THANK GOD, and I really don't care what you do."

Ms. Ramsey was introduced to several teachers that afternoon and received many pitying looks and a few genuine offers of help for the upcoming weeks. When she was able to speak with Mr. Jones for a few minutes, his tone was abrupt as he explained that the class was filled with underachievers, many on free and reduced lunch, and several with IEPs that needed constant attention, both the students and the IEPs. With that, Mr. Jones offered good luck, added the electric pencil sharpener to his box of belongings and left the room.

Respond to the questions on the next page by jotting down words, phrases or sentences that reflect your ideas and beliefs.

1. What do you see as the key problem(s) or concern(s) in this situation?

2. What would be the desired resolution of this classroom situation? (Do not explain how that end is accomplished. Simply describe the desired outcome.)

3. To what extent do you feel that you could bring about the desired resolution you described? (Please circle)

1----------2----------3----------4----------5----------6----------7----------8----------9

no confidence	very little confidence	some confidence	quite a bit of confidence	A great deal of confidence

4. Please list as many strategies, techniques, plans, or actions that you can think of for resolving the aforementioned situation. Write those responses in the middle column (#4).

#5 ✓	#5 X	#4 Strategies, techniques, plans, actions	#6

5. For the above entries, make the following marks in the left-hand column (#5).
   - Place a check (✓) next to the actions you would most likely implement.
   - Place an **X** next to the actions that you think are the best options.

6. Using the scale below, rate your confidence in your ability to carryout **each** of the actions listed above. **Indicate your response in the right hand column (#6).**

1----------2----------3----------4----------5----------6----------7----------8----------9

no confidence	very little confidence	some confidence	quite a bit of confidence	A great deal of confidence

Appendix E

Code Sheets for Vignette Strategies

	ID Instructional Practices – STRATEGY – Codes	List	Use	Best	Eff
1.	**TEACHER**				
2.	Teacher Knowledge				
3.	Teacher Help Seeking: Assistance, co-teach, parents				
4.	Teacher Help Seeking: Consultations				
5.	**GROUPING**				
6.	Group by Ability/Track				
7.	Separate Students from Class, ask for AP, new more homogeneous class				
8.	Flexible Grouping				
9.	Mixed Ability Grouping				
10.	Use Group activities				
11.	Managing Groups				
12.	Use Independent Activities				
13.	**DIFFERENTIATION**				
14.	Teach to the middle				
15.	Differentiate Instruction (lessons)				
16.	Differentiate Assignments/Materials				
17.	Differentiate Assignments/materials for GT students				
18.	Differentiate Assignments/materials for LD/ESL students				
19.	Differentiate Assessment/Grading				
20.	Don't Differentiate				
21.	**TEACH ALL STUDENTS MEET ALL NEEDS**				
22.	Ensure All students learn, understand, plan lessons for all				
23.	Engage All students, make learning fun, exciting				
24.	Instructional Techniques to reach All students				
25.	Know your students, Assess				
26.	Address Special Needs/ Offer extra help				
27.	Needs of LD /Low ability students				
28.	Needs of ESL Students				
29.	Needs of GT (TAG) Students				
30.	**Class Climate: Sharing Knowledge – student input**				
31.	Opportunity for all students to share strengths				
32.	Peer tutoring/study groups				
33.	GT (TAG) students tutor/lead others				
34.	**Class Climate: Student Interaction**				
35.	Teach social skills/respect for each other				
36.	Build relationships among students				
37.	**Class Climate: Teacher Approach/Attitude**				
38.	Teacher Approach				
39.	Teacher Encouragement – Motivation – Challenge				

	Instructional Practices – STRATEGY – Codes: *Continued*	List	Use	Best	Eff
40.	**Questions**				
41.	Response to the question – answer; how to?				
42.	Explaining of question				
43.	Routines/Systems for managing/dealing with questions				
44.	Turn question into assignment				
45.	**INSTRUCTION: Specifics**				
46.	Specific Assignments				
47.	Teach Specific Content/Skills/strategies				
48.	Vary instruction				
49.	Teach to all styles/intelligences/senses – use visual, auditory etc.				
50.	Specific Teaching Strategies: e.g. Scaffold, prior knowledge, discussion, choice				
51.	**INSTRUCTION: Techniques**				
52.	Cooperative learning				
53.	Use centers				
54.	Teach thematically				
55.	Hands-on activities				
56.	Use manipulatives				
57.	Incorporate discovery based learning				
58.	Use technology				
59.	Case Specific – Sam and Jen				
60.	**Unclassifiable**				

	ID Classroom Management – STRATEGY – Codes		List	Use	Best	Eff
1.	**Behavior Management – *Have plan***	**1.**				
2.	Operant conditioning – Rewards and punishments	2.				
3.	Positive Reinforcement only	3.				
4.	Punishment only	4.				
5.	Behavior contracts with students	5.				
6.	**Rules**	**6.**				
7.	New rules/expectations	7.				
8.	Create new rules with students	8.				
9.	Change Rule Terminology	9.				
10.	Communicate expectations/rules effectively/post make visible	10.				
11.	Minimize number of rules	11.				
12.	Establish Consequences	12.				
13.	Establish Importance/Need for rules/expectations	13.				
14.	Enforce rules/follow through/consistency	14.				
15.	**Teacher Actions/Responsibilities/Demeanor**	**15.**				
16.	Organization/structure/systems/routines	16.				
17.	Seating assignments	17.				
18.	Cleaning Routines	18.				
19.	Maintain Composure	19.				
20.	Assert/Maintain Control (strict, hardnosed, stern)	20.				
21.	Maintain Assertive/Positive Attitude/Demeanor/Consistency	21.				
22.	Effective communication with students/feedback, const. criticism	22.				
23.	Foster Student Autonomy/Responsibility/Ownership	23.				
24.	Establish Reputation as a Teacher	24.				
25.	**Physical Classroom Environment**	**25.**				
26.	Better Environment/Make Classroom Inviting	26.				
27.	Clean the classroom/organize	27.				
28.	Students and teacher clean room	28.				
29.	Teacher cleans room	29.				
30.	**Relationships**	**30.**				
31.	Teacher – Student Communication procedure/discussion/get input	31.				
32.	Establish rapport with students, caring/respect/treat as people	32.				
33.	Establish positive classroom social climate among students	33.				
34.	Have a new 1st day of class – New beginning	34.				
35.	Address previous classroom situation	35.				
36.	Raise Expectations/Goal Setting/Motivation/Encouragement	36.				
37.	**Pedagogy: Student Needs**	**37.**				
38.	Assess Students: Interests/abilities	38.				
39.	Address Special needs / IEPs/give 1 – 1 help	39.				
40.	Plan appropriate instruction	40.				
41.	Engage students in learning/Connect to student interests – real life	41.				
42.	**Pedagogy: Content – Instructional Choices**	**42.**				
43.	Teach structured lessons	43.				
44.	Use hands-on learning	44.				
45.	Student centered instruction	45.				

	Classroom Management – STRATEGY – Codes - *Continued*		List	Use	Best	Eff
46.	Teacher Centered	46.				
47.	Managem ent of Instruction	47.				
48.	Tutoring	48.				
49.	Specific lessons/activities	49.				
50.	Grouping/cooperative	50.				
51.	*Outside classroom*	**51.**				
52.	Consultations/Help seeking	52.				
53.	Training	53.				
54.	Parent Contact	54.				
55.	Financial/material concerns	55.				
56.	Unclassifiable:	**56.**				

	ID ENGAGEMENT – STRATEGY – Codes		List	Use	Best	Eff
1.	**INTERESTS**	**1.**				
2.	Develop Interest in content/class/make fun	2.				
3.	Connect her interests to content	3.				
4.	Encourage her Interests outside of Class	4.				
5.	**VALUE OF EDUCATION/REALITY CHECK**	**5.**				
6.	Real-world connections	6.				
7.	Need for education in entertainment – future – import of education	7.				
8.	Understanding Entertainment Biz – Reality Check	8.				
9.	Research Entertainers/Business	9.				
10.	Connect Teresa to professional entertainer (guest speaker)	10.				
11.	**GOAL SETTING- plan for future**	**11.**				
12.	Short term goals	12.				
13.	Long Term goals	13.				
14.	**FOSTER MOTIVATION**	**14.**				
15.	Rewards/Incentives/Reinforcement/+feedback	15.				
16.	Punishment	16.				
17.	**CLASSROOM MANAGEMENT**	**17.**				
18.	Rules	18.				
19.	Systems/Strategies for getting T's School-work done. E.g. tutoring/contracts	19.				
20.	Remove Magazines/stop from viewing	20.				
21.	**INSTRUCTIONAL PRACTICES**	**21.**				
22.	Individual Attention	22.				
23.	Teaching Techniques	23.				
24.	Group work/cooperative	24.				
25.	Hands-on/Interactive Lessons	25.				
26.	Interesting & Up-to-date lessons	26.				
27.	Competition	27.				
28.	Field Trip	28.				
29.	Specific Strategies/lessons	29.				
30.	Assignment – Requirements/teacher makes changes	30.				
31.	Assignment – Grading	31.				
32.	Alternative to Classroom	32.				
33.	**CHOICE/AUTONOMY SUPPORT IN INSTRUCTION**	**33.**				
34.	Assignments: Autonomy/Preference: choice, input in course	34.				
35.	Leadership Opportunities for Student: responsibility, opt. to teach	35.				
36.	**ATTENDANCE**	**36.**				
37.	Address via conference/contact	37.				
38.	Provide incentive for coming to class – projects that interest her	38.				
39.	Refer truancy to authorities/administration	39.				
40.	**BUILD SELF-ESTEEM – challenge**	**40.**				
41.	**SOCIAL SUPPORT**	**41.**				
42.	Teacher Builds Rapport with Teresa	42.				
43.	Peers	43.				
44.	Mentors	44.				
45.	Professional - Counselor	45.				
46.	**EVALUATE**	**46.**				
47.	Abilities	47.				
48.	Determine Source of Problem	48.				
49.	Interests/needs/goals	49.				

	ENGAGEMENT – STRATEGY – Codes - *Continued*		List	Use	Best	Eff
50.	**CONFERENCING**	**50.**				
51.	Individually with Teresa	51.				
52.	Parents /Guardian/Home	52.				
53.	Student and Parents/Guardian	53.				
54.	School Personal /Authorities	54.				
55.	**UNCLASSIFIABLE**	**55.**				

Appendix F

Pedagogical Knowledge Beliefs

Pedagogical Knowledge Beliefs

Indicate the extent to which <u>you</u> agree with each of the following statements.

A. Teaching is a talent. Some people have it, and some people do not.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

B. Good teachers get through most of their day on instinct.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

C. Expert subject-matter knowledge is necessary for effective teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

D. Knowledge about how to motivate students is essential for teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

E. As long as teachers know how to manage a classroom students will learn.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

F. Knowledge about instructional practices is the most important knowledge a teacher can have.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

G. When I read a professional article, I am *most* interested in learning what new teaching techniques are available.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

H. Knowing how to use and implement teaching techniques is the hallmark of a good teacher.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At All — Disagree — Agree — Completely Agree

I. It is important to understand the theory behind teaching techniques.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

J. Anyone can be a teacher.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

K. Expertise in teaching can be developed after only a few years of practice.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

L. Teaching is a skill that can only be learned and developed through practice.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

M. It is easy to recognize quality teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

N. The best teachers are passionate about their work.

1----------2----------3----------4----------5----------6----------7----------8----------9

Do Not Agree At All | Disagree | Agree | Completely Agree

Appendix G

Demonstrated Knowledge

Demonstrated Knowledge

Place the letter of the *best* response for each item on the line next to the number.

1. In which of the following situations would constructivist learning strategies be LEAST applicable?
    a. Developing seventh grade students appreciation of science method
    b. Teaching poetry composition to high-school students
    c. Teaching math facts to fourth-grade students
    d. Teaching students to conduct experiments in the physics laboratory

2. To increase student's value for learning tasks, teachers should
    a. offer external rewards, such as candy or stickers, for completing class tasks
    b. make the relevance of the task clear to students
    c. establish specific consequences for failing to complete tasks
    d. praise students when they complete the tasks well

3. How can you get students to cooperate and follow classroom rules?
    a. Develop harsh punishments for any infractions of the rules
    b. Call parents as soon as students begin to disobey the rules
    c. Get students to share responsibility for the classroom environment
    d. Offer whole class incentives for students' to exhibit appropriate behavior

4. A recommended teaching strategy for building positive expectations and motivation to learn is to
    a. eliminate difficult items from testing instruments.
    b. stress self-comparison.
    c. teach problem-solving techniques.
    d. use a curve when grading tests.

5. Which of the following teaching interventions will allow a teacher to alter lessons to meet the needs of a student with Attention Deficit Hyperactivity Disorder?
    a. Provide instruction on learning and memory strategies
    b. Provide motivational training to help him control his own learning.
    c. Plan instruction so the student encounters limited and well structured tasks with clear consequences.
    d. Provide instruction in study skills

6. Ms. Summers teaches sixth grade in a large middle school. Henry, a student in her class, is constantly out of his seat. When Ms. Summers confronts him and asks him to take a seat, Henry becomes angry and acts hostile. Which of the following actions should be considered for dealing with Henry?
    a. Ask other students to intervene to prevent open rebellion
    b. Send another student to notify the principal's office
    c. Stand your ground and do not back down; be firm and strong
    d. Wait for a few minutes for Henry to calm down before taking action

7. In specifying class rules, it is recommended that rules should be
    a. designated exclusively by the students
    b. directed to study skills as well as class behaviors
    c. written down and posted in a prominent place
    d. specific

8. Ms. Flower's class seems completely disinterested in her content area and focused primarily on their grade point average. Which of the following strategies may help to increase her students' interest in this content?
    a. Provide students with choice and opportunity for self-direction
    b. Establish a reward system that is based on performance level
    c. Establish a competition between the boys and girls
    d. Remind students of the importance of this content for their future

9. Expert teachers use detention primarily for what?
    a. To assemble misbehaving student so they could be dealt with as a group
    b. To make the consequences of misbehavior public to enhance peer pressure
    c. To prevent the student from participating in extra-curricular activities
    d. To talk privately to the student about the particular misbehavior

10. All of the following teachers are discussing the Civil War with their students. Which of the following teachers is helping her students to think critically?
    a. Ms. Carter requires students to distinguish between fact and opinion during class discussion
    b. Ms. Jones provides students with a completed Venn diagram comparing the North and South
    c. Ms. Riley allows students time to read and respond to the questions in their textbook
    d. Ms. Kelly employs the Jigsaw method to develop students' understanding of the lesson content

11. Mr. Olson teachers in a fifth grade resource room. The entire class is at least one year below grade level in their reading ability. What procedure should be recommended for use with his students?
    a. A single cycle of presentations over the material
    b. Lecture followed by individual study
    c. Cooperative group work
    d. Short presentations interspersed with group activities

12. If a student gives an incorrect response to a question, the teacher should:
    a. ask, "Does anyone have a different answer?" Then call on the first volunteer.
    b. simply correct the student's answer and go on with the lesson.
    c. rephrase the question or offer the student a prompt or clue
    d. say, "That's almost correct" and then call on another student.

13. Do evaluations of portfolios, exhibitions, and other types of alternative assessments have the same measurement concerns as more traditional assessment procedures?
    a. No, because alternative assessments are constructed by the students themselves
    b. No, because alternative assessments are inherently valid and fair to students
    c. Yes, because alternative assessments must be valid and reliable
    d. Yes, because alternative assessments promote learning better than traditional measures

14. The goal of alternative assessments is to:
    a. evaluate students' in a way that relates to every day life
    b. require students to perform tasks that resemble standardized tests
    c. assess a broad range of content
    d. assess students' factual knowledge

15. When working with very capable students, it is best to
    a. ensure that a greater quantity of material is covered
    b. allow these students to move ahead independently at their own pace
    c. pursue greater depth in content understanding
    d. Pair these students with less capable students for peer tutoring

16. Katie and Michelle are best friends and sit next to each other. Usually this is not a problem in class, however today the girls have started giggling during silent reading time, and are distracting the other students. The best intervention for this situation would be
    e. send the girls to the timeout table in the back of the room
    f. separate the girls for the remainder of the week
    g. stand near the girls' desks
    h. assertively tell the girls to stop

Appendix H

Discussion Group: Agenda

Agenda

I. Arrive and explain the purpose of the meeting.

II. Participants will complete the measures and record the length of time it takes to do so.

III. Dinner

IV. Explain purpose and rational for the measures.

V. Review Each Measure

   a. Vignettes

   b. Pedagogical Beliefs

   c. Knowledge

VI. Overall Comments on the survey

VII. Conclude by briefly reviewing comments made.

Appendix I

Discussion Group: Discussion Questions

Vignettes

Please respond to the following questions regarding the vignette portion of the test battery. Please make note of the salient group conclusions that are determined.

1. How clear were the instructions throughout the measure? What could be done to make these more clear?

2. On a scale of 1 to 10 (10 being most difficult) how difficult was this activity?

3. What do you think the vignettes were attempting to assess?

4. Do you think the vignette achieved this goal?

5. The vignettes were written to tap in to three areas of teachers' knowledge and skill:
    - Instructional practices: Ms. McCormick or Rodney
    - Classroom Management: Ms. Ramsey or Simon
    - Motivation: Teresa or Ms. Cuthbert

    a. Of the six vignettes which do you think best tap into each of these areas?

    b. Which vignettes do you think most reflect actual teaching experiences?

6. On a scale of 1 to 10 (10 being most difficult) how difficult would you rate each vignette?
    - Rodney
    - Simon
    - Teresa
    - Ms. McCormick
    - Ms. Ramsey
    - Ms. Cuthbert

7. Which three vignettes would you select for completion in this survey? Explain your selection.

8. If you were completing these vignettes on your own, at what point would you have stopped?

Pedagogical Beliefs

Please respond to the following questions regarding the pedagogical beliefs of the test battery. Please make note of the salient group conclusions that are determined.

1. How clear were the instructions throughout the measure? What could be done to make these more clear?

2. On a scale of 1 to 10 (10 being most difficult) how difficult was this activity?

3. What do you think these items were attempting to assess?

4. How clear were the items on this measure? Did you find yourself questioning the intent of any items? Which ones?

Demonstrated Knowledge

Please respond to the following questions regarding the demonstrated knowledge of the test battery. Please make note of the salient group conclusions that are determined.

1. How clear were the instructions throughout the measure? What could be done to make these more clear?

2. On a scale of 1 to 10 (10 being most difficult) how difficult was this activity?

3. This measure attempts to assess teacher knowledge regarding instructional practices, classroom management and motivation.
    a. Please sort the items by these areas of knowledge.
        - Instructional Practices
        - Classroom Management
        - Motivation
    b. Which 15 of these items would you select to best assess each knowledge area in teachers?
        - Instructional Practices
        - Classroom Management
        - Motivation

4. Are there any items you would absolutely omit from this type of test? Which items? Why?

Overall Test Battery

Please respond to the following questions regarding the demonstrated knowledge of the test battery. Please make note of the salient group conclusions that are determined.

1. On a scale of 1 to 10 (10 being most difficult) how difficult was this activity?

2. If you received this instrument in the mail, how likely would it be that you would complete it?

3. If someone came to your school and asked you complete the test battery by the end of the week, how likely would you be to complete it?

4. What could entice you to complete the test battery?

5. What general criticism do you have of this test battery?

6. In general how did you feel while completing the test battery?

Appendix J

Discussion Group: Pedagogical Measure

Time Started: _____

Please read the following scenario.

Simon is consistently out of his seat, tapping his pencil and generally disrupting the class, all of which are in violation of the classroom rules. He continues these and other disruptive behaviors throughout the school day and is confrontational when corrected. Simon's academic performance is average for the class, and he is able to complete most of the assigned work. However, his behaviors are a constant disruption to the rest of the class and often an annoyance to his classmates. Many of the students, aggravated by his behavior, choose to avoid Simon and have made it clear that they do not want to sit near or work with him. Recently there are a few students who have started mimicking Simon's disruptive behaviors. When these students are asked why they are doing this, they claim that they are not doing anything wrong. They are acting just like Simon.

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Time Started: _____

Please read the following scenario.

Teresa, having been retained, is in your class for the second year. Her retention was due to failing grades in three major subject areas as well as high absenteeism. (She missed 60 days of school, approximately one-third of the school year). Teresa rarely does assigned work. However, when she applies herself she is able to earn passing marks. In class, rather than taking notes or following along, she prefers to flip through an entertainment magazine, planning her future career as an entertainer. Teresa has made it clear that school is of little interest to her and that the subjects have little value for her future. Her interest is occasionally sparked when music, dance, or drama is somehow incorporated into class content or an assignment. However, this often fails to make a real difference in her performance for two reasons. First, she often misses large parts of the work due to lateness or absenteeism. Second, she tends to withdraw from the projects early on claiming that the music is "out of date" or the dance style is "funky" (meaning a bad thing) and that memorizing lines is unessential because in "real-life they have tele-prompters anyway."

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Time Started: _____

Please read the following scenario.

Ms. McCormick teaches in a very diverse school and her class includes a range of students including several identified as gifted and talented, learning disabled and ESL. She is deeply concerned about meeting the learning needs of all of her students. Specifically, she is often flustered when the gifted and talented students ask difficult but highly interesting questions which the majority of the class does not seem to understand. She is unsure how to deal with the potential confusion those questions often create in other students. Yesterday, for example, when Sam asked about singularities in Science, Jen groaned and gave her, the "not again!" look.

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Time Started: _____

Please read the following scenario.

Ms. Ramsey was ecstatic when the principal called and offered her a teaching job halfway through the school year. Having just relocated to the area, she was sure she would not find a position until the fall. She was so excited she accepted the position over the phone and agreed to start in one week. When she visited the school the next day she realized just what she had gotten herself into. The classroom was a mess, with books on the floor that had not been swept in months, unwashed chalkboards, piles of papers covering what she suspected was the teachers' desk, and a bulletin board that reads "Welcome Back to School." Finally, in the corner of the room she noticed a small sheet of paper with "Classroom Rules" printed across the top. The rules are as follows: "No calling out, No hitting or shoving, No getting out of your seat without permission." Under those rules, there was a second sheet of paper containing additional rules written in a variety of ink colors. These rules were: "No getting a drink, No changing seats, No leaving the classroom, NO TALKING!" Despite the litany of stated rules, Ms. Ramsey observed a room in disorder. She watched 2 students actually get up and switch places while the teacher, Mr. Jones, was turned to the board. Five minutes later when Mr. Jones finally noticed the switch he shouted, "Tina and Sharise go back to your assigned seats, NOW!" In response Tina crossed her arms and said, "No, I don't want to." Mr. Jones, obviously frustrated and annoyed responded "Fine Tina do what you want, this is my last day, THANK GOD, and I really don't care what you do."

Ms. Ramsey was introduced to several teachers that afternoon and received many pitying looks and a few genuine offers of help for the upcoming weeks. When she was able to speak with Mr. Jones for a few minutes, his tone was abrupt as he explained that the class was filled with underachievers, many on free and reduced lunch, and several with IEPs that needed constant attention, both the students and the IEPs. With that, Mr. Jones offered good luck, added the electric pencil sharpener to his box of belongings and left the room.

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Time Started: _____

Please read the following scenario.

Mr. Cuthbert is at wits end. He arrives at school each morning full of energy, ready for a new day with his students and leaves completely deflated and exhausted. He feels as though his students are sucking the life out of him with their disinterest, boredom, and unresponsiveness. The students sit in their seats and stare at him everyday, with a few eyes glazing over. When he asks questions to the class no one responds and when he calls on individual students they look at him like he's crazy. Mr. Cuthbert feels that somehow the culture of his classroom has become such that boredom and minimal effort are the rule of the day. When he raises this concern with the students he commonly hears that "the stuff he teaches isn't interesting or worthwhile." Another common response is "We're the low group and it's not like we can get any smarter."

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

Time Started: _____

Please read the following scenario.

Rodney is one of Mr. Stack's most confusing students. Rodney has an amazing memory and is able to recite back any information that is asked of him. But Rodney gets flustered and frustrated when he is asked to defend his responses, to compare and contrast ideas, or to apply what he knows to a new task. Rodney routinely gets good grades because he completes all assignments on time and because he is able to do well on the objective portion of most tests. However, Mr. Stack is concerned about Rodney's ability to problem solve and apply information. Mr. Stack wants to intervene, but Rodney is doing fine. Other students are falling behind and need his attention much more.

Respond to the questions that follow by jotting down words, phrases or sentences that reflect your ideas and beliefs.

1. What do you see as the key elements or issues in this situation?

2. What would be the desired resolution of this classroom situation? (Do not explain how that end is accomplished. Simply describe the desired outcome.)

3. To what extent do you feel that you could bring about the desired resolution you described? (Please circle)

1----------2----------3----------4----------5----------6----------7----------8----------9

no confidence	very little confidence	some confidence	quite a bit of confidence	A great deal of confidence

4. Please list as many strategies, techniques, plans, or actions that you can think of for resolving the aforementioned situation. Write those responses in the middle column (#4).

#5	#4 Strategies, techniques, plans, actions	#6

5. For the above entries, make the following marks in the left-hand column (#5).
   - Place a check (✓) next to the actions you would most likely implement.
   - Place an **X** next to the actions that you think most teachers would implement.

6. Using the scale below, rate your confidence in your ability to carryout the listed actions, indicate your response in the right hand column (#6).

1----------2----------3----------4----------5----------6----------7----------8----------9

no confidence	very little confidence	some confidence	quite a bit of confidence	A great deal of confidence

Time Finished: _____

Appendix K

Discussion Group: Pedagogical Knowledge Beliefs

Time Started _____

Pedagogical Knowledge Beliefs

Indicate the extent to which you agree with each of the following statements.

A. Teaching is a talent. Some people have it, and some people do not.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

B. Good teachers get through most of their day on instinct.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

C. Expert subject-matter knowledge is necessary for effective teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

D. Knowledge about how to motivate students is essential for teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

E. As long as teachers know how to manage a classroom students will learn.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

F. Knowledge about instructional practices is the most important knowledge a teacher can have.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

G. When I read a professional article, I am *most* interested in learning what new teaching techniques are available.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Agree At all — Disagree — Agree — Completely Agree

H. Knowing how to use and implement teaching techniques is the hallmark of a good teacher.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

I. It is important to understand the theory behind teaching techniques.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

J. Anyone can be a teacher.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

K. Expertise in teaching can be developed after only a few years of practice.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

L. Teaching is a skill that can only be learned and developed through practice.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

M. It is easy to spot quality teaching.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

N. The best teachers are passionate about their work.

1----------2----------3----------4----------5----------6----------7----------8----------9
Do Not Disagree Agree Completely
Agree At all Agree

Time Finished _____

Appendix L

Discussion Group: Demonstrated Knowledge

Time Started _____

Demonstrated Knowledge

Place the letter of the *best* response for each item on the line next to the number.

___ 1. In which of the following situations would constructivist learning strategies be LEAST applicable?
   a. Developing seventh grade students appreciation of science method
   b. Teaching poetry composition to high-school students
   c. Teaching math facts to fourth-grade students
   d. Teaching students to conduct experiments in the physics laboratory

___ 2. To increase student's value for learning tasks, teachers should
   a. offer external rewards, such as candy or stickers, for completing class tasks
   b. make the relevance of the task clear to students
   c. establish specific consequences for failing to complete tasks
   d. praise students when they complete the tasks well

___ 3. How can you get students to cooperate and follow classroom rules?
   a. Develop harsh punishments for any infractions of the rules
   b. Call parents as soon as students begin to disobey the rules
   c. Get students to share responsibility for the classroom environment
   d. Offer whole class incentives for students' to exhibit appropriate behavior

___ 4. Ms. Walton has not been satisfied with the quality of her students' seatwork assignments. To improve the situation, Ms. Walton could have her students:
   a. complete additional worksheets on the skill
   b. complete homework assignments for extra credit
   c. listen to additional teacher presentations on the topic
   d. work together in pairs on the seatwork assignments

___ 5. A recommended teaching strategy for building positive expectations and motivation to learn is to
   a. eliminate difficult items from testing instruments.
   b. stress self-comparison.
   c. teach the problem-solving technique that has proven best.
   d. use a curve when grading tests.

___ 6. Mrs. Marshall's first two science classes were devoted to demonstrating and explaining rules and procedures in the laboratory. Based on research involving effective management, this procedure will probably result in
   a. loss of student interest and involvement in the subject
   b. poor understanding of the course material
   c. rushing through much material to make up the lost time
   d. time gained over the course of the school year

___ 7. Which of the following teaching interventions will allow a teacher to alter lessons to meet the needs of a student with Attention Deficit Hyperactivity Disorder?
   a. Provide instruction on learning and memory strategies
   b. Provide motivational training to help him control his own learning.
   c. Plan instruction so the student encounters limited and well structured tasks with clear consequences.
   d. Provide instruction in study skills

___ 8. Ms. Summers teaches sixth grade in a large middle school. Henry, a student in her class, is constantly out of his seat. When Ms. Summers confronts him and asks him to take a seat, Henry becomes angry and acts hostile. Which of the following actions should be considered for dealing with Henry?
   a. Ask other students to intervene to prevent open rebellion
   b. Send another student to notify the principal's office
   c. Stand your ground and do not back down; be firm and strong
   d. Wait for a few minutes for Henry to calm down before taking action

___ 9. One effective way that teachers can increase students' interest in a topic is to:
   a. Link the topic to students' hobbies and activities
   b. Create a competitive situation
   c. Stress memorization off basic concepts
   a. Encourage students to spread the work out over time

___ 10. In specifying class rules, it is recommended that rules should be
   a. designated exclusively by the students
   b. directed to study skills as well as class behaviors
   c. written down and posted in a prominent place
   d. specific

___ 11. Which one of the following teachers is MOST appropriately adapting teaching to different students and situations?
   a. Mr. Klotz maintains a brisk pace by moving from topic to topic relative quickly
   b. Mr. Jacobs facilitates uniformity by using identical formats in his classes
   c. Ms. Martin assures continuity by giving the same projects to all her students
   d. Ms. Lorenzo uses examples that relate to her students' prior experiences

___ 12. Ms. Flower's class seems completely disinterested in her content area and focused primarily on their grade point average. Which of the following strategies may help to her students' interest in this content?
   a. Provide students with choice and opportunity for self-direction
   b. Implement a tangible reward system contingent on task performance
   c. Establish a competition between the boys and girls
   d. Remind students regularly of the importance of this class for their future

___ 13. Penny is an eighth-grade student in Mr. James' German class. Whenever Mr. James turns to the chalkboard, Penny pokes the student in front of her. The other students laugh, and it takes time to calm the class down. Which one of the following strategies would be the most appropriate for changing Penny's behavior?
   a. After-school detention
   b. Contact with parents
   c. Exclusion from group activities
   d. Expressions of disappointment

___ 14. Ms. Claiborne would like stimulate her students' critical thinking. Which of the following strategies should enable her to promote the development of such thinking in her students?
   a. Provide students will clear behavioral objectives at the beginning of each lesson
   b. Model expert performance on a variety of learning tasks
   c. Present students with an advanced organizer to the day's lesson
   d. Ask students to explain or justify their responses

___ 15. Expert teachers use detention primarily for what?
   a. To assemble misbehaving student so they could be dealt with as a group
   b. To make the consequences of misbehavior public to enhance peer pressure
   c. To prevent the student from participating in extra-curricular activities
   d. To talk privately to the student about the particular misbehavior

Time _____

___ 16. All of the following teachers are discussing the Civil War with their students. Which of the following teachers is helping her students to think critically?
   a. Ms. Carter requires students to distinguish between fact and opinion during class discussion
   b. Ms. Jones provides students with a completed Venn diagram comparing the North and South
   c. Ms. Riley allows students time to read and respond to the questions in their textbook
   d. Ms. Kelly employs the Jigsaw method to develop students' understanding of the lesson content

___ 17. Which of the following strategies would be most appropriate when dealing with a student who is being moderately defiant during a lesson?
   a. Publicly tell the student to stop trying to impress his/her friends
   b. Send another student to the office for help
   c. Acknowledge the behavior and say that you will deal with it later
   d. Ignore the behavior and continue teaching

___ 18. Mrs. Sanders is very concerned about her student Claire who is failing history. Mrs. Sanders wants to help Claire develop her conceptual understanding about the American Revolution. Which of the following strategies will be most effective in helping Claire to learn and remember the information?
   a. Use flashcards to help Claire memorize the important events and people.
   b. Develop a series of mnemonics for Claire to use a memorization tools.
   c. Help Claire to apply the course content in a meaningful way.
   d. Offer Claire a reward for each correct answer she gets on her next exam.

___ 19. Mr. Olson teachers in a fifth grade resource room. The entire class is at least one year below grade level in their reading ability. What procedure should be recommended for use with his students?
   a. A single cycle of presentations over the material
   b. Lecture followed by individual study
   c. Cooperative group work
   d. Short presentations interspersed with group activities

___ 20. During instruction, it is important for teachers to gauge student comprehension. Which of the following techniques provides teachers with the most information regarding student understanding during instruction?
   a. Taking note of students' on-task and off-task behaviors.
   b. Implementing pop quizzes which are evaluated and included in students' final grade.
   c. Listening to student' responses and questions about the material.
   d. Reviewing students' grades on the unit test.

___ 21. During Mr. Johnson's science class students exhibit a variety of non-verbal behaviors. Which of the following students most likely comprehends the lesson?
   a. Jack, tapping his pencil and staring out the window
   b. Jillian, sitting quietly and watching the teacher
   c. Jake, writing in his notebook and nodding his head
   d. Jane, copying every word down that Mr. Johnson says

___ 22. Terrance consistently disrupts class, doing things like calling out, wandering the room, humming to himself, and insulting his classmates. Mr. Watson, Terrance's teacher, has tried a variety of strategies, standing near Terrance, redirecting his behavior, and sending numerous 'looks' his way. However, these do not seem to be working. The next step Mr. Watson might take is to:
   a. Assign Terrance to detention each time he acts out
   b. Move Terrance's desk to an isolated area of the classroom
   c. Create a behavioral contract with specified contingencies
   d. Send Terrance to in-school detention for a week

___ 23. When creating and using questions in class it is best to
   a. Keep all questions at a similar level of cognitive difficulty
   b. Ask students a variety of cognitively demanding questions
   c. Hold all questions until the end of instruction
   d. Prevent embarrassment by calling only on students who volunteer

___ 24. If a student gives an incorrect response to a question, the teacher should:
   a. ask, "Does anyone have a different answer?" Then call on the first volunteer.
   b. simply correct the student's answer and go on with the lesson.
   c. rephrase the question or offer the student a prompt or clue
   d. say, "That's almost correct" and then call on another student.

___ 25. Do evaluations of portfolios, exhibitions, and other types of alternative assessments have the same measurement concerns as more traditional assessment procedures?
   a. No, because alternative assessments are constructed by the students themselves
   b. No, because alternative assessments are inherently valid and fair to students
   c. Yes, because alternative assessments must be valid and reliable
   d. Yes, because alternative assessments promote learning better than traditional measures

___ 26. The goal of alternative assessments is to:
   a. evaluate students' in a way that relates to every day life
   b. require students to perform tasks that resemble standardized tests
   c. assess a broad range of content
   d. assess students' factual knowledge

___ 27. Which one of the following statements is TRUE about portfolios?
   a. Criterion-referenced grading should be used
   b. Only positive samples of student performances should be selected
   c. Portfolios work best with middle or high school students
   d. Teachers should select the work to be included in the portfolio

___ 28. Getting parents and families involved in student learning can be essential for student success. Which of the following actions can a teacher employ to help families enhance their children's learning?
   a. Invite families to visit the classroom or assist in a class project
   b. Share with families specific learning strategies that they can teach their children
   c. Encourage parents to volunteer for the annual school fund raiser
   d. Establish family support programs to assist with nutrition and social services.

___ 29. When working with very capable students, it is best to
   a. ensure that a greater quantity of material is covered
   b. allow these students to move ahead independently at their own pace
   c. pursue greater depth in content understanding
   d. Pair these students with less capable students for peer tutoring

___ 30. Katie and Michelle are best friends and sit next to each other. Usually this is not a problem in class, however today the girls have started giggling during silent reading time, and are distracting the other students. The best intervention for this situation would be

a. send the girls to the timeout table in the back of the room
b. separate the girls for the remainder of the week
c. stand near the girls' desks
d. assertively tell the girls to stop

Appendix M

Case Study Codes

Case Study Emergent Codes

A – Knowledge
- A1 – of students
- P – Pupil developmental needs
- A2 – of content
- A3 – of pedagogy
- A4 – of self

B – Development as a teacher
C – Efficacy/Confidence
- C1 – Lack of efficacy
- C2 – w/qualifications /excuses
- D – Motivation/boring

E – Reasons – decisions
- E1 – for instructional practices
- E2 – because it's fun/ they'll like it
- E3 – Motivate students
- E4 – Classroom Management

F – Take pressure off
G – Support needed/ wanted/missing
H – Cooperative group techniques
I – Reflection/reconsideration
J – Evaluation of Success
- J1 – of student needs/behavior
- M – Evaluation of learning

K – Accepts responsibility
L – Autonomy – Acquiescence
N – Hesitation/confidence
O – Important skills
- O1 – Classroom Management
- O2 – Instructional Practices
- O3 – Student Engagement
- O4 – Child Development/ ed psych
- O5 – Content
- O6 - Timing

Q – Development of student social skills
R – Strategies
S – Awareness of class events during post class interviews
T – Relations with students/appreciation
U – Likes/dislikes
V – Goals as teacher
W – Extensions – creation of new programs etc.
X – Joy/love of teaching
Y – Beliefs/theories
Z – Flexibility
AA – Challenge
BB – Holding back/ making qualifications
CC – "Kids in my head"
DD – Relate to student interests
EE – Interest of the teacher (content)
FF – Teaching as ability/learned
GG – Class time management theories/organization of activities
HH – Hard/challenging to diversify instruction to meet all needs

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