TEACHERS' CONCERNS REGARDING THE ADOPTION OF THE NEW MATHEMATICS TEXTBOOK

A Dissertation

by

ILHAM KAMEL EL-SALEH

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPY

August 2011

Major Subject: Curriculum and Instruction

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Approved by:

Co-Chairs of Committee,	Yeping Li
	Gerald Kulm
Committee Members,	Bugrahan Yalvac
	Suojin Wang
Head of Department,	Dennie Smith

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ABSTRACT

Teachers' Concerns Regarding the Adoption of the New Mathematics Textbook. (August 2011)

Ilham Kamel El-Saleh, B.S., American Lebanese University;

M.S., Texas A&M University

Co-Chairs of Advisory Committee: Dr. Yeping Li
Dr. Gerald Kulm

The goal of this study is to identify and examine teachers' concerns regarding their use of the new adopted mathematics textbook. In Texas, middle school mathematics teachers are often given a great deal of flexibility in the decision to use or not to use textbooks in their classrooms. This provides an opportunity for discussion about the concerns of teachers regarding the use of the newly adopted textbook. This study focused on investigating the concerns of teachers in relation to the adoption of the new textbooks for their districts based their years of experience in teaching the same class and their involvement on using the same textbook. In addition, this study identified the source of support in implementing the new curriculum materials. The study utilized the Concern Based Adoption Model (CBAM) as its theoretical framework. A non-experimental, cross-sectional survey design, incorporating a researcher-developed Stages of Concern Questionnaire (SoCQ), was used to address the research questions. A qualitative analysis was used to explore the teachers needs related to the use of the new adopted textbook and to provide additional insights into the teachers' concerns. The

answers of 147 middle school mathematic teachers were analyzed in addition to teachers' interviews. Overall, the study found that teachers' highest concerns are focused ~~mainly~~ on the management of their work and that they are still in the early stages of implementing the new textbook. Teaching experience proved to be an important factor in explaining teachers' concerns in the implementation. Teachers feel isolated and unsupported in their use of the new curriculum materials and they expressed the need for support from their schools and from textbook publishers, as well as the need for more time and training to become familiar with the new textbook's content. They also wanted evidence that the new textbook supports student learning. Recommendations from the study include the need for the schools and the textbook publishing companies to work with middle grade school mathematics teachers to enable them to implement the new curriculum materials (textbooks) in the classrooms.

DEDICATION

To the memory of my mother, and to my father who always believed in me.

To my husband, Kassem, and my children, Sura, Ramzi, and Yousef.

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I would like to thank my committee chairs, Dr. Li and Dr. Kulm, and my committee members, Dr. Yalvac and Dr.Wang.

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NOMENCLATURE

AAAS	American Association for the Advancement of Science
NCEE	National Commission on Excellence in Education
NCLB	No Child Left Behind
NCTAF	National Commission on Teaching and America s Future
NCTM	National Council of Teachers of Mathematics
NRC	National Research Council
NSF	National Science Foundation
SMSG	School Mathematics Study Group
TEA	Texas Education Agency

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CHAPTER I

INTRODUCTION

While a number of studies have examined the positive influence of teacher quality on potential curriculum materials, others have explored the differences in how teachers interact with curriculum materials. The purpose of this research study is to investigate some of the concerns that middle school mathematics teachers have regarding the implementation of newly-adopted textbooks.

The study will focus on certain aspects of teachers' use of curriculum materials. First, the pervasive use of curriculum materials in mathematics education has proven their usefulness. Second, the use of curriculum materials has been shown to maximize student and teacher learning. Third, examining teachers' interactions with textbooks can provide valuable insight regarding the potential for curriculum materials to contribute to reform in mathematics teaching. According to Russell, "It is not possible for most teachers to write a complete, coherent, mathematically-sound curriculum. It is not insulting to teachers as professionals to admit this… We do not sell teachers short by recognizing that they cannot do this job" (1997, p. 248).

This dissertation follows the style of *International Journal of Educational Research.*

In a study measuring textbook integrity, Chval, Chávez, Reys, and Tarr (2009) found that mathematics teachers used their textbooks for planning about 87% of the time. Textbooks are the primary physical resource for students' performance in the classrooms. Teachers' editions of textbooks are an asset that helps them create lesson plans by providing explanations, classroom discussion techniques, and examples of students' errors or misconceptions (Elsaleh, 2010). There are many reasons why teachers rely heavily on textbooks including ease of use, sample lesson plans, instructional objectives, homework assignments, assessment materials, and additional class activities (Schug, Western, & Enochs, 1997). Textbooks are especially useful for beginning teachers. For example, the textbook was the first thing that allowed the researcher to step into the classroom and begin teaching during her first year.

More and more is being spent on textbooks each year. Public schools spend more than four billion dollars on the textbooks annually (Chávez, 2003). Textbooks are a big business in the publishing industry; often the largest seller for a company each year is the prototype with which other publishers must compete (Reys, 2001).

Textbooks are curriculum materials used for guiding students' acquisition of certain culturally valued concepts, procedures, intellectual dispositions, and ways of reasoning (Battista & Clements, 2000). The way teachers use textbooks affects their individual teaching practices and has the potential to shape their pedagogical and content knowledge (Elsaleh, 2010). Becoming a teacher can be viewed as a process of socialization. This process takes place within ecologies and relationships among contextual elements, which include all the people, programs, and settings within which

learning to becoming a teacher takes place (Feiman-Nemser & Buchmann, 1987; Gregg, 1995; Zeichner, 1985; Zeichner & Gore, 1989).

Textbooks can have an impact on mathematics teachers' instructional practices in their classrooms. According to Eisner (1987), textbooks not only define a substantial proportion of the content, sequence, and aims of the curriculum, they also affect how certain topics will be taught. The teachers' interaction with the textbooks is a primary source of learning (Leikin, 2005; 2006). When teachers plan lessons, they need to know the material covered in the textbooks well enough to teach it. The textbook materials stimulate the teachers' thinking; they must understand the strategies used to teach certain concepts in the textbooks.

According to Clandinin and Connelly (1992), the curriculum potential theory perceives the teacher as a critical agent in the curriculum assessment, adaptation, and implementation process, and states that teachers, subject matter, and context are in "dynamic interaction." Teachers identify the curriculum potential through using and analyzing the materials. Some teachers might choose not to teach certain topics in the textbook for its proven results in students' learning. Curriculum development efforts will be diluted or vanished as simply confronts with teachers' failure to comprehend and use the textbooks.

Theory and Conceptual Framework

The development of mathematics curriculum materials during the 1990s elicited a significant number of studies on teachers' use of such new materials. Frykholm (2004)

stated that teachers using novel curriculum materials often experience pedagogical discomfort. Understanding the process of change for teachers due to the introduction of new curriculum materials was first clarified by the Fuller's-philosophical approach of the process of change (Fuller, 1969). Fuller established the concern theory in the late 1960s, which focused on determining teachers' perceptions as an important tool in measuring the quality of an educational intervention (Fuller, 1969). He classified teachers' concerns as three developmental phases in response to new situations or demands arising from the adoption of new mathematics textbooks: self, task, and impact. "Self" described the teachers' worries about their own ability to successfully utilize the new textbook. "Task" involved management of the new materials. "Impact" describes teachers' concerns regarding change and includes experiences, worries, or constraints that reduce their motivation to incorporate new textbooks in their classrooms.

Teachers' involvement with the adoption process of new mathematics textbooks every few years can be framed within the context of change theory. Middle-school mathematics teachers' interaction with newly adopted mathematics textbooks can be better understood as a process of change for individuals exposed to an innovation adoption. Assuming that adoption of a new mathematics textbook is a process rather than a one-time event, then the teachers' concerns play a significant role in successfully incorporating new textbooks in the classroom. The Concern-Based Adoption Model (CBAM) developed by Hall and Hord (1987) is based on Fuller's 1969 theory of change. It is an appropriate model for framing the examination of change for the teachers because the model suggests the critical value of recognizing the implementation of new

curricula. According to Fullan and Stiegelbauer (1991), the phases of the change process proposed by Fuller have many similarities to the CBAM model. Phase I, Self, is concerned with the adoption process (phase of initiation) and corresponds to the information and personal levels of the CBAM model. Phase II, Task, deals with the implementation phase or putting the innovation into practice, and this phase corresponds to the management level of the CBAM model. Phase III, Impact, deals with the last decision of the user and whether the change is established as an ongoing part of the system. Phase III corresponds to the consequences, collaboration, and refocusing levels of the CBAM model.

An instrument used by educational researchers to evaluate intervention or innovation, the CBAM predicts the reaction of the individuals who are part of the change (Hall, George, & Rutherford, 1979; Hall & Hord, 1987, 2001; Hord, Rutherford, Huling-Austin, & Hall, 1998). CBAM is a participant-based change model used in studying the adoption of educational innovations and it is useful for examining the process of change for teachers who are using new instructional materials. CBAM is applied to anyone experiencing change, including policymakers, teachers, parents, and students (Hall & Hord, 1987). The CBAM is comprised of three components: Stages of Concern (SoC), which assesses concerns about innovations; Levels of Use (LoU), which assesses how teachers actually use the innovations; and Innovation Configuration (IC), which identifies the patterns of using the innovations in classrooms.

The first component of the CBAM (SoC) was used in the current study to assess the seven stages of concern exhibited by teachers who are using new instructional

materials. A questionnaire was administered that assessed the following stages of concern: Awareness, Informational, Personal, Management, Consequences, Collaboration, and Refocusing. Each of these stages is summarized as follows:

- Awareness (Stage 1): Teachers have no knowledge of the textbook adoption event and have no interest in any action. The teachers decline the use of the newly adopted textbooks.
- Informational (Stage 2): Teachers express some concerns regarding the use of the textbooks (the nature of the innovation). They are concerned about the requirements needed to fulfill the implementation. Teachers usually show an interest in learning more about the usefulness of the innovation (textbooks).
- Personal (Stage 3): Teachers' concerns focus on the impact of the change on them and they question their abilities to implement the innovation. They may worry about their own limitations and the changes they are expected to make.
- Management (Stage 4): Teachers express concerns regarding the methods for managing the innovation within the classroom, including the organization and details of implementation, and the overcoming difficulties. Time requirements are among the prime management factors, teachers worry about other duties like covering the TEKS material and benchmarks testing at the same time. Time will create skepticism on the part of the teachers in relation to the use of the textbooks. Time is critical and a source of doubt for teachers' belief in their own ability to use the new curriculum materials.

- Consequences (Stage 5): Teachers' concerns are focused on the effects of the innovation on their students' learning. If the results are positive at this stage, then the teachers are in the process of implementing the innovation and using the textbooks.
- Collaboration (Stage 6): Teachers are interested in relating what they are doing with the innovation (the new textbook) to what their colleagues are doing with it.
- Refocusing (Stage 7): Teachers evaluate the innovation and are able to make suggestions for further improvement; also, they are able to consider alternative ideas that, in their opinions, work better than the methods described in the textbook.

The SoC instrument recognizes four broad stages of concerns -- unrelated, self, task, and impact -- within the seven categories of concern. According to the SoC model, an individual's concern about change lessens as he or she becomes more experienced with innovation, progressing sequentially from stage one through seven (Fuller, 1969; Hall et al., 1979; Hall & Hord, 2001). Years of experience with the innovation and professional development activities related to innovation can affect the nature of the concern (Hall & Hord, 2001). Understanding an individual's concern about an innovation at a particular stage is recognizing the peak in the SoC. According to Hall and Hord, the stage of most concern and focus for an individual is the one that causes the individual the most tension or concern.

According to Hall and Hord (1987), there is a general pattern to the intensity of the different stages of concern. The changes in the pattern are linked to the change process as it unfolds (Hall et al., 1979). In the beginning of the change process, the individual who is the "non-user" has high concerns in the Awareness, Information, and Personal stages, which correspond to the CBAM's Phase I "self" concerns. In CBAM Phase II (task concerns), concerns become more intense in the Management stage as the individual begins to use the new program. As individuals become more experienced in the innovation, the concerns of the lower stages decrease in intensity while those in higher stages increase (CBAM Phase III, impact concerns). The concerns change over time in a predictable, developmental manner (Hall & Hord, 1987). Designing an appropriate intervention according to the needs of the teachers involved in an innovation is through predicting their concerns' stage. Teachers could be provided with specific help according to the needs of their determined stage of concern.

The seven stages of concerns acknowledge the importance of noting the progression of adopting new materials and approaches (Hall & Hord, 1987). First, the seven stages point out the importance of attending to where teachers are and addressing the questions teachers ask. Second, the model suggests it is important to study implementation of new materials and approaches for several years, because it takes at least three years for early concerns to be resolved and for additional concerns to emerge. Such long-term study provides an opportunity to determine if the teachers' levels of concern are a function of either years of teaching experience or years of involvement with the textbook. Finally, the model suggests that teachers should be given the chance

to acknowledge and address concerns critical to progress in a curriculum reform implementations effort and curriculum development.

Cultural constructivism can also serve as a general philosophical and psychological framework for the design and evaluation of teachers' interaction with textbooks. As defined by Salomon and Perkins (1998), cultural constructivism involves a person's interaction with cultural artifacts, including socially derived symbolic systems and tools. Ball (1994) views teachers as continually constructing new knowledge from classroom experiences and interactions with the textbooks and other curriculum materials. Ball stated:

> Teachers must figure things out as they teach. They are constantly faced with the data of their own experience. They must develop knowledge of particular children, of the material they are teaching, and ways to engage students in the content. (p. 9)

Textbooks have a powerful effect on both the content and structure of classroom instruction. The process of trying to understand a textbook assignment may cause teachers to rethink or even change their strategies of teaching. The educational reform efforts envisioned this rethinking process as a pedagogical change (NCTM, 2000). Teachers could expand their pedagogical knowledge of teaching when they increase the potential of interacting with the textbooks. The interaction with the learning materials is a significant source of teacher learning (Leikin, 2005; 2006). When planning lessons, teachers often express the need to know the subject matter of the textbooks well enough

to teach. The textbooks stimulate teachers' thinking process, which increases their content knowledge. The interactive relationship between the teacher and the textbooks implies certain issues related to teachers' learning the content of the mathematics textbooks. Teachers create meaning from the intended curriculum as a result of the interaction between their experiences and beliefs with the intended curriculum. Teachers' interactions with the new curriculum materials could be better understood by learning how teachers perceive resources that could facilitate and support their use of the textbooks. Facilitating the change process by introducing new curricula is a team effort. Teachers are able to specify all their needs in the adaptation process; acknowledgement of such needs could reduce the challenges experienced by the first use of new textbooks.

Problem Statement

The National Research Council found that there is not sufficient evidence of an effective mathematics curriculum (NRC, 2004). Many studies (Brown, 2002; Davis & Krajcik, 2005; Remillard, 2005) have shown that increased curriculum potential depends on how teachers interact with the curriculum materials, and that teachers interact differently with their curriculum materials. This is problematic and concludes the presence of an ideal curriculum's use.

Making progress and changes in textbooks is a challenging task because it involves being responsive to a diversity of the needs. Policymakers and educational leaders need additional feedback from researchers to secure better service for teachers and to avoid confusion and frustration for teachers in using the textbooks. The impetus

for this investigation was the importance of textbooks in mathematics teaching, the critical role of teachers in effective implementation, and the concerns of teachers regarding adoption and use of new mathematics textbooks. The role of the teacher in the implementation of textbooks must be examined more explicitly and carefully.

The American Association for the Advancement of Science (AAAS) Project 2061 presented a rigorous analysis of 12 mathematics textbooks used in middle grades (AAAS, 2000). The learning goals for the evaluation were derived from the 1993 AAAS Benchmarks for Science Literacy report, and the criteria for the ratings were drawn from research on teaching and learning mathematics. The evaluation process was guided by two main concepts: (a) alignment of the textbook content with selected mathematics learning goals, and (b) the contribution of textbooks to quality instruction leading to students' learning and understanding. One of goals of the AAAS evaluation was to provide trustworthy research-based information to support selection and use of curriculum materials that had the potential for promoting higher achievement among students, as well as helping teachers learn new teaching practices. The evaluation of results from a study by Schmidt, McKnight, and Raizen (1997) indicated that curriculum materials have significant effects on middle school students' mathematics performance.

Student learning is not the only outcome of textbook use; the acquisition of new learning techniques by teachers is another desired outcome. Davis and Krajcik (2005) remarked that researchers have only recently begun to focus on the effects of curriculum materials on teachers. Current reform efforts in mathematics education are the result of curriculum development based on standards recently adopted by the National Council of

Mathematics Teachers (NCTM, 2000). Teachers are challenged by the demands of using new curriculum materials, and new conceptual and pedagogical approaches are required to teach in these new standards-based classrooms. Standard-based curriculum requires students to answer questions with high levels of cognitive demands that emphasize conceptual understanding and connection of many mathematical ideas rather than traditional procedural skills.

The new curriculum standards have generated many questions about teachers' cognition and thinking processes (Clark & Peterson, 1986; Thompson, 1984). Teachers' interaction with the new curriculum is part of an assessment of the impact of the curriculum on student learning. Because teachers are the critical agents for bringing change into their classrooms, the teachers themselves should be the major source of evidence about the effectiveness of new curriculum materials (Gross, Giacquinta, & Bernstein, 1971; Doyle & Ponder, 1977; Fullan, 1982). The National Research Council found that there is insufficient evidence regarding the effectiveness of any of the present studies "due to the restricted number of studies for any particular curriculum, limitations in the array of methods used, and the uneven quality of the studies" (NRC, 2004, p.3). The NRC study recommended that a study of the quality of teachers' implementation be included in future research.

Understanding the teachers' reactions to the curriculum materials is critical in the implementation of curriculum by teachers. The manner in which teachers use the textbooks affects individual teaching practices. Textbooks and their use have the potential to shape the in-class pedagogy and the content knowledge teachers present. An

individual becoming a teacher can be viewed as going through a process of socialization (Gregg, 1995; Zeichner & Gore, 1989). Such processes take place within ecologies and relationships among contextual elements, which include all the people, programs, and settings within which learning to becoming a teacher takes place (Feiman-Nemser & Buchmann, 1987; Zeichner, 1985).

Several studies have suggested the teachers who do not possess curricular repertoires of their own depend on the textbooks to know how and what to teach (Ball & Feiman-Nemser, 1988; Christou, Eliophotou-Menton, & Philippou, 2009; Kauffman, Johnson, Kardos, Liu, & Peske, 2002; Remillard & Bryans, 2004). The textbook materials stimulate teachers' thinking. Teachers have to understand the strategies of teaching certain concepts in the textbooks and overcome challenges of teaching with new approaches, especially with the introduction of new curriculum materials developed in the 1990s that reflect the new standards proposed by the National Council of Teachers of Mathematics (NCTM, 1989).

Not only are teachers affected by the curriculum, but they also influence the curriculum by serving as a filter through which they develop their own interpretation of the curriculum content (Cohen & Ball, 1990). Teachers vary in their level of textbook implementation. Many contextual and social factors influence how teachers engage with and use curriculum materials. Some teachers make adaptations to the lessons, supplement the lessons with additional activities, or selectively omit entire lessons. Drake and Sherin (2006) suggested that there are changes in the ways in which teachers read and evaluate the curriculum materials, called "curriculum vision."

Because teachers are given the freedom of using or not using the textbooks adopted by their districts, there is a range of use of the textbook within each classroom. Grouws and Cebulla (2000) reported that about two-thirds of teachers use textbooks almost every day. However, some teachers decline the use of the textbooks in favor of worksheets and other learning materials. Other teachers may use only part of the textbook. A serious investigation of teachers' interaction with the textbooks could lead to better understanding of the critical relation between the teacher and the written curriculum, as well as the role of mathematics textbooks on students' performance and teachers' learning.

Teachers also vary in their conceptions of using the newly adopted textbooks as a function of years of experience (Christou, Eliophotou-Menon, & Philippou, 2004). Remillard and Bryans (2004) suggested that experienced teachers' use of curriculum materials varies significantly from that of new teachers. Christou et al. (2004) adopted a specific approach to study teachers' concerns; they placed an emphasis on concerns associated with change in the educational system. In studying teachers concerns regarding adoption of the standard-based curriculum in Cypress, they found that experienced teachers worry more about the management of their classrooms than about themselves when textbooks based on the new standards are introduced.

Manouchehri and Goodman (2000) examined teachers' reactions to the standard-based mathematics textbooks and found that changes in teachers' practices do not happen automatically; teachers do not change their teaching practices merely from exposure to innovative materials. The results of Manouchehri's and Goodman's

qualitative study suggested that teachers should be guided and supported in their pedagogical approaches. Their 2000 study supports the belief that teachers need training incorporating concrete images that depict teaching methods to succeed. Without these images, implementation will be futile (Senger, 1999). Kauffman et al. (2002) interviewed first and second grade teachers to investigate how teachers experience the curriculum and assessment of curriculum materials. Their study asserted that teachers are not prepared enough to use the curriculum material, and schools fail to offer help and support in the use of these materials. The process of giving and receiving feedback works only "if people recognize each other" (Ridley, 1996, p. 70).

Cooperative relationships and a collaborative process between implementers of innovative teaching methods could produce effective strategies to foster the progress of educational change. Using shared knowledge, teachers could overcome problems of textbook implementation. The ongoing interaction between teachers regarding instructional materials, including textbooks, could serve to motivate teachers to take a step farther in the change process.

Statement of Purpose

The purpose of this study is to identify and examine teachers' concerns regarding mathematics textbooks newly adopted by their school districts. The goal of this study is to examine teachers' adaptation process and to investigate the direct and indirect implications of the process of change when teachers adopt the mathematics school textbook. The analysis and implications of teachers' actions in such change process

contributes to understanding of the forces for change in the educational system. We could argue that the ultimate purpose of introducing new mathematics textbooks every six or seven years benefits the students. Textbooks are innovations for students' improvement. The finding of this study could be used by textbook publishers to strengthen awareness of teachers' views and concerns regarding their use of the textbooks, and hence, affects reform in school system.

Making progress and changes in textbooks is a challenging task because it involves being responsive to a diversity of the needs. Policymakers and educational leaders need more and more feedback from the researches to secure better service for the teachers and to avoid confusion and frustration for teachers in their use of the textbook. The importance of textbooks in mathematics teaching, the critical role of teachers in effective implementation, and the concerns of teachers regarding adoption and use of the newly adopted mathematics textbooks were the impetus for this investigation.

Research Questions

This study will identify how middle school mathematics teachers perceive the use of the newly adopted textbooks in Texas schools and school districts. It will also examine the differences in teachers' concerns regarding the adoption of the textbooks based on their experience and years of their involvement in using the same textbook, as well as how such personal characteristics or factors might produce changes in teachers' concerns. Specifically, the study will examine the effect of the school's and the district's support for the middle school mathematics teachers in their assessment and adaptation of

new curriculum materials. The contextual factors (list these) have proved their influence in insuring and sustaining effective implementation of textbooks. To be successful, the adoption of the curriculum materials and teachers' movement in the change process requires time and appropriate intervention strategies. Understanding the factors that might contribute to either facilitating or impeding the implementation of the curriculum materials, other contextual factors will also be examined through teachers' thoughtful analysis for their provided curriculum.

The study seeks to answer the following questions:

1. What are teachers' concerns regarding the use of newly adopted mathematics textbooks?
2. How do more experienced teachers with longer periods of textbook use vary in their concerns about the use of mathematics textbooks compared with teachers with limited experience and use of the textbooks?
3. How does the school's or district's support affect teacher satisfaction with the use of the new textbook?
4. What are teachers looking for in the new mathematics textbooks?
5. How do teachers use the newly adopted textbook?

Significance of the Study

The current study will provide information about teachers' interaction with mathematics textbooks and teachers' perception the adoption of new curriculum materials. Understanding the change process for the teachers using the adopted

mathematics textbook is a component of educators' effort in educational reform. Establishing teacher concerns could be a starting point for development of new ideas in curriculum improvement and for subsequent studies, and could have profound implications for change in school systems. The study of teachers' concerns regarding the adoption of the newly textbooks could facilitate the process of new textbook adoption. Planning of pre-service programs could be more accurately tailored to familiarize teachers with resources offered by the textbook. Pre-planning could also direct attention to professional development with the focus on supporting taking full advantage of and learning from the newly adopted mathematics textbooks. The interaction with curriculum materials is an important source for teachers' learning process (Leikin, 2006). When teachers plan for lessons, they express the need to know the content of the textbook well enough in order to teach. In this way, the textbook stimulates teachers' thinking processes.

The proposed research on teacher interactions with textbooks could provide valuable insights as well as the potential for curriculum materials to contribute to reform in mathematics teaching. Mathematics education is at an intersection between two trends: (a) the availability and the implementation of newly designed curriculum materials, and (b) the tendency of schools to use and mandate a single curriculum to regulate teaching practices for mathematics (Remillard, 2005). In the latter regard, using a high-quality textbook in every classroom is an effective way to enhance teaching practices and further develop curriculum materials. Reducing the variables that affect students' performance in this complex equation is part of the solution to reform. The

variables that affect improved teaching quality are easier to control when all teachers use the same high-quality textbook.

The use of textbooks could relieve teachers of time-consuming and often overwhelming responsibilities. Many aspects of the change process for teachers when using new curriculum materials could also be solved by studying teachers' interaction with the textbook (Richardson & Placier, 2001). In response to all of the above, teachers should get the best out of the textbook adoption service in their classrooms.

This study, which seeks to understand the concerns of middle school mathematics teachers in Texas undergoing the adoption of new textbooks, will be of value in understanding teachers' potential in using curriculum materials. This study attempts to justify the need for more research studies on effective curriculum implementation, and on how teachers can be involved in an active process and satisfying their students' needs. The components of the CBAM model will be used to bring about systemic change in education by evaluating progress in the change process for teachers. Teachers' concerns can provide the foundation for real change and systemic change in education.

Definition of Terms

The following terms are used throughout this study.

Adoption. This term refers to the decision of using an innovation, in this case new mathematics textbooks (Rogers, 1995).

Concern-Based Adoption Model (CBAM). The CBAM is a conceptual framework for change that recognizes teachers experiencing change. This framework considers change as a process not an event, recognizes change as highly personal, and recognizes that innovations entail development in both feelings and skill levels. The concern-based model requires the change facilitators to have an understanding of how teachers perceive the change and then adjust what they do accordingly. The model suggests the importance of paying attention to the implementation of new curriculum materials. Responding to teachers' needs through professional activities could address where teachers are in the change process (Hall and Hord, 2001).

Concerns. These are a combined representation of feelings, preoccupation, reflection, and contemplation concerning a particular issue (Hall et al., 1979; Hall & Hord, 1987, 2001).

Curriculum materials. This term is used interchangeably with the term textbooks. Both include the teacher's guide, student's book, and supplemental materials such as assessment materials and workbooks.

SoC. This is a dimension in the CBAM developed by Hall, Wallace, and Dossett (1973). SoC refers to Stages of Concern, which define the varying emotional intensity of feelings regarding an innovation (unrelated, self, task, and impact).

Stages of Concern Questionnaire. This quantitative tool was used to collect data about the concerns of individuals involved in an innovation.

Innovation. An innovation is an idea, practice, or object that is perceived as new to an individual or another unit of adoption (Rogers, 1995).

Middle school. The term middle school refers to grades six through eight in the United States.

Standards. Standards are objectives identified by a state or national educational organization that students are expected to achieve and learn.

Outline of the Study

Chapter II reviews prior research studies related to this study and provides background knowledge of several concepts related to teachers' adoption of the mathematics textbooks. Chapter III presents the methodology used in the study, which is based on Fuller's (1969) theory and his classification of teachers' concerns. An adaptation of the Stages of Concern Questionnaire (SoCQ) derived from the CBAM model was employed to collect the data. Chapter IV presents the results, which included (a) determining the teachers' stages of concern, (b) comparing teachers' concerns based on their years of experience and their years of involvement in the innovation and, (c) exploring teachers' reactions concerning their implementation of the new curriculum

materials and the adopted mathematics textbooks. Chapter V provides a summary of the research, a discussion of each research question, overall conclusions drawn from the research, and recommendations for future research.

CHAPTER II

LITERATURE REVIEW

The theoretical framework of this study is based primarily on the CBAM model's theorized Stages of Concern (SoC) and their intensity in individuals involved in innovation (Hall et al., 1979; Hall & Hord, 1987, 2001, 2005). This study uses the informing nature and tools of the CBAM model to understand and manage change. When one thinks of change via new curriculum materials, newly published textbooks often come to mind. Teachers who choose to use these newly developed textbooks are engaged in a form of change. When teachers implement new curriculum materials, they change their modes of instruction, engaging in the intellectual activity of trying to understand the content of the new textbooks and their students' thinking. Independently selected variables were chosen to examine the textbooks' influence on teachers' concerns. Teaching experience, years of involvement in using the same textbook, and the support of the school or school district were included, along with studying contextual factors. The dependent variable selected was the teachers' most intense stage of concern regarding the use of the new adopted mathematics textbooks.

The literature review in this chapter provides background knowledge of several concepts related to teachers' adoption of the mathematics textbooks. The purpose of this chapter is to strengthen the connections between present research and the accumulated body of knowledge on the field of teacher interaction with textbooks. It is organized into four main sections: the process of adoption and development of textbooks in the United

States, teachers' concerns regarding the use of new curriculum materials, teachers' use of textbooks, and contextual factors in teachers' use for curriculum materials.

The use of new curriculum materials brings new ideas and changes in teaching practices. The new curriculum materials are a source of change for teachers (Sosniak & Stoddlsky 1993; Remillard, 2000; Collopy, 2003). Each teacher interacts differently with the new curriculum (Remillard, 1999). By examining the changes that teachers experience as a result of the innovation, we can better understand the nature of teachers' relations with textbooks. These recent findings confirm the complex nature of the role played by contemporary teachers. It is evident that teacher change is a long process that needs both time and effort (Barnett & Friedman 1997; Borko, Davinroy, Bliem, & Cumbo, 2000).

Extensive research on innovation in education suggests that textbook adoption is a kind of educational innovation. This study examines middle school teachers' concerns as they respond to new situations created by the adoption of new mathematics textbooks in their district. Many efforts have been made to explain the teachers' change process resulting from classroom innovations (Remillard, 2005, 2009; Wheatley, 2002; Guskey, 2002). Understanding the concerns of the teachers as they interact with the curriculum materials could provide insight on the process of textbook adoption and its management. It could also help textbook authors design and produce materials that are more effective and direct the attention of support systems to help teachers deploy the new materials. Many studies (Drake & Sherin, 2006; Lloyd, 1999, Manouchehri & Goodman, 2000) focused on investigating teachers' concerns and reactions to the use of the new

curriculum materials as a critical issue in studying the teacher-curriculum relationship. The complexity of challenges that teachers face as they use new curriculum materials led to the development of serious concerns.

Adoption and Developmental Process for Mathematics Textbooks in the U. S.

Examining the role of the state as an influence on mathematics textbooks selection process is important in understanding the relationship between teachers and textbooks. Unlike many other countries around the world, the United States does not have a national curriculum; each state has its own framework for teaching mathematical content. About half of the states are *state adoption states* in which state committees review and adopt the textbooks. The other states are *open states* in which each district or school chooses its own instructional materials without state oversight.

State Adoption States

In the late nineteenth century, some states uniformly addressed the challenges of transient populations and standardized costs for school districts through increased access to textbooks (Farr & Tulley, 1985). Today, these states are responsible for funding the process of approving a list of instructional materials, dictating the timing of the adoption cycle, and providing the regulations that local districts must follow. Before school districts start the selection of the textbooks, a state-level committee is appointed to set a list of approved instructional materials. The committee is comprised of teachers, supervisors, and administrators who specialize in the specific content area, such as

mathematics. Mathematics content, integration of technology, and alignment to the state standards and grade-level expectations are some of the criteria that these committees consider in the evaluation process for the submitted textbooks. In Texas, instructional materials that are a 100% match with the Texas Essential Knowledge and Skills (TEKS) requirements are placed on the conforming list. Materials with a 50-99% TEKS matching score are placed on a secondary or non-conforming list.

All the districts within a state that uses the state-adoption method adopt the materials at the same time and on a cycle set by the state. For example, Texas selects new textbooks for middle school classes every seven years. The state-adoption states influence the districts' polices in this adoption process. State-adoption states set the guidelines that ensure fairness to all publishers of educational materials and the inclusion of all stakeholders in the selection process. For example, the state requires districts to make an official adoption within six months of the official recommendation.

Testing Influence on Adoption States

The No Child Left Behind (NLCB, 2002) legislation and recent state mandates demand greater accountability for student achievement. This demand for higher accountability also sheds light on the textbook selection process. School districts are looking for instructional materials that improve student achievement. The districts are primarily concerned with aligning their instructional materials with the state standards and testing. Grade-level expectations are developed by the districts in response to their grade level testing results. The new state standards issued within the last five years offer

greater level of details (Reys, 2006). They aimed at clarifying the curricular emphasis at each grade level and deep students' understanding. The timing of the adoption cycle for the mathematics textbooks is affected by the release of new standards and test results. Looking for the right materials at the right time in order to match them with the current state expectations is a concern for the curriculum leaders employed by the state.

The increased pressure faced by teachers due to the state testing was an origin of studies explored the accountability status impact on teachers' ways of using curriculum materials. Kaufman (2000) presented some ways local expectations regarding teachers' use of curriculum materials can be related to levels of implementing accountability polices in schools and districts. The change in curriculum materials in each adoption cycle contributes to the phenomenon of teachers' use of new curriculum materials. Such new experiences for teachers are a difficult arena for many teachers, as well as a source for many studies specific to teachers' use of mathematics textbooks (Durkin, 1983; FitzGerald, 1979; Komoski, 1977).

Open States

States with the open option do not dictate the instructional materials for the districts, nor do they support the districts financially in the adoption of instructional materials. Some of these states have characteristics similar to state-adoption states, while others are highly reliant on local districts' decisions with little or no involvement from the state. Districts and schools in open states make the final decision (Reys, 2001).

Quality of Mathematics Textbooks in the U. S.

Like many other countries, the United States has made many dramatic changes to the traditional curriculum in mathematics in an attempt to improve how mathematics is taught. The distinction between inquiry-based teaching of mathematics and traditional methods of teaching mathematics was the main concern for reform efforts in recent years (Cobb, Wood, Yackel, & McNeal, 1992). In the past, practice and drill were the main strategies used by teachers in traditional classrooms. Students learned mainly from the text rather than from the teacher. Traditional textbooks were the main source of mathematics curriculum materials (Goodlad, 1984).

During the 1960s, studies by the School Mathematics Study Group (SMSG) showed that changing learning objectives should improve teacher effectiveness in the classrooms. The studies stated that teachers are important and that further studies on that regard were needed (SMSG, 1965). According to the SMSG studies, teacher education and training were the preferred methods of incorporating changing objectives into the learning process. In inquiry-based mathematics instruction, teachers were expected to implement student-centered investigations, problem solving, and real-life activities into the classrooms, and they were asked to implement these new objectives while they were teaching. Teachers have increasingly proved their critical roles in the educational change (Datnow, Hubbard & Mehan, 2002; Duke, 2004).

The development of the mathematics curriculum insures teacher involvement in the educational process is continually improved. Several studies have stated that the crisis in mathematics education must be addressed effectively (NCTM, 1989; NCEE,

1983; AAAS, 1989). The publication of *Curriculum and Evaluation Standards for School Mathematics* (1989, 2000) and *Professional Standards for Teaching Mathematics* (1991) by the NCTM was the driving factor behind many research projects focused on textbook quality.

The development of a method to measure the effectiveness of mathematics textbooks for middle grades was the focus of Project 2061 (Kulm, Morris & Grier, 2000). The learning goals and criteria for evaluation used in Project 2601 were derived from the NCTM 1989 study and a 1994 study by the American Association for the Advancement of Science. The project concluded that most middle-grade textbooks do a credible job addressing number benchmarks.

A comparison study of selected mathematics textbooks from mainland China and the United States at the lower-secondary grade levels reveals that both series provided a wealthy source of material for the students to develop their ability in problem solving (Zhu & Lianghuo, 2006). In addition, the U.S textbooks were found to include more problems contextualized in real-world situations, especially authentic problems. These kinds of problems help students to better understand mathematics and appreciate its use in their lives. These real-life application problems can enhance logical reasoning and provide a learning environment supporting a higher level of understanding (Gu, Huang & Marton, 2004). Encouraging teachers to take the initiative and incorporate new curriculum changes into daily practice is important. Program administrators should work on identifying the positive aspects of these changing objectives for teachers.

Concerns Caused by Adoption of New Curriculum Materials

Teachers today play a more prominent role in the larger educational process than they previously did. There is extensive literature dealing with the changing processes that teachers experience (Richardson & Placier, 2001; Silver, Ghousseini, Charalambous, & Mills, 2009). Because teachers are conventionally thought to resist change (Duke, 2004), it is essential to understand the individual characteristics of teachers and how these affect their concerns. Concerns are the thoughts, feelings, worries, and reactions that an individual develops because of his or her involvement with a new program or an innovation (Hall & Hord, 2001).

The concept of teachers' concerns regarding the adoption of an innovation originated during late 1960s. In 1969 Fuller proposed a hierarchy of teacher concerns consisting of three levels: self, task, and impact. Fuller's model was later expanded by Hall et al. (1979), who proposed seven stages of concern for teachers involved in the innovation. Teachers progress through these seven stages as they interact with new reforms in the classroom environment. These stages of concern, the levels of innovation implementation, and the innovation's configuration constitute the Concern-Based Adoption Model (CBAM). Studies built on the CBAM have provided empirical evidence supporting the sequential of the teachers' concerns (Hall & Hord, 1987; Hord et al., 1998; Loucks-Horsley & Stiegelbauer, 1991). The study of teachers' concerns regarding changes in educational materials is significant because it sheds light on how teachers interact with these new textbooks. Many studies have proved that the successful

implementation of new curriculum materials depends on each teacher's particular experience and circumstances while deploying them.

A study conducted in Cyprus (Christou et al., 2004) examined teachers' concerns in relation to the implementation of a standards-based curriculum in elementary schools that followed CBAM guidelines. Teachers reflected on their experiences while using the new textbooks and most of the teachers were at the *task* stage of the SoC profile. The management concern scored the lowest mean. The highest mean was for self-concern and indicates that teachers were not concerned about their abilities to implement the new mathematics textbooks. However, the study shows that there were significant differences in the concerns of teachers across years of teaching experience but not across years of implementing new curriculums. Each teacher's cumulative experience was critical in explaining the developmental nature of that teacher and in determining the degree of implementation for the textbooks.

A recent study (Tunks & Weller, 2009) explored an important shift in teachers' concerns. The CBAM model was used to examine the process of change for teachers by introducing the one-year *Teacher Quality Grant*. The program is designed to support algebraic thinking in mathematics instruction. Teacher concerns and levels of success with the program were measured in this study. To enhance the implementation of the program, support structures following CBAM principles were employed to make progress in understanding teachers' concerns. The study identified three factors that had positive effects on the change process for teachers: having direct contact with supportive staff members, having a teacher support system, and incorporating teachers'

observations regarding student success. The teachers' concerns were evolved from the task to the impact stage. Teachers experienced the learning of the innovation with their students.

Two other studies (Christou et al., 2004; Tunks & Weller, 2009) followed identical research methodologies while assessing the concerns of teachers but reached different conclusions regarding how teacher concerns develop. The study by Christou et al. indicated that teacher experience is an important factor that affects textbook usage. However, Tunks and Weller recognized that supporting the professional development of teachers was an important factor determining whether the implementation of new curriculum materials was successful. These two studies joined numerous others (Doerr & Chandler-Olcott, 2009; Christou et al., 2004) confirming the presence of significant factors that influence teachers' work with the curriculum materials. Using the CBAM as a conceptual framework for studying the teachers' change process, Hall & Hord (2001) pointed out the importance of appropriate interventions that could reduce the challenges of change.

Teachers should not be viewed as mechanisms for the use of a particular curriculum to promote students' learning nor as executors of polices enforced on them. During the course of implementing new curricula, teachers have the responsibility to make connections between what is in the written curriculum and students' needs. Teachers' *curricular reasoning* (McDuffie & Mather, 2009) is defined as how teachers assess, plan for, adapt, and implement curricula in the classroom. The *curriculum potential theory* considers teachers to be an inextricable part of the curriculum

assessment, adaptation, and implementation process in which the teachers, learners, subject matter, and context are in "dynamic interaction" with each other (Clandinin & Connelly, 1992). Remillard (2005, p. 230) commented on the practicality of curriculum implementation and stated, "It is impossible for curriculum developers to address all the needs of individual schools and classrooms." It is generally accepted that a single 'ideal curriculum,' which applies to any group of students and in any school, does not exist. Accordingly, the National Research Council's review of curriculum programs reported that there was "insufficient evidence of the effectiveness of any program studied" (NRC, 2004, p.3). An ideal and perfect curriculum that works for every group of students in any school has never been identified. Remillard (2005) remarked that mathematics education is at an intersection between two trends: the availability and the implementation of newly designed curriculum materials, and the schools' tendency to use and mandate a single curriculum in order to regulate mathematics' teaching practices.

Researchers should not ignore the role that teachers play in implementing curriculum materials. Each teacher brings different types of knowledge, experience, and beliefs regarding how the curriculum materials should be used. Consequently, the professional identity of a teacher is composed of many interconnected beliefs, subject-matter expertise, teaching and learning, personal self-efficacy, and orientation toward work and change (Drake, Spillane, & Hufferd-Ackles, 2001). This professional identity includes how teachers understand themselves and how they are positioned in relation to the curriculum materials (Lloyd, 2009).

Teachers need an appropriate level of knowledge to correctly perceive and interpret the content of textbooks. Two recent studies reported that beginning-level teachers appear to appreciate and rely on the explicit guidance on what and how to teach particular textbooks (Kauffman et al., 2002; Remillard & Bryans, 2004). A teacher's knowledge is among the characteristics that influence his or her concerns regarding the use of the new curriculum materials. "Teachers must know and understand deeply the mathematics they are teaching and be able to draw on that knowledge with flexibility in their teaching tasks" (NCTM, 2000, p. 17). Teachers' knowledge of mathematics plays an important role in their teaching of the particular subject matter. Teachers interact differently at various phases of their careers. Silver, Clark, Ghousseini, Charalambous, and Sealy (2007) found that very experienced teachers use the curriculum material differently than new teachers do.

During initial attempts to investigate how beginning teachers learn to teach, researchers divided knowledge into seven separate categories that together make up the "knowledge base" for teaching (Shulman, 1987; Wilson, Shulman, Richert, 1987). The categories of knowledge included subject matter knowledge, pedagogical content knowledge, general pedagogical knowledge, curriculum knowledge, knowledge of learners, knowledge of school context, and knowledge of educational aim.

The first two types of knowledge (subject matter and pedagogical content) were employed most by teachers in their interactions with the curriculum materials. Training, concepts, and teaching strategies interact with the curriculum resources to produce meaningful experiences for students in a particular classroom. A blend of content and

pedagogical expertise enables teachers to design and implement curricula most effectively (Benz-Peretz, 1990). Subject knowledge denotes the knowledge of facts and concepts (Ball, 1991; Stodolsky & Grossman, 1995). Shulman (1986) perceived a complementary relationship between pedagogical knowledge and content knowledge of a subject area and identified it as *pedagogical content knowledge*. Shulman (1987, p. 8) presents pedagogical content knowledge as "blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction."

Teachers engage in intellectual activities as they implement curriculum materials. In the case of student teachers, Borko, Livingston, McCaleb, and Mauro (1988) found that differences in subject matter knowledge constituted the main reason behind variances in student teachers' ability to plan and teach using identical curriculum materials. Teachers with stronger content knowledge were more responsive to their students while teaching. Teachers' knowledge and belief systems influence implementation (Cohen & Ball, 1990; Fullan, 1982). Brown (2009) introduced the concept of *pedagogical design capacity* to refer to the capacity of a teacher to create instructional episodes through perceiving and mobilizing the curriculum materials. Distinct curricula can result from having the same curriculum interpreted differently by various teachers.

Teachers' views and knowledge of mathematics content, pedagogy, and students' learning affect their decisions on textbook adoption and their implementation of the new

instructional materials. Researchers use the term "implement" to refer to what happens when the curriculum is used effectively by the teacher. Teachers who do not appreciate the rationale behind the introduction of new curriculum materials may make unproductive changes (Collopy, 2003; Remillard, 1999; Schneider & Krajcik, 2002).

Teachers with high efficacy often correlate with high student achievement (Ross, 1992) and it has been suggested that it affects teacher attitudes regarding educational changes and their willingness to experiment with new teaching approaches and materials (Bandura, 1997; Tschannen-Moran, Woolfolk, & Roy, 1998). Ball and Cohen (1999) use the term *commitments* to refer to teacher beliefs and orientations regarding the material they teach. Teachers may not be motivated to teach using the new curriculum materials.

It is critical to consider the teacher's perspective on how the curriculum materials should be implemented in order to maximize the curriculum's effectiveness. Schnepp (2009, p.197) asserts that "one of the most significant factors in teachers' use of curriculum materials is how they position themselves in relation to those materials," including how much they believe they should be changing or supplementing the curricula. Teachers' understanding of their role while using the curriculum contributes to their curriculum practices. Challenges encountered in curriculum implementation are mainly related to teachers' "underdeveloped understanding of their role as active agents in mediating the interaction of students and content through curriculum materials" (Silver et al., 2009, p. 251). Teachers' beliefs about the nature of student learning and capabilities can impede their adoption of new instructional approaches (Wilson, 1990; Spillane, 1999). Teachers have different backgrounds and experiences with student

learning and this affects their perception and classroom decisions regarding the use of the curriculum materials.

Some studies (Herbel-Eisenmann, 2009; Grant, Kline, Crumbaugh, Kim, and Cengiz, 2009; El Barrio–Hunter College PDS Partnership Writing Collective, 2009) have examined success stories and challenges faced by teachers as they evaluate and execute innovative new curricula programs. New materials published during the 1990s are considered a source of change for classroom teachers. They may not be willing or able to learn new materials. Teachers working with a standards-based curriculum may choose to reduce the cognitive demands imposed on students by those materials because of their own mathematics knowledge base, their knowledge of students' thinking, and their goals for the students (Henningsen & Stein, 1997). Curriculum changes continue to receive a lot of attention (Collopy, 2003; Remillard, 2000) because many teachers experience difficulty teaching with new materials. The standards-based curriculum materials may have a mathematical emphasis (mathematical thinking and reasoning, conceptual understanding, and problem-solving in realistic contexts) or an emphasis on pedagogical approaches. The types of pedagogical change that the NCTM (1989) proposed require additional training for teachers.

Some studies offer accounts of teacher learning while deploying standards-based materials. Silver et al. (2007) found that the participants in their study, experienced teachers, viewed themselves as "active mediators of the interactions between students and content through the tasks found in the mathematics curriculum materials" while using the standards-based reform curriculum. The teachers in their study were supported

with training sessions that increased their awareness of and involvement with the pedagogical practices embedded within the textbook' materials.

The opportunities that were made available for the teachers in Silver et al.'s study (2007) should encourage us to give higher consideration to the value of support systems for novice teachers. Teachers made use of the standard-base materials as a learning source for themselves as well as their students. Drake and Sherin (2006) described how three primary teachers were able to make significant adaptations to lessons through planning, enacting, and reflecting on lessons from the standards-based curriculum materials during the first two years of implementation.

During 1995-1996, 158 middle school teachers from 24 Missouri school districts participated in a curriculum review project conducted by Manouchehri and Goodman (1998) and funded by the National Science Foundation. The project's goal was to review and evaluate four standards-based middle level (sixth through eighth grades) textbooks. Teachers were directed to cover various units from the assigned textbooks in each district. Teachers were provided with the training and support necessary for using the textbooks and were given an opportunity to discuss their experiences with the textbooks through project-sponsored conferences.

The data showed that the presence of support structures within the schools was the major factor in helping teachers uses the textbooks. There were several patterns of reactions to the use of the textbooks. Ten of 66 teachers from the two regions showed great commitment to using the textbooks and consistently provided evaluation reports about the textbooks and materials as well as the textbooks' influence on student learning.

Another 15 teachers reported occasional textbook usage as circumstances allowed. Another 40 teachers reported declining usage of the textbooks even though they expressed enthusiasm during the early stages of the study.

Considering the diversity of feedback from teachers, the study demonstrated that teacher reactions to new textbooks are quite complex. The study results integrated teachers' presumptions regarding the new textbooks. The researchers found that supportive structures within the school districts were not enough of a factor to keep all teachers performing at the same level. Introducing new curriculum materials to the classroom is a major change which can break a teacher's established routine. Many studies had focused on investigating factors which could facilitate or impede a teacher's success while using the new curriculum materials (Clarke, 1996; Firestone, Mayrowetz, & Fairman,1998; Manouchehri, 1998, 1999, Manouchehri & Goodman, 2000).

A separate study by Kauffman et al. (2002) indicated that new teachers face a variety of difficulties while deploying standards-based curriculum materials. The standards-based reforms brought challenges for new teachers using the new curriculum. Fifty-one first and second grade teachers were interviewed in order to document how new teachers experienced the curriculum and assessment as well as which curricular materials they found in the school. Along with the study's survey, a semi-structured interview with each respondent teacher was conducted. Teachers reported that they faced significant stress while preparing the content for the classroom and that they were concerned about the curriculum's coherence and support systems. Ball and Feiman-Nemser (1988) questioned the pre-service teachers' decision to incorporate their own

ideas and views on the subject matter and pedagogy because they viewed the teachers as better planning resources than textbooks. They explored the teachers' decisions because they believed it was likely that this group of teachers did not fully understand nor consider the content's pedagogical value. Teachers should be given more opportunities to work thoughtfully with the curriculum materials.

Teachers' use of curriculum materials continues to increase but is still considered less than desired (Lloyd, Remillard, & Herbal-Eisenmann, 2009). Educator reactions to new curriculum materials need to be investigated by exploring how teachers use and interpret these types of innovations.

Textbook Usage during Curriculum Changes

Textbook content is aligned with the curriculum by providing tasks and strategies that support the presentation of the new curriculum. New textbooks are foreign in form and content to teachers because they are designed to promote reform within the school of mathematics. Teachers play the central role in the process of developing real lessons from the suggested mathematical tasks, lessons plans, and pedagogical recommendations. Understanding why and how teachers use the new curriculum materials are critical to understanding the relationship between teachers and textbooks better.

The two primary reasons that teachers deploy new curriculum materials are to improve student learning and to improve pedagogical practices. Teachers are likely to

resist change unless they are convinced that it will bring significant benefits to both teachers and students (Thompson, 1992).

A growing number of studies offer insight regarding teacher use of innovative curriculum materials and standards-based curricula. Mathematics education has gone through many reform efforts in response to dramatic changes in society. In the last two decades of the 20th century, the NCTM produced a standards-based set of recommendations for mathematics curricula for grades K-12 (NCTM, 1989, 2000). The documents provided a new vision for the school of mathematics by shaping the content, instruction, and assessment of new standards. The new mathematics standards, supported by the National Science Foundation, called for changes in both content and teaching practices and have been available commercially since 1997.

When teachers use innovative educational programs, they are influenced by contextual and cognitive factors. For example, the NCTMs *Curriculum and Evaluation Standards for School Mathematics (*1989) and the *Principles and Standards for School Mathematics* (2000) assert the student's active role in learning while enrolled in a standards-based curriculum. Students are encouraged to discuss mathematics with peers and teachers and the student should be the center of the learning process. The classroom should involve students in many activities that justify and clarify their thinking and ideas about mathematics. The reform efforts embodied in these standards documents have resulted in the development of a new *standards-based* curriculum that requires students to answer questions that demand a higher level of cognition, emphasizes conceptual

understanding, and interconnects assorted mathematical concepts rather than the traditional procedural demonstrations found in traditional curricula.

Teachers have changed how they teach mathematics in order to help students better understand an educator's thinking. The method of instruction should now include communications that foster understanding of mathematics in such a way that students *"*organize and consolidate mathematical thinking*"* and develop their mathematical knowledge by considering the *"*thinking and strategies of others*"* (NCTM, 1989, p.60). The content and pedagogy of this material is based on the introduction of new curriculum. Studies that compared new curriculum materials with traditional textbooks have consistently showed that students using the new curriculum outperform their peers when they are evaluated on mathematical problem solving and reasoning (Carroll, 1997; Zawojewski, Hoover & Ridgway, 1997; Lapan, Barnes, Reys, & Reys, 1998). Briars and Resnick (2000) revealed that the standards-based curriculum has a positive effect on student achievements in their comparative studies between traditional and innovative curricula.

Many studies that analyze curriculum materials typically focus on the base programs, student activities, and student learning. For example, in Project 2061 (Kulm et al., 2000), criteria were evaluated based on the instructional strategies and their influence on student learning in a constructive classroom environment. Constructing knowledge is an active endeavor on the part of the learner (Baroody, 1987; Cobb, 1988; Fosnot, 1996; Von Glasersfeld, 1990, 1996). When getting a new idea, the learner is actively thinking and building on what he or she already knows. Through the act of constructing this new

knowledge, students are also applying their prior knowledge in a new setting. The sequence and selection of tasks in those curriculum materials are important aspects of students' ability to develop conceptual understanding and empowering their ideas and skills (Kulm & Capraro, 2008). It follows that student learning is affected by the quality of curriculum materials. When Project 2061 analyzed curriculum materials, the goal was to evaluate the instructional materials and tasks that were being implemented for student learning (Kulm et al., 2000). These tasks required different levels of cognition when students changed from one textbook to another, and this formed the basis for judging the quality of each textbook. The textbooks that scored highest correlated with higher student achievement and these are used to determine which content is taught and how. In their study, Grows and Smith (2000) reported that textbooks are the instructional foundation of the eighth grade.

The evaluation of results from *The Third International Mathematics and Science Study* has shown that curriculum materials enhanced middle school student performance (Schmidt et al., 1997). Despite the variations within enacted curricula, student achievement has been shown to be related to the quality of the textbooks (Kulm & Capraro, 2008). In the United States, educational accountability has called for extensive research to measure student outcomes related to mathematics curriculum programs (NRC, 2004; Lloyd, 2009; Senk & Thompson, 2003). "The role of the teacher… is as a curriculum developer who, together with his or her students, grows ever more competent in constructing education experiences" (Snyder, Bolin, & Zumwalt, 1992, p. 418).

The best innovative new curricula address the need to help teachers learn the new strategies and pedagogical approaches contained in the new textbooks. Teaching mathematics generally relies on textbooks more than any other subject area (Johansson, 2006). The mathematics textbook is often the teacher's source of content, sequencing, and instructional activities and ideas for lessons (Johansson, 2006; Reys, Reys, & Chaves-Lopez, 2004; Woodward, Elliott, & Nagel, 1988).

Quality textbooks give teachers a lot of instructional opportunities for implementing in the classroom. Ball (1994) views teachers as continually constructing new knowledge from classroom experiences and interacting with the textbooks is part of that process:

> Teachers must figure things out as they teach. They are constantly faced with the data of their own experience. They must develop knowledge of particular children, of the material they are teaching, and ways to engage students in the content (p. 9).

The use of a particular textbook has a powerful effect on both the content and structure of classroom instruction. When teachers interpret and deploy a textbook's assignments, they often rethink or even change the teaching strategies contained in the textbook. Reform efforts envision this as a pedagogical change (NCTM, 2000). Teachers could develop their pedagogical knowledge whenever they increase their own interactions with textbooks. Eisner (1987) stated that textbooks not only define a

substantial proportion of the content, sequence, and aims of the curriculum, but also affect how certain topics are taught.

These interactions with learning materials are a big source of the teacher learning experience (Leikin, 2005, 2006). When teachers plan a lesson, they express the need to know that particular subject matter from the textbook well enough in order to teach it. The textbooks stimulate teacher thinking and increase their content knowledge. Teacher learning happens through their understanding of what and how such curriculum materials help achieve student learning. Teachers can learn about both content and pedagogy through their use of these innovative curriculum materials (Davis & Krajcik, 2005).

Doerr and Chandler-Olcott (2009) showed that teacher evaluations regarding the material's literacy demands vary over time. These evaluations shift from being obstacles to student learning to supporting language and the larger learning experience. Shifts in teacher practices are evidence of teacher learning for particular curriculum materials. Teachers' developmental learning from the textbooks is part of understanding and examining the relationship between teachers and textbooks.

Teachers use curriculum materials in a variety of ways. Brown (2002) presented three types of curriculum usage, suggested by and adapted from an extensive study of three particular teachers. The first usage, offloading, showed that teachers depend on the mathematical tasks, worksheets, and pedagogical steps provided by the curriculum in their design of an instructional episode for their classroom. The second usage, adapting, showed that teachers make use of their personal resources and curriculum materials to

fulfill the need of their particular group of students. The third usage, improvising, showed that teachers craft the instructional episodes through the use of the curriculum resources.

Some teachers use the textbook as a guide or resource. Others use them as scripts. Remillard's 2005 study indicated that teachers and the curriculum materials are engaged in a dynamic and participatory relationship from which the planned and enacted curriculum emerges. She discussed many ways that teachers use textbooks, ranging from simply following or subverting the textbook to actively participating with the textbook and interpreting it.

Drawing on similar distinctions, Hall and Hord (2001) identified seven levels of curriculum use starting from *non-use* to *renewal*, shown in Table 1. The teachers' use of and engagement with curriculum materials is defined as being their capacity to develop strategies that help them make sense and use of such materials.

Table 1. Level of usage for curriculum materials reflects behaviors related to how teachers use them

Levels of Use	Behavioral Indicators of Level
VI. Renewal	The user seeks more effective alternatives than the established use of the innovation.
V. Integration	The user makes deliberate efforts to coordinate with others in using the innovation.
IVB. Refinement	The user makes changes to increase outcomes.
IVA. Routine	The user makes few or no changes and has an established pattern of use.
III. Mechanical	The user makes changes to better organize use of the innovation.
II. Preparation	The user has definite plans to begin using the innovation.
0I. Orientation	The user takes the initiative to learn more about the innovation.
0. Non-Use	The user has no interest and takes no action.

Factors Influencing Teachers' Use of Curriculum Materials

The research studies explaining the relationship between teachers and curriculum should investigate the influence of the institutional context on teachers' approaches to teaching and learning (Cobb, 1999; Elmore, 2000; Cobb, McClain, Lamberg, & Dean, 2003; Spillane, 2000). The context is an integral component that must be considered in order to understand the teachers' implementation of the mathematics textbooks. Much of the research has focused on uncovering the many factors that influence teachers'

implementation of the curriculum materials in an attempt to understand more about the teachers' relationship with the textbooks. Some contextual factors that figure prominently in the research include: (a) aspects of the local culture, including departmental, district, school, or community culture (Manouchehri & Goodman, 2000); (b) the text content; and (c) time.

The way teachers use the curriculum materials is influenced by how they view the institutional context in which they teach (McClain, Zhao, Visnovska, & Bowen (2009). Cobb et al. (2003) reviewed teachers' instructional practices situated within the institutional settings of the school and school district. They concluded that there is a relationship between the social structures (institutional settings, including the school and the district) and local events (teachers' enactment of instructional decisions within the context of the classroom) as mediated by social practice of teaching.

The school context has an influence on the teachers' use of the curriculum materials. The accountability demands lead some schools to require strict adherence to the curriculum programs or districts' adopted textbooks. The current context of high-stakes accountability mandated by the No Child Left Behind Act of 2001 (NCLB, 2002) calls for stronger academic standards, and the adoption of new curriculum materials is often a school's first strategy (Remillard, 2005).

The enhanced importance of measuring teachers' use of the curriculum materials related to teachers' support structures has resulted in many research studies. McClain et al. (2009) used the term "fidelity approach to implementation," which describes the extent to which there is a match between the written curriculum and the enacted

curriculum. McClain et al. (2009) described a framework of three levels of curriculum program adherence as related to the extent or level of district's support provided to the teachers. First, the curriculum is defined by the districts and administrators to insure that teachers follow the curriculum materials. Second, teachers have professional assistance to help them develop their decisions regarding the use of the curriculum materials. Third, the textbook is just a tool and a resource in helping teachers design their lessons.

The nature of support teachers receive affects textbook implementation. Administrative support is one type of support given to teachers (Olson, 1988; Sykes, 1990). Teachers' perceptions of support and commitment from authority structures and peers are highly influential in measuring the extent of implementation (Bresler & Walker, 1990). We know that teachers need support when implementing new curricula and when new approaches to teaching require practice and each topic brings new surprises. Administrators could provide the time, appropriate materials, and ongoing support to facilitate the innovation.

Through investigating the change process of teachers involved in educational reform, Hall and Hord (2001) identified "six functions of interventions" (p. 107). The interventions which make the up the supportive context in teachers' change process are: (a) developing, articulating, and communicating a shared vision of the intended change; (b) planning and providing resources; (c) investing in professional learning; (d) checking on progress; (e) providing continuous assistance; and (f) creating a context supportive of change. The individuals involved in the innovations need information, assistance, and moral support. Kauffman et al. (2002) identified ways in which local expectations of

teachers' use of the curriculum materials can be related closely to school and district levels for implementing accountability polices. In their study, two beginning teachers stated that their "principals and curriculum coordinators expect them to adapt and supplement the textbook materials regularly, using them as resources for teaching the state standards rather than relying on them to determine the curriculum" (Kauffman et al., 2002, p. 17). In contrast with other two beginning teachers, these two teachers perceived that "they are expected to use the textbook regularly. The materials themselves constitute the *de facto* curriculum. There is also an expectation that they supplement the materials, but in clearly defined ways and in a limited fashion" (p. 18).

The adoption process for new mathematics textbooks is more complex than might be expected. Many contextual factors are considered constraints by studies that have focused on the failure of the implementation process. The curriculum materials are not delivered the same way as they intended by the curriculum authors. Teachers, curriculum materials, and students have a dynamic relationship, no one is independent from the other, and each is essential for effective instruction (Ball & Cohen, 1999). Teachers' conceptualizations of mathematics teaching and learning are influenced by the particular instructional resources they use in the classrooms. The content of the textbook with its variety of design features is one of the most important influences on teachers' decisions. Kauffman et al. (2002) released that certain characteristics of the curriculum materials were central in teachers' ways of approaching their lesson plans and instructions. Remillard (2005) described the critical importance of the materials themselves in teachers' interactions with curriculum materials. The curriculum materials

contain certain tasks that direct students to learn specific skills and teachers should be engaged in rationales or assumptions that support their knowledge of students' actions. The development of such teachers' knowledge will help and guide future teachers in implementing the curriculum materials to their specific groups of students.

Stein and Kim (2009) comparative analysis of two-standard-based programs support Remillard's (2005) research. The curriculum materials were different in their ways of making their rationales transparent to teachers in anticipating students' responses. Davis and Krajcik (2005) elaborated on ways that teachers can better understand and use the curriculum materials. Their design heuristics are organized around the support of teachers' subject and pedagogical content knowledge. The curriculum should be developed in such a way that the rationales for including particular tasks and their relation to the gained mathematical understanding are clear and help the teachers learn and anticipate students' responses to certain instructional activities.

Effective teachers prepare their lessons through envisioning students' approaches and understanding of the mathematical tasks (Fernandez & Yoshida, 2004; Schoenfeld, 1998; Smith, 1996; Stigler & Hiebert, 1999). The desired responses are those that are expected by the teacher to direct and increase students' understanding of the mathematical task. The teachers should comprehend all students' responses in order to blend them with the desired responses to achieve the required task. Teachers' capacity in anticipating students' responses can be developed in the curriculum materials themselves; the text may include details and even some real examples on how students

typically respond to certain problems, as is in many Japanese programs (Fernandez & Yoshida, 2004; Schoenfeld, 1998; Stigler & Hiebert, 1999).

Chval et al. (2009) determined that text integrity includes three essential components: (a) teachers and students regularly use the adopted textbooks, (b) teachers use a significant portion of the text to determine instruction, and (c) teachers utilize instructional strategies consistent with pedagogical orientation of the text. The definition of a successful curriculum program is determined by the extent of its use in the classroom. Teachers' support in using such curriculum is by following the steps of teachers' successful implementation of the curriculum. However, there is still no definite effective structure for curriculum implementation. Many teachers do not know how to adapt the curricula. Loucks-Horsley, Hewson, Love, and Slites (1998)-identified two main contributions to successfully implementing curriculum: (a) the amount and type of professional support provided to teachers in the first three years using a curriculum, and (b) the support systems existing within the school among administrators, and other teachers outside consultants.

Previous experiences with adopted textbooks may influence teachers' decisions about using new curriculum materials. Previously adopted textbooks may not contain intelligible or practical strategies for teaching. Curriculum materials should possess built-in incentives that encourage their use by the teachers; teachers must learn to trust in their curriculum. New teachers believe that the best teachers are those who create their own curriculum instead of following the adopted textbooks (Ball & Cohen, 1996, Remillard, 2005).

Drake and Sherin's (2006) study provided evidence of teachers developing a trust in the curriculum materials. The authors pointed out the decreased role of teachers' adaptation of the curriculum materials as they increased their trust in the curriculum materials. Teachers changed their opinion regarding the curriculum materials and now saw the curriculum as something that could be used. Davis and Krajcik (2005) described how teachers could make "productive changes" by using the curriculum materials as a significant resource (p. 9). The successful implementation of the new curriculum materials must engage teachers in meaningful experiences and in conceptual exploration of mathematics, as well as assisting them in constructing pedagogical approaches. Otherwise, efforts to introduce new curriculum materials can be futile.

Time is crucial for teachers when using new curriculum materials. Teachers need time to learn, adapt, and reflect on their use of new material and to develop new skills in teaching. Teachers must consider the time and the energy needed to implement new instructional materials, especially when they must connect new techniques from the textbook with their own beliefs of teaching mathematics. They need extra time to learn the content of the updated textbooks and practice it in the classroom.

Changes will be required in teachers' lesson planning and in their teaching practices. More time will be needed if teachers decide to go adapt portions of the curricula to meet their students' specific needs. Fullan and Promfret (1977) described adaptation as a process in which teachers "look for modifications of curriculum materials according to specific classroom situations." Teachers must read, analyze, and realize the potential of the curriculum in addressing their students' learning. Considering

teachers' knowledge and experience's effect on teachers' implementation, it seems likely that more time is needed by new mathematics teachers to implement new curriculum materials. It is more difficult and time consuming for new teachers or teachers teaching a subject for the first time to adapt new published materials because they do not yet have enough knowledge of what their students know and can do. Adaptations may be based on teachers' context, their knowledge, identities, and orientations (Drake & Sherin, 2006; Pintó, 2005; Remillard & Bryans, 2004, Valencia, Place, Martin, & Grossman, 2006).

Teachers may need more time to implement new materials if the textbook content is not clear or is hard to understand. Curriculum developers need to support teachers' engagement and understanding of the written curriculum. The designers of published textbooks can influence teachers' implementation of new textbooks by involving teachers in each step of the development and implementation (De Diana & Collis, 1990; Ely, 1990). The need for an educative curriculum that supports teachers' learning has been suggested by many research studies (Ball & Cohen, 1999; Davis & Krajcik, 2005; Remillard & Bryans, 2004). Teachers need to know how to use the curriculum materials. Curriculum materials should support teachers' reading, evaluating, and adapting the content to use in their classrooms. The content and structure of newly published textbooks should clearly identify the long-term goals, the objectives of the lessons, and the purposes of the activities. Ideally, teachers want new curriculum material to be a cohesive and connected whole before they decide to use it. The

characteristics of the curriculum materials will determine how much time teachers will need to figure out and comprehend the material's connectedness.

In a study on how curriculum materials should help teachers help their students develop an understanding of the mathematical proof, Stylianides and Stylianides (2008) remarked that curriculum materials should help teachers provide rich learning opportunities and "provide teachers with the guidance necessary to enact these opportunities with their students" (p. 21). Aikin (1942) proposed that maximizing teachers' time should be considered as one of the factors necessary to build a successful curriculum. Effective curriculum requires a thorough understanding of the critical role of teachers' time in using new instructional materials.

Teachers spend time prioritizing, breaking down the curriculum content standards, and matching them with the state curriculum. The overarching scope and sequence of a curriculum is another characteristic of its content and structure. In a study comparing recent reform efforts with those of the 1950s and 1960s, Remillard (2005) noted that mathematics' teachers view the textbooks as inflexible, especially when they are trying to apply them to state standards. Teachers take more time in addressing the state standards and their sequence. Time is a crucial factor for teachers trying to get their students to understand their new approaches of teaching. Teachers need extra time to be able to design and plan new lessons. Most teachers work long hours and tend to be unwilling to add additional responsibilities (Hargreaves, 1994).

Summary of the Literature Review

The literature review provided a glimpse on the adoption and the developmental process for mathematics textbooks in the United States. It also presented critical issues related to curriculum material use that emerges for teachers. The adoption of curriculum materials with their new or innovative can affect and produce a change in the teachers' instructional practices. Therefore, the considerations and challenges accompanied with introducing new curriculum materials have generated great interest in studying teachers' interactions with textbooks. Extensive studies were administered to evaluate existing curriculum programs based on teachers' use of them, especially in regard to the introduction of the standard-based materials. The standard- based materials are the source of the pedagogical changes called for by the NCTM (1989). Accountability issues produce more pressures on the teachers to use the adopted textbook in order to improve students' achievement scores. There are many contextual and social factors that shape teachers' use and engagement with the textbooks.

CHAPTER III

METHODOLOGY

This study explores the effects of some teachers' personal characteristics regarding their use of adopted mathematics textbooks in their classrooms. Years of experience in teaching and years of involvement in using adopted mathematics textbooks are considered two major personal characteristics that may affect teachers' concerns regarding the use of the newly adopted mathematics textbooks in the middle schools. Introducing new curriculum materials clearly depends on developing teachers' skills and providing appropriate support to assist them in skill development.

This study also examines the influence of school and district support for teachers' implementation of new textbooks. The successful implementation depends on addressing teachers' attitudes and perceptions in the process of change. The Stages of Concern Questionnaire (SoCQ) is an instrument that focuses on teachers' feelings as they become involved in implementing innovation (Hall, George, & Rutherford, 1986). The SoCQ is one of the CBAM tools used in this study to measure where teachers are in the change process. The CBAM model used in this study is described as a comprehensive tool for empowering individuals and addressing changes in educational settings. Using the original Stages of Concern (SoC), a questionnaire for this study was developed based on the six stages of concern in order to investigate middle school mathematics teachers' concerns regarding their use of the newly adopted curriculum materials. The six stages are (1) informational, (2) personal, (3) management, (4)

consequence, (5) collaboration, and (6) refocusing. The contextual characteristics examined in this study include the teachers' experience, years of involvement in using new curriculum materials, and the perceived support from the school or district. Hall and Hord (1987, p. 15) stated that the context is "critical in understanding the change process" because context will create challenges unique to the suggested situation.

The purpose of this study is to understand the ways and reasons behind teachers' use of newly adopted mathematics textbooks. The study will provide initiative for developing effective and supportive structures for teachers by recognizing and meeting teachers' concerns about implementation of new curriculum.

Research Design

This study uses a cross-sectional predictive survey to examine teacher concerns about the use of the newly adopted mathematics textbooks. Trochim (2006) describes the cross-sectional study as one that takes place at a single point in time. It is like taking a "slice" or cross-section of the entity or group under observation. Cross-sectional predictive survey designs are particularly suited for collecting data on many variables simultaneously and for a large group of subjects, and are "the design of choice" to gather information about the attitudes of many individuals (Creswell, 2003).This research study is non-experimental research with a descriptive and regression analysis design used to answer the questions proposed in this study.

Population and Sample

The population of interest for this study was middle school mathematics teachers in regular public schools in Texas. New mathematics textbooks are mandated to be distributed by the Texas Education Agency (TEA) to public schools every seven years according to the adoption cycle of textbooks. Mathematics textbooks for grades six, seven, and eight were implemented in the 2007-2008 school year in Texas public school districts. An online survey was sent to all middle school websites that were provided by the TEA web page. The sample population of this study is middle grades mathematics teachers who decided to complete the survey about their perceptions of the newly adopted mathematics textbooks. The final sample was 208 middle school mathematic teachers who attempted the survey and 145 who completed the survey. For the second part of the instrument, three teachers were chosen from three specified different groups of teaching experiences.

Instrumentation

The study first used an online survey. This first section of the instrument established independent variables with demographic questions, including gender, years of experience in teaching, years of involvement with the same textbook, and grade level. Demographic factors are of a personal nature; they include questions about age, education, and employment (O'Sullivan, Rassel, & Berner, 2003). The researcher developed the questions and scales to measure independent variables in the model.

Definitions of the terms and questions were examined for clarity and to ensure they accounted for all possible responses.

The second section of the survey consisted of the Stages of Concern Questionnaire (SoCQ) measuring dependent variables (see Appendix A) (Hall & Hord, 2005). However, the questions used for the survey were created by the researcher. Questions were adapted to fit the context of the current study. Factor analysis was conducted during the pilot phases in order to validate the six stages of concern. A minimum of .30 factor loading was consistently required for the inclusion of any statement within a certain factor or stage. The factor loadings are the correlation coefficients between the variables and the factors. The .30 level is a generally accepted minimum factor loading because it indicates that approximately 10% of the variance for a corresponding variable has been explained by a factor (Tinsley & Tinsley, 1987). In addition, Merenda (1997, p. 160), said that "It seems from the general literature in the social and behavioral sciences that a threshold factor loading of 0.30 is the minimum that is traditionally used when deciding to accept an item or variable as belonging to a factor or component." In this study, a satisfactory description for the factor structure was obtained as a result. The loadings of the items on each factor and the variance are presented in Appendix E. The first section of the instrument contained demographic questions, including gender, years of teaching, years of using the newly adopted textbook, and grade level. The independent variables are the years of teaching as well as the years of using the same textbook.

The survey is based on the Concern-Based Adoption Model, or CBAM, an instrument used by educational researchers to evaluate intervention or innovation such as the newly adopted textbooks in this study. The model predicts the reaction of individuals who are part of the change (Hord et al., 1998). The CBAM is one of the most popular educational models used to describe the developmental psychological phases for individuals involved in innovation or change.

Regarding the measure of teacher concerns in implementing a new curriculum, Marsh (1997) suggests the use of the Stages of Concern Questionnaire, which is part of the CBAM model. The SoCQ has been used to measure concerns regarding new educational innovations in quantitative studies. The stages of concern focus on the teachers' feelings as they become involved in curriculum implementation. The SoCQ was originally developed and tested at the Research and Development Center for Teacher Education (RDCTE) at the University of Texas in the 1970s (Hall et al., 1979). Southwest Educational Development Laboratory (SEDL) subsequently obtained the copyright. The idea of assessing individuals' concerns about innovation had its genesis in 1973; it was based mainly on earlier work by Fuller (1969). He hypothesized that, over time, teachers had unrelated, self, task, and impact concerns regarding innovation. Fuller's four concerns were eventually delineated into seven stages, which are used later in several studies on educational innovations (Hall et al., 1979).

The present study provides the means for assessing some of the seven stages of concern: informational, personal, management, consequences, and collaboration. The awareness stage was dropped from this study. Teachers are familiar with the textbook's

adoption term. Teachers experience the change in the correspondence questions of each stage. The early questions of the model are more self-oriented: teachers are concerned about the change effect on themselves. These early questions are assumed more important for novice teachers than experienced teachers. The next questions seek to resolve issues stemming from the earlier questions. In the latter stage, teachers are more task-oriented and are in the process of implementation: How do we do it? How can we use these materials efficiently? How can we organize our lessons? What is a suitable time for achieving the work efficiently? Finally, when self and task concerns are largely resolved, teachers are focused on the impact: Does this new textbook work better for our students than previous materials? The concerns-based model identifies and provides ways to assess the seven stages of concern.

In this study, some changes and accommodations to the original 35 questionnaire items were necessary to meet the study conditions and domain. The study is directed to mathematics teachers concerning their adoption of the newly adopted mathematics textbooks for their district. The SoCQ can be adapted to reflect the innovation under study, as suggested by Hall et al. (1979) and Hall and Hord (1987, 2001, & 2005). For this study, the researcher developed 36 questions. Teachers are well acquainted with the adoption cycle of newly adopted mathematics textbooks. The six stages of concern used in this study are categorized into self-concerns (informational, personal); task concerns (management) and impact concerns (consequence, collaboration, and refocusing). Each item of the questionnaire is rated along an eight-point Likert Scale, from zero (not true for me now) to seven (very true for me now). Teachers' responses were coded on a scale

from zero to seven. Items were arranged and constructed to measure each particular stage of concern. The highest mean for a certain stage indicates the highest concern (peak) and the lowest mean indicates no concern (valley).

The independent variables were the teachers' total teaching experience and the years of their involvement in using the most recently adopted textbook. The sample included three groups of teachers dispersed across a wide range of teaching experience and three groups covering the years of involvement with the innovation. Table 2 presents the number of teachers in each specific group.

Table 2. Teachers grouped by years of experience and involvement

		Years of Teaching			Total
		<5 Years	5-10 Years	>10 Years	
Years of Involvement	1	9	6	11	26
	2	10	17	38	65
	3	9	12	33	54
Total		28	35	82	145

The second instrument used in this study is a semi-structured interview (see Appendix B). A semi-structured interview allows respondents to express themselves at some length, but offers enough shape to prevent aimless rambling (Wragg, 1978). In order to confirm the self-reported data from the questionnaire, a semi-structured

interview promoted understanding of teachers' use of the curriculum materials. This semi-structured interview protocol guided the conversations intended to explore mathematics teachers' views and opinions on their implementation of new curriculum materials, particularly the mathematics textbooks. The interview helped identify teachers' experiences with and conceptions of the adoption process, their practices, and the challenges of implementing the new mathematics textbooks.

Data Collection

Data collection for the first instrument was accomplished with online surveys to school districts and mathematics teachers in Texas. The survey was conducted online at the end of two consecutive school years (2008–2009/2009–2010) when teachers could release more information regarding their use of the newly adopted textbooks, and the researcher could develop the third category of teachers' involvement of the textbook. The data were collected in two different periods of two consecutive school years. The researcher filed the necessary Institutional Research Board (IRB) forms and received permission to complete the study (see Appendix C). The internet survey was the most convenient method for the researcher to use. To improve the response rate, the researcher sent the emails not only to the teachers' school email addresses (see Appendix C) but also to the districts' email addresses found on the Texas Education Agency website (see Appendix D). According to O'Sullivan et al. (2003), common factors affecting response rates include the accuracy of the sampling frame, the questionnaire design, and the actual delivery of the questionnaire. This survey was anonymous, and

because anonymous survey tracking software was not available, tracking respondents or non-respondents was not possible. The response rate was satisfactory and more than the target response. Teachers who participated in the survey received an email message explaining the study's procedure, as well as how to access the online survey. The email message gave the teachers an option of participating or not and an estimated time for completing the survey. The participants of the study are the respondents who use the most newly adopted mathematics textbooks and comprised 74% of the total respondents (see Figure 1).

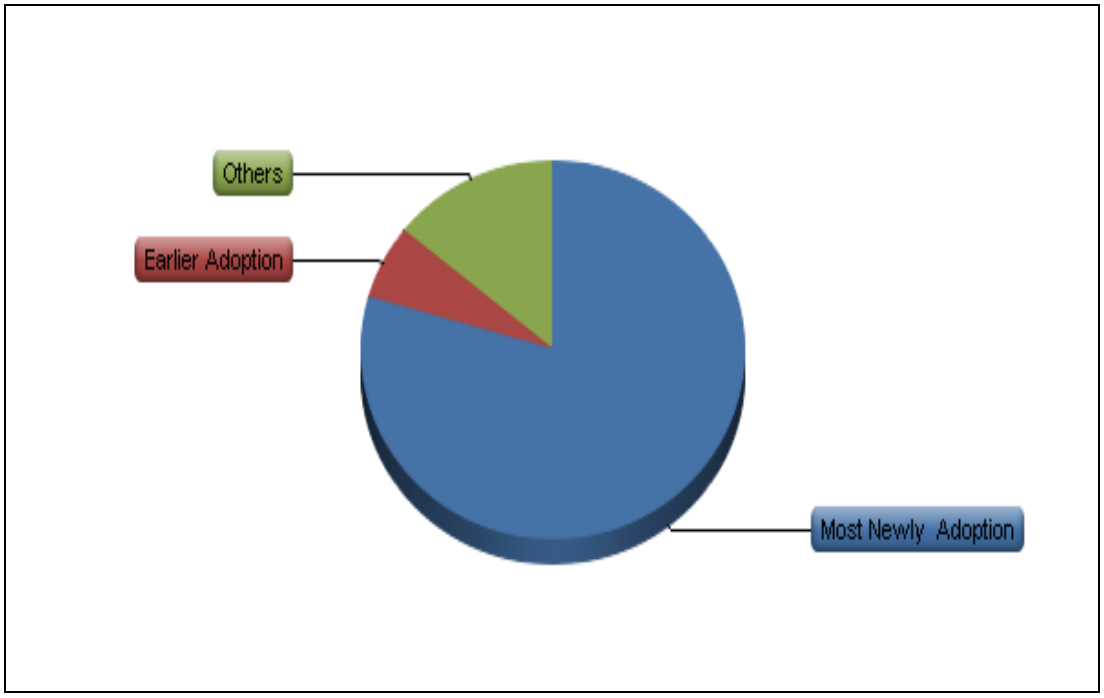

Figure 1. Current mathematics textbooks used by teachers.

The total sample responding (see Figure 2) included 56% with more than ten years of teaching experience, 22% with five to ten years of teaching experience, and 22% with less than five years of teaching experience.

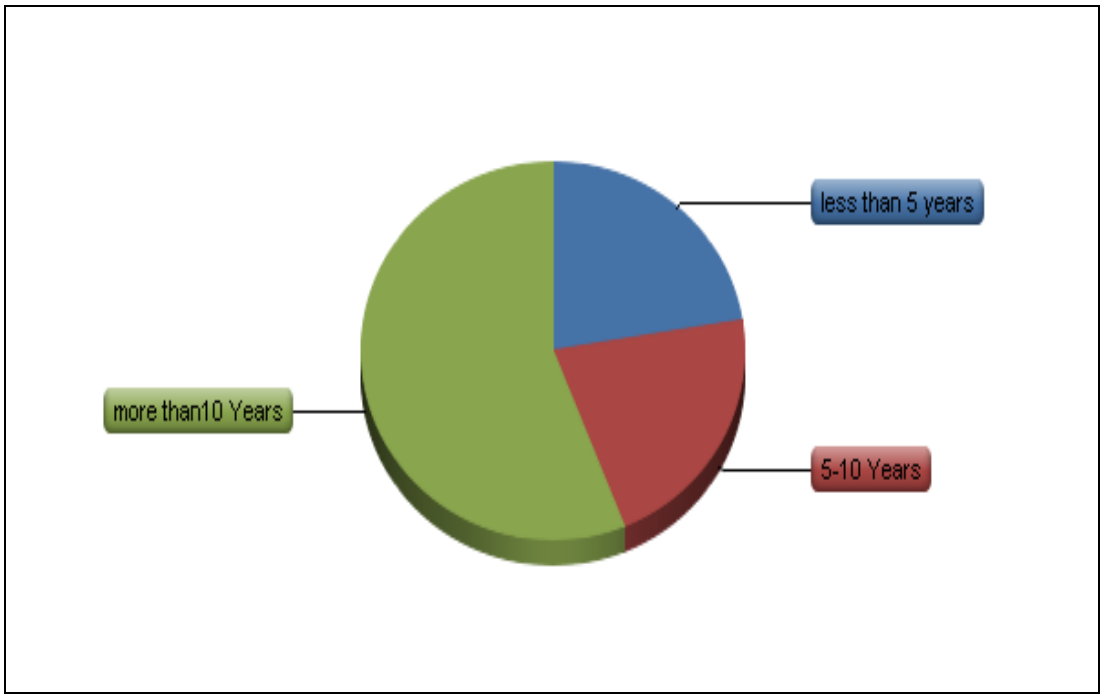

Figure 2. Teaching experience for the total sample.

The total sample of teachers' involvement (see Figure 3) included 36% in their 3rd year of using the textbook, 46% in their 2nd year of using the textbook, and 18% in their first year of using the same textbook.

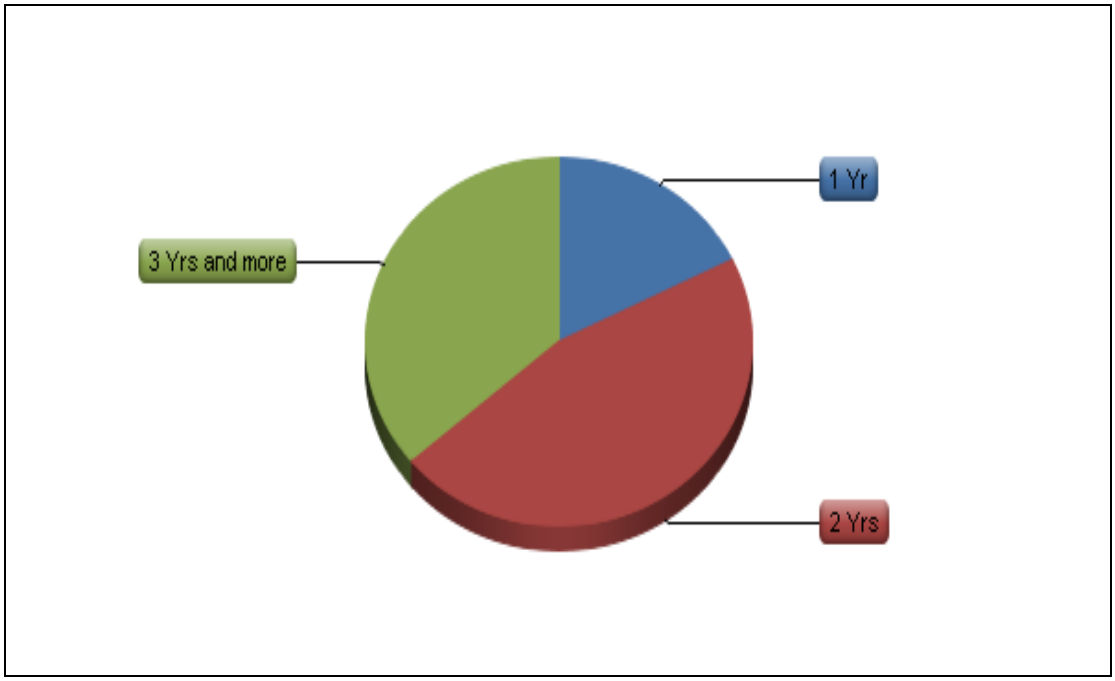

Figure 3. Years of involvement for the total sample.

The data for the second instrument was derived from semi-structured interviews of three middle school mathematics teachers in Texas. The teachers were three females from two different schools; two teach in the same school. Teachers were interviewed within the same month and by the end of the school year 2009-2010. Their teaching experiences ranged from a highly experienced teacher to a relatively novice teacher. The first teacher had more than 21 years of experience teaching the seventh grade. The second had 11 years of experience teaching eighth grade, and the third teacher was in her second year of teaching seventh grade. The highly experienced teacher and the novice teacher both have a master's degree in education.

Two interviews were conducted in a school quiet room while the third was conducted in the teacher's house for her convenience. Each interview lasted about 40

minutes. The interviews were digitally recorded and later transcribed by a specialist. The interview format was open discussion to allow teachers to express their opinions, especially in the last two interviews. The main theme of the interviews was the teachers' criticism and comments regarding the textbooks' use and their views regarding their interactions with the new adopted textbook.

Reliability

Reliability is measured by stability, equivalence, and internal consistency. Stability refers to getting the same result every time a phenomenon is measured. Equivalence is defined as getting the same result when a phenomenon is a measured by different investigators. Internal consistency means the items used in the study constitute a measurement of the same phenomenon (O'Sullivan et al., 2003). A reliability analysis was conducted based on Cronbach's alpha, a reliability coefficient based on the average covariance among items in a scale. The researcher arranged the items of each factor on a scale that are positively correlated with each other. The alphas (shown in Table 3) were sufficiently high for the total sample involved in the study. The coefficients are close to the original study of concerns (Hall & Hord, 2001). A high alpha ($\geq .7$) would be consistent with the hypothesis that all of scale items are measuring the same construct and the low alpha ($< .6$) is generally considered unacceptable reliability (Neill, 2004).

Table 3. Coefficient of internal reliability for the SoCQ, n=147

Broad Definition	**Self**		**Task**	**Impact**		
Category	Informational	Personal	Management	Consequence	Collaboration	Refocusing
Cronbach alphas	.68	.65	.84	.87	.82	.89

Validity

Validity refers to the success of a study in measuring its intended values. Evidence of this study's validity is supported by presentation of the results of some studies of SoCQ (Hall et al., 1986). A series of validity tests of the SoCQ were demonstrated to achieve the purpose of validity in the 1974-1976 study. A random group of participants who completed the SoCQ were selected. The purpose was to compare the participants' SoCQ answers with their interviews and open-ended answers. The questions were similar in both the interviews and open-ended answers. After examining the scores on the SoCQ and the other instruments' analyzed results, the researchers found a relationship between the SoCQ scores and the concerns of the participants (Hall et al., 1979). The validity was supported through finding a correlation between the peak stage estimated by investigators and the actual percentile scores of stages measured by the SoCQ. As an additional check of validity, an experienced teacher who was not included in this study was asked to give comments about the study's questions and their directions.

Scoring

The SoCQ is a 36-question, eight-point (0-7) Likert-scale instrument indicating the degree of teacher's present concerns regarding the implementation of new textbooks. The score is determined by summing the responses of the questions assigned to each of the proposed categories: self (informational, personal); task (management); and impact (consequence, collaboration, refocusing). Refer to Table 3 for these categories.

Summary of Dependent Variables

The broad categories of concern (self, task, and impact) are valid, and the instrument reliabilities for the scales are within the acceptable ranges for social science research. However, the Cronbach alphas for the first two self-stages are relatively low (α *informational* = .68, α *personal* = .65), while the alphas for the management stage (α = .84) and the impact stage (α *consequence* = .87, α *collaboration* = .82, α *refocusing* = .89) are considerably higher. The dependent variables are the stages of concern for the teachers.

Contextual Factors

The contextual variables examined in this study include perceived support from the school and district. Developing and delivering interventions for teachers involved in the innovation is critical in facilitating the change process for teachers. Besides offering evaluative judgments about teachers' processes of change and teachers' differences in implementing the textbook, assisting teachers in their professional growth is also

necessary. The collaboration stage constitutes several contextual variables that are examined in this study (see Table 4). The literature (McDuffie & Mather, 2009) examining the diffusion of innovations confirmed the value of the school's support in teachers' use of the curriculum materials. This support includes training sessions and meetings at grade level for teachers using the new curriculum materials. Teachers and their department heads can discuss current text materials' pedagogies to insure their understanding and their confidence in teaching. The value of peer influence is crucial in teachers' use of new curriculum materials; that is, if a fellow faculty member is using the innovation, then it may increase the awareness and use of the innovation of the current non-user (Goldfield, 2001; Kozman, 1978; Rogers, 1995). In their meetings about the use of the new textbook, teachers can learn from each other's experiences. Novice teachers can learn what works and what cannot work in their classrooms.

Table 4. Contextual variables examined in this study

Predictor Variables
There is support of the campus for use of the textbook.
I was well informed about the district philosophy for adopting the new textbook.
There is cooperation between the mathematics teachers within the grade level in using the textbook.
The training sessions for the use of the textbook covered the needs of teachers regarding teaching with the new textbook.
I have been supported in the use of the textbook by the district.
There is frequent communication with the department head/department chair concerning use of the textbook.

Summary of Independent Variables -Personal

The demographic questions in this study included gender, the nature of teaching material used, years of teaching, and years of using the adopted textbook or other materials. Such questions determined and measured the independent variables, which were the years of experience and years of involvement in using the most newly adopted mathematics textbook. Demographic factors include such personal questions as age, education, race, or employment (O'Sullivan et al., 2003). The actual number of years in teaching the same class was one of the questions asked, which helped set a range used to determine each specified group of teachers. A mixture of demographic questions and scales measured the personal independent variables: years of teaching experience and years of using the same textbook. Specifically, years of teaching experience is defined as the number of the years the teacher has taught the same grade level. The years of involvement is defined as the number of years the teacher has used the most recently adopted textbook. The middle school mathematics textbook is in its third year of the adoption cycle.

Data Analysis

The questionnaire data were initially analyzed using exploratory factor analysis. This type of analysis helped the researcher to organize the questionnaire statements into latent factors capturing teachers' responses (see Table 5).

Table 5. Structure matrix

Questionnaire Statements	Latent Factors					
	Consequence	Refocusing	Collaboration	Information	Management	Personal
A32	.848	.785	.350	.536	.525	.335
A35	.844	.751	.477	.443	.408	
A23	.823	.547	.420	.384	.402	
A26	.792	.704	.379	.508	.471	.406
A31	.785	.516	.387	.308	.366	
A15	.749	.739	.468	.625	.452	.362
A36	-.739	-.516			-.509	
A24	.726	.670		.458	.439	.361
A22	.719	.697	.354	.593	.505	.321
A33	.700	.463	.328		.383	
A34	.658	.337				
A25	.624	.516		.412	.374	
A21	.508	.341	.419	.373		
A3	.550	.863	.309	.469	.499	
A2	.616	.831		.352	.619	
A8	.593	.815	.306	.314		
A7	.589	.785	.319	.354		
A16	.690	.717	.474	.552	.426	
A4	.516	.714		.487	.534	
A9	.568	.701	.338	.331		
A27	.660	.688	.489	.420	.380	
A1		.368		.306		
A28	.530	.418	.745	.373		
A12		.302	.704	.540		
A30	.321		.655	.304		
A13	.354	.375	.651	.592		
A14	.486	.470	.601	.433		
A29			.549			
A10			.323	.696		
A11			.527	.574		
A19	.353	.375		.555		
A20				.543		
A5	-.504	-.409			-.894	
A6	-.487	-.446			-.867	
A18						.653
A17						.632

Descriptive analysis in this study was used to describe the sample and to determine the stage of teachers' concern regarding the adoption of the textbooks. Answers to the first question of this study helped the researcher determine the stage of concern of the teachers. Hall and Hord (1987) said that determining a person's stage of concern can be as simple as asking questions. The highest score on the stages of concern is the most intense, or primary concern of the individuals involved in the innovation (Hall et al., 1979). The score is created by summing the responses of the questions that measure each of the proposed categories (self-informational, self-personal, task-management, impact-consequence, impact-collaboration, and impact-refocusing) within the broadly defined stages of concern (self, task, and impact), as shown previously in Table 3. Means and the standard deviations were used to describe the intensity of teachers' concerns. Multivariate and univariate analyses of variance were employed to analyze the answers to the second question of the study. The aim of this analysis was to gain insights into the relationship of the teachers' concerns to their years of experience and their years of implementing the new mathematics textbook.

The six stages of concerns are the dependent variables. Years of teaching experience and years of involvement of using the textbook are the independent variables and the personal factors. Teachers were grouped into three categories based upon their years of teaching experience and their years of involvement in using the same textbook, as shown previously in Table 2. The first group consisted of those teachers with less than five years' experience. The second group consisted of teachers with five to ten years' experience. The third group consisted of teachers with more than ten years' experience.

The years of involvement were the teachers' first three years of using mathematics textbook.

Answers to the third question were analyzed using a prediction equation and stepwise multiple regression analysis. Stepwise multiple regressions are used as a data analytic strategy to explain the dependent variable through a set of dependent variables. Selected variables were employed from the SoCQ for this purpose. The contextual variables were used as the dependent variables in the equation. These contextual variables are the questionnaire statements in the collaboration stage, as shown previously in see Table 4. The independent variable is a questionnaire statement that was chosen from the refocusing concern stage (see Table 6).

Table 6. Independent variable examined in this study

Independent Variable
I am pleased with the textbook content and organization.

A correlation analysis was employed to answer the fourth and last quantitative question. The correlation analysis is used to express the relationship between variables using effect statistics. All the items in the refocusing concern stage (see Table 7) were used along with the same item used before in the third question (from Table 6). This item came from the refocusing concern stage and reflects the satisfaction of teachers' use of the textbook.

Table 7. Correlation variables: refocusing stage items

The textbook meets the needs of students with different styles of learning.
The mathematics textbook used in the class offers the proper ratio of information/knowledge content (Bottom of Bloom's Taxonomy) and higher order conceptual thinking (Top of Bloom's Taxonomy).
The mathematics textbooks used in the class provide activities that are of higher order thinking.
The mathematics textbooks used in the class provide plenty of real life examples.
The mathematics textbook used is congruent with the state curriculum framework.
The mathematics textbook is written at the appropriate grade level for students in the class.
The mathematics textbooks used in the class focus on students as the center of the learning/teaching process.
The textbook and textbook resources support different learning styles.

Several questions asked on the teachers' interviews' instrument were qualitatively analyzed to find the most stable and most critical reasons for the teachers' use of the textbook and to answer the last question of the study. The goal of this research was determination of the type of support that would facilitate classroom use of new textbooks. Qualitative questions were analyzed using general data analysis and interpretation guidelines described by Creswell (2003).

Assumptions and Limitations of the Study

The study assumes the teachers are using the textbook and that they have already voiced some appropriate concerns regarding their use of the textbook. The study assumes the respondents' concerns are representative of the overall middle school

mathematics teachers' concerns regarding the textbook in Texas. The study is limited by weaknesses inherent in short-term, cross-sectional designs (O'Sullivan et al., 2003). The survey and the semi-structured interviews were the sole measure for data collection. The results are accurate only if the teachers accurately reported their self-concerns. Teachers' concerns could be affected by the time they dedicated to finish the survey as well as the method of processing the data.

Generalizations of the results of this study might be limited due to the sampling because teachers who chose to participate in the survey might not be a good representation for all middle school mathematics teachers in Texas. The participants of the online survey were anonymous so the data collection was limited in its ability to track the participants. The following chapter provides an overview of the findings about determining the teachers' stages of concern regarding their use of the new curriculum materials. It also examines the extent to which teachers' concerns vary according to overall teaching experiences and years of involvement with the innovation.

CHAPTER IV

RESULTS

Teachers develop concerns in relation to new programs or innovations that are related to their daily job (Hall & Hord, 2001). These concerns are teachers' thoughts, worries, and reactions. Teachers have a significant role in implementing any innovation in the classroom. The concerns people have regarding any innovation may determine the degree of innovation success more than its objective features (Hall & Hord, 2001; Van Den Berg, 1993). The use of new curriculum materials can be a burden to teachers' already loaded schedules. The years of experience in teaching and years of involvement in using the textbook were two major personal factors perceived to affect the teachers' implementation for the new curriculum materials. This study examined the influence of these two factors on the teachers' self, task, and impact concerns related to the implementation of recently adopted middle school mathematics textbook in Texas. Self-concerns are related to the teachers' anxiety about their own ability in performing and using the new curriculum materials. Task concerns are related to the daily challenges and duties of their teaching jobs, and impact concerns are related to teachers' worries about students' outcomes. The three mentioned stages of concern are the base of this study.

The study also examines the schools' and the districts' effects on the teachers' use of the new curriculum materials. The teachers' curriculum use is influenced by contextual characteristics as well as personal factors. Understanding the personal and the

contextual factors that jointly shape teachers' use of new curriculum materials will help administrators to provide teachers with better and more productive experiences as they use the new materials. Teachers' concerns deserve attention to assure that the maximum benefits from using the newly adopted textbooks are realized.

The research study used the Stages of Concern (SoC) from the CBAM model to derive the three stages of concern base used to evaluate the change process for teachers as they use new textbooks. Using a random sample of 145 middle school mathematics teachers, the study sought first to answer four quantitative research questions. The fifth question was analyzed qualitatively through interviews of three teachers who represented the three ranges of experience in teaching.

The study sought to answer the following questions.

1. What are teachers' concerns regarding the use of newly adopted mathematics textbooks?
2. How do more experienced teachers with longer periods of textbook use vary in their concerns about the use of mathematics textbooks compared with those of limited experience and use of the textbooks?
3. How does the school's or district's support affect teacher satisfaction with the use of the new textbook?
4. What are teachers looking for in the new mathematics textbooks?
5. How do teachers use the newly adopted textbook?

Reliability of the Study

The dimensions of reliability include stability, equivalence, and internal consistency. As noted in Chapter III, stability occurs when the measure gives the same result when applied to the same phenomenon more than one time, equivalence occurs when the measure give the same results when applied to the same phenomenon, and internal consistency occurs when the items constituting a measure relate to the same phenomenon (O'Sullivan et al., 2003). This study used a reliability analysis based on Cronbach's alpha for each of Hall et al.'s (1979) originally hypothesized stages of concern. The analysis revealed similarity in coefficients to the original study, with the exception of the informational and personal stage, which were slightly below the .70 alphas normally viewed as an acceptable standard in the social science literature studies. Lower alphas (.60 to .69) are sometimes reported (Neill, 2004).

Validity of the Analysis

Quantitative Research Questions Analysis

Teachers' concerns. The intensity of the concern is described through the means of the six stages of concern. The highest mean occurred at the information stages ($\overline{X}$ Information = 6.57), indicating that the respondents were aware of the changes accompanied with introducing the textbooks (see Table 8). Teachers claimed that they did not have any difficulty in teaching with the new mathematics textbooks. The teachers claimed they knew the content of the textbooks and that they were aware of changes accompanied with their use of new textbooks such as using new pedagogical

approaches of teaching. The teachers stated they had the level of knowledge they needed to use the districts' adopted textbooks.

Table 8. Teachers' stages of concern

	N	Minimum	Maximum	Mean	Std. Deviation
Information	718	1	8	6.57	1.905
Personal	708	0	8	5.40	1.924
Management	714	0	8	3.89	2.351
Consequence	996	0	8	4.70	2.168
Collaboration	855	1	8	4.90	2.424
Refocusing	1151	1	8	4.84	1.955
Valid N (listwise)	615				

Five statements in the information stage concern all have high means (see Table 9). Although the mean of the personal stage is lower, it is still among the highest means of the six stages ($\overline{X}$ Personal=5.40) (as shown in Table 8). This indicates that the teachers at this stage of implementation have quiet self-confidence in teaching all the textbook's topics. In their opinions, the mathematics textbook provides adequate coverage of the recommended standards and it is a helpful resource in accommodating each student's progress.

Table 9. The Means and Standard Deviations for the SoC Questionnaire

Stages of Concern	Mean	STD
Information		
1. I have no problem reading the newly adopted mathematics textbook.	6.7	1.85
10. I know the content in the new textbook for the classes that I am teaching.	7.1	1.31
11. I am aware of the changes in the new textbook in the mathematics curriculum.	6.2	1.96
19. I do not have any difficulties in teaching with the new textbook.	6.3	2.07
20. I have no difficulty with the knowledge required by the new mathematics textbook.	6.6	2.12
Personal		
17. The mathematics textbook requires the use of methods that I am not sufficiently familiar with.	5.9	1.65
18. I feel insecure about teaching some topics in this textbook.	5.9	1.77
15. The mathematics textbook I am using for my class provides appropriate coverage of the recommended standards.	5.4	2.02
26. The textbook resources allow me to accommodate lessons based on the progress of each student.	4.6	1.9
24. The textbook is equipped with reasonable independent practices material.	5.2	1.97
Management		
5. Due to the inadequate coverage of the textbook package, I frequently substitute materials from other resources.	2.7	2.39
6. Due to the absence of material in the textbook package, I frequently must create or add material for my class.	3	2.33
22. The textbook support my role in the classroom as a facilitator of learning.	5	1.96
23. The textbook reduces the stress of developing lessons so I can focus on teaching.	4.2	2.26
25. The material included in the book can be covered in the available time.	4.5	1.96
Consequence		
2. The newly mathematics textbook provides adequate materials for student learning.	5.6	1.83
31. The textbook plays an important role in improving the teaching /learning process.	4.5	2.08
32. I am pleased with the textbook content and organization.	4.7	2.13
33. I agree that textbooks are good for reducing the responsibilities of teachers like the preparation of guided and independent practices.	4.8	2.18
34. The quality textbooks are a major tool in mathematics teaching.	5.2	2.11
36. The textbook is useless in my classroom.	4.7	2.41
21. I make use of all of the activities in the textbook.	3.5	1.86
Collaboration		
13. The training sessions for the use of the textbook covered the needs of teachers regarding teaching with the new textbook.	4.6	2.38
14. I have been supported in my use of the textbook by the district.	5.1	2.28
28. There is support on the campus for use of the textbook.	4.7	2.26
29. There is frequent communication with the department head/ department chair concerning use of the textbook.	4.3	2.57
30. There is cooperation between the mathematics teachers within the grade level in using the textbook.	5.5	2.4
12. I was well informed about the district philosophy for adopting the new textbook.	5.2	2.48

Table 9. Continued

Stages of Concern	Mean	STD
Refocusing		
3. The mathematics textbook used in my class offers the proper ratio of information/knowledge content (Bottom of Bloom's Taxonomy) and higher order conceptual thinking (Top of Bloom's Taxonomy).	5.2	1.94
4. The mathematics textbook is written at the appropriate grade level for students in my class.	5.6	1.85
7. The mathematics textbooks used in my class provide plenty of real life examples.	4.7	1.77
8. The mathematics textbooks used in my class provide activities that are of higher order thinking.	5	1.76
9. The mathematics textbooks used in my class focus on students as the center of the learning/teaching process.	4.7	1.73
16. The mathematics textbook used is congruent with the state curriculum framework.	5.6	1.91
27. The textbook and textbook resources support different learning styles.	4.7	1.84
35. The textbook meets the needs of students with different styles of learning.	4.4	1.91

There are five statements under the personal stage concern (see Table 9). The highest means are observed at the two stages of concern that correspond to the self-stage of concern. The result of the relative means suggested that the teachers' concerns are not focused mainly on the self-stage of the innovation, which was expected, because most teachers have some experience in teaching with new mathematics textbooks.

Following the self-stage, teachers showed that they are more worried about managing the implementation of the textbooks. The mean of this stage is the lowest ($\overline{X}$ Management = 3.89) (as seen in Table 8.). This stage corresponds to Fuller's task stage of innovation (Fuller, 1969). The results of this study found that teachers worried about covering the content of the mathematics textbooks within the set time limits and making use of all the activities in the textbook. Teachers do not consider the textbook as a primary resource for teaching because the textbooks are not equipped with sufficient

materials to help teachers in developing good lessons for teaching (as seen in Table 9). The five items that are under the management stage of concern have low means.

The next three stages are related to the impact of the innovation on the teachers. The means are $\overline{X}$ Consequences = 4.70, $\overline{X}$ Collaboration = 4.90, and $\overline{X}$ Refocusing = 4.84 (see Table 8.). The means of the items specified under each stage are listed in Table 9. The moderate means of these last three stages indicate that teachers are not well supported in their use of the textbooks. Teachers are not given chances to cooperate with other teachers in implementing the innovation. Teachers are not focused well on the innovation impact on their students and they may not have clear views or suggestions regarding the implementation of the new mathematics textbooks. Teachers are not supported enough in their use of new curriculum materials at their campuses, nor are they provided with sufficient training sessions for the use of the textbooks. They are not supported through their districts, nor are they cooperating with other teachers within grade level to use the new curriculum materials (as seen in Table 9).

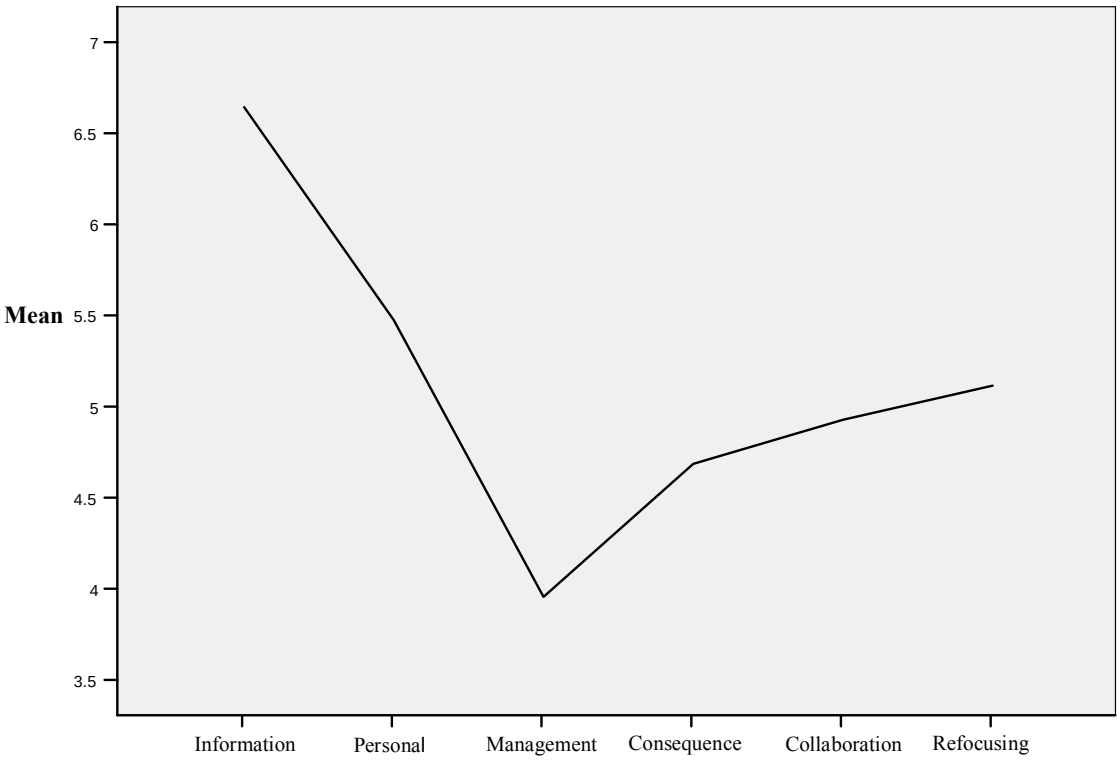

Figure 4. Mean percentiles for all stages of concern for all teachers.

Figure 4 shows the pattern of concerns of the middle school mathematics teachers on the textbook. The results of this study indicate that teachers in general did not go farther than the information stage of concern regarding their use of the textbook. Teachers are mainly concerned about accomplishing the objectives of the innovation.

Differences in teachers' stages of concerns in terms of years of experience and years of involvement. The second study question examined the influence of the teachers' experience and years of implementation of the same textbook on their stages of concern. In order to answer this question, a multivariate analysis of variance

(MANOVA) was applied to the six stages of concerns used as the dependent variables in this study. Years of experience as well as years of involvement with the textbook were the independent variables. The results of the MANOVA revealed significant differences in the information and collaboration stages of concern relating to the teachers' experience [F (2, 145) = 3.73, 3.01 and P = 0.03, 0.05, respectively, as shown in Table 10]. Tables 11, 12, and 13 summarize the mean responses to each sub-scale as it is related to teachers' total experience and involvement in the innovation.

Table 10. Stages of concern by total years of experience and years of involvement using the textbook

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.
Years of Teaching	Information	25.744	2	12.872	3.726	.027
	Personal	13.701	2	6.851	2.362	.099
	Management	7.362	2	3.681	.920	.401
	Collaboration	35.608	2	17.804	3.096	.049
	Consequence	3.544	2	1.772	.570	.567
	Refocusing	4.437	2	2.218	.581	.561
Years of Involvement	Information	.326	2	.163	.047	.954
	Personal	11.388	2	5.694	1.963	.145
	Management	8.249	2	4.124	1.031	.360
	Collaboration	7.204	2	3.602	.626	.536
	Consequence	1.408	2	.704	.227	.798
	Refocusing	11.925	2	5.962	1.562	.214
Years of Teaching * years of Involvement	Information	32.080	4	8.020	2.321	.061
	Personal	3.748	4	.937	.323	.862
	Management	7.759	4	1.940	.485	.747
	Collaboration	20.190	4	5.047	.878	.480
	Consequence	5.358	4	1.339	.431	.786
	Refocusing	18.736	4	4.684	1.227	.303

Table 11. Teachers' concerns in different groups of teaching experiences

Years of Teaching		Information	Personal	Management	Collaboration	Consequence	Refocusing
<5 Years	Mean	6.11	5.22	4.64	4.52	5.39	5.16
	N	28	27	28	27	28	25
	Std. Dev.	1.969	2.100	1.747	2.376	1.548	2.075
5-10 Years	Mean	7.17	5.82	5.18	6.15	5.68	5.00
	N	35	34	34	34	34	34
	Std. Dev.	1.543	1.766	2.096	2.162	1.804	2.030
>10 Years	Mean	6.64	6.11	5.05	5.09	5.60	5.15
	N	84	83	83	80	82	78
	Std. Dev.	1.893	1.371	1.975	2.547	1.943	1.914
Total	Mean	6.67	5.88	5.00	5.23	5.58	5.12
	N	147	144	145	141	144	137
	Std. Dev.	1.852	1.647	1.958	2.475	1.831	1.959

Table 12. Teachers' concerns in different groups of textbook involvement

Years of Involvement		Information	Personal	Management	Collaboration	Consequence	Refocusing
1	Mean	6.27	5.58	4.88	4.67	5.19	5.67
	N	26	26	25	24	26	24
	Std. Dev.	2.325	2.023	1.764	2.461	1.855	1.810
2	Mean	6.85	5.72	5.23	5.34	5.80	4.87
	N	65	64	65	64	65	61
	Std. Dev.	1.603	1.864	1.835	2.521	1.734	2.012
3	Mean	6.67	6.17	4.85	5.45	5.57	5.18
	N	54	52	53	51	51	50
	Std. Dev.	1.913	1.043	2.152	2.403	1.857	1.956
Total	Mean	6.68	5.86	5.03	5.27	5.61	5.13
	N	145	142	143	139	142	135
	Std. Dev.	1.863	1.653	1.943	2.466	1.802	1.964

Table 13. Means of stages of concern by teachers' experience and by years of involvement in the innovation

Years of Involvement	Years of Teaching		Information	Personal	Management	Collaboration	Consequence	Refocusing
1	<5 Years	Mean	6.22	5.00	4.00	4.22	5.00	5.00
		Std. D	1.563	2.398	1.225	2.333	1.658	2.390
	5-10 Years	Mean	8.00	5.33	5.67	6.33	6.00	5.67
		Std. D	.000	2.733	1.862	2.066	1.414	1.633
	>10 Years	Mean	5.36	6.18	5.20	4.00	4.91	6.20
		Std. D	2.976	1.079	1.932	2.550	2.212	1.317
	Total	Mean	6.27	5.58	4.88	4.67	5.19	5.67
		Std. D	2.325	2.023	1.764	2.461	1.855	1.810
2	<5 Years	Mean	6.00	4.80	5.10	4.20	5.50	4.33
		Std. D	2.449	2.486	1.595	2.486	1.716	2.000
	5-10 Years	Mean	6.88	5.71	5.29	6.47	5.76	4.81
		Std. D	1.364	1.759	1.961	1.772	1.786	2.373
	>10 Years	Mean	7.05	5.97	5.24	5.14	5.89	5.03
		Std. D	1.394	1.691	1.881	2.679	1.752	1.874
	Total	Mean	6.85	5.72	5.23	5.34	5.80	4.87
		Std. D	1.603	1.864	1.835	2.521	1.734	2.012
3	<5 Years	Mean	6.11	6.00	4.78	5.25	5.67	6.25
		Std. D	1.965	.926	2.279	2.435	1.323	1.488
	5-10 Years	Mean	7.17	6.27	4.73	5.55	5.36	4.92
		Std. D	2.038	1.104	2.494	2.770	2.111	1.782
	>10 Years	Mean	6.64	6.18	4.91	5.47	5.61	5.00
		Std. D	1.868	1.074	2.067	2.342	1.944	2.084
	Total	Mean	6.67	6.17	4.85	5.45	5.57	5.18
		Std. D	1.913	1.043	2.152	2.403	1.857	1.956

A univariate analysis of the variance (ANOVA) was used to evaluate the significant differences in these two stages of concern (Information and collaboration stages) (see Tables 14 and 15). Concerning the information stage, the results indicated that teachers with more than five years of experience scored higher than teachers with less than five years of experience ($\overline{X}_{Information} = 6.107$). Those teachers with more experience ($\overline{X}_{Information} = 7.171$ and $\overline{X}_{Information} = 6.643$) expressed higher confidence in having the abilities and the required level of knowledge in teaching with the newly adopted mathematics textbook as shown in Table 14 and Figure 5. Less experienced teachers do not reflect knowledge of the textbook's content or self-confidence in teaching all the topics in the textbook; thus, they do not possess the required knowledge to achieve successful implementation of the newly adopted textbook. They are less aware of the expected changes accompanying the introduction of this new resource as an instructional material in their classrooms. Concerning the collaborative stage, experienced teachers ($\overline{X}_{Collaboration} = 6.147$ and $\overline{X}_{Collaboration} = 5.088$) have revealed that they are more supported in the use of the new textbook than the less experienced teachers are ($\overline{X}_{Collaboration} = 4.519$), as shown in Table 15 and Figure 6. Experienced teachers are well informed about the philosophy of adopting new textbooks in their districts. They describe that there is frequent communication with the department head concerning their use of the newly adopted textbook, and there is cooperation between the teachers in their use of the textbook within the same grade level.

Table 14. Univariate analysis for years of teaching (dependent variable: information)

			95% Confidence Interval	
Years of Teaching	**Mean**	**Std. Error**	**Lower Bound**	**Upper Bound**
<5 Years	6.107	.346	5.423	6.791
5-10 Years	7.171	.310	6.560	7.783
>10 Years	6.643	.200	6.248	7.038

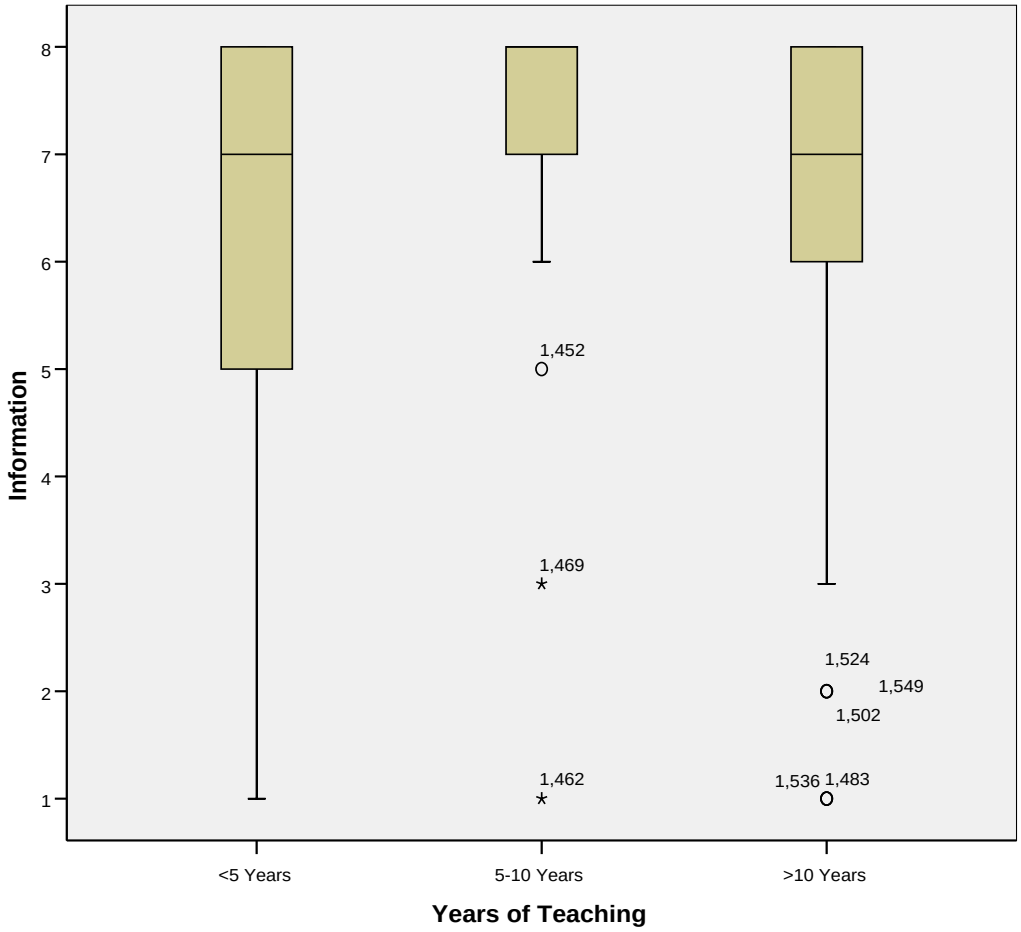

Figure 5. Box plot distribution of information based on years of teaching.

Table 15. Univariate analysis for years of teaching (dependent variable: collaboration)

			95% Confidence Interval	
Years of Teaching	**Mean**	**Std. Error**	**Lower Bound**	**Upper Bound**
<5 Years	4.519	.467	3.595	5.442
5-10 Years	6.147	.416	5.324	6.970
>10 Years	5.088	.271	4.551	5.624

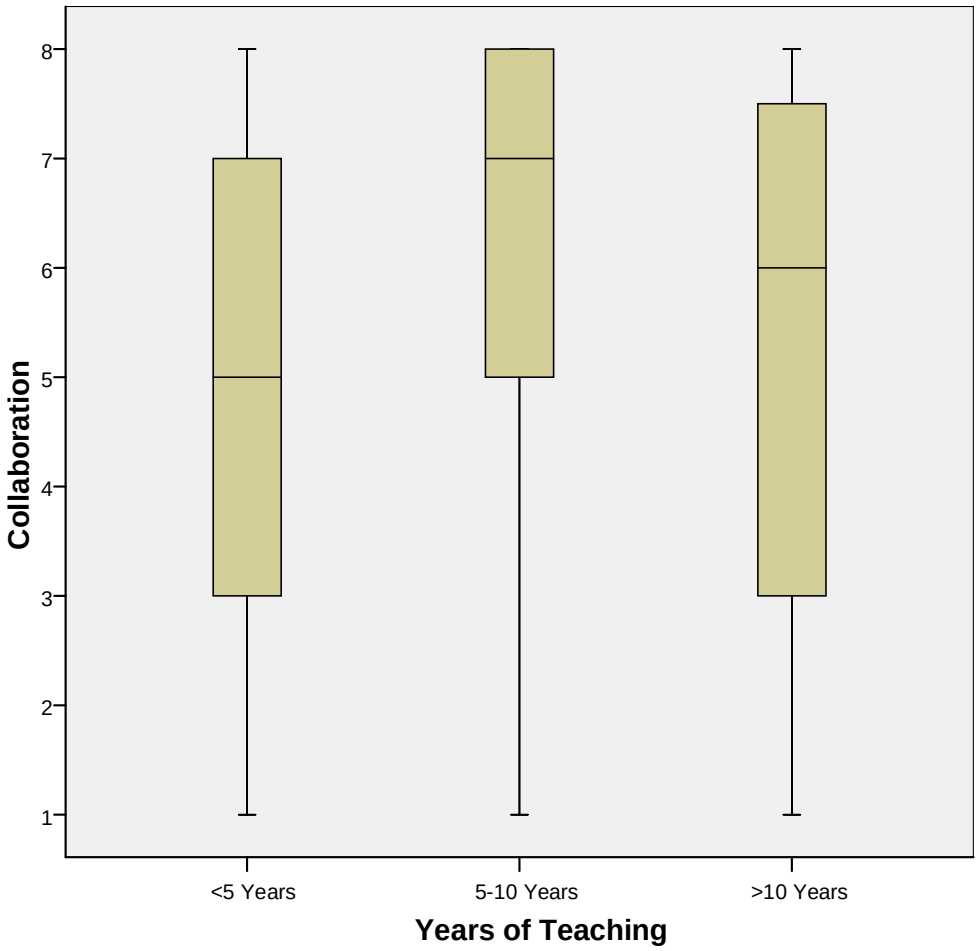

Figure 6. Box plot distribution of collaboration based on years of teaching.

The difference in the management stage, which corresponds to the task stage of concern, was not statistically significant. This indicates that teachers with different ranges of experiences have more or less the same task concerns regarding the textbook implementation. Even with their different levels of experience, teachers worried about substituting or creating materials due to inadequate or absent coverage of some materials in the textbook. Textbooks do not cover the all needs of different learning styles of students. The consequence and the refocusing stages were also found not to be significantly different within the years of experience. Even with their varied years of experience in teaching, almost all teachers agreed on the same issues regarding the textbook's evaluation.

Exploring the teachers' types of concerns regarding their implementation of the textbook within the years of involvement variable revealed that teachers do not show differences in types of concerns across their years of involvement or implementation of the textbook [F (2, 146) = .95, .14, .34, .51, .39, .20]. This result does not agree with developmental nature of the innovation. There is no shift in teachers' stages of concern, because they are more involved in using the new curriculum materials.

Differences within the concerns in collaboration. The third question examined the effect of the school's or the district's support in teachers satisfaction with their implementation of the textbook. Multiple regression analysis was used to answer the third question of the study. Before conducting the multiple regression analysis, a correlation analysis was applied in order to check the possibility of any relation between the specified collaborative stage and the specified item reflecting the teachers'

satisfaction with the textbook. The next step in this analysis was to check for multicollinearity. Multicollinearity is a "condition existing when the independent variables in a regression equation are closely related" (O'Sullivan et al., p.488). The estimation of the independent variables' effects on the dependent variable may not be accurate. The collinearity statistics (see Table 16) are not a problem in this case. The tolerance is not below .10, and/or VIF (Variance Inflation Factor) is above 10). The multicollinearity might be a problem if the value of the VIF is over 10 (Gliem, 2005).

Table 16. Collinearity of the items in the collaborative stage

Model		Sig.	Collinearity Statistics		
		B		Tolerance	VIF
1	(Constant)	2.006	.000		
	A12	-.134	.132	.509	1.963
	A13	.181	.055	.508	1.967
	A14	.290	.005	.481	2.077
	A28	.151	.177	.400	2.502
	A29	-.073	.330	.675	1.481
	A30	.131	.139	.595	1.682

The effect of the independent variables on a specific item (A32-Dependent variable; see Table 17) is provided through this type of analysis. The items of the collaborative stage are the independent variables (see Table 18). With the regression analysis, all the independent variables are combined in one equation to get an idea about their combined predictive power in estimating the dependent variable. The selected statement item directly reflects the teachers' satisfaction with the textbook. In this item,

teachers directly stated that they were pleased with the textbook content and organization.

Table 17. Dependent variable: item (A-32)

A-32. I am pleased with the textbook content and organization.

Table 18. Collaboration stage items: independent variables

A-12.	I was well informed about the district philosophy for adopting the new textbook.
A-13.	The training sessions for the use of the textbook covered the needs of teachers regarding teaching with the new textbook.
A-14.	I have been supported in my use of the textbook by the district.
A-28.	There is support on the campus for use of the textbook.
A-29.	There is frequent communication with the department head/ department chair concerning use of the textbook.
A-30.	There is cooperation between the mathematics teachers within the grade level in using the textbook.

Table 19. Regression model summary for independent variables of the collaboration stage and teachers' satisfaction item

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.533(a)	.284	.251	1.842

Predictors: (Constant), A30, A14, A29, A12, A13, A28

The coefficient of the multiple determination, R^2, indicated the degree to which such predictors explain the variance of the dependent variable; the adjusted R^2 score for this model indicated (see Table 19) that 28.4% of the variation in teachers' satisfaction

with the textbook is a result of the independent variable items from the collaboration stage. The result is significant level of p =0.000< 0.05 (see Table 20).

Table 20. Statistically significant relation

Model		F	Sig.
1	Regression	8.526	.000(a)
	Residual		
	Total		

The regression coefficients summary table (Table 16) provides the interpretation of how much each item contributes to the dependent variable. There are the t-score, Beta weights, and the significance values. The predictive value of the dependent variable is summarized as follows according to Table 16.

$$Y= 2.00-.13A12+ .18A13 + .29A14+0.15A28-.07A29+ .13A30.$$

The variable A14 has significance values less than 0.01, which means that teachers' support makes a significant contribution to the teachers' satisfaction with the textbook use. For every one-point increase in A32, there is a .29 increase in the positive attitude of teachers regarding their textbooks. The teachers are more satisfied with the textbook content and organization when they get more support in their use of the textbook. This study perceived some aspects of the school's and district's support of the teachers' use of the curriculum materials: (a) teachers are informed about the district

philosophy for adopting the new textbook, (b) teachers cooperate with each other within the grade level in using the textbook, (c) teachers receive training sessions about the use of the textbook, and (d) teachers communicate frequently with the department head/chair concerning their use of the textbook.

Differences within the refocusing consequence concerns. The results of the correlation analysis (see Table 21) indicate that middle school mathematics teachers in Texas are concerned about the textbook content of materials that are directed to different learning styles of their students (A-35). They are also interested in appropriate grade level materials contained in the textbook and its alignment with the state curriculum.

Table 21. Correlation coefficients of the associated variables

		A32- I am pleased with the textbook content and organization
A3-	The mathematics textbook used in my class offers the proper ratio of information/knowledge content.	.619(**)
A4-	The mathematics textbook is written at the appropriate grade level for students in my class.	.547(**)
A7-	The mathematics textbooks used in my class provide plenty of real life examples	.623(**)
A8-	The mathematics textbooks used in my class provide activities that are of higher order thinking.	.594(**)
A9-	The mathematics textbooks used in my class focus on students as the center of the learning/teaching process.	.604(**)
A16	The mathematics textbook used is congruent with the state curriculum framework.	.661(**)
A27	The textbook and textbook resources support different learning styles.	.633(**)
A35	The textbook meets the needs of students with different styles of learning.	.739(**)

Qualitative Analysis for the Fifth Question

Research question five asked, "How do teachers use the newly adopted textbook?" The initial analysis of opinions expressed in the interviews of the three teachers indicated that the concerns of these educators are dominated by their need of a quality textbook and appropriate support. Teachers' concerns reflect their need to meet their students' level of achievement, their need for appropriate support of textbook implementation, and their need to have the textbook be in alignment with their state curriculum. The textbook appeared to have influenced the teacher with limited experience most strongly because this teacher lacked other curriculum material resources from the district and school.

Methodology

A ten-question semi-structured interview (see Appendix B) was used to elicit responses from three teachers with varied teaching career lengths and learning experiences in order to describe their professional development activities with regard to the newly adopted textbook, implementation of the textbook, and any incentives that might encourage use of the newly adopted mathematics textbook. The teachers with 11 and 21 years of experience, respectively, have developed their own mathematics curriculum. The second-year teacher has only the curriculum material presented in the new textbook. The responses to the interview questions were initially grouped by stage of concern. The responses were then analyzed using the general data analysis and interpretation guidelines described appropriate by Creswell (2003). Thematic responses

were first identified and categorized, then broken into more thematic elements to closely categorize nuances of responses. Two interviews were conducted at the school in a quiet room, and one at the interviewee's house for her convenience. Each interview lasted about forty minutes. The interviews were digitally recorded and later transcribed by an editor. There were three broad themes covered in the interview: (a) concepts of the textbook adoption process, (b) challenges with implementation of the textbook curriculum, and (3) elements that could facilitate the adoption or the change process. The data was analyzed qualitatively to discern the most important key elements regarding adoption of the new textbook from the teacher interviews.

Findings

In the beginning, the researcher noticed the importance the teachers placed on the textbook. Initial data analysis indicated three common key elements: textbook content, alignment with state standards, and adoption process. A qualitative content analysis was conducted to investigate how teachers experienced the curriculum and assessment of curriculum materials. Data on use of the textbook revealed five themes delaying teachers' progress in their use of the curriculum materials: (a) school-developed curriculum, (b) teacher knowledge and experience, (c) appropriate school and textbook innovation support, (d) alignment with the state standards, and (e) textbook generality.

School-Developed Curriculum

The teachers' interactions with and responses to the textbook varied. The change process associated with the textbook's use is complex. Remillard (1999) showed that teachers interact differently with textbooks materials. She discussed that teaching is a multi-dimensional activity. In each dimension, teachers are likely to use the textbook differently as a function of different decisions and support. The two local teachers with a school-developed mathematics curriculum are in different stages of concern than the less-experienced teacher without a school-or district-developed curriculum is. Availability of a school-developed curriculum tends to increase resistance to implementation of new curriculum materials. The interviewed teachers had developed minimal proficiency with the new curriculum materials. The teachers' involvement with the textbook is reflected through their reading of the textbook. The first two teachers glanced through the textbook for a broad overview and to "fill the gaps." Teachers with a school-developed curriculum use the textbook merely as a source of exercises. These teachers believe that the textbook is not going to provide them with valuable information in teaching; consequently, they spent minimal time reading the textbook. The teachers seemed somewhat defensive regarding their choice to maintain their existing curriculum. These teachers might have a sense of guilt for avoiding the textbook, which may explain their perceived defensiveness. One teacher, secure with the school-developed curriculum already practiced by her colleagues stated, "I am not going page by page, and I do not know any teachers through the years of teaching who did."

These two experienced teachers are mainly looking for homework exercises, if any, to improve their school-developed curriculum. The textbook does not represent a major change for them. The teacher with 21 years of teaching experience said, "The newly adopted mathematics textbook did not add to me more than what I got from earlier adoption."

The less-experienced teacher with no school-developed curriculum indicated that she has read and used the textbook content in her first year of teaching. This teacher expressed greater concern regarding innovation than the first two teachers. She said, "After going through it for a year, I know what worked for the kids with the textbooks and what didn't, so this year I'm more selective on picking what I'm going to use from the textbook."

The novice teacher was more receptive of and relied more on the new materials due to her need for new materials than the other two teachers did. However, this teacher was not able to make significant adaptations to the textbook's materials based on the needs of her students in this year as she has mentioned. She is more selective about meeting her students' needs and ability levels in her classroom. She said that the textbook does not address the needs of students at low achievement levels in her second year of teaching.

Effects of Teacher Knowledge and Experience on Textbook Adoption

A novice teacher lacks the necessary knowledge and experience to interact with the published curriculum materials. Existing teacher training programs do not instruct a

prospective teacher in the use of the textbook in the classroom, especially when the textbook is her or his choice of instructional materials. Ball and Feiman-Nemser (1988) suggest specific instruction in the implementation of the textbook tailored to their students, particularly for inexperienced teachers. Novice teachers need such support before stepping into their classrooms. Using the new curriculum materials requires change and learning on the part of the teachers; and novice teachers can be involved with a minimum degree of change and adaptation. The tendency of a teacher to avoid textbook use in her second year of teaching could be a function of her understanding of the textbook content. The decreased role of adaptation with the curriculum strategies from the first year to the second year indicates that the teacher either uses or does not use the textbook materials. This is not an adaptation but a "cut and paste" process, and the textbook is not a major source of change. In the second year, the teacher is looking for a main resource of instructional material other than the textbook. The novice teacher does not plan to use the textbook material next year as much as she did the year before. She said, "I'm going away from it more and more."

Remillard (1999) wrote that novice teachers are not well supported in their use of the adopted textbook; the potential influence of the curriculum materials has much more effect on them than on teachers with more experience. Regardless of textbook adoption, novice teachers need help in seeing that decisions about what to teach to which students has important consequences (Goodlad, 1984; Scheffler, 1958).The teacher-curriculum relation did not develop over time; this could be due to the teacher's limited knowledge and experience with textbook use.

Appropriate School and Textbook Innovation Support

All the interviewed teachers recognized their need of support in implementing the textbook either from the school, textbook content, or from the publishers themselves. In their commentary about the textbook, teachers mentioned strategies that could facilitate textbook implementation. The teachers argue that specific and direct textbook guidance is needed, through curriculum program organizations supported either by the publishers or the school districts.

In the United States, many studies have proven that the implementation of the new instructional materials is more effective coupled with the professional development, especially those on standards-based curriculum. McDuffie and Mather (2009) studied teachers' practices as they implemented the Connected Mathematics Project (CMP) and formed a professional development team with a university mathematics educator. Their findings suggested that the team's work with the curriculum materials improved teachers' curricular knowledge development. The professional development team in that study supported the new comprehension of the curriculum, including the mathematics content and strategies as well as an understanding of students' needs. All the interviewed teachers mentioned their need for professional developmental in using the textbook. Without the individual instruction in curriculum development, teachers may choose exercises based merely on their individual preferences, commonsense views of what is meaningful or "fun," or stereotyped notions of what particular students "need" or "can" learn (Anyon, 1981; Ball & Feiman-Nemser, 1988; Brophy, 1983; Buchmann, 1986; Dewey, 1938, 1977; Floden 1985).

The three interviewed teachers thought that successful implementation might be better achieved through teachers learning textbook content through either training sessions or workshops. They believe that the training sessions could be the "key component" in implementing new curriculum material. One of the teachers said,

> If you want them to use something like that, they need to be taught, not just one lesson model, but something modeled from each of the units. Exactly what the people who had the vision of that particular chapter, what were they envisioning the teacher doing. Teachers need to experience it before they'll try it in a classroom; otherwise, they'll go back to their old ideas. Anything that I've experienced in a student mode, if I've gone to a workshop and learned how to do something and I've experienced it from the student side, I'm much more likely to use it in the classroom than just reading it. The training aspect I think would be a key component.

Another teacher said, "Nobody showed me what was involved in the textbook. Last year I was given a class set and given a teacher's edition of the textbook… There was no support of how to use the textbook... I was exploring." The content of the textbook was not supportive either in showing teachers ways to integrate the textbook materials or lessons or suggesting new teaching methods. Teachers could not adapt textbook content to their specific group of students. Meeting students' various levels and needs are stable facts in teachers' minds, especially during the current era of accountability and increased school pressure in raising students' achievement level.

Support for instruction of the teacher is more effective when related to existing classroom context (Borko & Putnam, 1996). The novice teacher said that she is using the textbook less in her second year of teaching because the textbook materials do not address the needs of her students. Practical textbook content support could be achieved by relating lesson topics with the unit's main concept. One of the teachers said that teachers lack "the vision of that particular chapter." All interviewed teachers agreed that they are in need of substantiated information about how such instructional strategies work. The teachers could not get "what were they envisioning the teacher doing" from the textbook material ('they' meaning the publishers). The teacher who used the textbook in her first year said, "If it were a good-quality textbook, it would speak for itself. If it really was self-explanatory and easy to use."

Another teacher who recommended workshops commented on the difficulty in understanding the concrete models in the textbook. She said, "The concrete models -- a lot of the teachers are coming out and they don't understand the hard-core." Teachers are in need of educative curriculum materials that support their own familiarization with material in addition to student learning (Ball & Cohen, 1996). Grant et al. (2009) showed the effectiveness of certain types of guidance provided by the teacher's guide support teachers in extending students' mathematical thinking. The materials provided the teachers with information about students' strategies and ideas they might expect during their teaching of certain lessons.

Teaching becomes even more difficult for the new interviewed teacher who worked in a classroom the textbook formed the core of instruction. The novice teacher

said, “Last year I was given a class set and given a teacher’s edition of the textbook… There was no support of how to use the textbook... I was exploring.”

By developing an understanding of the use of the textbook in conjunction with their ideas to meet the main concept, teachers can intensify their relation with the textbook and make their contributions to the new curriculum. In that case, teachers could interact with the textbook materials. The teachers who were interviewed failed to understand the reasons behind the textbook adoption because they had neither the time nor the inclination to become familiar with new curriculum materials, nor were they given appropriate support to do so.

Alignment

Texas mathematics teachers are pressured to demonstrate student competency of standards and achievement by way of student performance on standardized tests. Teachers criticized the recently adopted textbook for not being aligned with the TEKS objectives, especially for the seventh grade. The two-year teacher stated that “the modeling aspect of our fractions is virtually nonexistent” in the textbook, “so it’s not aligned to the TEKS at all. It’ll just have 1/3 times 1/2 and will show the algorithm, but that doesn’t meet the TEKS, because the TEKS wants the students to model.”

The concepts are named in the state standards and addressed in the textbook; but there is no careful alignment of the specific ideas about some concepts that students are expected to learn. The seventh grade mathematics textbook has additional problems and

concepts that go beyond the TEKS. One of the teachers mentioned that some of the math problems are not suitable for the students, stating that they

> … go beyond what our Texas TEKS require, and you have to be very careful you're not going beyond where the kids are…. for example, on the multiplying and dividing fractions unit, they introduce the positive and negative and irrational numbers with it. That's not seventh grade in Texas... texts that are more eighth grade text.

The lack of textbook alignment to the state standards is a source of frustration and anxiety, especially for the novice teachers. The greater specification and systemic alignment support teachers by providing them with greater certainty than their predecessors about what to teach and how teach it (Schmoker & Marzano, 1999).

Textbook Generality

The mathematics textbook is inflated and filled with extra information that does not help teachers in their workloads. The textbook is full of "fluff." Teachers believe textbook publishers "fluff it up instead of getting to the meat," and that publishers "are geared nationally to get as big a population as they can." Teachers are tight on time and any extra effort they put forth in teaching cuts into that time. Teachers appear to reject any additional task that is not part of their planned assignment. They feel that the textbook is full of repetition and it takes a long time for them "to sit and read" it.

This chapter has attempted to describe the interactions between the teachers and the curriculum materials by examining their answers to the SoC questionnaire and via teachers' interview protocol. Among the findings that were highlighted was the undeveloped use of the curriculum materials, even after teachers had used the materials for more than two years. The study also found that teachers are not supported enough during the process of new textbook implementation, and that there are various factors that interfere with and influence teachers' use of the new curriculum materials.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Using data collected from a random sample of middle school mathematics teachers in Texas, this study explores the influence of selected personal characteristics on the teachers' self, task, and impact concerns related to the adoption of newly adopted mathematics textbook in their districts. The study also focuses on examining the contextual factors and their effects on teachers' implementation of new curriculum materials. This chapter provides a summary of the research, a discussion of each research question, overall conclusions drawn from the research, and recommendations for future research.

Summary of the Research

Investigating teachers' concerns regarding the use of newly adopted mathematics textbooks is an important addition to the increasing number of the studies on teachers' role in implementing curriculum materials. Tyson-Bernstein and Woodward (1991) noted that textbooks are a prominent, if not dominant, part of teaching and learning in the United States. The purpose of the present study is to explore the influences of some selected factors on teachers' concerns regarding the use of textbooks in their classrooms. Teaching experience and teachers' involvement with the use of the curriculum materials were selected as the personal characteristics that might affect teachers' textbook implementation. Recent studies have reported that novice teachers and experienced

teachers may use the mathematics textbooks differently (Kauffman et al., 2002; Remillard & Bryans, 2004). The current study also examined the facilitators of such educational change. The influence of the school's and districts' support of teachers' use of new curriculum materials was investigated. In addition, the study examined some of the needs identified by teachers that would support their implementation of the curriculum materials.

This study utilized the Concern Based Adoption Model (CBAM) as its theoretical framework. A non-experimental, cross-sectional survey design was used to address the research questions. The questionnaire was constructed in order to reflect the Stages of Concern Questionnaire (SoCQ) (Hall & Hord, 2001). This part of questionnaire identified the means of assessing the concerns in six stages: informational, personal, management, consequences, collaboration, and refocusing. Another set of questions developed by the researcher was employed to get additional information from the teachers regarding their use of the recently adopted textbooks. The survey was distributed electronically to all school districts through their websites posted on the Texas Education Agency (TEA) website. Quantitative analysis was used to identify the stages of concern for the teachers and the influence of contextual factors on teachers' use of the textbooks. In addition, a qualitative analysis explored and provided additional insights into the teachers needs related to the use of the newly adopted mathematics textbooks.

Overall, the study found that middle school mathematics teachers' highest concerns were the self-informational and self-personal concerns, which may indicate

some resistance in using the newly adopted textbook. Individual variables found to be predictive of teachers' concerns included yeast of teaching experience and support provided by the school or district. Teachers expressed the need for support from the textbooks' content and the school or districts, concrete evidence of textbook support of students' learning, textbook alignment with state standards, and reduction of the textbook's generality.

Recommendations resulting from this study include the need for textbooks' support to facilitate the use of the offered curriculum materials in classrooms, as well as the need to improve and enhance the quality of the mathematics textbooks through providing more evidence that the use of textbooks increase both students' achievement and teachers' learning. In addition, administrators also need to facilitate a climate conducive to using the new curriculum materials, especially for novice teachers. Administrators also need to request more support from the publishers in implementing the textbooks in the classrooms. Novice teachers should receive a higher level of preparation in how to use the textbook. Schools have expectations about teachers' use of the curriculum materials. The school culture should be knowledgeable and defined for the novice teachers.

Question One Analysis and Discussion

Question one asked, "What are teachers' concerns regarding the use of newly adopted mathematics textbooks?" Concerns are the thoughts, feelings, worries, and reactions that an individual develops as the result of his or her interaction with an

innovation (Hall & Hord, 2001). Earlier studies have shown that the conceptions of people involved with an innovation are critical of the success of the process (Lloyd, 2002). The concept of "concern" dates back to Fuller's classification of teachers' concerns into three consecutive stages: self, task, and impact concern (Fuller, 1969). Hall et al. (1979) have modified the Fuller's concept of concern.

Self: Informational Concerns

Self-concerns are intrinsic to each individual teacher. Informational concerns are the reflections of the desire to know more about the innovation (I think I would like to know more about this.). Teachers usually express willingness to know more about the requirements for a specific innovation, which in this case is the newly adopted textbook. The highest mean occurred at this stage of concern. Teachers were aware of the changes accompanying their use of new textbook. The length of using the educational innovation should determine the score of the concern. The novice user should have higher informational concerns, while the experienced user usually has higher task and impact concerns. The SoCQ profile noted a high peak in the self-informational concerns for teachers (see Figure 4, p. 85). The result might indicate that teachers are at the self-informational stage for their third year of implementing the curriculum materials.

Self: Personal Concerns

Teachers are focused on the impact an innovation will have on them personally (How does this affect ME?) (Hall & Hord, 1987, 2001). Teachers check their abilities in

implementing a textbook. In this study, the participated teachers reflected a quiet self - confidence in teaching all the textbook's topics. The means of the above two stages (Information and Personal stages) reflect the self-concerns of teachers about the new curriculum materials. The high means reflect the teachers being informed and have self-confidence in teaching with the new textbook.

Management: Task Concerns

The lowest mean occurs at the management-task concern level (How am I going to manage all of this every day?). This is an indication of teachers' worries about accomplishing the objectives and covering the materials of the textbook within set time limits. Teachers are concerned with daily instructional practices. Teachers do not consider the textbook as a primary resource for teaching because it is not equipped with sufficient materials to help them develop good lesson plans. When the high mean for the self stage is compared with the high mean for the task stage, the results suggest that teachers have contradictory experiences. Borko et al. (2000) remarked that there is a difference between what teachers what they say they know and how they act.

Impact: Collaboration Concerns

Several teachers expressed a desire to work more closely with other teachers when deciding how best to use newly adopted textbooks (I would enjoy working with my colleagues in this.). Many SoC studies (Ansah & Johnson, 2003; Atkins & Vasu, 2000; Dobbs, 2004; Gershner & Snider, 2001) found that professional development

could help alleviate teachers' personal concerns about implementing innovations. These studies confirmed such findings and emphasized the importance of professional development in supporting teachers' implementation for the textbooks. Administrative support is essential in allowing the "time" for the teachers to manage the use of the new curriculum materials. This is an important issue that aligns theoretically with Hall et al.'s (1979) description of the task management concern.

Impact: Consequence Concerns

According to Hall and Hord (2001), an "ideal" concerns-based profile is a user with high impact-consequence and impact-collaboration concerns. This indicates that an active, engaged user of the innovation thinks about the impact of the educational innovation on students' learning (How does this affect the students?) and works collaboratively with his peers. The low mean for the impact-collaboration concern stage could explain the low mean for the impact-consequence concern stage.

Impact: Refocusing Concerns

Results from this study indicated that higher positive attitudes toward teaching with the new mathematics textbook increased the impact refocusing concern score. Teachers who scored higher on the impact refocusing concern think about ways to improve implementation of the textbook, including the textbook meeting students' different learning styles and levels. The low mean for the impact concern reveals teachers' negative attitudes regarding teaching with the new mathematics textbook. They

do not think of the textbook as a well-substantiated instructional tool for their classrooms. The low means for the last three stages (Collaboration, Consequence and Refocusing stages) suggest that the teachers are less concerned about students' performance when using the mathematics textbook because they felt more confident about using other materials to supplement the shortcomings of the textbook.

In general, the self-concerns (informational and personal) were high. Task and impact concerns were less evident. Teachers were more focused on the self-stage with this innovation during the third year of textbook implementation. Previous research indicates that this should be expected in the early involvement with the innovation. "Concerns at this point have to do with feelings of potential inadequacy, self-doubts about the knowledge required, or uncertainty about the situation they are about to face." (Hall & Hord, 1987, p. 57)

The developmental nature of concerns in the implementation of the newly-adopted textbooks does not support the expected developmental pattern. Figure 4 shows the pattern of concerns of the middle school mathematics teachers regarding the use of the textbook. The length of involvement with the newly-adopted textbook (more than two years) suggests that teachers do not think of it as a well-substantiated instructional tool for their classrooms. This result might indicate that teachers' use for the textbook is still in the beginning stages. The length of involvement with the newly-adopted mathematics textbook in Texas suggests that teachers may not be progressing developmentally in their stages of concerns even though they are in the successive third year of using the most recently adopted textbook. The results of the study suggest that

the change experienced by the teachers, using new curriculum materials, is an event rather than an ongoing process. Teachers' concerns are still focused on the self-stage instead of on the later stages. The Concerns-based Adoption Model (CBAM) suggested that there should be a developmental change of concerns across the years of involvement with the innovation (see Figures 7 and 8).

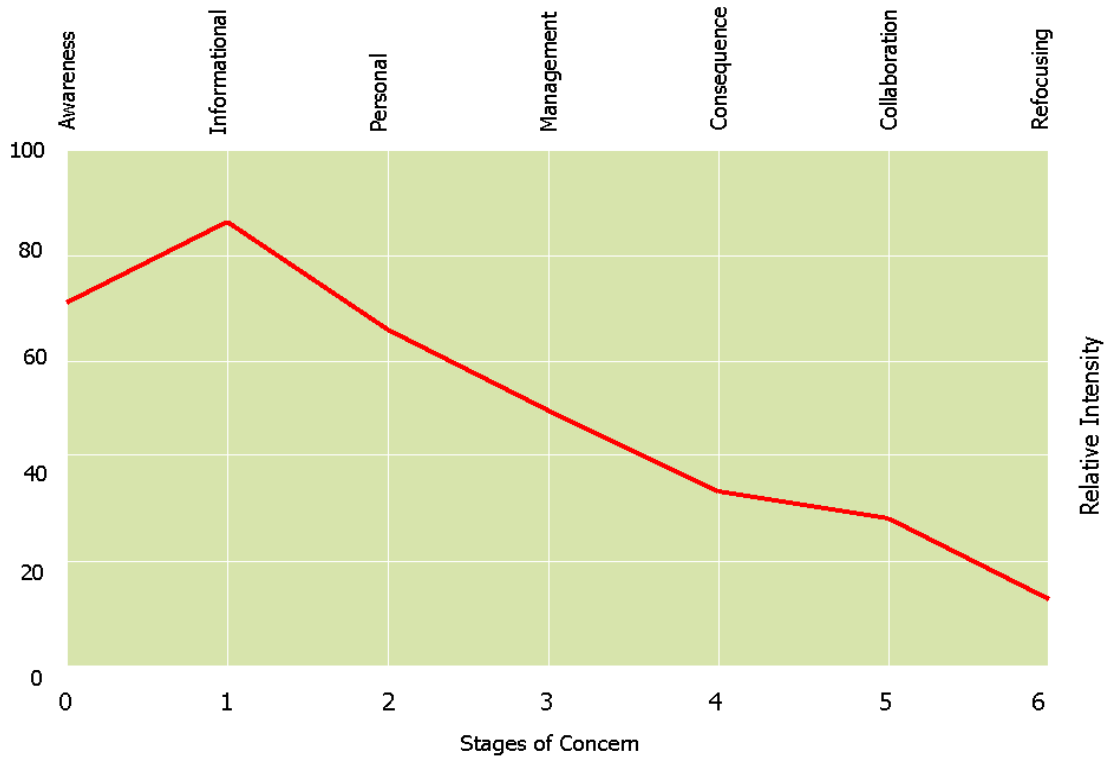

Figure 7. Developmental stages of concern in the beginning of implementation.

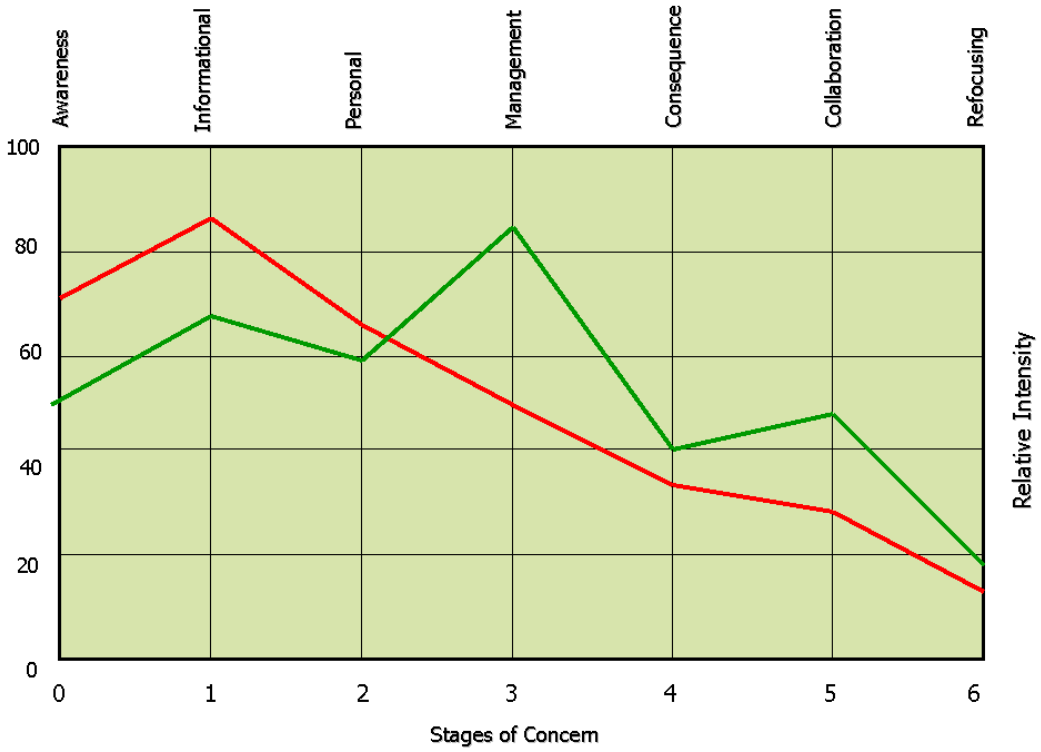

Figure 8. Developmental stages of concern.

McKinney, Sexton, and Meyerson (1999) pointed out that individuals move in a developmental pattern through the stages of implementation. They begin the process with more focus on the first stages and they gradually develop more concerns about the rest of stages as they develop more interactions with these stages (see Figure 8). Higher relative means across the six stages of concerns are expected when the teachers have been using the textbook for a longer period.

The results of this study indicate that teachers are not progressing developmentally through the stages of concern as they gain more years of using the textbook. There were no significant differences in teachers' concerns even with the

increased years of implementing the textbook. It appears that the teachers' concerns may not progress from self to task and then to the impact stage. According to the CBAM theory, more involvement in using the textbook should decrease the self-concerns, and conversely increase the task concerns, which is the most intense stage for teachers. These results direct us to determine the task orientation for the teachers and the influence of the impact collaboration stage. Teachers might not be receiving the right kind of support needed to use such innovation in their classrooms. Teachers should have several opportunities to learn the use of new curriculum materials, including mathematics methods courses in teacher education programs, textbook training sessions, or in-school professional development.

Question Two Analysis and Discussion

Question Two asked, "How do more experienced teachers with longer periods of textbook use vary in their concerns about the use of mathematics textbooks compared with those with limited experience and use of the textbooks?" In an attempt to facilitate the implementation process for the new textbook, this study focused on examining the concerns of teachers with different years of teaching experience and years of involvement with the textbooks. The success of similar implementations has been investigated in many previous studies through studying the concerns of those involved in the innovation (Lloyd, 2002; Christou et al., 2004). The comparison between the concerns of teachers with different learning experiences can help facilitate teachers' implementation of the textbooks. Recognizing the various challenges teachers face as a

result of enacting the curriculum materials will contribute in improving the process for teachers.

Recent studies found that different teachers enact the same curriculum materials in different ways (Cohen & Ball, 2001; Lloyd, 1999; Manouchehrei & Goodman, 2000; McClain, Zhao, &Bowen, 2004). The teacher is highlighted as the most important contextual factor that contributed to the curriculum enactment. Hargreaves (2005) argued that years of teaching experience and the teachers' stages of their careers has an influence on their way of responding to an innovation. The novice and experienced teachers develop different stages of concern as they interact with an innovation. Thus, the implementation of the new curriculum materials is affected by teachers' years of experience in teaching and their involvement time with a classroom innovation.

Literature reviews in researches involve the teachers' personal factors, including beliefs, knowledge, experience, understanding students' thinking process, influence teaching pedagogical decisions. The interaction between the teachers' characteristics and their use of the curriculum materials was the focus of at least two studies (Lloyd, 1999, Manouchehrei & Goodman, 2000). How much experience teachers have is significant in determining the nature of their relation with the curriculum materials. As teachers enact the curriculum materials, they know how and what knowledge is presented in the textbooks. They explore the curriculum potential of the textbook by selecting, adapting, and developing materials to suit their needs in their specific classrooms (Ben-Peretz, 1990). Novice and experienced teachers interact differently because of which career phase they are in at the time of the innovation. Experience is part of the professional

identity for teachers and it influences how the materials are used in their teaching (Lloyd, 2008).

Years of using the innovation has an effect on teachers' progress within the change as does the years of teaching experience. The CBAM suggested that there should be a developmental change of concerns across the years of involvement with the innovation. Individuals gradually develop more concerns about the rest of stages as they interact with these stages. Based on the CBAM, teachers should progress in their concerns as they spend more time using the innovation (Hall & Hord, 2001). Teachers develop curriculum vision and trust as they get more "experience and expertise with a particular set of curriculum materials" (Drake & Sherin, 2006, p. 325).

The analysis of the data from this study indicates that there was no significant difference in teachers' concerns based on their years of teaching and years of involvement using the same textbook. However, the analysis did indicate that self-informational and impact-collaboration concerns were significantly different within the years of teaching experience. The novice teachers reflected lower self-confidence the more experienced teachers did when using curriculum materials and covering all the topics suggested in the new textbook. The difference in teachers' self-confidence levels concerning the use of the textbooks may have contributed to their ways of using the textbooks.

Schnepp (2009, p.197) confirmed that "one of the most significant factors in teachers' use of curriculum materials is how they position themselves in relation to those materials." Novice teachers' low self-confidence in having the required knowledge to

cover the topics in the textbook will affect their teaching practices while using it. While novice teachers are expected to have more challenges as they are just starting their professional careers, it creates additional problems when they must also respond to completely new situations that emerge from using the newly adopted textbook. According to Kauffman et al. (2002), mathematics curriculum materials are a major issue in novice teachers' work; they describe beginning teachers as "lost at sea" during their initial use of the mathematics curriculum materials. Recognizing the needs of novice teachers can help guide administrators in providing support for the pre-service teachers.

The results of this study suggested that teachers' concerns regarding the use of new textbooks are not directly related to their years of using the textbook. The expected result, that more years of implementing the textbook would result in higher relative means in the six stages of concerns, was not proved in this study. This study indicated that teachers are not progressing developmentally through their stages of concerns as they acquire more years of using the textbook. The results suggest that the change experienced by the teachers is an event, not a developmental process. Teachers' concerns may not progress from the self to the task and then to the impact stage. The task concern is the most intense stage for the teachers, even with different years of involvement with the textbook. These results direct us to determine the task orientation for the teachers.

Teachers, particularly novice teachers, need support when using new curriculum materials. This is especially true because of the new teaching accountability demands.

Fullan (1999) indicated the importance of support for teachers and especially novice teachers as they enact new curriculum materials. Some teachers who use the standards-based curriculum reduce the cognitive demands of the materials and depend on their own knowledge base of mathematics and knowledge of students' thinking processes (Henningsen & Stein, 1997).

Hall et al. (1979) argued that educational change is a process that involves the development of teachers' feelings and skills. They proposed a model for the stages of concern (SoC) that recognizes teachers moving through these stages as they adopt new educational reforms: awareness, informational, personal, management, consequences, collaboration, and refocusing. The mean responses of the teachers for each SoC are shown in Table 8. The results of the multivariate analysis revealed some significant differences in the self-informational and impact-collaboration stages of concern for novice teachers (< 5 years), for teachers with some experience (5 to 10 years of teaching), and for teachers with the most experience (> 10 years of teaching).

With regard to the self-informational concern, novice teachers scored lower than the other two groups of teachers. This indicates that novice teachers do not have the required knowledge to understand the textbook's content nor do they have the confidence to teach all the topics covered in the textbook. Novice teachers are less aware of the all the changes as the result of introducing new curriculum materials than more experienced teachers. Novice teachers have a problem in implementing the new curriculum materials and are more frustrated with the new demands of using new materials than other groups of teachers are. The coverage of new mathematical topics

involves teaching challenges with high cognitive tasks. Novice teachers believe that their existing knowledge is not enough to support them in these new teaching situations. As long as teachers worry about, and feel threatened by, the demands of new visions of mathematics teaching, all innovations will continue to be at risk (Van den Berg, Sleegers, Geijsel, & Vandenberghe, 2000).

As expected, experienced teachers expressed higher confidence in having the abilities and the required level of knowledge needed to use the newly adopted textbook. Novice teachers do not reflect sufficient knowledge of the textbook's content or self-confidence in teaching all the topics in the newly-adopted textbook. Therefore, the novice teachers do not possess the required knowledge to achieve a successful implantation of the textbook. They are less aware of the expected changes accompanying the introduction of the new resource as an instructional material in their classrooms.

Regarding the self-personal stage of concern, the difference in the means for the self-personal stage was not significant. However, the experienced teachers scored higher than the novice teachers did. This indicates that the experienced teachers are a little more focused on the impact of the change on them. A shift from information and personal concerns to management concerns, then to consequences, collaboration, and refocusing concerns was expected in this study based on teachers' years of experience and years of involvement with this particular innovation. The novice teachers were expected to score higher in the early stages than the experienced teachers. Novice teachers were supposed to be more concerned in the self-informational and self-personal aspects of the innovation than experienced teachers were. However, the results of this study indicated

that teachers with more than five years' experience scored higher in the early stages than novice teachers who had less than five years' experience.

An analysis of the two variables' (years of teaching experience and years of involvement) influence on teachers' concerns found that the only significant differences were in the teachers' self-information and impact-collaboration stages of concerns across years of teaching experience. Concerning the self-information stage, the results indicated that teachers with more than five years' experience scored higher than novice teachers who had less than five years' experience. Concerning the collaborative stage, experienced teachers revealed that they felt more supported in their use of the textbook than the novice teachers felt. Their comments indicated that they felt well informed about the philosophy of adopting new textbooks in their districts, that there was frequent communication with the department head concerning their use of the mathematics textbook, and that there was cooperation between the teachers in their use of the textbook. Because experienced teachers have higher collaboration concerns, the researcher found that it interesting to consider the aspects of school context in influencing teachers' work with curriculum materials and textbooks. Kauffman et al. (2002) discussed some ways that expectations about teachers' use of mathematics textbooks can be related to school and district level implementation of accountability polices. Two beginning teachers in his study remarked that their principles and curriculum coordinators expect them to use regular adaptation for the textbook materials.

School type and culture determine the distribution of the most experienced teachers. Using data from 1996 National Assessment of Educational Progress (NAEP),

Weglinsky (2002) reported that the different experiences and backgrounds of middle school mathematics teachers vary according to the school's overall student achievement. Ingersoll (2003) reported that the distribution of experienced teachers showed novice teachers were much more likely to quit than their more experienced counterparts.

It has also been reported that attrition is about 50% higher in poor schools than it is in wealthy ones (NCTAF, 2003). Wealthy schools tend to have more experienced teachers than the poorer ones do. In his 2008-2009 study on the differences in teacher quality, Garza reported that "schools with greater percentages of economically disadvantaged students have more novice teachers, more teachers who are assigned out-of-field and higher rates of teacher turnover than the more affluent schools in most districts." His data came from 5,700 schools covered during the 2008-2009 school year. Wealthy schools usually have the budget within the school structure to support educating their teachers through forming a team of teachers who share knowledge and collaborate in facilitating the textbook implementation. These schools have also the budget to pay more experienced teachers than other schools.

The difference in the management stage, which corresponds to the task-stage of concern, was not statistically significant, indicating that teachers with different ranges of experience have more or less the same task concerns regarding the textbook implementation. The consequence and the refocusing stages were not found to be different significantly within the years of experience too.

Question Three Analysis and Discussion

Question three asked, "How does the school's or district's support affect teacher satisfaction with the use of the new textbook?" The study analysis proved teachers' concerns regarding the adoption of new mathematics textbook can be influenced by the support they receive from their school or district. Teachers' interactions with the curriculum materials depend on the school or district context in which they work. This study showed that teachers are more satisfied with the textbook content and organization when they get more support in their use of the textbook. The perceived support in this study was considered in four themes that emerged from a synthesis of previous studies (Stein & Kim, 2009; McClain et al., 2009; Christou et al., 2004). These themes are: (a) teachers are informed about the district philosophy for adopting the new textbook, (b) teachers cooperate within the grade level in using the textbook, (c) teachers are involved in training sessions for the use of the textbook, and (d) teachers' communicate frequently with the department head/chair concerning the use of the textbook. Facilitating and supporting the role of the teachers in producing meaningful learning experiences for the students is critical. Ben-Peretz (1990) indicated that teachers could recognize the curriculum potential through their pedagogical content knowledge. There is a need for teachers to have a comprehensive, long-term view of the curriculum (Zumwalt, 1989).

Many studies (Clandinin & Connelly, 1992; Corcoran, 2003; Behm & Lloyd, 2009; Kaufman, 2000) have highlighted how the school context contributed to enacting the curriculum materials and impacting teachers' use of the textbooks. McDuffie and

Mather (2009) provided an example of two seventh-grade teachers and a researcher/teacher educator who engaged in collaborative support of their professional development team. The teachers got the chance to plan, teach, and reflect on their lessons. The teachers also learned about the mathematics subject material and curriculum resources.

The use of new curriculum materials requires learning on the part of the teachers. Many studies have shown that learning about new curriculum materials involves teachers in many different practices needed to understand the teaching process (Freeman & Porter 1989; Manouchehri & Goodman, 1998; Remillard & Bryans, 2004; Remillard; 2005). Qualified teachers have a positive effect on their interaction with the curriculum materials. Recent studies examined the importance of mathematical knowledge in teaching (Hill, Rowan, & Ball, 2005). Planning, implementing, and reflecting on the use of new curriculum materials helps teachers develop curricular reasoning by applying their curricular knowledge, content knowledge, and pedagogical content knowledge (McDuffie & Mather, 2009). Introducing new curriculum materials contributes to teachers' changing the way they engage the materials. Teachers need skills, knowledge, and understanding to interact positively with the curriculum materials. The support offered by the school or district is one of the social factors that influence the ways that teachers engage with and use curriculum materials in teaching.

Teachers construct their knowledge and beliefs of mathematics teaching through interacting with others. Social constructivism emphasizes that knowledge is constructed in collaboration with others as "a communal activity, a sharing of the culture" (Bruner,

1986, p. 127). Accessing the resources through cooperating with others has a major effect on teachers' ability to implement the curriculum materials.

The analysis of the data from this study describes the evident role of the school or the district in supporting teachers' use for the curriculum materials. The teachers recognized the reasons behind the use of new curriculum materials and they had opportunities to communicate with department head or chair concerning the use of the textbook. Teachers' perceptions of support and commitment from those in authority structures and peers are of major importance in determining the extent of implementation (Bresler & Walker, 1990). School or district administrators can support teachers in developing new skills and knowledge so that they can interact positively with the new curriculum materials. The success of the implementation can be influenced by administrators' arrangement of professional development opportunities focused on curriculum use. In this study, training sessions on the use of the textbooks was part of the support provided by the schools or districts for the interviewed teachers in order to cover their needs of teaching with the new curriculum materials.

In the United States, many studies (especially those on standards-based curriculum) have proven that the implementation of the new instructional materials is more effective when coupled with professional development. McDuffie and Mather (2009) studied teachers' practices as they implemented the Connected Mathematics Project (CMP) and formed a professional development team with a university mathematics educator. Their findings suggested that the team's work with the curriculum materials improved teachers' curricular knowledge development.

Question Four Analysis and Discussion

Question four asked, "What are teachers looking for in the new mathematics textbooks?" The results of this study revealed that teachers expressed concerns about the curriculum accommodating students' different learning styles, having appropriate grade-level's materials, and being aligned with state required standards. Stodolsky and Grossman (2000) point out that "effective" adaptation of curricula must focus primarily on maximizing students' learning of content.

These results might indicate that the pressure of accountability has made the teachers' attention geared towards meeting her or his students' specific needs, especially given the demands on teachers' time and energy. The results might also indicate that teachers' interaction with the curriculum materials is more "offloading" than "adapting." Due to time constraints, teachers look for curriculum materials to use as is, without having to adapt the materials. Teachers' specific needs for this type of curriculum materials questioned their level of knowledge required to implement the mathematics textbooks. Teachers might lack the confidence to adapt the curriculum effectively. Brown (2009) proposes that teachers' interaction with the curriculum materials can be explained in three different degrees of instructional appropriation of the materials: (a) offloading, or using materials as is; (b) adapting, or modifying materials to fit students' specific needs; and (c) improvising, or using materials are more as a secondary resource.

Stein, Grover, and Henningsen (1996) remarked that the use of the standards-based materials is a source of change for the teachers to implement in their classroom. The types of pedagogical change called for by the National Council of Teachers of

Mathematics in 1989 require learning on the part of the teachers. This type of change in the curriculum materials has and still receives a lot of attention (Collopy, 2003; Remillard, 2000) in studies concerning the teacher's role in implementing the curriculum materials.

There is no ideal curriculum that fits all students in all classrooms. When teachers adapt curriculum materials, they should have the capacity to perceive and analyze the curriculum materials and create new instructional strategies in a way that meets their students' needs. The National Research Council (2004) called for the consideration of quality teachers' implementation of curriculum materials during its review of the success of existing curriculum programs. Davis, Darling-Hammond, LaPointe, & Meyerson, 2005) indicated that well-prepared teachers have developed a sense of "where they are going" and how they and their students are going to get there. They are able to create a coherent curriculum that is also responsive to the needs of students (2005, p.177). Building on that analysis, the textbook's contents and its role in facilitating teachers' work should be questioned. Teachers might be looking for more information that allows them to adapt the instructional approaches of their textbooks to their own students (Gravemeijer & van Eerde, 2009). Textbooks' content may not be helping teaching in effectively implementing the new material and in meeting their students' needs. Teachers may not be supported in their schools to use the adopted textbook.

Question Five Analysis and Discussion

Question five asked, "How do teachers use the newly adopted textbook?" Based on the qualitative analysis, the textbook was the primary resource used to teach mathematics in the first year of teaching for the novice teacher. The other two teachers did not use the textbook, drawing instead on school-developed curriculum. The interviewed teachers provided information that led the researcher to determine that there were three main contextual factors that impeded teachers' use of the curriculum materials in the schools: (a) the existence of a school-developed curriculum, (b) the teachers' own experience and knowledge, and (c) the content of the newly-adopted curriculum materials.

The results of this study indicated that teachers interactions with and responses to the textbook vary based on their teaching experiences and school culture. The change process associated with the textbook's use is more complex. Remillard (1999) showed that teachers interact differently with textbooks materials. She stated that teaching is a multi-dimensional activity. In each dimension, teachers are likely to use the textbook differently as a function of different decisions and support.

In the first year of teaching, the novice teacher's desperate need for curriculum materials makes the textbook more important for her than the other two teachers who used their own school-developed curriculum. Mathematics is more challenging to teach than any other subject. Teachers need the instructional materials to know what to teach for a certain grade level because it is completely based on what students already know, as well as how to teach the material in order to meet students' level of thinking. Novice

teachers, who lack curricular repertoires of their own, may appreciate and depend upon the explicit guidance of the textbooks more than other teachers (Lloyd, 2009).

In the second year of teaching, the novice teacher quit using the textbook although she was not able to find any curriculum materials to address the needs of her new group of students. The tendency of a teacher to ignore the textbook in the second year of teaching is explained as a function of the teacher's understanding of the textbook content. The teacher has read and interpreted the curriculum, but failed to adapt it. Failing to interact positively with the published curriculum materials can be attributed to the teachers' lack of the necessary knowledge and lack of experience.

Using the new curriculum materials requires change and learning on the part of the teachers. Brown (2009) introduced the term *"pedagogical design capacity"* to describe teachers' ability to perceive and mobilize the pedagogical ideas embedded in the curriculum resources in the process of crafting instruction. Teachers' beliefs and their knowledge system influence implementation and can be affected by experiences with the innovation (Cohen & Ball, 1990; Fullan, 1982). In this case, the novice teacher's interaction with the textbook was neutral. Remillard (1999) wrote that novice teachers are not well supported in their use of the adopted textbook; the potential influence of the curriculum materials has a greater effect on them than it does on more experienced teachers. However, all the teachers who took part in this study expressed the need for support in learning the new material of the textbook. They expressed the need for the type of support that enables them to analyze the lessons from their students' perspectives. When provided with the proper support and guidance, teachers are given

incentives to use the curriculum materials. Teachers expressed their needs for training programs in the use of the textbook in the classroom, especially when the textbook is the preferred choice of instructional materials.

Analysis of the teachers' comments indicated the curriculum materials failed to support the teachers' use of the materials. The teachers described many deficiencies in the textbook's content. Textbook support is found in its matching of grade level expectations and in its alignment with the state standards. Seventh grade teachers indicated that the textbook does not contain the right grade-level materials or the required grade-level skills. In addition, modeling the tested curriculum is not included in the textbook. Texas mathematics teachers are pressured to demonstrate student competency of specific state standards and achievement by way of student performance on standardized tests. Finding the appropriate materials for this is even harder for novice teachers with limited experience in students' thinking. Ball and Feiman-Nemser (1988) suggested that specific instruction is needed in the implementation of the textbook tailored to students' specific needs, particularly for inexperienced teachers. Meeting students' various levels and needs are constantly on teachers' minds, especially with the current era of accountability and increased school pressure to raise students' achievement levels. The innovative instructional approaches found in the textbook should be adaptable to teachers' specific needs for their students. Teachers might be looking for more information that allows them to adapt the instructional approaches of their textbooks to their own students. Teachers need such support before stepping into their classrooms. Regardless of textbook adoption, novice teachers need help in

understanding that decisions about what to teach to which students has important consequences (Goodlad, 1984; Scheffler, 1958). The newly-adopted textbook was hard to interpret and did not support the teachers with adequate resources for teaching strategies to use in their particular classrooms. Teacher's success in implementing curriculum materials depends not only on their capabilities but also on the structure of the mathematical tasks in such materials and the degree of its support of teaching. Ball and Cohen (1996) suggested that curriculum materials could be designed in two ways in order to facilitate teachers' implementation. First, curriculum developers should make visible rationales in including particular mathematical tasks and their relationship to students' understanding. Second, curriculum developers should include material that helps teachers learn how to anticipate what learners may think about or do in response to instructed activities.

The design features of the curriculum materials do affect teachers' use of and decisions to use the adopted textbooks. Teachers who participated in this study remarked that they face difficulty in understanding all the core concepts presented in the textbook. The results from the study substantiate the assertion that teachers need concrete images that depict what it is like to teach in ways recommended by the textbook. The characteristics of the new curriculum materials were not easily managed by the teachers nor did it accommodate their level of understanding or existing teaching practices. Teachers' reasons for integrating pieces of a new curriculum include their desire to maintain the use of activities from the previous years (Drake, 2006). Support for

instruction of the teacher is more effective when related to existing classroom context (Borko & Putnam, 1996).

The content of the textbook as described by the teachers was not supportive in showing teachers ways to integrate the lessons in the textbook. Some researchers have suggested that curriculum materials themselves must have information specially designed to help teachers learn as they use the materials (Davis & Krajcik, 2005). The curriculum material in mathematics is integral and spiral in structure; the knowledge and skills to be learned by the students must be taught in a specific sequence. The nature of the integral curriculum materials places significant emphasis on the teachers' learning and increases the challenges of using the curriculum materials. In describing the *curriculum vision* as being the teachers' comprehensive, long-term view of the curriculum, Zumwalt (1989) added that teachers need to understand curriculum's purpose and how it is positioned within the department and school.

The teaching of new concepts or skills depends on what previous concepts or skills were developed and mastered over a sequence of lessons or units. The difficulties of such an integral program suggest that engaging the teachers with more rationales in such mathematical tasks is crucial. Davis and Krajcik (2005) indicated that "design rationales" can help teachers see connections among suggested activities in the curriculum materials. The curriculum materials should be more helpful in directing teachers with the requirements of the scope and sequence and how to progress through designated curriculum topics at regimented pace.

The teachers revealed that the mathematics textbook is inflated and filled with extra information that does not help them in their workloads. Chávez (2003) had suggested that the "authors and publishers tend to add topics to U.S mathematics textbooks to meet various local and state curriculum requirements, but they rarely delete information." The large size of the textbook is a problem for the teachers, but not for the publishers who are trying to find more consumers for their textbook. Teachers are tight on time and any extra efforts they must put forth in teaching can cut into the time they can allot for teaching. Teachers appear to reject any addition task that is not part of their planned assignment. The textbook is written on a more generic, national level and that makes teachers go through more effort in reading, interpreting, and choosing the right mathematical tasks for their specific students. Teachers are interested in information that is less general and more directed to their required state curriculum. Based on this information, a major change in the textbook's contents might need to be developed.

Appropriate support of curriculum materials could produce clearer images of the complex relationship between teachers and textbooks. Teachers' reactions to externally imposed expectations and changes of internal conditions are often seen as ambiguous (Lloyd, 1999).

Conclusions

This study used the psychological approach of change, which assumes that an innovation is simply assimilated into the basic operating principles of the implementers who are then supposed to go through developmental progress during the change, in order

to investigate some of the concerns that middle school mathematics teachers have regarding the implementation of newly-adopted textbooks. Textbooks are considered to be major resource for change for teachers. However, the results of this study did not reflect progress in the textbook's implementation within the years of involvement.

Successful implementation is a process, not an event (Friel & Gann, 1993; Fullan, 1982; Hall & Hord, 1987). Both the high levels of concerns for the first stages and the length of time of using the innovation determine the nature of textbook use in the classrooms. We could assume teachers' overall concerns are intensified regarding the use of the innovation. The recently adopted middle school mathematics textbooks used in Texas are still in the early stages of the process of being implemented. Publishers should address this result, navigating or delaying in the use of curriculum materials in the classrooms for over two years of adoption is an indication of a failure textbooks' use. There were significant differences in teachers' concerns associated with years of teaching experience. Experienced teachers are more advanced than novice teachers in their stages of concern regarding the use the new mathematics' textbook.

Based on the CBAM theory, schools and districts can offer a more conducive climate for the change process. The school or district can provide support in using the textbooks, which will help teachers become more satisfied with the textbook's content and organization. The increased impact-collaboration concern indicated higher teacher satisfaction in textbook content and organization. Support from the school or district is regarded as an intervention that can facilitate the change process (Hall & Hord, 2001).

This study examined what the teachers need from the textbooks in an attempt to look for support in facilitating the process of implementation. Throughout this study, the teachers were concerned with accommodating the different learning styles of their students, the use of appropriate grade level materials, and textbook alignment with the required state standards. The textbook's alignment with the state curriculum could play a big factor in reducing the job stress for teachers. During one of the interviews, the novice teacher reported that she was struggling with adapting the material to the needs of her specific group of students. It is possible that her engagement with the curriculum material could have been influenced by the textbook's design.

Teachers evaluated the textbook's content and commented on their need for information within the curriculum materials to help them adapt the material to their specific students' needs. Teachers described some deficiencies in the textbook's content. This finding illustrates a need for educative learning material to help teachers successfully implement the textbook. Understanding the suggested teaching methods in the textbook is essential in using the curriculum materials. Teachers' curricular reasoning in anticipating their students' way of thinking is critical to making teachers use the textbooks. Teachers expressed a need for support from both the publisher and their schools in learning the content of the textbook.

Teacher change is a long and complex process that requires time and effort (Barnett & Friedman 1997; Borko et al., 2000). For that reason, the effectiveness of the textbook implementation and teacher change could be studied through other approaches. Marzano, Zaffrom, Zraik, Robbins, and Yoon (1995) suggested that some educational

innovations simply do not address the dynamic of change which is "fundamentally ontological in nature." They said that this kind of change addresses the existing framework of perceptions and beliefs for the teachers as part of the change process. The teachers are not "sponges" in the innovation process. Teachers have other resources, their perceptions, and other considerations. The "failure of many innovations is not due to inherent weaknesses in the innovations themselves but in the basic nature of the change process" (Marzano et al., 1995, p. 172).

Other studies have tried to explain the reasons behind teachers' resistance to change (Guskey, 2002), and future studies might investigate the reasons that make teachers unwilling to go through changes when using new instructional materials in their classrooms. The Research Advisory Committee of the National Council of Teachers of Mathematics argued that comparative research does not offer teachers the basis for adapting the curriculum (NCTM, 2000). Teachers might regard the new mathematics textbook's material simply as theories and conjectures. Teachers do not have enough time to test these conjectures or investigate students' learning as a result of teaching unproven conjectures. Practice and theory may be potential areas for research related to investigating the change process for the teachers.

In general, this study will help in understanding teachers' interaction with the textbooks, teachers' different capabilities in implementing the approaches suggested by the textbooks, and discovering what teachers are looking for in the mathematics textbook. This study of teachers' concerns can facilitate the planning of pre-service programs aimed at preparing novice teachers to use the textbook. The responsibility of

educational leaders and policy makers is to help teachers get the best out of the textbook. The newly-adopted textbooks are already in use, but without substantial professional preparation for all the teachers. Hall and Hord (2001) indicated to the critical role of policy makers in recognizing the importance of teacher preparation through considering educational change a process rather than an "event". Effective mathematics textbooks help facilitate the teachers' work, especially considering the constraints on teachers' time and day-to-day difficulties in meeting their students' various needs. Meeting the teachers concerns is crucial in writing and publishing usable, high quality mathematics textbooks.

Appropriate support from the school and the textbook itself could prove highly useful for novice teachers. Teachers are in need of educative curriculum materials that support their own familiarization with the material in addition to providing opportunities for meaningful student learning (Ball & Cohen, 1996). The selection criteria for the textbook should be based on the textbook's support for teachers' learning. Administrators have to define the nature of the curriculum materials in their districts.

Several studies (Lloyd, 1999, 2002; Remillard, 2005) have been concerned with the quality and progress of mathematics textbooks over the years. The Standards of the National Council of Teachers of Mathematics (NCTM, 2000) guide and direct the development of curriculum materials. Reform in mathematics education, which uniformly calls for an increased emphasis on meaningful experiences in mathematics and a decreased emphasis on the repeated practice of computational algorithms, accompany a change in developing mathematics textbooks.

Mathematics educators constantly design new curriculum materials accompanied by research on their implementation (Riordan & Noyce, 2001; Senk & Thompson, 2003; NRC, 2004). The National Science Foundation (NSF) routinely provides funds to mathematics educators to develop curriculum materials supporting the released standards. Textbooks companies strive to meet the mandated objectives and standards of the reform movements, and publishers attempt to meet the criteria, including the scope and sequence requirements of curriculum frameworks. Ultimately, the teacher plays the crucial role in deciding and determining the qualities of the textbooks. Teachers bring their own beliefs and experience to their encounters with curriculum to create their own meanings, and teachers interpret the intentions of the authors by using curriculum materials. Teachers are the mediators between the students' needs and the publishing market, and their concerns about the textbooks should be critical in developing new textbooks.

Improving K-12 mathematics education is focused on teachers' experiences with the curriculum materials, especially with textbooks. The standards document published by the NCTM in 1991 delineates the huge responsibility of mathematics teachers in creating a classroom environment to support teaching and learning mathematics. A high-quality mathematics experience depends on whether the teachers are able to select worthwhile mathematical tasks, create a challenging and nurturing classroom environment, and facilitate meaningful discourses that can lead to socially negotiated understanding (Martin, 2007; NCTM, 2000). Accomplishing the pedagogical goals of the curriculum materials is mainly on the teachers' shoulders. Textbooks have long held

prominent roles in guiding teaching practices American classrooms (Tyson-Bernstein & Woodward, 1991).Textbooks are physical resources that can be easily manipulated in order to enhance the teaching/learning environment.

Törnroos (2005) used the term "potentially implemented curriculum" to describe the role of the textbook and other curriculum materials in the mathematics classroom. This role is an intermediate stage between the intended curriculum and the implemented curriculum. The intended curriculum is what is in the textbooks. The implemented curriculum is what teachers actually teach in the classroom as they interact with the available curriculum. Curriculum is not enacted by itself. Teachers determine how the innovations envisioned by reformers and curriculum designers become implemented in mathematics classrooms (Cooney, 1988; Freudenthal, 1983). In addition, curriculum is not always implemented in the time frame envisioned by planners and policy makers (Friel & Gann, 1993; Hall & Hord, 2001). Curriculum materials can provide information and scaffolding to help teachers learn about students' thinking, the design of activities, and mathematical content (Ball & Cohen, 1996; Davis & Krajcik, 2005; Remillard, 1999, 2000). When describing the effective roles of teachers in using the textbooks, it is important to study their concerns in using new textbooks based on their years of experience in teaching the same class and their years of involvement with the same textbook.

The curriculum development researchers will have the opportunity to investigate important themes when the textbook is "in practice" or implemented by the teachers. Teachers and textbooks are in a dynamic interrelationship. The process of putting the

curriculum into practice could create an atmosphere of interaction between the teacher and the curriculum materials.

Recommendations

The content of curriculum materials should be investigated in future studies in an attempt to explore the kinds of support offered to teachers. Teachers should receive appropriate guidance in using new curriculum materials. The mathematical tasks in textbooks have increased, and teachers' confidence in their pedagogy has decreased. Teachers are burying themselves in teaching materials (e.g., they are rushing themselves in superficiality of the textbook materials) because of their lack of competence and understanding for the concepts. The effect of new materials on teachers' use for them is critical to understanding the relation between the teacher and the curriculum materials.

Furthermore, the state committee members should receive training in textbook selection criteria, the state's grade level expectations and assessments, voting procedures, and methods of dealing with publishers. The choice of the materials by this committee should involve all the committee members' voices to ensure the fairness of the selection process. The tasks and the strategies should be designed to support the teaching as wells as the learning process. The use of the curriculum materials should be monitored through the district and the schools.

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APPENDIX A

QUESTIONNAIRE USED IN THE STUDY

Part I: Demographics

General information about yourself. Please check your answer with √ in ○, or fill in the blank ( )

Gender	Male ○ Female ○
Year of Teaching	< 5 years ○ 5-10 years ○ >10 years ○
Year of using the adopted textbook	1 yr ○ 2 yrs ○ 3 yrs ○ 4yrs○ 5yrs ○ 6 yrs ○ 7 yrs○
Grade level you are teaching.	Sixth Grade ○ Seventh Grade○ Eight Grade○
Name of the publisher of your current mathematics textbook	Holt, Rinehart and Winston○ Others ○
Do you have a team-planning period?	YES ○ NO ○

Part II: Questionnaire (Stages of Concern- Textbook Adoption)

0	1	2	3	4	5	6	7

← Not True for me now Somewhat True for me now Very True for me now →

Subscales/Items	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. I have no problem reading the newly adopted mathematics textbook.								
2. The newly mathematics textbook provides adequate materials for student learning.								
3. The mathematics textbook used in my class offers the proper ratio of information/knowledge content (Bottom of Bloom's Taxonomy) and higher order conceptual thinking (Top of Bloom's Taxonomy).								
4. The mathematics textbook is written at the appropriate grade level for students in my class.								
5. Due to the inadequate coverage of the textbook package, I frequently substitute materials from other resources.								
6. Due to the absence of material in the textbook package, I frequently must create or add material for my class.								
7. The mathematics textbooks used in my class provide plenty of real life examples.								
8. The mathematics textbooks used in my class provide activities that are of higher order thinking.								
9. The mathematics textbooks used in my class focus on students is the center of the learning/teaching process.								

Subscales/Items	0	1	2	3	4	5	6	7
10. I know the content in the new textbook for the classes that I am teaching.								
11. I am aware of the changes in the new textbook in the mathematics curriculum.								
12. I was well informed about the district philosophy for adopting the new textbook.								
13. The training sessions for the use of the textbook covered the needs of teachers regarding teaching with the new textbook.								
14. I have been supported in my use of the textbook by the district.								
15. The mathematics textbook I am using for my class provides appropriate coverage of the recommended standards.								
16. The mathematics textbook used is congruent with the state curriculum framework.								
17. The mathematics textbook requires the use of methods that I am not sufficiently familiar with.								
18. I feel insecure about teaching some topics in this textbook.								
19. I do not have any difficulties in teaching with the new textbook.								
20. I have no difficulty with the knowledge required by the new mathematics textbook.								
21. I make use of all of the activities in the textbook.								
22. The textbook support my role in the classroom as a facilitator of learning.								
23. The textbook reduces the stress of developing lessons so I can focus on teaching.								
24. The textbook is equipped with reasonable independent practices material.								
25. The material included in the book can be covered in the available time.								
26. The textbook resources allow me to accommodate lessons based on the progress of each student.								
27. The textbook and textbook resources support different learning styles.								
28. There is support on the campus for use of the textbook.								
29. There is frequent communication with the department head/ department chair concerning use of the textbook.								
30. There is cooperation between the mathematics teachers within the grade level in using the textbook.								
31. The textbook plays an important role in improving the teaching /learning process.								
32. I am pleased with the textbook content and organization.								
33. I agree that textbooks are good for reducing the responsibilities of teachers like the preparation of guided and independent practices.								
34. The quality textbooks are a major tool in mathematics teaching.								
35. The textbook meets the needs of students with different styles of learning.								
36. The textbook is useless in my classroom.								

APPENDIX B

INTERVIEW PROTOCOL USED IN THE STUDY

Questions:

Note: Questions 1-5 are introduction question that will warm-up the conversation.

1. How many years have you been teaching?
2. How many years have you been using the same mathematics textbook?
3. Are you using the most recently adopted textbook of the district? If not, which textbook are you using?
4. What is the name of the publisher of your current mathematics textbook?
5. Which grade level are you teaching?
6. In your opinion, what are the essential reasons behind the adoption of the mathematics textbooks every seven years in the district? Why?
7. When you plan to use a new mathematics textbook, what factors do you take into account? Why?
8. How do you coordinate your teaching practices around the new mathematics textbooks?
9. What kind of support mechanism do you have at your school when it is time to use a new mathematics textbook?
10. What are the difficulties of implementing a new mathematics textbook?
11. What suggestions do you have for future textbook's implementation throughout the entire districts or in particular at your school?

APPENDIX C

EMAIL SENT TO TEACHERS

Dear Teacher:

Thank you for participating in this survey, Mathematics Textbook Adoption. The purpose of the study is to examine your concerns regarding the adoption of the newly adopted textbooks in your district.This survey will involve about 100 participants. The survey will take less than 7 minutes to complete. Do not add your name or other identifying data to the survey.

Your name and email address will never be associated with your responses.

By responding to this survey, you acknowledge that you understand the following:

- your participation is voluntary;
- your identity will remain anonymous;
- there are no positive or negative benefits from responding to this survey;
- there is no compensation;
- the survey will be used for research;
- the results will be kept for 24 months in a locked file and then destroyed;
- the data obtained from the survey may be published.

If you have any questions, you can contact (Ilham El-saleh, phone number 979-7396253, email-address ilham@tamu.edu)

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Brittany Roy at 979-458-4067.

If you understand and agree with the above information stated, please complete the survey at:

http://tamucehd.qualtrics.com//SE?SID=SV_bKEHretwofLtEZ6&SVID=Prod

Thanks,

Ilham Elsaleh
Doctoral student in mathematics education at Texas A&M.

APPENDIX D

EMAIL SENT TO THE TEXAS SCHOOL DISTRICTS

Hi,

We are conducting a research study on teachers' concerns of the newly adopted mathematics textbooks, Dr. Gerald Kulm is my advisor at Texas A&M University and he supervises me in this study. The study will help in the development of quality mathematics textbooks in Texas. Please forward my email to your mathematics middle school teachers to help us in getting more responses about teachers' concerns of the newly adopted textbooks in mathematics.

Thanks,

Ilham Elsaleh
Doctoral student in mathematics education at Texas A&M.

Dear Teacher,

I am piloting a survey instrument for a research study of teachers concerns regarding the use of the newly adopted textbooks in Texas A&M University, and I hope that you can help my efforts by completing the survey instrument. Thank you in advance for your participation in supporting the development of quality mathematics textbooks; this is an important part of my doctoral research that will allow me to move forward in the dissertation process. Completing the survey will take less than 7 minutes. I know you are busy by the end of the school year, but I really appreciate your input.

The survey link is at: http://tamucehd.qualtrics.com//SE

APPENDIX E

ITEMS OF THE QUESTIONNAIRE AND THEIR LOADING

UNDER EACH FACTOR

FACTORS	LOADINGS
Consequence	
1. I am pleased with the textbook content and organization	.848
2. The textbook plays an important role in improving the teaching /learning process	.785
3. The textbook is useless in my classroom.	-.739
4. I agree that textbooks are good for reducing the responsibilities of teachers like the preparation of guided and independent practices.	.700
5. The quality textbooks a major tool in mathematics teaching.	.658
6. The newly mathematics textbook provides adequate materials for student learning.	.616
7. I make use of all of the activities in the textbook.	.508
Refocusing	
1. The textbook meets the needs of students with different styles of learning	.751
2. The mathematics textbook used in my class offers the proper ratio of information/knowledge content (Bottom of Bloom's Taxonomy) and higher order conceptual thinking (Top of Bloom's Taxonomy).	.863
3. The mathematics textbooks used in my class provide activities that are of higher order thinking	.815
4. The mathematics textbooks used in my class provide plenty of real life examples.	.785
5. The mathematics textbook used is congruent with the state curriculum framework.	.717
6. The mathematics textbook is written at the appropriate grade level for students in my class.	.714
7. The mathematics textbooks used in my class focus on students as the center of the learning/teaching process.	.701
8. The textbook and textbook resources support different learning styles	.688
Collaboration	
1. There is support on the campus for use of the textbook.	.745
2. I was well informed about the district philosophy for adopting the new textbook.	.704
3. There is cooperation between the mathematics teachers within the grade level in using the textbook.	.655
4. The training sessions for the use of the textbook covered the needs of teachers regarding teaching with the new textbook	.651
5. I have been supported in my use of the textbook by the district	.601
6. There is frequent communication with the department head/department chair concerning use of the textbook	.549
Information	
1. I know the content in the new textbook for the classes that I am teaching	.696
2. I am aware of the changes in the new textbook in the mathematics curriculum.	.574
3. I do not have any difficulties in teaching with the new textbook.	.555
4. I have no difficulty with the knowledge required by the new mathematics textbook.	. 543
5. I have no problem reading the newly adopted mathematics textbook.	.306

FACTORS	LOADINGS
Management	
1. Due to the inadequate coverage of the textbook package, I frequently substitute materials from other resources.	-.894
2. Due to the absence of material in the textbook package I frequently must create or add material for my class	-.867
3. The textbook reduces the stress of developing lessons so I can focus on teaching.	.402
4. The textbook support my role in the classroom as a facilitator of learning	.505
5. The material included in the book can be covered in the available time.	.374
Personal	
1. I feel insecure about teaching some topics in this textbook	.653
2. The mathematics textbook requires the use of methods that I am not sufficiently familiar with.	.632
3. The textbook resources allow me to accommodate lessons based on the progress of each student	.406
4. The mathematics textbook I am using for my class provides appropriate coverage of the recommended standards.	.362
5. The textbook is equipped with reasonable independent practices material.	.361

VITA

Name: Ilham Kamel El-Saleh

Address: TLAC Department, MS 4232
Texas A&M University
College Station, TX 77843

Email Address: ilham@tamu.edu

Education: B.S., Mathematics, 1994, American Lebanese University
M.S., Mathematics, 2005, Texas A & M University
Ph.D., Curriculum and Instruction, 2011, Texas A & M University