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Implementing Connected Math Project 2: Observable Influences of Professional Development Activities on Reported Staff Attitudes about Implementation

Mary Lee Kappes
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Implementing Connected Math Project 2:
Observable Influences of Professional Development Activities on
Reported Staff Attitudes about Implementation

BY

MARY LEE KAPPES

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Submitted in Partial Fulfillment of the
Requirements for the Degree
Doctor of Education
Seton Hall University

2012

SETON HALL UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN SERVICES
OFFICE OF GRADUATE STUDIES

APPROVAL FOR SUCCESSFUL DEFENSE

Doctoral Candidate, **Mary Lee Kappes**, has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this **Fall Semester 2012.**

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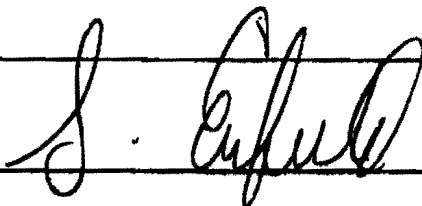
Dr. Joseph Stetar _____

Committee Member:

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ABSTRACT

The chronic underperformance of our public school system in preparing students for college or career is one of the most discussed and debated challenges today. Though much attention is given to this problem, research shows that innovations have had little impact on classrooms and student performances. This qualitative study focused on the implementation of a new mathematics curriculum in a mid-sized northeast urban school district with a history of inconsistent performance and persistent underperformance as measured on annual student performance assessments used to report Annual Yearly Progress (AYP). The purpose of this inquiry was to better understand the relationship between staff attitudes about the innovation being implemented and participation in the professional development activities provided to support that implementation.

Specifically, this study focused on professional development and staff attitudes as pieces of a complex implementation process and their possible influences on each other during the implementation of educational innovations. This study addressed the following primary question: How, if at all, does participation in the professional development program associated with the *Connected Math Project 2 (CMP)* influence staff attitudes on implementation activities?

The research design used the case study methodology in order to gather the rich data needed to understand the perceptions and behaviors of individuals and their impact on the process being studied. By interviewing teachers from four middle schools, principals and central office staff in focus groups and one-on-one settings, it was possible to examine patterns and themes that emerged between the type and amount of professional development activities staff participated in and their self-reported attitudes

about the innovation and the implementation process. Additional data was obtained through the review of institutional documents.

The study found that indeed professional development and staff attitude impacted each other among teachers and central office staff. The embedded higher expectations and levels of rigor associated with the math innovation allowed students to demonstrate math and problem solving skills that had been unseen previously, causing teachers and school leaders to reconsider their previous expectations in the classroom. The participants also demonstrated a focus on adaptations to the program to meet the needs of special education students and teachers, including in student materials, pacing guidelines and assessment protocols. Though all participants had positive attitudes about the inclusion of teachers in the implementation process, overall the attitudes of staff related to the implementation process were negative. This was primarily a result of lack of support for the district's special education population.

The findings of this study supported three conclusions:

- 1) Teachers enjoy and benefit from the process of learning from other teachers
- 2) Leadership during implementation of an innovation really matters.
- 3) Implementation processes should be planned for a 3-5 year period.

Innovations will continue to be implemented as we struggle to increase public school performance. Professional development will continue to play a critical role in the implementation process of these innovations and staff attitudes will continue to impact the outcomes of those implementation efforts. This study reinforced those findings and concludes that school leaders should place considerable energy into developing

implementation plans for innovations that include a strong and strategic system of professional learning that is continuous and responsive to staff input.

ACKNOWLEDGEMENTS

From the beginning, I knew my doctoral ambition was a selfish one. Through the process I came to understand it would also be a humbling one. My ultimate accomplishment was only made possible by the ongoing support, guidance and encouragement of family, friends and colleagues.

First, I am grateful to the teachers, principals and district administrators who participated in this study. As much as I learned from them through my formal interviews and data collection, I was more struck and appreciative of their honesty, commitment and willingness to share their time and thinking. I would especially like to thank Ina Fisher and Tammy Baumann whose help was invaluable to me throughout the research process.

Having a strong, supportive committee is a critical key to success for any doctoral student – and in this regard I was most fortunate. It is with sincere gratitude that I acknowledge and thank my mentor, Dr. Joseph Stetar. He led me through this process with the patience, wisdom and respect of a true teacher. I also wish to acknowledge and thank my committee members, Dr. Martin Finkelstein and Dr. Susan Enfield. Each took a pivotal role in this experience through their encouragement, presence, comments, questions and valuable feedback. I am grateful to each of them for their generosity of time and advice.

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Finally, I have been supported and sustained by my extraordinary family – Bob, Merry, Joey, Katie, Sean, Cory, Nicole, Judy, Matt, Colleen and Andy. I am especially indebted, however, to my husband, Bob. From the time I first expressed my idea of applying to Seton Hall, he has been a constant source of faith, love, and optimism as I labored through this process. On the days when I did not think I could finish, his belief that I would never wavered. My success would not have been possible without him as my partner. I look forward to “post-doctoral life” together!

DEDICATION

I have been blessed by the influence of **many** amazing women, all of whom have had a profound impact on my life. I dedicate this work to them – they have all contributed to this accomplishment.

My mother - Mary Pender

My daughters - Meredith Pannia, Katherine Kappes, Courtney Kappes, Judith
Buonforte and Colleen Kappes

My sisters – Kathleen Seddon, Christine Martin, Debra Condon, Patricia Avakian,
Coleen Barbeau, Anne Rechis and Michelle Fulco

My friend – Cathy Feldman

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Chapter I

INTRODUCTION

Background Information

In April 1983 *A Nation at Risk* (National Commission on Excellence in Education, 1983) was released and school reform was on public education's radar screen. At that time, the authors of this seminal report painted a dismal picture of the education landscape in the United States and put forth five areas of focus for school improvement: (a) standards and expectations, (b) academic content, (c) time on task, (d) teacher quality, and (e) school leadership and fiscal responsibility (National Commission on Excellence in Education, 1983). The effects of the report on efforts to improve teaching and learning in our nation's schools continue to be discussed and debated (Carnegie Council on Advancing Adolescent Literature, 2010; Guthrie, Harris, Wong, 2003). All five areas of focus from almost 30 years ago remain hot topics today among reform-minded educators. And, so too, does the chronic under-performance of our public education system in meeting the needs of all students to be college and career ready (Achieve Inc. and the National Governors' Association, 2005). While some modest increases have been observed in math and reading performance, [Foy, Martin, Mullis, 2008; OECD, 2009; U.S. Department of Education (ED), National Center for Education Statistics (NCES), 2011a; U.S. Department of Education, National Center for Education Statistics, 2011b.] overall U.S. achievement growth trends continue to lag behind that of other developed countries (Barton & Coley, 2009; U.S. Department of Education, National Center for Education Statistics, 2011; Wagner, 2008). The 2011 Nation's Report Card (ED, NCES, 2011a; ED, NCES, 2011b) states that student reading and math performance

in the fourth and eighth grades on the National Assessment of Educational Progress (NAEP) either stayed the same or made nominal growth in the 2 year period since last recorded in 2009 (ED, NCES, 2011a; ED, NCES, 2011b). It is important to note that with the modest increase, average scores remain 8-17 points below the national proficient score on the NAEP (see Table 1).

Table 1 - National Assessment of Educational Progress (NAEP)

| National Assessment of Educational Progress (NAEP) | | | | | | | | | |
|---|------------------|------|-----|------|-----|------|-----|------|-----|
| Score range 0-500 | | | | | | | | | |
| Grade | | 2005 | | 2007 | | 2009 | | 2011 | |
| | | R | M | R | M | R | M | R | M |
| 4 | US Prof Score | 238 | 249 | 238 | 249 | 238 | 249 | 238 | 249 |
| | US Average Score | 219 | 238 | 221 | 240 | 221 | 240 | 221 | 241 |
| 8 | US Prof Score | 281 | 299 | 281 | 299 | 281 | 299 | 281 | 299 |
| | US Average Score | 262 | 279 | 263 | 281 | 264 | 283 | 265 | 284 |

Table 2 - Programme for International Student Assessment (PISA) 2009

| Programme for International Student Assessment (PISA) 2009 | | | | |
|---|---------------|--------------------------|-------------------------|---------------------------|
| Score range 0-1000 | | | | |
| | Average Score | Us Avg. Score was Higher | US Avg. Score was Lower | No Measureable difference |
| Reading Literacy | (493) 500 | 13/33 | 6/33 | 14/33 |
| Math Literacy | (496) 487 | 5/33 | 17/33 | 11/33 |

() OECD Average score

Recent international measures of academic performance, Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), indicated that the United States continues to demonstrate, at best, mediocre performance when judged against international achievement (Foy et al., 2008; Gonzales, Williams, Jocelyn , Roey, Kastberg, & Brenwald, 2008; OECD, 2009). As reflected in PISA data from 33 participating countries in 2009 not only was the U.S. average score (493) lower than the average score of all tested countries (500), but as a nation our average score was only higher than 13 countries in Reading Literacy, higher than 5 countries in Math Literacy, and higher than 9 countries in Science Literacy (see Table 2). The outcomes are similar when studying the results from the TIMSS data in 2007. TIMSS was developed and implemented at the international level by the International Association for the Evaluation of Educational Achievement and is used to measure, over time, the mathematics and science knowledge and skills of fourth- and eighth-graders. TIMSS is designed to align broadly with mathematics and science curricula in the participating countries. The U.S. average scores in math experienced an increase from 1995 to 2007. No significant change in U.S. science scores was recorded from 1995 to 2007. It is also worth noting that in 2007 only 10 percent of U.S. fourth-graders and 6 percent of U.S. eighth-graders scored at or above the advanced international benchmark in mathematics; and only 15 percent of U.S. fourth-graders and 10 percent of U.S. eighth-graders scored at or above the advanced international benchmark in science (Gonzales, et al, 2008). (see Table 3).

Table 3 - Trends in International Mathematics and Science Study (TIMSS) 2007

| Trends in International Mathematics and Science Study (TIMSS) 2007 | | | | |
|--|---------------|-----------------------------|----------------------------|--|
| Score range 0-1000 | | | | |
| | Average score | Average US score was higher | Average US score was lower | No measurable difference in average scores |
| Math 4th Grade | (500) 529 | 23/35 | 8/35 | 4/35 |
| Math 8th Grade | (500) 508 | 37/47 | 5/47 | 5/47 |
| Science 4th Grade | (500) 539 | 25/35 | 4/35 | 6/35 |
| Science 8th Grade | (500) 520 | 35/47 | 9/47 | 3/47 |

() TIMSS average score
Advanced Benchmark is set at 625 or higher.

American students posted high rates of illiteracy, lower average test scores relative to those in other industrialized nations (Carnegie Council on Advancing Adolescent Literature, 2010), and lower percentages of students at the advanced level when compared to other developed countries (Brenwald, Gonzales, Jocelyn, Katsberg, Roey, & Williams, 2008; ED, 2010). Neither a significant rise in achievement, nor closure of the racial achievement gap, is being achieved (Lee, 2006). Current political coalitions grow more divisive as stakeholders position themselves to implement the rewritten NCLB law, renamed *A Blueprint for Reform: The Reauthorization of the Elementary and Secondary Education Act* (ED, 2010). One result of these disappointing realities is that school leaders continue to struggle

daily to identify and successfully implement effective, lasting solutions to tackle persistent student achievement gaps and challenges in this ongoing agenda for school reform and improvement.

Innovating our Schools

A notable outcome of this focus on the shortcomings of educational systems has been the countless innovations implemented in school settings across the United States (Ellis, 2005; Elmore, 2004). For the purpose of this study, innovation means: a product or practice that is new to its developers and/or to its potential users. In the school-based world of teaching and learning, innovation seems to be all-important and unavoidable. State and local education agencies continue to labor to determine the right innovations that will bring about needed change. Such innovations have addressed all aspects of schooling, that is governance models, standards-based instruction, curriculum, high leverage instructional strategies, assessment routines, parental and community engagement, cultural relevance, attendance, extended day programs, teacher evaluation protocols, and broader use of data bases. In all instances, the goal of innovation in education remains increased student performance. The teacher workshop and in-service training business, which employs educational innovations as its stock-in-trade, is a multimillion-dollar industry in the United States (Ellis, 2005). Most of these dollars are coming from tightly stretched school, district, and state budgets. To that end, one can wonder what measurable impact innovative efforts to date have had on classroom instruction, one of the greatest influences on student learning and achievement (Marzano, Pickering, Pollack, 2001; Palardy & Rumberger, 2008)? Past and current

research concludes that educational innovations aimed at improving classroom practice have had little real impact at the classroom level (Elmore, 1996; Hargreaves, 2003; Lubienski, 2003; Webb & Vulliamy, 2007); and therefore, on student performance. It can be further argued there is little new in education. Most things touted as innovative have been tried before in one form or another, without producing drastically different results.

The school district studied in this project has struggled overall with inconsistent performance and persistent underperformance in several schools as measured on statewide annual performance assessments used to report Annual Yearly Progress (AYP) (see Table 4). In 2008 the district received a grant from the General Electrics Foundation to fund an overhaul of the K-12 mathematics program. The decision was made to initiate the innovation at the middle school level. The innovation chosen, and studied in this research, was *Connected Mathematics Project 2* (Lapin, Fey, Fitzgerald, Friel, & Phillips, 2009)

Connected Mathematics Project 2

The National Science Foundation (NSF), tasked between 1991 and 1997 to develop a mathematics curriculum for grades 6 – 8, funded the Connected Mathematics Project (CMP). The result was *Connected Mathematics*, a complete mathematics curriculum that helps students develop understanding and construct meaning of concepts, skills, procedures, and ways of thinking and reasoning in six stands of mathematics: number, geometry, measurement, algebra, probability, and statistics. (Lapin, et al, 2009) In 2000, the NSF funded a revision of the *Connected Mathematics* materials to reflect learnings from the field during the 6 years of initial

implementation. The revised program was named *Connected Mathematics Project 2* (Lapin, et al, 2009).

| District Achievement Data | | | | | |
|---------------------------|----------------------|----------|----------------------|----------------------|----------------------|
| AYP Status 2003-2011 | | | | | |
| Year | Entire District | School A | School B | School C | School D |
| 2011 | School Improvement 1 | Made AYP | School Improvement 1 | School Improvement 1 | Made AYP |
| 2010 | Warning | Made AYP | Warning | Warning | Warning |
| 2009 | Made AYP | Made AYP | Made AYP | Made AYP | Made AYP |
| 2008 | Made AYP | Made AYP | Made AYP | Made AYP | Made AYP |
| 2007 | Made AYP | Made AYP | Made AYP | Made AYP | Made AYP |
| 2006 | Making Progress | Made AYP | Made AYP | Making Progress | Made AYP |
| 2005 | School Improvement 2 | Made AYP | Made AYP | School Improvement 2 | Making Progress |
| 2004 | School Improvement 1 | Made AYP | Made AYP | Making Progress | School Improvement 1 |
| 2003 | Warning | Made AYP | Warning | School Improvement 1 | Warning |

Table 4 – District Achievement Data

The overarching goal of CMP2 is to help students and teachers develop mathematical knowledge, understanding, and skill along with an awareness of and appreciation for the rich connections among the six mathematical strands in the program, mathematics and other disciplines. The program highlights the side-by-side attention paid to both student and teacher needs in the development of curriculum and materials. CMP2 names the following key operational features of the program: problem centered, practice with concepts and related skills, a complete curriculum, for teachers as well as students, research based, and results

driven. CMP2 identified as its underlying tenets: a focus on the big ideas of middle grades mathematics, teaching through student-centered exploration of mathematically rich problems, and continual assessment to inform instruction. CMP2 differs from many current mathematics programs in that it is problem-centered. A growing body of evidence from the cognitive sciences supports the theory that students can make sense of mathematics if the concepts and skills are embedded within a context or problem. In CMP2 time is spent exploring interesting mathematical situations, reflecting on solution methods, examining why the methods work, comparing methods, and relating methods to those used in previous investigations. The authors of CMP2 maintain that these approaches are more likely to build deeper, more robust understandings of mathematical concepts and related procedures. This approach stands in contrast to the more traditional assumption that students learn by observing a teacher as he or she demonstrates how to solve a problem and then practices that method on similar problems. This contrast of practice requires a paradigm shift for many implementers.

Implementing Innovations

Is the disheartening lack of positive results associated with so many innovative efforts due to the particular innovation, or to factors associated with implementing that innovation? Researchers have identified a variety of conditions and factors (e.g. organizational culture and climate, capability, professional development, staff attitudes, social-emotional factors, management and policy strategies, financial and human capital resources, leadership qualities) associated with the process of implementing innovations, making it complex. (Ball & Cohen,

1999; Forkosh-Baruch, Mioduser, Nachmias & Tubin, 2005; Galvis, 2004; Hargreaves, 2003; Marzano, 2003). This qualitative study will focus on two of these factors, professional development and staff attitudes, both widely documented in the literature.

Professional Development

Schools exist in rapidly changing environments that require new and different approaches to improve performance and raise achievement. School leaders search for programs characterized by increased rigor, relevance and opportunities for personalization. The implementation of any innovation aimed at school improvement and reform is a complex process (Elias, Graczyk, Weissberg, & Zins, 2003). School reform agendas ask individuals to engage in new practices, routines and procedures, often with unfamiliar content. Elmore (2002) described the need for professional development in the school improvement process as an “imperative investment in human skill and knowledge” (p. 3). Guskey (2002) defined professional development programs as “systemic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students” (p. 381). Learning Forward (LF), previously named the National Staff Development Council (NSDC), defined professional development as “a comprehensive, sustained, and intensive approach to improving teachers’ and principals’ effectiveness in raising student achievement”. Professional development remains a constant component and factor in nearly every implementation process. In this study professional development activities associated with the implementation of the new math innovation, Connected Math 2

(CMP2) will be studied to better understand their possible influence on staff attitudes.

Staff Attitudes

Attitude is defined as “the way a person views something or tends to behave towards it” (Collins Dictionary, 2012). Implementing innovations is demanding and challenging work. The effect of school culture on school improvement efforts is significant. The attitudes and beliefs of the persons in that school shape that culture. Attitudes of the staff involved in the innovation matter (Choi & Price, 2005; Evers, Brouwers & Tomic, 2002). Innovation failures are caused not only by technical difficulties or deficiencies, but also by the overall attitude of staff towards the proposed innovation. A positive, direct relationship has been found to exist between people’s attitudes toward the innovation and their behavior in implementing that innovation in practice (Choi & Price, 2005). Of all the participants involved, the attitudes of teachers are fundamental when it comes to the success or failure of an innovation within a school.

The interest in the role of attitude in successful innovative practice includes examination of the attitudes of leaders as well. Musteen, Barker & Baeten (2010) studied the attitudes of organizational leaders as possible predictors of innovative behavior. Their findings suggest that organizations headed by leaders with more liberal attitudes toward change were more likely to explore and develop innovations. Meanwhile, organizations led by individuals with more conservative attitudes toward change were found to focus more energy and reliance on existing advantages rather than innovations (Barker, Baeten, & Musteen, 2010).

Research studies have indicated that both staff attitudes and professional development activities are important determinants of effective implementation. This analysis will add to the literature by focusing on the possible influence of one determinant on the other and, in so doing, deepen understanding of these two critical factors, as well as the possible effect they may have on the other.

Statement of the Problem

Too many students in public schools across the United States fail to receive the education they need to be successful in college or the workplace after graduating from high school (Achieve, 2005). As a result, school reform and improvement efforts continue to dominate the educational arena. Millions of dollars, endless amounts of human resource energy, and countless hours of strategic planning time have been spent in the name of school reform and innovation (Hargreaves, 2003; Wagner, 2008). Educators need to know and act on the results of so much time, energy and money spent. Parents and community members have a right to know how resources are used and the effect they have. Far too many innovation efforts continue to fall short of success at the implementation stage and fail to positively impact student achievement. Why is it that so many innovation efforts fail to achieve their intended outcomes?

Current research has focused on implementation outcomes and measures of implementation success. This case study adds to the research literature regarding implementing innovations by focusing on two factors of the implementation process, staff attitudes and the professional development program, and their possible influence on each other.

In the context of this research project, implementation is the process of putting into practice an idea, program, or set of activities and structures new to the people attempting or expecting to change their behavior (Fullan, 1991). Specifically, this project studies the professional development program designed to support the implementation of a middle level math innovation (CMP2) and the self-reported staff attitudes about the innovation and implementation process.

Purpose of the Study

The purpose of this inquiry is to deepen understanding of the implementation factors of professional development and staff attitudes associated with the implementation of CMP2, including the possible influence one factor has on the other. Specifically, do patterns and themes emerge between the type and amount of professional development activities staff participated in and their self-reported attitudes about the innovation and the implementation process?

Participants in this study included teachers from four middle schools, principals and central office staff in a mid-sized urban northeast school district.

Research Questions

Many variables impact the implementation of any innovation. The more the innovation necessitates a significant departure from existing behaviors and norms, the more complicated the process becomes. Implementation efforts of many educational innovations have been disappointing (Elias et al., 2003). The findings of this study add to the current understanding and knowledge about the influence of professional development and staff attitudes on implementation activities in one

urban school district. Specifically, this study addresses the primary research question:

- How, if at all, does participation in the professional development program associated with the *Connected Math Project 2* (CMP) influence staff attitudes on implementation activities?

And the four subsidiary questions:

- Describe and explain the professional development program for the CMP2 program.
 - What activities were offered to teachers in the professional development program?
 - What were requirements around attendance at professional development activities?
 - What was the context in which the professional development activities occurred?
- What were the self-reported staff attitudes concerning the math innovation and the implementation process following year one of full implementation?
 - What were the self-reported staff attitudes about the different professional development activities?
 - What were the self-reported staff attitudes about the math innovation?
 - What were the self-reported staff attitudes about the implementation process of the math innovation?

- What, if any, changes in attitudes were self-reported about the innovation following year one of full implementation?
- What were the participation rates at the professional development activities offered to staff?
 - What percent of invited staff participated in each professional development activities?
 - Which professional development activities had the greatest attendance rates?
 - Which professional development activities had the least attendance rates?

Theoretical Rationale

Thomas Guskey (2002) presents a professional development and teacher change framework that takes into account two critical factors: (a) what motivates teachers to engage in professional development, and (b) the process by which change in teachers typically occurs (Guskey, 2002). Guskey's model, portrayed in Figure 1, depicts a temporal sequence of events that takes place from professional development experiences to enduring change in teachers' attitudes and perceptions. The examination of these two factors is not unique. The relationship between behavior and attitude is well documented in the social psychology literature. In fact, Choi and Price (2005) found that a person's attitude toward the innovation had a positive, direct relationship to that individual's behaviors when implementing said innovation.

What is unique in Guskey's theory is his explanation of how these two factors interact. Many professional development planners attempt to change teachers' beliefs about certain aspects of teaching with the desirability of a particular program or instructional innovation. Such professional development planners presume that changes in teachers' attitudes and beliefs will lead to specific changes in their classroom behaviors and practices, which in turn will result in improved student learning and outcomes. Guskey challenges the assumptions of this model and presents an alternative approach. According to Guskey's framework, significant change in teachers' attitudes and beliefs occurs primarily after they gain evidence of improvements in student learning. While this may seem a nuance to many, in the context of this study it is the basis of inquiry into the possible influence the two implementation factors of professional development and staff attitudes have on each other.

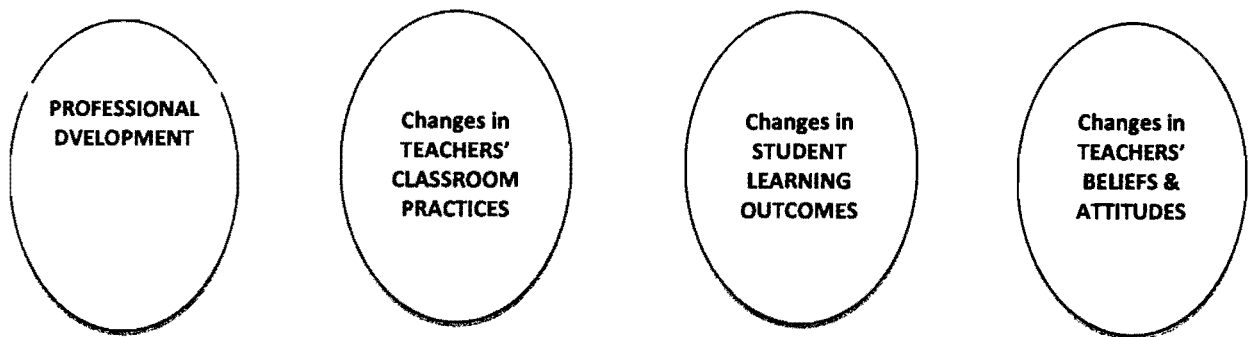


FIGURE 1. A model of teacher change (Guskey, 2002).

Significance of the Study

Given (a) the current achievement levels of United States students as compared to those of other developed countries, (Carnegie Council on Advancing Adolescent Literature, 2010; ED, NCES, 2011; Wagner, 2008;), (b)the persistent

achievement gaps amongst student groups (Lee, 2006; Loveless, Farkas, & Duffett, 2008) and (c) the current national education agenda (ED, Office of Planning, Evaluation and Policy Development, 2010) innovations in educational programs will continue. Intervention researchers have stated the need for studies that focus on the factors of implementation activities (Domitrovich & Greenberg, 2000; Hargreaves, 2003; Thomas, Aarab, & Tuzun, 2009). This study analyzes two critical factors of the implementation process highlighted in the literature - professional development and staff attitudes - and their possible influence on each other in the implementation process.

Information about the professional development program and staff attitudes was collected during interviews, focus groups and the review of district documents. Information from district and state databases was collected and analyzed. A qualitative design was chosen for the type of rich data the researcher is able to collect (Patton, 2002). The case study method was used to delve deeply into the potential effects the two factors (professional staff development and attitudes, and their possible influence on each other) have on levels of implementation processes (Patton, 2002).

The findings of this study will provide district leaders insights about implementation efforts currently underway and planned for in the future. Such information can be used to define and plan for future innovation efforts and supports. Additionally, the results of the study provide inputs about school leadership, central office supports, and their influence as potential implementation factors.

This qualitative study adds to the current knowledge in the field about: implementation practices, issues of sustainability, and the link between the desired implementation activities and improved student outcomes. This research also addresses an existing gap in the literature regarding the possible influence that implementation factors of professional development and self-reported staff attitudes have on each other.

Limitations of the Study

The primary goal of this qualitative study is to deepen understanding of how the two implementation factors, professional development and staff attitudes, influence each other. The study was conducted in a mid-size northeast urban district and focused on the implementation of the CMP2 program in all middle level (grades 6-8) mathematics classrooms. The data developed from five focus group sessions, three one-on-one interviews and district and state databases and documents. The limitations within this proposed study are twofold: both related to the methodology of a single case study design.

Not all teachers and district administrators responsible for implementing the CMP2 program participated in this study. The research was bounded in participation by the staff at the four middle level programs chosen to participate. The Coordinator of K-12 Mathematics and the Director of K-8 Curriculum and Instruction made the site selections. The decision to conduct more in-depth interviews with fewer participants was made consciously due to the complexity of the implementation process, and the desire to study thoroughly these two factors of

professional development and self-reported staff attitudes. Not all those invited to participate returned signed consent forms.

The bias of the respondents, as well as the interpretation of the data, may produce potential limitations. It is assumed that all participants gave honest responses and recalled facts and information as accurately as possible.

Delimitations of the Study

Given this is a single-district case study it is difficult to know how applicable these findings may be to other schools and districts. While it is reasonable to project some generalizable findings, others may be unique to this particular school's set of circumstances and conditions.

Definitions

Terms and concepts used in this study are defined below. Literature-based and operational definitions are provided.

Attitudes. A state of mind, way of thinking, feeling, or disposition typically reflected in a person's behavior

Commitment to implementation. Belief in a particular innovation and willingness to exert considerable effort in its implementation

Conditions. Situations, settings and circumstances that exist in the environment

Factors. Issues and influences that contribute to the outcome of something

Innovation. A product or practice that is new to its developers and/or to its potential users

Innovation adoption. The decision to use an innovation

Innovation implementation. “The transition period during which individuals (ideally) become increasingly skillful, consistent, and committed in the use of an innovation

Professional Development. The systemic program for planned learning activities intended to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students associated with the implementation of the new math innovation, Connected Math 2 (CMP2) provided to all staff participating in the implementation process.

Chapter II

REVIEW of RELATED LITERATURE

Introduction

Schools exist in politically charged and rapidly changing environments that demand creative and different approaches to improve performance and raise student achievement. By some measures schools are doing a better job than in years past of educating an increasingly diverse student body, but they have not done well enough. Currently 52% of students who enter public high schools graduate in 4 years (Achieve Inc. and the National Governors' Association). The United States Department of Education (2012) reports that 58% of freshman entering 4 year accredited institutions will successfully complete their college course work in 4 - 6 years. Efforts to meet increasing demands for improvement, higher levels of accountability, and comparative studies of U.S. student performance in the international arena, place schools in a constant cycle of adopting and implementing innovations (Wagner, 2008). As a general rule, the adoption process, though often more expensive, is much easier than that of implementation. While the two (adoption and implementation) are often lumped together when it is time to evaluate the effectiveness of the innovation on obtaining desired outcomes, it is important to distinguish between the ineffectiveness of the chosen innovation per se, and the ineffectiveness of the implementation process wrapped around that adopted innovation. This research study focused on the implementation process of a math innovation to analyze the factors of staff attitudes and professional development and their possible influence on each other.

The implementation of organizational innovations is difficult and complex. An understanding of the system levers that impact the eventual effectiveness and success of the innovations implemented is critical. For these reasons, this literature review documents pertinent information on the complexity of implementing innovations, with particular attention paid to the implementation factors of staff attitudes and professional development.

Complexity of Innovation Implementation

The complexity surrounding innovation implementation efforts often results in unintended confusion and ambiguity amongst those charged with implementing the innovation at the district, school, and classroom level. Stumbling blocks faced early on the road to implementation often provide the first series of challenges that innovators must face. Four such possibilities have figured prominently in the implementation literature. First, many innovations require would-be users to learn and acquire new knowledge and skills. For many people this will be tedious and stressful. Second, the decision to adopt and implement an innovation is typically made by people higher in the organization than those targeted to use it. This reality is further aggravated by the intended users' existing feelings of skepticism towards anything different than the status quo. Third, many organizational innovations require individuals to change existing roles, routines, and norms. In the case of the instructional innovation under investigation in this study, implementation required individuals who had previously worked quite independently now needing to coordinate their activities and share information with others. And, fourth, implementation is time consuming, expensive, and, in the beginning often results in

a dip in performance. These upfront, known challenges reinforce the complicated nature of the implementation process. Additionally, many existing conditions, factors, constructs, and organizational qualities, as well as unanticipated events, are impactful during the implementation process, making it a messy one at best.

Conditions and Context Related to Innovation Implementation

In an earlier study Wohlstetter and Mohrman (1995) focused on the relatedness of school-based management and the implementation of four instructional innovations: teaching for understanding, the use of technology as a tool for learning and producing, differentiating learning for all students and the use of integrated approaches. It is interesting to note within the context of this study, all four of these strategies remain hot topics in school reform and improvement agendas. The researchers identified seven conditions found to have consequences on the implementation process: decentralization of power, knowledge and skills, information, rewards, an instructional guidance system, leadership, and resources. Evidence showed the conditions to be interrelated and, in fact, all seven served to reinforce each other in the process of introducing innovative practices. Additionally, all conditions, with the possible exception of resources, appeared to be instrumental in facilitating the ongoing implementation of the innovations studied by Wohlstetter and Mohrman.

These findings have been supported in subsequent studies (Blumenfeld, Fishman, Krajcik, Marx, & Soloway, 2000; Elias, et al., 2003; Geijsel, Sleegers, van den Berg, & Kelchtermans, 2001; Klein & Knight, 2005;) concerned with related conditions and issues of innovation implementations. Klein and Knight (2005)

investigated the implementation of innovations that required the collaboration and active participation of multiple organizational members. They identified six conditions that when present were predictive of effective implementation outcomes.

1. An established package of implementation policies and practices that clearly identify and support the specifics of the implementation plan.
2. A strong and positive climate for the innovation implementation that makes clear for people the importance of the innovation in the organization and the message that this is not merely a distraction from the real work.
3. Demonstrable and convincing support from all management about the innovation so that there is no confusion about the organization's intent for the implementation.
4. The availability of financial resources to cover the expenses associated with training, ongoing supports and communications to all stakeholders.
5. A culture of professional learning that includes a set of interrelated practices and beliefs to support and enable employee and organizational skill development, learning, and growth.
6. Managers who are committed to the long-term benefits of innovation implementation and have the patience to see past some initial lack of results and diminished productivity. (Klein & Knight, 2005, p. 245)

Elias et al. (2003) found similar conditions (elements) present in their study of sustainability and scaling up of innovations in public schools. In addition to addressing the aforementioned conditions, these researchers highlighted the role

that linkage to state, district, and school goals, as well as high visibility of the implementation goals on the organization's agenda, both played in effective implementation efforts.

Earlier discussion on institutional policy as a condition of implementation was provided by Blumenfeld et al. (2000). In their study of usable innovations in systemic reform, the researchers found that whether or not innovations were sustained through the implementation process depended in part on the establishment of appropriate policies and management structures. It is easy to imagine that most innovations would require new schedules, additional resources, revised assessments, and the reallocation of responsibilities among different levels of the system: teachers, principals, and central office administrators. Changing demands, priorities, and constraints at different levels in the system will influence how involved individuals will respond. It is important to note that policy decisions are also impacted by political conditions that are unpredictable and beyond the control of change leaders (falling tax revenues, testing programs, or conflict between regional and state authorities about curriculum goals) - often times with unintended consequences that appear to derail the innovative efforts underway.

Efforts to set the right conditions for success are critical pre-readiness behaviors for launching an effective implementation effort. In addition to needs forecasting, strategic planning, and the commitment of influential stakeholders Choi and Price (2005) found that addressing the role of context, or what they referred to as "person-innovation fit" (p. 85) is important in identifying and coordinating specific steps to ensure the right conditions for each environment are put into play.

These researchers found that a good fit between people and relevant conditions in their environment (e.g. communication, climate, clear sense of priorities from managers) induced a greater commitment and more positive approach to the implementation process.

Factors Associated with Effective Implementation

Other studies have sought to identify the factors of greatest import in the outcome of implementation efforts. Researchers studying the success of classroom technology innovations identified 11 salient factors that impacted the degree of success in the implementation process (Zhao, Pugh, Sheldon, & Byers, 2002): content proficiency, pedagogical compatibility, cultural awareness, distance of the innovation from school culture, distance of the innovation from exiting practice/experiences, distance from available resources, dependence on others, dependencies on technological resources, human infrastructure, technological infrastructure, and social support (p. 490). The researchers then constructed a model of relationships among the factors to better understand their interactions in the classroom where implementation actually takes place. The model included three interactive domains: the innovator, the innovation, and the context. Each factor was placed in one of the interactive domains as follows:

- The innovator (teacher), with associated factors of content proficiency, pedagogical compatibility, cultural awareness.
- The innovation, with associated factors of distance of the innovation from school culture, distance of the innovation from existing practice/experiences,

distance from available resources, dependence on others, dependencies on technological resources.

- The context (environment), with associated factors of human infrastructure, technological infrastructure, social support.

These findings further suggested, with regard to the three interactive domains listed, that the teacher presented the greatest influence. Zhao et al. (2002) caution, however, about underestimating the cumulative effect all three factors may have on desired outcomes.

Studies in clinical settings have rendered similar findings. Grol and Grimshaw's (2003) study of innovations in medical practices focused on the attributes of the evidence, barriers and facilitators to changing practice, and effectiveness of dissemination and implementation strategies. They identified the following guidelines as critical in implementing innovations more effectively:

- prepare well,
- involve the relevant people,
- develop a proposal for change that is evidenced based, feasible and attractive,
- study the main difficulties in achieving the change,

- select a set of strategies and measures at different levels linked to that problem,
- define indicators for measurement of success, and
- monitor progress continuously or at regular intervals.

While presented as suggested guidelines, these factors echo aforementioned ones and reinforce the complexity of innovation implementation processes.

Challenges to the Implementation Process

The literature addresses the multitude of complex challenges faced by implementers (Blumenfeld et al., 2000; Elias et al., 2003; Geijsel et al., 2001; Rowan & Correnti, 2006). Consensus exists that the number of innovations already underway, the choice of the innovation and how it fits in the existing culture, persistent structural features in the educational setting, inadequate attention to the characteristics of the adults who must carry out planned reforms, and poor management of time and resources can all jeopardize the proposed innovation at the early implementation stage (Elias et al., 2003; Frank, Zhao, & Borman, 2004). Given current climates and trends, educational leaders will find it necessary to grapple with the conditions and factors associated with implementation of innovations into the foreseeable future.

Some innovations appear much more difficult to implement than others. What remains unclear is the degree of importance connected with each condition, issue or factor on levels of implementation and the overall impact, if any,

implementations have on student achievement. What remains clear is the daunting challenge of effectively implementing and expanding successful examples of school innovation and reform into widely replicated practices.

Professional Development

There is broad consensus in the research and professional literature that continuous learning has a positive impact on school improvement (Borko, 2004; Darling-Hammond, Chung Wei, Andree, Richardson, & Orphanos, 2009; Elmore, 2002; Fullan, 2001; Schmoker, 2006). School districts across the country continue to embark on rigorous school improvement agendas that inevitably ask individuals to engage in new content matter, practices, routines, and procedures for which they are underprepared. Elmore (2002) described the need for professional development in the culture of school improvement as an “imperative investment in human skill and knowledge” (p. 3). Preparing professionals with an array of skills that match the demands of twenty-first century reform efforts has never been greater. School districts are wise to invest in creative ways to translate new knowledge and pedagogical understanding into observable practice. A professional development program that paves the way for changes in practice can be a major contributor to effective school reform.

Key Features and Conditions

Researchers and professional development designers agree on key features of effective professional development programs that lead to changes in teaching practices. (Carroll, Fulton, Abercrombie, & Yoon, 2004; Darling-Hammond et al., 2009; Elmore, 2002; Guskey, 2002; Learning Forward, 2011; Loucks-Horsley &

Matsumoto, 2003; Wallace, 2009; Wilson & Berne, 1999). As stated in the related literature, high quality professional development programs are:

- Grounded in research and clinical knowledge
- Aligned with a school's curriculum and assessments
- Focused on *improving* student learning in that setting
- Informed by teachers' collaboration both within and across schools using teacher expertise to plan activities and cultivate leaders.

Additionally, effective learning experiences for adults in school settings also:

- include mechanisms for garnering principal support,
- model and explicitly discuss methods of good practice,
- provide teachers with active learning opportunities,
- aim to build teachers' content knowledge and pedagogical skills,
- are intensive and sustained over time to allow for integration of new knowledge into practice, and
- include follow-up support.

Mentioned above, and receiving attention in the current discussion of professional development for teachers and school leaders, is a focus on how professional development activities lead to improved student learning. (Guskey, 2002; Learning Forward, 2011)

A System of Professional Learning

Professional development remains a constant component in nearly every school reform or improvement implementation plan. Borko (2004) described effective professional development as a system with four key elements: (a) the

professional development program, (b) teachers as learners, (c) the facilitator guiding the learning, and (d) the context in which the learning occurs. Each element is elaborated as follows:

1. The professional development program Guskey (2002) defines professional development programs as “systemic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students” (p. 381). The conception and design of the professional development program is based on research and proven, successful practices that have been evidenced in similar school environments. The professional development program identifies the content to be studied or learned, the vehicles for learning and the intended audiences. Researchers found professional development programs that integrated conceptual understanding and practical applications, coupled with sustained active learning opportunities, worked best (Gersten, Dimino, Jayanthi, Kim, & Edwards Santoro, 2010). School-based professional development programs taking place within professional learning communities and aligned with district, state, and national standards led to stronger coherence of goals and initiatives for teachers struggling to make changes in their practice (Borko, 2004; Gersten et al., 2010; Learning Forward, 2011). Current initiatives to change teacher evaluation tools provide another opportunity for the type of systemic cohesion. District and state leaders can take the initiative of

making transparent connections for teachers and school leaders between implementing chosen innovations and the opportunities provided by doing so to demonstrate effective practice as measured by new evaluation tools and processes. (Hillsborough County Public Schools, 2010)

2. Teachers as learners. “Educational change depends on what teachers do and think – it’s as simple and as complex as that” (Fullan, 2001, p. 115), The importance of teacher buy-in is emphasized repeatedly throughout the school reform literature, while little attention is paid to the real messiness of school life and the impact that has on teachers as learners. Historically teachers have worked in isolation with few opportunities to interact and collaborate with other teachers. That will change with current innovations like the Common Core State Standards (CCSS), now being implemented in 46 states and the District of Columbia. Teaching in twenty-first century schools implementing the CCSS requires a skill set that may prove to be, for many practitioners, a significant shift in how teaching and learning will happen in classrooms. The professional development needs to meet the instructional demands of the CCSS will be great. Desimone (2009) stressed the importance of creating more active and dynamic learning experiences for teachers in which teachers are treated as professionals and expected to participate in rich discourse about the content at hand. Stillman (2011) added that when teachers as

learners were given the opportunity to grapple with the reforms and practices they were expected to implement, a “productive tension” (p. 134) led the teachers towards important professional learning and instructional improvement. Stillman further cautioned that school leaders need to assure the professional development program provides a balanced delivery approach that does not de-professionalize teachers in the process and is flexible enough to differentiate for the varied abilities of participating teachers.

3. Facilitator as learning guide. The role of the facilitator, historically referred to as *the staff developer* is shared by a variety of people in the organization: teachers, coaches, principals, and external partners can all effectively facilitate professional learning opportunities. This person is responsible for orchestrating the learning opportunities into a cohesive and meaningful whole. Frank, Zhao, and Borman (2004) discussed the outcomes of professional development activities when teachers serve as professional development facilitators. They found that when teachers take on more active roles within professional development programs for their own learning, they are more likely to “try on” the new strategies or techniques, adding to the overall effectiveness of the learning process and innovation implementation. Recent studies shed light on the influential role that principals can play in increasing effectiveness of professional learning. Matsumura, Sartoris, Bickel and Garnier, (2009) found that principal leadership in

professional development proved to be critical in determining the overall impact of its outcomes. The feasibility of principal-led professional development is considered given the multitude of responsibilities they manage on a daily basis. External partners often times provide the right balance of expertise and influence to move the professional learning agenda to the next step. What matters most is that the individual chosen to facilitate the professional learning of others has been chosen for the qualities and skills he/she possesses to assure success.

4. Context in which the professional development occurs. Jerald (2012) reported that the context in which professional development takes place matters too. Lack of time to learn and practice new techniques, lack of understanding and support from school leaders, or a professional culture that is not conducive to collaboration and improvement can undermine professional development efforts that might, in a more hospitable environment, improve teaching and learning. Professional development in this context, like teaching, is to a large extent about decision making in order to design optimal opportunities tailored to the unique situation.

Challenges with Getting Results

While researchers agree that the role of professional development is essential to improvement in education, (Darling-Hammond et al., 2009; Elmore, 1996; Elmore, 2002; Fullan, 1991; Guskey, 2002; Schmoker, 2006) a review of the research also

indicates consensus on the ineffectiveness of most professional development programs in impacting student achievement (Cohen & Ball, 1999; Weiss & Pasley, 2006; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). A variety of factors undoubtedly contribute to this ineffectiveness. Research supports two primary factors contributing to this failure:

- Lack of attention to teacher and administration motivation (Guskey, 2002), and
- lack of attention to the role of the change process and its impact on professional learning (Elias et al., 2003; Elmore, 2002; Fullan, 1991; Guskey, 2002).

From these two factors several challenges persist: teacher turnover, quality of the professional developer provider and agenda, emphasis on materials and mechanics versus deepening understanding and pedagogy, inconsistency or lack of ongoing support for teachers and administrators, principal support of teachers, principal buy-in and understanding of goals and expectations, and difficulty in reaching all teachers within the constraints of contractual obligations (Yoon, et al., 2007; Borko, 2004; Elmore, 2004; Borko, 2004).

In *Teaching at Risk: A Call to Action* the Teaching Commission (2004) describes teaching as “our nation’s most valuable profession” (p. 12). Public education continues to come under fire for the existing inequities and disparities evidenced in our achievement data. As a result, practitioners at every level are being asked to take on new roles and responsibilities in reform strategies. The implications for learning needs are apparent. Professional development is essential

to school improvement and the successful implementation of innovations that support a continuous cycle of improvement. Research findings (Desimone et al., 2002; Garet, Porter, Desimone, Birman, & Yoon, 2001; Higgins & Parsons, 2009;) support the statement: professional development can lead to improvements in instructional practices and student learning. There remains a need for deeper understanding about the sustainability, replication and efficacy of professional development efforts that lead to positive changes in teacher effectiveness and, ultimately, increased student outcomes.

Staff Attitudes

In this study attitude is defined as: a state of mind, way of thinking, feeling, or a disposition - typically reflected in a person's behavior. One's attitude, or that of a group, is often lumped into one of two categories, positive or negative. Within those two broad categories we associate a variety of descriptors to determine how individuals are placed in either category. For instance, when describing how they felt about a new math program, teachers talked about the lack of support for special education students. (Kappes, 2012) This response would be categorized as a negative attitude toward the math innovation. Other teachers, when asked the same question, discussed the program's multi level approach to the content and how it enabled them to differentiate in their classroom. (Kappes, 2012) This comment would have been recorded as a positive attitude in the current discussion.

School districts, and the schools in them, are continually trying to reshape themselves in response to ever changing environments and higher levels of

accountability. Implementing innovations is demanding and challenging work and attitudes of the staff involved toward the innovation matter (Choi & Price, 2005; Evers, Brouwers & Tomic, 2002). In fact, Christensen (1997) found that many innovation failures were not caused by technical difficulties or deficiencies, but rather by the overall attitude of staff towards the proposed innovation. Hess, Maranto, Milliman, and Ferraiolo (2002) also discovered a positive relationship between staff attitudes about the chosen innovation and the success of that innovation in implementation when they studied school choice and private vouchers in Arizona public schools.

Choi and Price (2005) tested a set of hypotheses concerning “person-innovation fit constructs” and their predictive affective and behavioral responses to particular innovations (p.93). Choi and Price found that a positive, direct relationship existed between people’s attitudes toward the innovation and their behavior in implementing that innovation. Additionally, the findings also highlighted the importance of the individual in the implementation process and the researchers caution against ignoring the needs of individuals. Corroborative educational research supports the connections between staff attitudes and feelings of self-worth, and the energy modeled in implementation efforts (Choi & Price, 2005; Elias et al., 2003; Evers et al., 2002; Weiss & Pasley, 2006).

Factors Related to Staff Attitudes

Hess, Muranto, Milliman and Ferraiolo (2002) conducted a study on choice-based school reform and found three factors shaped staff attitudes about the proposed reform agenda in positive and negative ways:

- familiarity with the innovation, prior knowledge about, or experience with, the intended innovation increased positive implementation efforts and outcomes;
- professional background, this factor addresses the technical skills needed for successful implementation of the innovation and the degree to which staff have been previously schooled in those desired skills based on professional background; and
- school environment, the effect of a school's unique culture and environment on school improvement efforts is significant.

Penuel (2006) adds to the discussion on factors related to teachers' attitudes and their impact on implementation efforts in his synthesis of the research and educational studies. He described two factors affecting teachers' attitudes and beliefs associated with influencing a program's implementation and success:

- teachers attitudes about the chosen innovation, how teachers feel about the particular innovation impact implementation outcomes positively or negatively; and

- the nature and frequency of messages they hear in the environment, communication about the implementation as well as how messages are constructed and disseminated factor into levels of implementation success.

Student Learning Outcomes

Guskey (2002) added to the discussion about teacher attitudes and their impact on school improvement efforts and companion innovation implementation efforts. His research findings on teacher change challenge the accepted construct that professional development in and of itself can lead to a change in teacher attitudes and beliefs. Guskey presented an alternate approach in his suggestion that professional development may lead to a change in teacher practice, but it is improved student learning outcomes that will bring about a shift in teachers' attitudes and beliefs. This alternate approach is impactful on the interaction of professional development and staff attitudes in implementations of innovations and deserves further study.

Finally, in a discussion about the effect of staff attitudes on implementation the literature on school culture cannot be ignored. Krueger and Parish's (1982) study of five districts implementing and then discontinuing programs, found a common key to successful implementation effort "the interactive relationships that teachers have worked out together regarding how things get done" (p. 133). This collaborative interplay is fruitful when staff is aligned in thought and attitude toward the stated goals.

Summary

The implementation of any innovation in an organizational setting places new demands on all involved. The responsiveness of staff to this complex process is defined by many factors, including preparedness, existing supports, clearly stated expectations and targets, a vision for the future, connectedness to other initiatives already underway, and current environmental factors. As Fullan (1991) noted, factors affecting implementation “form a system of variables that interact to determine success or failure” (p.67). This review explored three factors, or attributes, of implementation - complexity, professional development, and staff attitudes - and found all three have bearing on the outcomes of implementation efforts.

Chapter III

METHODOLOGY

The purpose of this case study is to deepen understanding of the implementation factors of professional development and staff attitudes associated with the implementation of CMP2, and the possible influence one factor has on the other. By describing the participants, instrumentation and setting, this chapter lays out the research design and methodology. Data collection methods and data analysis techniques are also described.

The primary and subsidiary research questions for this study are as follows. The primary research question is: How, if at all, does participation in the professional development program associated with the *Connected Math Project 2* (CMP2) influence staff attitudes on implementation activities?

The subsidiary research questions are:

1. Describe and explain the professional development program for the CMP2 program.
2. What were the self-reported staff attitudes concerning the math innovation and the implementation process following year one of full implementation?
3. What, if any, changes in attitude were self-reported about the innovation following year one of full implementation?
4. What were the participation rates at the professional development activities offered to staff?

Research Design

For this qualitative inquiry, an inductive approach was applied to a single case study methodology. I focused on the implementation of the CMP2 math program (Lapin, et al., 2006) as a district math innovation in grades 6-8 in four sample schools of a northeast urban district. The qualitative approach was chosen for the opportunities it provides to investigate complex issues deeply, holistically, and in the natural environment of the phenomenon being studied (Creswell, 1998; Patton, 2002,). As Patton (2002) further explained, case study methods and processes allow the researcher to gather the rich data needed when trying to better understand the motives, perceptions, and behaviors of individuals, and their impact on the process being studied, in this case the implementation of a math innovation in grades 6-8. The case study methodology allowed me to study the complexity of implementing an innovation in educational practice within the real-life context of one district's innovation implementation. In-depth data was collected from a variety of sources, including: focus groups, one-on-one interviews, district documents, and district and state databases.

This qualitative design included four teacher focus groups and one school administrator focus group formed from the four sample schools under study. The use of focus groups within this case study is consistent with Krueger and Casey's (2009) definition: "A focus group study is a carefully planned series of discussions designed to obtain perceptions on a defined area of interest in a permissive and nonthreatening environment" (p.5). Additionally, three one-on-one interviews were conducted with central office staff for the rich and valuable information they yield (Patton, 2002). In the instance of this study, the three central office staff individuals

were interviewed separately because of their unique positions in the district and the desire to assure a risk-free environment during the interview process. Due to the limitations of the research design, the maximum number of eligible invited participants was 32 and represented the following categories of people:

- 22 teachers teaching CMP2 in the four-school sample,
- two math coaches assigned to central office and serving all schools implementing CMP2,
- six school administrators - four principals and two assistant principals, and
- two central office administrators.

Participation in the study was completely voluntary. Based on the number of signed consent forms received, the actual participants included 14 teachers, one math coach, four school administrators, and two central office administrators, for a combined total of 21 participants (see Table 5). Additional detail about the sample schools and participants in this study is found in the Data Collection section. Using a multiple-category design was effective when making comparisons within and among the various groups (Krueger & Casey, 2009).

I met with the Superintendent to explain the project and was given permission to meet with the district's Director of Research and Evaluation to assure no conflicts or burdens on the district would occur by participating in the study. The Director of Research and Evaluation forwarded a recommendation to allow the study to the Superintendent, Director of Curriculum and Instruction, and the Coordinator of K-12 Mathematics. Following a meeting with the Coordinator of

Table 5 – Research Design

| Research Design | | | | |
|---|------------------------------|----------------------------|--|---|
| Category | Possible Participants | Actual Participants | Method | Details |
| Teachers | 22 | 14 | 4 Focus Groups | Middle School Teachers from the four sample schools directly involved in teaching CMP2 |
| School Administrators | 6 | 4 | 1 Focus Group | School Administrators from the sample schools directly involved with implementation of CMP2 |
| Coach | 2 | 1 | One-on One Interview | Math Coach (1 of 2) supporting implementation of CMP2 |
| K-12 Coordinator of Math | 1 | 1 | One-on One Interview | District Administrator responsible for coordinating implementation of CMP2 |
| Director of K-12 Curriculum & Instruction | 1 | 1 | One-on One Interview | District Administrator responsible for oversight of all K-12 academic programs |
| Total | 32 | 21 | 5 Focus Groups 3 One-on One Interview | |

K-12 Mathematics, in which I further detailed the purpose and proposed design of the study, the Superintendent provided me with a signed site approval letter via U.S.Mail. Then, after receiving approval from the Seton Hall Institutional Review Board (IRB), letters of solicitation and informed consent forms were sent to all prospective participants via the district's interoffice mail system.

Data Collection

Once returning signed consent forms were received, teachers were placed in homogeneous groups with colleagues from their same school buildings.

Participating school administrators comprised their own focus group. One-on-one interviews were set up with the Math coach, Coordinator of K-12 Mathematics, and the Director of Curriculum & Instruction. During May and June 2011 each focus group met with me for approximately 60-90 minutes. During this same time period one-on-one interviews, lasting approximately 1 hour, were also conducted. At predetermined dates and times each teacher focus group met in a school conference room. The principal focus group and all one-on-one interviews were conducted at the district's central office building. One week prior to each scheduled meeting, a reminder was sent to all participants detailing again purpose, time, and place for data collection.

As the researcher, I served as the sole moderator for all focus groups and interviews sessions. At the beginning of each meeting, I welcomed participants and explained the purpose and goal for the meeting: to obtain information and insight into the implementation of the CMP2 program in their schools and classrooms. Participants were encouraged to speak honestly and openly during the input and dialogue session. Acting as the facilitator, I highlighted the intended norms for the meeting - speaking one at a time, not using names during the audiotaping, the intended use of the audio tapes in data analysis, and allowing equal opportunity to share ideas. To ensure the same process was adhered to, a written statement was read to participants at the start of each meeting outlining proper protocol (see Appendix A).

The data collection techniques for focus groups and interviews included my hand written notes and audio tape recordings of the five focus groups and three

one-on-one interviews. In addition, district and state databases and district documents and records provided information on student performance, implementation efforts, and professional development programs, plans, and attendance records.

Participants

This single case study researched a diverse, mid-size, urban district located in a mid-Atlantic state. With 12,452 students, City School District (City) is the seventh largest in the state. City is considered a high poverty district with 73 percent of students qualifying for free and reduced lunch and all 22 schools qualifying for Title I dollars. Its total student population has remained relatively stable since 2000-01, with an increase of 325 students, primarily in the number of ELL students, which rose from 529 to 733 between the 2000-01 and 2003-04 school years.

Patton (2002) discussed the importance of choosing an “information-rich” (p. 46) case to study deeply when researching complex issues. City was chosen as the site for this study for the following reasons:

- **Stability of leadership .** The superintendent was voted into the position in the 2010-2011 school year with full support of the Board of Education. His predecessor was superintendent of schools for 17 years, more than three times as long as the national average of 5 years for urban superintendents (Standard & Poors, 2005). The transition of leadership was planful and thoughtfully executed.

- Implementation plan. The school district had developed an intentional approach for the innovation implementation process including an in-depth professional development plan.
- Access. I was given ready access to documents and personnel based on a trusting, professional relationship with the district built over many years of working together.

Samples

CMP2 is a middle level mathematics program. In the district under study eight schools provide middle level mathematics programs in the following configurations:

- one K-6 building
- five K-8 buildings, and
- two 6-8 buildings

From the population of all City's middle level programs, four schools - School A (K-8), School B (K-8), School C (6-8), and School D (6-8) - were selected to provide substantive data using the purposeful sampling method (Patton, 2002). As Patton explained, purposeful sampling is used in qualitative research to select those participants likely to better inform the research through their particular understanding and involvement in the phenomenon being studied when the focus is on in-depth understanding. The decision to choose these particular schools in this convenient sample selection was made by the district's K-12 Coordinator of Mathematics, with final approval given by the Superintendent of Schools. The schools chosen represent two of the three middle level configurations, a range of

socio-economic demographics, varied student achievement outcomes, and different levels of implementation activities.

Within each school sample the units of analysis included teachers directly involved in teaching CMP2, the assigned math coach responsible for supporting the implementation of CMP2 in classrooms, building administrators responsible for the implementation of CMP2 in their schools and professional development activities. Additional units of analysis for this case study included the K-12 Coordinator of Mathematics and K-8 Director of Curriculum and Instruction. The decision to include these two central office administrators was based on their direct responsibility for defining the professional development program for the math innovation and ensuring its implementation.

Data Sources

This section provides information on the data sources used to answer the subsidiary research questions:

1. Describe and explain the professional development program for the CMP2 program.
2. What were the self-reported staff attitudes concerning the math innovation and the implementation process following year one of full implementation?
3. What, if any, changes in attitude were self-reported about the innovation?
4. What was the participation rate at the professional development activities offered to staff?

Data was collected from the following sources to inform the research questions:

- district documents and archival records for the school years 2008-2009 and 2009-2010 documenting the professional development strategies and activities associated with the implementation process. These documents include: descriptions of all professional development activities offered to staff, the calendar of professional development events, participants' self-reflections, and documentation of attendance at professional development events;
- district and state databases of demographic and student achievement information;
- teachers in the sample schools who teach mathematics in grades 6-8, including those working with students receiving Special Education and English Language Learner services ($n = 22$);
- district and school-based coach ($n = 1$);
- building principals ($n = 4$);
- K-12 Coordinator of Mathematics ($n = 1$); and
- K-8 Director of Curriculum & Instruction ($n = 1$).

Instrumentation

This case study employed two dominate methods of collecting data used in qualitative inquiries: interviewing and document/record collection and review (Glesne, 1999). All data were collected to obtain information about the implementation attributes of staff attitudes and the professional development program in the implementation of a middle level math innovation, and the possible influence of one factor on the other. Consequently, the research instruments used

included one-on-one interview protocols, focus group protocols, and retrieval of institutional documents and archival information.

Focus Group and Interview Protocols

Focus group interviews were conducted for the unique quality of data they provide. Given the complex nature of implementation processes and the intent of this study to gather information about attitudes, perceptions, and personal experiences related to implementing an innovation, the focus group strategy was chosen for its specific design qualities and ability to gather information in a permissive, relaxed environment (Krueger & Casey, 2009). Question protocols for teacher and principal focus groups (see Appendices B and C), were created using the guidelines for developing focus group questions outlined by Krueger and Casey (2009). Particular attention was given to clarity, open-ended construction and simplicity in question construction. Additionally, opening questions elicited quick, easy responses and gradually transitioned from general to more specific key questions. Closing questions allowed opportunity for additional comments and closing thoughts. Certain questions were included to create an easy rapport during interviews and may not have a direct consequence on the research questions. The consistent questioning route employed enabled the researcher to compare and contrast responses among groups. Tables 6 and 7, found on pages 12 and 13, code the focus group protocol questions to the research questions of this study.

Individual interviews were conducted for the quality and comprehensive nature of the information they are able to provide (Patton, 2002). One-on-one interview protocols, found in Appendices D, E and F, were created using the

guidelines for developing interview questions outlined by Glesne (1999) and Patton (2002). Particular attention was given to the ordering of questions in the protocol and the use of leading or vague questions. Tables 8, 9, and 10 code the interview protocol questions to the research questions of this study.

Institutional Documents and Archival Information Retrieval

A variety of district and archived documents were retrieved for analysis in this study. Glesne (2009) outlines three important contributions that documents make in qualitative studies: corroborate observations or statements made in interviews, raise questions about hunches the researcher may have, and provide historical perspective.

The following documents, records, and archives were collected and analyzed for this study:

- defined district professional development plan for the implementation of this innovation;
- professional development evaluations, teacher reflections and attendance records;
- descriptions of the professional development activities offered; and
- institutional memoranda communicated to staff (i.e. program updates, schedule changes for professional development events, new information about professional development opportunities).

In addition, district and state databases provided information about demographics and student achievement.

Table 6 – Analysis of Teacher Focus Group Questions

| Teacher Focus Group Question | Research Guiding Questions | | | |
|---|-----------------------------------|---|------------------------------------|-------------------------|
| | Describe professional development | Participation in professional development | Self-reported changes in attitudes | Self-reported attitudes |
| 1. Tell us who you are, where you teach, the grade level you work with, and something you like to do outside of teaching. | | | | |
| 2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program? | | | X | X |
| 3. How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP? | | | | |
| 4. Tell me about the opportunities created for teacher input about the math adoption. | X | | | X |
| 5. How did you feel about the idea of a math adoption when it was first introduced? | X | | X | X |
| 6. Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. How would you describe them? | X | X | | X |
| 7. Describe how, if at all, CMP has changed your math instruction. | X | X | | X |
| 8. What, if anything, could the district have done to better prepare teachers through professional development activities or other ways for the adoption of CMP? | X | X | | X |
| 9. Are there additional supports you need to successfully implement CMP? If yes, what are they? | X | X | | |
| 10. Did your knowledge and skills about the math innovation change over time? If yes, please explain? | X | X | X | X |
| 11. Did your attitude about the math innovation change over time? If yes, please explain. | | | X | X |
| 12. Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain. | X | X | X | X |
| 13. Is there anything else you would like to add about the implementation of CMP in your district? | | | X | X |
| 14. Have we left anything out? | | | | |

Table 7 – Analysis of Principal Focus Group Questions

| Principal Focus Group Question | Research Guiding Questions | | | |
|--|-----------------------------------|---|------------------------------------|-------------------------|
| | Describe professional development | Participation in professional development | Self-reported changes in attitudes | Self-reported attitudes |
| 1. Please tell me a little bit about your current role and what other positions you have had in district.. | | | | |
| 2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program? | | | | X |
| 3.How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP? | | | | |
| 4.How did you feel about the idea of a math adoption when it was first introduced? | | | X | X |
| 5.How would you describe the feelings of teachers about the idea of a math adoption when it was first introduced? | | | X | X |
| 6.What support did principals receive in readying for the math adoption in your buildings? | X | | | |
| 7.What professional development did teachers receive in using this new math program? | X | X | | |
| 8.How would you describe the way teachers feel about the new math program in your building? | | | X | X |
| 9. Describe how, if at all, the adoption of CMP has changed 6-8 math instruction in your building. | X | X | | X |
| 10.What, if anything, could the district have done to better prepare teachers for the math adoption? | | X | | |
| 11. Are there additional supports needed to successfully implement this adoption in your building? If yes, what are they? | | X | | X |
| 12.How would you describe the implementation process of CMP to date? | | X | | X |
| 13. Did your knowledge and skills about the math innovation change over time? If yes, please explain? | | | X | X |
| 14. Did your attitude about the math innovation change over time? If yes, please explain. | | | X | X |
| 15. Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain. | X | | | X |
| 16.How would you describe the attitudes of teachers and coaches regarding the adoption and implementation of CMP? | | | X | X |
| 17.Is there anything else you would like to add about the implementation of CMP in your district? | | | X | X |

Table 8 – Analysis of Coach Interview Questions

| Math Coach Interview Questions | Research Guiding Questions | | | |
|--|-----------------------------------|---|------------------------------------|-------------------------|
| | Describe professional development | Participation in professional development | Self-reported changes in attitudes | Self-reported attitudes |
| 1. Tell us who you are, where you are working with teachers, the grade level you work with, and something you like to do outside of teaching and coaching. | | | | |
| 2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program? | | | X | X |
| 3. How would you describe the math curriculum in grades 6-8 prior to the CMP adoption? | | | | |
| 4. Tell me about the opportunities created for teacher and coach input about the math adoption. | X | | | X |
| 5. How did you feel about the idea of a math adoption when it was first introduced? | | | X | X |
| 6. Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. | X | X | | |
| 7. How would you describe the way teachers feel about the new math program? | | | X | X |
| 8. How would you describe the way the implementation has gone in your building? | | X | X | X |
| 9. What, if anything, could the district have done to better prepare teachers and coaches for the adoption of CMP? | X | X | | X |
| 10. Are there additional supports you need to successfully coach the implement of CMP? If yes, what are they? | X | | | X |
| 11. Did your knowledge and skills about the math innovation change over time? If yes, please explain. | | X | X | X |
| 12. Did your attitude about the math innovation change over time? If yes, please explain. | | | X | X |
| 13. Did professional development activities you participated in impact your attitude about the math innovation? If yes, please explain. | X | X | | |
| 14. Is there anything else you would like to add about the implementation of CMP in your district? | | | | |
| 15. Have we left anything out? | | | | |

Table 9 – Analysis of Math Coordinator Interview Questions

| Math Coordinator Interview Questions | Research Guiding Questions | | | |
|---|-----------------------------------|---|------------------------------------|-------------------------|
| | Describe professional development | Participation in professional development | Self-reported changes in attitudes | Self-reported attitudes |
| 1. Please tell me a little bit about your current role and what other positions you have had in district. | | | | |
| 2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program? | X | | X | X |
| 3. How would you describe the math curriculum in grades 6-8 prior to the CMP adoption? | | | | |
| 4. How did you feel about the idea of a math adoption when it was first introduced? | X | | X | X |
| 5. How would you describe the feelings of teachers about the idea of a math adoption when it was first introduced? | X | | | |
| 6. Describe the process used to select the new math program. | X | X | | |
| 7. Describe the professional development plan for the implementation of this math innovation. | | X | | X |
| 8. What did central office do to support teachers in using this new math program? | X | X | | X |
| 9. What, if anything, could the district have done to better prepare teachers for the math adoption? | | X | | X |
| 10. Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they? | X | | | X |
| 11. How would you describe the implementation process of CMP to date? | X | | X | X |
| 12. How would you describe the attitudes of teachers and coaches regarding the adoption and implementation of CMP? | | | | |
| 13. Describe how, if at all, has the adoption of CMP changed math instruction in the district in grades 6-8. | X | | | |
| 14. If you could change anything about the implementation process what would you change? | X | | | |
| 15. What data have you collected to measure the level of implementation of CMP? What have you found out so far from the data collected? | X | | | |
| 16. Is there any other pertinent information you would like included in this data collection about the implementation of CMP? | | | | |
| 17. Have we left anything out? | | | | |

Table 10 – Analysis of Director of Curriculum & Instruction Interview Questions

| Director K-12 Curriculum & Instruction | Research Guiding Questions | | | |
|---|-----------------------------------|---|------------------------------------|-------------------------|
| | Describe professional development | Participation in professional development | Self-reported changes in attitudes | Self-reported attitudes |
| 1. Please tell me a little bit about your current role and what other positions you have had in district.. | | | | |
| 2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program? | X | | X | |
| 3. How would you describe the math curriculum in grades 6-8 prior to the CMP adoption? | | | | |
| 4. How did you feel about the idea of a math adoption when it was first introduced? | X | | X | |
| 5. What did central office do to support teachers in using this new math program? | X | X | | |
| 6. Describe the process used to select the new math program. | X | X | | |
| 7. What, if anything, could the district have done to better prepare coaches for the math adoption? | X | X | | X |
| 8. What, if anything, could the district have done to better prepare teachers for the math adoption? | X | X | | X |
| 9. Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they? | X | | | X |
| 10. How would you describe the implementation process of CMP to date? | X | | | X |
| 11. How would you describe the attitudes of principals, teachers, and coaches regarding the adoption and implementation of CMP? | X | | | |
| 12. Describe how, if at all, has the adoption of CMP changed math instruction in the district in grades 6-8. | X | | X | |
| 13. Is there any other pertinent information you would like included in this data collection about the implementation of CMP? | | | | |
| 14. Have we left anything out? | | | | |

All three instruments were used collectively to obtain information about each of the three research questions. With respect to document retrieval and review instrument, all of the documents collected informed all of the research questions. Tables 6, 7, 8, 9 and 10 provide analyses of the questions asked in one-on-one interviews and focus groups as they directly relate to each of the four research questions.

Data Collection Techniques

This research design consisted of multiple data collection methods. The first method was retrieval of records and data from several sources. Data was collected from district and state databases, district archives and records. This data assisted the researcher in providing important background information and findings that address the four subsidiary research questions.

The remaining methods occurred during the focus groups and one-on-one interviews. These included hand-written notes taken by the researcher during the focus groups and interview sessions and an audio recorder. The researcher using a computer-assisted transcription application then transcribed tape recordings of each session. These transcriptions were then used to sort, organize and code responses.

Data Analysis

Krueger and Casey (2009) described systematic analysis as deliberate and planned, following a prescribed, sequential, and continuous process. In this study analysis occurred concurrently with data collection, beginning with the first focus group meeting and continuing to evolve as the project was completed. I was the

sole moderator for all focus groups and interviews allowing me to collect anecdotal information from each session, which I immediately summarized for comparison against the session transcripts at a later date. The homogeneous makeup of the focus groups enhanced participants' willingness to provide honest thorough responses, which improved my ability to accurately analyze the data and ensure validity. I followed the Classic Approach (Krueger & Casey, 2009) to sort, categorize, and summarize data from transcripts and hand-written notes. Each transcript was reviewed and analyzed against each of the four subsidiary research questions. Recurrent themes and patterns were identified and coded. After transcribing recordings from each group, I wrote a summary identifying what additional information might be needed, as well as to make any necessary adjustments for the next group. This practice was consistent with the classic analysis strategy (Krueger & Casey, 2009) and allowed me to identify themes and categorize results. The focus group and interview question routes directly correlated to the research guiding questions (see Tables 5 to 9). In each session the first two questions were general and served to develop a rapport with participants. The remaining questions followed a multiple-layer design with consistent content, yet varied order depending on the group. See Appendices B, C, D, E, and F for more detail.

After transcribing the audiotapes recorded during focus groups and one-on-one interviews, the coding process of sorting, reading, and rereading each transcript to get a general feel for the responses from each group or individual was completed. The strategies of convergence and divergence (Guba, 1978) were then applied to the data sets. Convergence refers to the process of searching for recurring regularities

in the data that reveal patterns and themes that were then sorted into categories and titled. Periodically throughout the coding process the strategy of divergence was also applied. Patton (2002) described this as “fleshing out” the patterns and categories by stopping and rereading the full array of responses to ensure that: (a) all sources of information were exhausted, (b) redundancy did not exist within categories, and (c) clear, integrated regularities had emerged (Patton, 2002). This data analysis method revealed a number of themes related to the self-reported staff attitudes, positive and negative, regarding the implementation of CMP2. The findings from this analysis were then organized into three groups for reporting purposes: teachers, principals, and central office personnel (the math coach, the K-12 Coordinator of Mathematics and the Director of Curriculum & Instruction) for each of the three guiding questions associated with subsidiary research question 2 and subsidiary research question 3. Themes and patterns for both positive and negative attitudes are included, as well as examples of participant responses recorded during focus groups and one-on-one interviews. Participant responses to their self-reported changes in attitude were summarized and recorded.

Additional information was obtained from district records and state databases. This data was reviewed, organized, and recorded.

Reliability and Validity

In order to deal with the threats to validity that are often raised in relation to qualitative studies (rigor, credibility and design strategy), I used triangulation methods (Patton, 2002). Multiple data sources and collection techniques will “increase the credibility and quality by countering the concern that a study’s

findings are simply an artifact of a single method or a single source..." (Patton, 2002, p. 556).

During the course of this study, I remained acutely aware of how my biases could be affecting my data collection and analysis, as well as how the participants' reactions to me could be potentially affecting their responses to my questions.

Summary

Implementing innovations is complex and challenging work. Studying complex and challenging work requires a research design that allows for multiple opportunities for deep investigation, preferably conducted on site at the place under study (Patton, 2002). The case study methodology chosen for this research study provided the rich data needed to understand the perceptions and behaviors of individuals and their impact on the process being studied, in this instance the implementation of a math innovation in middle level classrooms. In-depth data was collected from staff members directly involved in implementing the innovation through focus groups, one-on-one interviews, and institutional documents. The inductive process of analysis allowed the researcher to distill the data collected into recognizable patterns and themes in response to the research questions posed. Particular attention was paid to concerns of reliability and validity; in particular the researcher's own potential biases. Chapter IV provides the results of the data analysis.

Chapter IV

DATA ANALYSIS AND FINDINGS

Introduction

This research project analyzed the possible influence of implementation factors on each other. Specifically, I studied the professional development program and self-reported staff attitudes associated with the implementation of CMP2, a middle school mathematics innovation. This chapter presents an analysis of the data and a discussion of the findings as they pertain to each of the four subsidiary research questions and associated guiding questions.

Based on the number of signed consent forms received, this data analysis summarizes responses from 14 teachers, 4 school administrators, 1 coach, and 2 central office administrators. More specifically, the information derived from five homogeneous focus groups (four teacher groups and one school administrator group) and three one-on-one interviews. Additional information was gathered from district and state records.

Sample Characteristics

Teachers. The 14 teacher participants were all directly involved in implementing the CMP2 math innovation with students. There were equal numbers of females and males and 100% of the participants were White. Participants' tenure in the district ranged from 1-28 years. The teaching experience of the participants ranged from 1-28 years with most (79%) having taught only in this district. One participant had previous experience with CMP2 during his student teaching experience, and three of the teachers had participated in the district's pilot program for CMP2. Thirteen of the 14 participants reported participating in each of the three

professional development activities reported on in this study: CMP2 Summer Institute, Just-in-Time trainings and job-embedded coaching. The remaining participant was unable to attend the summer institute as it occurred prior to his date of employment, but he did report attending the other two activities.

Administrators. The administrator participants all worked in schools where they were directly responsible for the implementation of the math innovation in all 6-8 math classrooms. Two principals and two assistant principals comprised the school administrator group. Three of the four administrators were female, all were White, and years of experience as school leaders were: three with 7 years and one with 1 year. All of the administrators reported attending professional development activities offered to them to varying degrees.

Mathematics coach. The district math coach was a White female with 20+ years of experience in the district. Prior to becoming a coach she taught mathematics at the high school and middle school levels. She served on the Math Work Study Committee during the adoption process and provided professional development to teachers implementing CMP2.

K-12 mathematics coordinator. The Mathematics Coordinator is responsible for all mathematics programs district-wide, including curriculum, classroom instruction, assessment practices, and the supervision of math coaches. Prior to this position, she served as a high school mathematics teacher, coach, and school-based math facilitator. The Mathematics Coordinator position was created 3 years ago to manage the district-wide math adoptions and the current administrator has held the position since its inception.

Director of K-8 curriculum & instruction. The Director is responsible for the day-to-day operations and academic programs of all elementary and middle schools, 18 campuses in total. She is in her second year in this position. Prior to this position, she was the GE Grant Manager for central office, a school administrator, and classroom teacher. As the GE Grant Manager she was responsible for oversight of the grant funding the CMP2 adoption.

The Professional Development Program

This section reports on findings associated with subsidiary question 1: Describe and explain the professional development program for the CMP2 math innovation, and related guiding questions:

(a) What activities were offered to teachers in the professional development program?;

(b) What were requirements around attendance at professional development activities?; and

(c) What was the context in which the professional development activities occurred?

Background

The K-12 Coordinator of Mathematics was responsible for the creation and implementation of the CMP2 professional development plan. She was assisted by a group of district stakeholders (teachers, coaches, school administrators, and central office staff) known at the Math Work Study Committee (MWSC). This group was convened in Spring 2008 and charged with developing a long-term strategic K-12 plan for the teaching and learning of mathematics in City schools. The MWSC agreed

upon six constructs to guide decisions made in their work: curriculum, instruction, assessment, school and classroom culture, professional development, and program support.

Guided by national standards (Learning Forward, 2011), the MWSC identified a set of characteristics and qualities necessary for effective professional development and were committed to creating a program that embodied them. The committee described the professional development program as a system of “diverse processes and on-going activities that ensure all teachers have the skills and knowledge to effectively deliver highly effective mathematics content, instruction and assessment within well managed classrooms” (School District of the City of Erie Mathematics Work Study Committee, 2008). The professional development program for CMP2:

- focused on the content being taught, the instructional tasks being used, the pedagogical practices implemented and the student work that emerges;
- allotted time for formal and informal professional sharing and interaction;
- provided opportunities to ensure teachers were familiar with the mathematics that came before and after the mathematics they were currently teaching;
- promoted a culture of shared and collaborative analysis of practice and student outcomes;
- included a strategy for mentoring teachers new to CMP2; and
- addressed the unique professional development needs of administrators enabling them to supervise, monitor and oversee highly effective

mathematics instruction. (School District of the City of Erie Mathematics Work Study Committee, 2008)

The professional development program designed and developed to support the implementation of CMP2 was viewed as an “unique approach for the district – and raised the standard for professional development moving forward” (Director of Curriculum and Instruction, 2011).

Professional Development for Teachers

Three distinct activities comprised the CMP2 professional development program for teachers: (a) summer institutes, (b) Just-in-Time trainings, and (c) job-embedded coaching. Each activity is described separately below.

Summer Institutes. This professional learning activity took place during the summer prior to year one of implementing the CMP2 innovation. The Institute was described by the Mathematics Coordinator as “an academy for teaching” designed to help teachers “work on changing their practice from a very teacher-centered approach to a student-centered one.” The math coach responded that the intended focus of the institutes was “a lot on content, some on pedagogy, but mostly on content” in order to address the weak mathematics knowledge of many middle level math teachers.

The 3 day course offered a comprehensive introduction to the CMP2 mathematics program’s design, principles, content, organization, and formatting. In addition, teachers learned about inquiry-based teaching, classroom discourse, cooperative learning, technology uses in math instruction, and classroom management strategies. One teacher described the institute as a “three day

intensive summer workshop for CMP” where participants learned about “expectations for the program and how to approach the teaching – instead of direct teaching, more hands-on and engaging.” The days were made up of a series of topic specific sessions and were delivered by school district personnel and trainers from Pearson, the program publisher. The summer institutes, according to the math coach, were “well-planned and well received and most of the teachers came.” Attendance at these institutes was voluntary and teachers were paid for attending. This professional development activity supported the district’s commitment to focusing on content knowledge, instructional practice and creating a culture of shared learning and professional collaboration.

Just-in-Time Trainings. These professional development sessions were scheduled to occur right before teachers taught each new CMP2 unit of study. Teachers were released from the classroom to attend a full-day training on the upcoming materials. The trainers who led these sessions in year one worked for the publishers of the CMP2 program. All of the trainers were currently or recently teaching in the classroom and had first-hand experience using the program materials with students over time. Each grade specific session provided teachers the opportunity to preview and learn about the problems and content in CMP2 in the same way students would be experiencing the materials in class. One teacher described the sessions this way:

Basically the way the training worked was they had us do the problems the way our students would have to. Once we got past that initial “oh this is never going to

work” we would start working on a problem together, the way our kids were supposed to, and we would be able to solve it. And then, in that same training, we would talk about what we thought would work and what wouldn’t and be able to tweak the general worksheets to make them higher or lower levels as needed.

Other teachers described a variety of supports provided by the trainers during sessions based on their own experiences implementing the materials in practice. These examples, as described by participants, included sharing “the pitfalls and challenges and how to deal with different things that come up,” “what was effective and what wasn’t and what could be skipped and what you don’t want to miss,” or “this is always a place where students get tripped up.” Teachers also described the trainers in these sessions as pivotal to effectiveness and that all trainers were not equal. As one teacher reported, “it made a huge difference who you had for a trainer.” This statement is corroborated by another participant who states, “I think it kind of depended on who you had as your facilitator, because some of the facilitators were much better than others, ours in 7th grade was wonderful.” Despite the inconsistency in the trainers provided by Pearson, overall response to the Just-in-Time sessions was positive with teachers reporting gains in content understanding and practice techniques. All teachers implementing CMP2 were expected to attend the Just-in-Time trainings.

As stated by the Math Coordinator, the goal of the Just-in-Time trainings was to be sure that “every teacher had training for every unit prior to teaching it.” This professional development activity supported the district’s commitment to focusing on content knowledge, instructional practice, creating a culture of shared learning and professional collaboration, and ensuring that teachers were familiar with the mathematics that came before and after the mathematics they were currently teaching. Data summaries on attendance at these sessions can be found in Table 11.

Job-embedded Coaching . This third leg of the professional development program offered teachers opportunities over the school year for in-class modeling and coaching. There were two aspects to this professional development component:

- Every CMP2 teacher was offered two individual coaching sessions with an external consultant from the program publisher. As described by the Mathematics Coordinator, the practice consultant would be working with teachers “in their classrooms, with their kids, on their issues.”
- Every CMP2 teacher would have access to a district math coach all year long as needed and requested.

In both instances teachers would have the opportunity to ask for one-on-one or, in some cases, small group support and technical assistance. The coaching strategy was intended to follow up on needs that surfaced from Just-in-Time trainings. The coaching sessions represented a variety of learning experiences including demonstration lessons, observing and debriefing lessons, leading professional learning communities, assisting with creating modifications and adaptations, modeling how to score student work, or problem solving challenges in

implementing new materials. Contractual limitations in the district's agreement with teachers dictated that all coaching opportunities be initiated only by the teacher.

Professional Development for Administrators

District administrators had multiple and varied opportunities to learn about the math innovation. In addition to being invited and encouraged to attend all teacher professional development activities, administrators attended information meetings, participated in learning walks and observed site-based coaching sessions. Each professional development component is described below.

Information Sessions. During the innovation's pilot year, administrators were given opportunities to learn about the CMP2 program at information sessions designed specifically for principals and those who would be responsible for overseeing the implementation of the program in classroom practice. These sessions were embedded in regularly scheduled district meetings for administrators. As stated by the Mathematics Coordinator, these sessions were designed to inform principals about "what to expect, what to listen for in classrooms, and what to look for - so they were aware of the changes that would be occurring." It was not clear from the data collected what the district expectation for attendance at these sessions was.

Attendance at Teacher Professional Development Activities. Principals and other district administrators were invited to attend all teacher focused professional development activities including, participating in Just-in-Time trainings and sitting in on coaching sessions occurring in their buildings. Participating

principals described participating in lesson debriefings and professional learning community (PLC) meetings as beneficial and worthwhile. One principal participant indicated that the aspect of having “a coach from the program come and work in our schools and in our classrooms” was a part of the professional development that “made the most sense.” Another principal participant indicated that the district math coach would “come and facilitate the conversation with teachers during PLC time” which she was able to attend and observe. Attendance at these teacher trainings also resulted in principals being able to use the same protocols of practice in follow up sessions with teachers in the buildings. There was no mandatory behavior associated with this professional development opportunity for principals. All participants indicated that they had attended some form of teacher professional development activities. None of the participants indicated they had attended all forms of teacher professional development.

Learning Walks. This professional development component focused on implementation of CMP2 at the classroom level. Administrators met in small groups of four to six to deepen their program content knowledge and understanding of what the effective CMP2 practice should be looking and sounding like in classrooms. The Mathematics Coordinator led these professional learning sessions, which were highlighted by a classroom visit and lesson observation. Learning Walks included a pre-observation conversation to set the context for the lesson to be observed as well as to provide an opportunity for administrators to become more comfortable with the content. During the classroom visit and observation that followed, administrators focused on specific data points to collect for part of the debriefing

conversation to follow. The debriefing conversation was another facilitated discussion that allowed critical program features and principles to be highlighted. One principal participant noted that “going into classrooms and doing the Learning walks really helped me make sense out of the program – what it was based on and how it worked with students.” Another participant commented similarly about the learning walks when stating, “the walk-throughs should be kept going – these practices help us go deeper and be better administrators. It is our professional development and allows us to support teachers in a different way.” All four participants reported participating in the Learning Walks but there was no data collected that identified the expectations that they do so.

Attendance at Professional Development Events

This section reports on the data findings associated with subsidiary question 4: Which activities and to what extent, did staff participate in the professional development program offered to them? and associated guiding questions (a) What percent of invited staff participated in each professional development activities? (b) Which professional development activities had the greatest attendance rates? and (c) Which professional development activities had the least attendance rates?

Background

As stated in the district’s Mathematics Strategic Plan, Professional Development and Collaboration is “the ongoing processes that ensure that all teachers have the skills and knowledge to effectively deliver the curriculum, instruction and assessment within effectively managed classrooms.” (School District of the City of Erie Mathematics Work Study Committee, 2008)

This data analysis section reports both quantitative and qualitative data on attendance at the professional development activities directly related to the implementation process of CMP2 during the 2009-2010 and 2010-2011 school years offered to teachers and principals. The data reflects information from document review and interview analysis.

Teachers. Specifically, this data reports on attendance by teachers at the grade specific Just-in-Time (JIT) trainings (see Table 1), the CMP2 Summer Institutes (SI) (see Table 2), and participation in job-embedded coaching during these same time frames.

Administrators. Specifically, this data reports on attendance by principals at Information Sessions, Learning Walks and attendance at teacher focused professional development opportunities (Sis, JITs and Job-embedded coaching).

Data Analysis Procedures For This Section. The data analyzed was limited by the teachers and administrators from the schools participating in this study, as well as the available documents and records provided by the SDCE. During site visits to the SDCE over the course of this study I collected a variety of district documents that recorded attendance at professional development activities during the time frame specified. It was important to include document data in this study since “documents corroborate your observations and interviews and thus make our findings more trustworthy” (Glesne, 1999, p. 58). The documents collected included: (a) attendance sign-in sheets, (b) spreadsheets summarizing attendance at professional development activities, and (c) individually completed feedback forms that included date and activity attended. When I received the documents they were

not organized in any consistent format and the same types of documents were not available for all professional development events. Examples of these inconsistencies and missing pieces include:

1. Summary spread sheets were not available for all JIT trainings reported on sign-in sheets.
2. No attendance records were provided for professional development events offered to administrators.
3. The numbers of teachers does not necessarily guarantee that they are the same teachers year to year.

All document data was compiled and organized by each individual professional development event in order to determine if attendance at the same event was being recorded twice based on sign-in sheets, teacher feedback forms, and summary spreadsheets. Then data pertaining only to the four participating schools was separated out for analysis of attendance at summer institutes and Just-in-Time trainings. This was possible because spreadsheets and sign-in sheets collected included the total number of people invited to the event and the name and school of attendees. Using the list of teachers from participating schools and the grade levels they teach, I was able to match attendance at specific trainings with schools and grade levels (see Tables 11 and 12) for the JIT trainings and SI. Using the number of people invited and the number of people who attended, a percentage of attendance for each professional development event reported (see Tables 11 and 12) was determined. Finally, I went back and reviewed all audio transcriptions for pertinent qualitative data on attendance at professional development activities.

Findings

Guiding question 4a:

What percent of invited staff participated in each professional development activities?

Teachers. *Just-in-Time (JIT) trainings.* Table 11 summarizes participating teachers' attendance data at all JIT trainings offered during the 2 year period in grades 6-8. For each of these 34 professional development events reported the information about the number of people invited (175) and the number that attended (145) are provided. Those two numbers were used to obtain a percentage of attendance for each individual event. When looking at percentages of attendance in this way, 22 of the 34 professional development events reported had attendance percentages of 76% or higher. Sixteen of the 22 events in this category had 100% attendance by invited teachers. The lowest percentage of attendance reported was 28% and only four events reported attendance below 51%. An average percentage score for attendance at JIT events is 83% when dividing the total percentages by the number of events.

Summer Institute (SI) trainings. Table 12 summarizes participating teachers' attendance data at all SI trainings offered during the 2 year period in grades 6-8. For each of these 10 professional development events reported the information about the number of people that attended (112) and the number invited (116) are provided. Those two numbers were used to obtain a percentage of attendance for each individual event. When looking at percentages of attendance in this way, all 10 of the professional development events reported had attendance percentages of 76% or higher. Eight of the 10 events in this category had 100%

attendance by invited teachers. The lowest percentage of attendance reported was 83% at two of the events. An average percentage score for attendance at SI events is 97% when dividing the total percentages by the number of events.

Job-embedded Coaching. No hard data was collected by the district on teacher participation in one-on-one or small group coaching with either the district math coach or the external consultant. However, both the Mathematics Coordinator and the Math Coach commented on teacher participation in coaching opportunities during their one-on-one interviews. When asked during the interview how much did teachers take advantage of the one-on-one coaching opportunity, the Mathematics Coordinator replied, "I would say about two thirds of the teachers took advantage of the coaching professional development." When asked the same question the Math Coach responded similarly saying, "1/3 of the teachers are fully on board and take advantage of all professional development opportunities, one third of the teachers are doing what they need to do to make it work and implement the program and some of them ask for coaching, and one third of the teachers are adamantly opposed to it." While not explicitly saying so, the Math Coach indicated that about two thirds of the teachers were involved in some form of the coaching element of the professional development plan.

Administrators. No district document data was provided to describe or record attendance by principals at professional development events offered to them. During the principal focus group all of the principals self-reported about their attendance at professional development events. In addition to previously stated

comments in this chapter by principals, examples of these self-reports from the transcription of the principal focus group audio file included:

- “I have been able to take more advantage of opportunities to learn about it (CMP2) and feel more comfortable...,”
- “Seeing it (CMP2) in action (during learning walks) has made me understand it and recognize what should be happening in classrooms,” and
- “... going into classrooms and doing the learning walks really helped me...”

These comments indicate the principals’ referred to their own presence at particular professional development events. While indicating attendance at professional development opportunities, these comments provide no insight into how frequently they attended such opportunities.

Guiding question 4b:

Which professional development activities had the greatest attendance rates?

The SI trainings recorded higher percentage rates of attendance overall with an average attendance rate of 97%. Attendance at more than half the JIT trainings was 92% or higher – one at 92% and 16 at 100%. No data was collected to inform similar summary statements for job-embedded coaching for teachers or the principals’ professional development events.

Which professional development activities had the least attendance rates?

One of the JIT trainings (Stretching and Shrinking) reported the lowest level of attendance at 28% one of the times it was offered. In total five out of the 34 JIT trainings offered reported attendance percentages between 26% and 50%. No data

was collected to inform similar summary statements for job-embedded coaching for teachers or any of the principal professional development events.

Table 11: Attendance at Just in Time Trainings 2009-2011 by Participating Teachers – refer to page 69 for additional descriptive detail
Key: Number of actual participants/Number of invited participants = 145/175
Percentage of all invited who actually attended = 83%

| CMP2 Mix | | 8 th Grade | | 7 th Grade | | 6 th Grade | | Just in Time Trainings – Session Titles represent the content in each upcoming unit of study | |
|----------|-------------|-----------------------|------------------|-----------------------|------------------|-----------------------|------------------|---|---------------------------|
| 2010-11 | 2009-10 | 2010-11 | 2009-10 | 2010-11 | 2009-10 | 2010-11 | 2009-10 | | |
| | | | | | | | 7 5 / | 3 / | Prime Time |
| 100% | 1 / 1 | | | | 4 3 / % | 3 / 7 | | | Variables & Patterns |
| 100% | 1 / 1 | | 2 8 / % | 2 / 7 | 6 / 6 | | | | Moving Straight Ahead |
| | | | | 1 0 / 0 | 1 / 1 | 2 8 / % | 2 / 7 | | Stretching & Shrinking |
| | | | | | | | 5 0 / 0 | 2 / 7 | Bits & Pieces I |
| | | | | | 6 4 / % | 9 / 7 | | | Comparing & Scaling |
| | | | | | | | 6 7 / 0 | 6 / 7 | Shapes & Designs |
| 100% | 1 / 1 | | 9 2 / % | 1 2 / % | | | | | Thinking w/ Math. Models |
| | | | 1 0 / 0 | 2 / 2 | | | | | PSSA Prep |
| | | | | | | | 1 0 / 0 | 7 / 7 | Bits & Pieces II |
| | | | 1 0 / 0 | 1 3 / % | | | | | Looking for Pythagoras |
| | | | | | | 6 7 / % | 2 / 7 | | Covering & Surrounding |
| | | | 8 3 / % | 5 / % | | 7 5 / % | 6 / % | 8 3 / % | CMP2 Technology Training |
| | | | 1 0 / 0 | 2 / 2 | | | | | Filling & Wrapping |
| | | 1 0 / 0 | 2 / 2 | 1 0 / 0 | 5 / 5 | | | | Growing, Growing, Growing |
| | | | | | | | 1 0 / 0 | 7 / 7 | About Us |
| 100% | 2 / 2 | | 1 0 / 0 | 4 / 4 | | | | | Frogs Fleas Painted Cubes |
| | | | 1 0 / 0 | 6 / 6 | | 1 0 / 0 | 6 / 6 | 1 0 / 0 | Curriculum Meeting |
| 80% | 4 / % | | | | | | | | Shapes of Algebra |
| | | | | 3 / % | 1 / % | | | | What Do You Expect? |
| | | 8 7 / % | 7 / % | | 6 7 / % | 4 / % | 8 0 / % | 4 / % | Doing Even Better |

Table 12: Attendance at Summer Institute Trainings 2009-2011 by Participating Teachers

Key: Number of actual participants/Number of invited participants = 112/116

Percentage of all invited who actually attended = 97%

| Summer Institute – * Focus on 4 Buildings | | Day 1 Summer Institute | Day 2 Summer Institute | Day 3 Summer Institute | Day 4 Summer Institute | Day 1 Summer Institute | Day 2 Summer Institute | Day 3 Summer Institute | Day 4 Summer Institute | Day 1 Summer Institute | Day 2 Summer Institute | Day 1 Summer Institute | Day 2 Summer Institute |
|--|---------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| CMP2 Mix | 2009-10 | 12/12 | 12/12 | 12/12 | 12/12 | 11/11 | 11/11 | 11/11 | 11/11 | | | | |
| | | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | | | | |
| | 2010-11 | | | | | | | | | 10/12 | 10/12 | | |
| | | | | | | | | | | 83% | 83% | | |

Self-Reported Staff Attitudes and Changes in Staff Attitudes about the Innovation

This section reports on data findings associated with Subsidiary Questions 2 and 3. Subsidiary question 2: What were the self-reported staff attitudes concerning the math innovation and the implementation process following year one of full implementation? And, the associated guiding questions: 2a: What were the self-reported staff attitudes about the different professional development activities? 2b: What were the self-reported attitudes about the math innovation? 2c: What were the self-reported attitudes about the implementation process of the math innovation? Subsidiary Question #3: What, if any, changes in attitudes were self-reported about the innovation following year one of full implementation?

Background

The impact of staff attitudes on the outcomes of implementation efforts for any innovation has been well documented in the literature (Christensen, 1997; Choi & Price, 2005; Evers et al., 2002;). In fact, Choi and Price (2005) found that a person's attitude toward the innovation had a positive, direct relationship to that individual's behaviors when implementing said innovation.

This data analysis section reports on the self-reported staff attitudes concerning three distinct aspects of this innovation implementation: (a) professional development activities, (b) CMP2 as the innovation, and (c) the implementation process, and, the self-reported changes in attitude about the innovation. The data reflects information gained from analyses of focus group and one-on-one interview transcripts and the researcher's annotated notes taken during the recorded sessions with participants.

Data analysis procedures for this section

An inductive analytic approach was used to examine the responses of teachers, principals, and central office staff (the math coach, the K-12 Coordinator of Mathematics and the Director of Curriculum & Instruction) regarding their attitudes about the implementation of CMP2. Inductive analysis begins with specific observations about the data and builds toward general patterns and themes. As Patton (2002) described, “categories or dimensions of analysis emerge from open-ended observations as the inquirer comes to understand patterns that exist in the phenomenon being investigated” (p. 56). Furthermore, this type of analysis approach allows themes and categories to emerge from patterns found in the current study without self-prophesizing in advance what those important themes and categories might be (Patton, 2002).

After transcribing the audiotapes recorded during focus groups and one-on-one interviews the coding process of sorting, reading, and rereading each transcript to get a general feel for the responses from each group or individual was completed. After this initial step, the strategies of convergence and divergence (Guba, 1978) were applied to the data sets. Convergence refers to the process of searching for recurring regularities in the data that reveal patterns and themes that were then sorted into categories and titled. Periodically throughout the coding process the strategy of divergence was also applied. Patton (2002) describes this as “fleshing out” the patterns and categories by stopping and rereading the full array of responses to ensure that: (a) all sources of information were exhausted, (b) redundancy did not exist within categories, and (c) clear, integrated regularities had

emerged (Patton, 2002). This data analysis method revealed a number of themes related to the self-reported staff attitudes, positive and negative, regarding the implementation of CMP2. The findings from this analysis were then organized into three groups for reporting purposes: teachers, principals, and central office personnel (the math coach, the K-12 Coordinator of Mathematics and the Director of Curriculum & Instruction) for each of the three guiding questions associated with subsidiary research question 2 and subsidiary research question 3. Themes and patterns for both positive and negative attitudes are included, as well as examples of participant responses recorded during focus groups and one-on-one interviews. Participant responses to their self-reported changes in attitude are summarized and recorded.

Findings

Teachers.

Subsidiary Question 2. What were the self-reported staff attitudes concerning the math innovation and the implementation process?

Teacher participants discussed their attitudes related to the professional development activities associated with implementing the CMP2 program, the CMP2 program as the innovation, and the district's implementation process. A variety of qualifiers and descriptors exemplified the positive and negative attitudes self-reported by individual participants. The inductive analysis process allowed the varied responses to each research question to be clustered into thematic categories related to expressions of positive attitudes and negative attitudes. Figure 2

provides a summary of the findings related to this question and detailed examples of the responses follow.

Guiding question 2a

What were the self-reported staff attitudes about the different professional development activities?

During teacher focus groups participants self-reported both positive and negative attitudes about the professional development activities associated with implementing the CMP2 program. This guiding question correlated with interview questions 6, 7, 8, 10, and 12 on the Focus Group Protocol for Teachers (see Table 5 and Appendix A for additional detail). Individual participants expressed a variety of qualifiers and descriptors explicating these positive and negative attitudes. The positive attitudes expressed by teachers about the professional development associated with the math innovation were attributed to one or more of three categorical explanations.

1. Professional development opportunities were well executed with many opportunities provided for participation. Teachers in all four focus groups expressed this finding in various ways. Sample responses included: "We had a lot of opportunities"; "But they offered a lot of trainings to make sure we got it"; "They took us out of class, made sure everyone had the books, and teach it again to make sure everyone got it"; "There were many trainings and workshops offered during the first year. There were also in-services, trainings, and workshops offered over the summer in preparation of adopting CMP2"; "... the district really, from my perspective, they went out of

Summary of Teachers' Responses to Research Question 2

FIGURE 2: Summary of teacher responses when asked about their attitudes concerning the implementation of CMP2

| | |
|---|---|
| <p>Positive</p> <ul style="list-style-type: none"> Professional development opportunities were well executed with many opportunities provided for participation Professional development activities allowed teachers to collaborate and learn new practices from colleagues Professional development activities empowered teachers with deeper mathematical understanding and content knowledge | <p>Negative</p> <ul style="list-style-type: none"> The lack of attention paid to the particular needs of special education teachers and how to make adaptations for their students in the planned professional development activities The perceived drop in the effectiveness of professional development activities during year 2 of implementation |
| <p>Positive</p> <ul style="list-style-type: none"> The math innovation provided a systematic, logical approach to teaching mathematics with provisions for differentiating instruction The math innovation supported an inquiry-based, problem solving approach with opportunities for hands-on learning experiences The math innovation led to positive changes in student behaviors and achievement outcomes The math innovation added to teachers' mathematical knowledge and confidence in their subject matter and teaching abilities | <p>Negative</p> <ul style="list-style-type: none"> The CMP2 program is not a good fit for special education students The CMP2 program does not build in enough student practice |
| <p>Positive</p> <ul style="list-style-type: none"> The district did a good job of preparing teachers and they felt ready for the change The district incorporated teacher input when making changes to the plan | <p>Negative</p> <ul style="list-style-type: none"> The implementation process did not take into account necessary adaptations for special education teachers and students |

their way to insure there was a lot of training”; “I felt, at least at the 7th grade level, when I started the school year, that I was as ready as I could be with a brand new program”; “The more professional development activities that were offered made the transitions to the new series much easier”; and, “I have been presented with many opportunities to develop, learn and grow in order to successfully teach my students”; “My honest opinion after the school year started...I was somewhat skeptical about how the new series was going to be successful long term. But, after receiving proper training with the first two modules, the CMP series and its set-up began to make more sense to me...”.

2. Professional development activities allowed teachers to collaborate and learn new practices from colleagues. This theme was expressed in all four focus groups multiple times with a variety of responses. Examples of these expressions include: “I also liked the opportunity, as the learning support teacher, to work side by side with the classroom teacher – we were bouncing ideas off each other, discussing problems, and before the school year even began we were working together”; “I get a lot from talking to other teachers. When we have PD days I gain the most knowledge, I benefit the most from talking to my colleagues, from talking to other 8th grade teachers from across the district”; “...we just started sharing how you are going to deliver this. We became very focused on the goals of the lesson”; “To be able to get new ideas and fresh innovative types of things to do is great. I wasn’t used to collaborating and working with other teachers”; “...once again it is working

with the other teachers that changes my attitude and keeps me motivated”; and, “But then we began talking to other teachers who had piloted the program and erring their first hand experience sort of alleviated my worries”.

3. Professional development activities empowered teachers with deeper mathematical understanding and content knowledge. Participants from all four focus groups indicated expressions of this positive attitude, including: “...I came into the classroom (for the training) thinking I kind of thought it was going to be everything I already knew, but the connections that it showed, I was really surprised to see the connections”; “...the math isn’t the hard part for me, but ‘why’ it works is. So it (CMP2) has increased my exposure and helped me understand how the years work together”; “Now I was making connections between the different relationships I had never seen before ...Now I understand why, I can see it, I can do it, I can show you four different ways to do it”; and, “It’s given me, as a math teacher, a better appreciation of learning styles and the way we look at various types of math issues and solving math problems.”

Two categories surfaced through data analysis that explained teachers’ negative attitudes about the professional development program for CMP2:

1. The lack of attention paid to the particular needs of special education teachers and how to make adaptations for their students in the planned professional development activities. Participants in each focus group expressed this theme repeatedly. Sample responses include: “ I was going

there with the notion that I would get training specific to my kids, that didn't happen"; "Adaptations in professional development for our special needs students didn't exist..."; "We are still trying to work with our special education department in adapting the assessments (during professional development)"; "The one thing that should have been done right off the bat (in professional development) was adaptations. A lot of schools are going to total inclusion which means all special education students are in the regular classrooms"; "I do not think there is enough special education materials that go along with it (CMP2)...there should have been more professional development for adapting materials"; and, "All the professional development was more geared toward regular education."

2. The perceived drop in the effectiveness of professional development activities during year 2 of implementation – This theme was expressed in each of the focus groups similarly. Sample responses of these expressions about year 2 professional development include: "...it's redundant and not only that, possibly pointless in some regards, it's wasting instructional time"; "...to sit there and do 50 problems you've already done – doesn't help me"; "...they did a nice job until the end and then it (professional development) seemed to fall off"; and, "Some of our most recent professional development doesn't do much for me, it seems to repeat the same information over and over again..."

Guiding question 2b

What were the self-reported staff attitudes about the math innovation?

Teacher focus groups discussed the math innovation program, CMP2, and participants self-reported both positive and negative attitudes. This guiding question correlated with interview questions 2, 7, 10, 11, 12, and 13 on the Focus Group Protocol for Teachers (see Table 5 and Appendix A for additional detail). Through inductive analysis the varied responses were clustered into four categories related to positive attitudes and two categories related to negative attitudes about CMP2.

The positive attitudes expressed by teachers about the math innovation were attributed to one or more of four categorical explanations:

1. The math innovation provided a systematic, logical approach to teaching mathematics with provisions for differentiating instruction. This theme was expressed multiple times in one focus group and singularly in a second group. These responses include: "It seems to have a logical flow, there's one (theme/concept) than another, than another. It's circular – it's very systematic"; "You know what's coming next - there's a logical progression"; "... it (CMP2) gives you a chance to go into different areas so that you can really reach them (students) and what they need"; "... there's a lot of flexibility for some students who don't have that mobility in the curriculum"; and, "This program allows for a lot of flexibility."
2. The math innovation supported an inquiry-based, problem solving approach with opportunities for hands-on learning experiences. Participants in each focus group expressed this theme. Sample responses include: "... it's a program that instills inquiry in the kids being taught"; "... the students work

collaboratively to solve problems”; “I still am very excited about the manipulatives - we use hands on items, they (students) can address concerns themselves, teach their peers”; “There’s a lot of flexibility so students can figure things out”; “The one thing I want to point out is the inquiry. There is not just one way to solve a problem and it is so neat ... having the kids share all those ideas. I think that is probably one of the biggest things they’ve gotten out of it”; “I enjoyed it from the moment I started teaching it because I liked the idea that it was inquiry based”; “The hands on was easier for my students because they could actually see the visual learning...they could pick things out and work with them”; “I like the fact that they (CMP2) had them (students) in groups and they could work together as a team”; and, “...instead of direct teaching, (CMP2 is) more hands on and engaging.”

3. The math innovation led to positive changes in student behaviors and achievement outcomes – Participants in all four focus groups indicated expressions of this positive attitude, including: “I have seen an improvement in ... the ways they are interacting with each other, and teaching each other”; “...it’s really nice to see the students stepping up and working together and helping each other understand the curriculum on their own level”; “I’ve seen a tremendous difference...where the tentative students in the beginning won’t ever want to say anything because they’re afraid they’re wrong...now they are the first ones to volunteer – they don’t care if they have a different answer... they see you not worried about it, I really like that aspect of the program”; “This math series has allowed my students to learn how to

cooperatively work with each other and share their individual strategies”; “I see a lot of merit in the ability of them to do things on their own”; “...students are working with each other in order to solve higher-order thinking skills”; “Students are beginning to develop and maintain cooperative learning skills”; “I like how it’s forcing kids to get a deeper understanding of certain ideas and math concepts”; “I like the investigations because the kids can actually see how we get to some things – they can all tell me about the Pythagoreum theory...”; and, “...for the kids, it goes without saying that this (approach) benefits them so much more than direct instruction.”

4. The math innovation added to teachers’ mathematical knowledge and confidence in their subject matter and teaching abilities. Here too, teachers in each focus group expressed this theme. Sample indicative responses include: “I’ve always felt extremely confident about my mathematical abilities ... I kind of thought it was going to be everything I already knew. But I didn’t know what I was doing ... now I am seeing how everything (the content) fits together”; “... (doing) the math isn’t the hard part for me, but why it works ... so it has increased my exposure and helped me understand”; “One of the things I’ve learned is to look at problems in a different way”; “CMP2 has completely changed my teaching style and my overall feeling about math itself.”; “My instruction is now less teacher directed and more student directed. I feel like my questioning skills have improved since we began implementing”; “...by teaching this particular math series it has allowed me to grow and develop new thoughts and methods in regard to the subject area

of math”; “I feel much more confident of my math skills and knowledge after teaching it (CMP2) for a couple of years”; “...the new math series, which overtime, I believe, has made me a better math teacher”; “...so they had to reteach me some of the content and I know exactly how they want it taught to the kids”; “CMP has changed my math instruction”; “I really didn’t understand it (math) until we started with CMP... Now I understand why, I can see it, I can do it, I can you show you four different ways to do it”; “...it shows me how much I have changed in 2 years. I have become a Connected Math teacher”; “Now we are more capable of doing it (CMP2) because we understand it. Now we are able to ask them (students) questions and help them figure it (the math) out for themselves”; “It’s all about intentionality ... we don’t question ourselves as much anymore because we are confident with ourselves and the decisions we are making”; and “...I wanted them (school leaders) to know how much I had grown and how now I truly understand what I am doing and should be doing to teach eighth grade math.”

Two categories emerged from analysis of teacher participants’ self-reported negative attitudes about the math innovation:

1. The CMP2 program is not a good fit for special education students. This expression of negative attitude was expressed repeatedly in all four focus groups. Sample responses include: “...my only concern with it, again because I work with students that struggle, was the amount of reading involved and for them to be able to interpret the questions and what exactly is it they’re being asked to do”; “...it’s difficult for the special education kids who have

learning difficulties to grasp concepts – let alone understanding the process”; “I worried about my special education students who excelled in math, but not language arts, and now they were going to struggle in math too”; “I think special education adaptations, materials and ideas are necessary for this program”; “I have to help some of the special education students with reading and reading comprehension. This series has a lot of reading with it”; “I have a pull out classroom of students that are all learning support and this CMP program is really tough for these kids”; “...for special education students it’s very frustrating for them because it’s a very intense program – and if they can’t get the basics, how do we expect them to get this work?”; “...some kids are still having so many difficulties – especially my special education students. I wish I could do more for them, and that is the only issue I still have with the program”; and, “Adaptations for our special needs students really didn’t exist and I think we are still trying to work with our special education department in adapting our assessments, specifically.”

2. The CMP2 program does not build in enough student practice. Sample responses of this negative expression include: “The first thing is not enough practice...they (students) don’t get enough practice of the concept and that, it seemed, would have helped”; “...we could give more practice during our time with kids to drill and be sure they get it”; and, “There’s a lot of pitfalls and a lot of things to be improved on to assess students and more practice for those students who need that repetition.”

Guiding question 2c

What were the self-reported staff attitudes about the implementation process of the math innovation?

The implementation plan and process were discussed during teacher focus groups and here too, participants self-reported both positive and negative attitudes. This guiding question correlated with interview questions 2, 4, 6, 8, 9, 10, and 13 on the Focus Group Protocol for Teachers (see Table 5 and Appendix A for additional detail). Following the same process outlined above, participant responses were clustered into like categories related to self-reported positive and negative attitudes about the implementation process for CMP2.

The positive attitudes expressed by teachers about the implementation process were attributed to one or both of two categorical explanations:.

1. The district did a good job of preparing teachers and they felt ready for the change. This theme, also expressed in the discussion of the professional development program, was voiced in each of the focus groups. Sample responses include: "...so I felt very well prepared to start it with my kids"; "I felt ... when I started the school year, that I was as ready as I could be with a brand new program"; "...the district, really from my perspective, went out of their way to insure there was a lot of training"; "I taught 7th grade...I felt very prepared"; "it was nice to have the district support the program in such regards that they were a 100% behind it and were willing to give you everything"; "...I witnessed firsthand the steps the district took in preparing, developing and implementing the new CMP2 series. I would have to say all the steps were taken in order for the district to achieve the best results

possible”; “I think they (the school district) did a really good job preparing us”; and, “Change is inevitable and you have to move forward and do it with a 100% and I think they (the district) did a good job of doing that.”

2. The district incorporated teacher input when making changes to the plan.

Sample responses descriptive of this theme include: “At the beginning of introducing CMP district teachers had the opportunity to be part of the implementation team”; “... there was a lot of room for discussion and teacher input”; “they (the school district) made a lot of changes in those nine months (due to teacher input after year 1)”; “...at the same time we would talk about what we thought would work or not and be able to tweak the general worksheets...”; and, “I believe they are really taking our opinions to heart and I think they really matter because we are on the front line doing the work and that is a good feeling.”

One, recurring, theme explaining teachers’ negative attitudes about the implementation process emerged from analysis of participants’ responses.

1. The implementation process did not take into account necessary adaptations for special education teachers and students. Indicative responses to this recurring theme, also expressed earlier in this analysis, include: “I get kids who have so many issues and roadblocks in their way to higher level thinking – after an entire year they are still stuck”; “...they (the school district) did a really good job of preparing us, however, I do not think that there is enough special education materials that go along with it. I think there should have been more professional development for adapting materials”; and, “I wish

our district would have had examples of adaptation and materials ready for us.”

Subsidiary Question 3. What, if any, changes in attitudes were self-reported about the innovation?

During teacher focus groups participants were asked if their attitude about the innovation had changed, and if so, why? This research question correlated with interview questions 2, 5, 10, 11, 12, and 13 on the Focus Group Protocol for Teachers (see Table 5 and Appendix A for additional detail).

Nine people reported a change in attitude from when the innovation was first introduced and the time of data collection 2 years later for this research study.

Figure 3 provides a summary of how teachers responded.

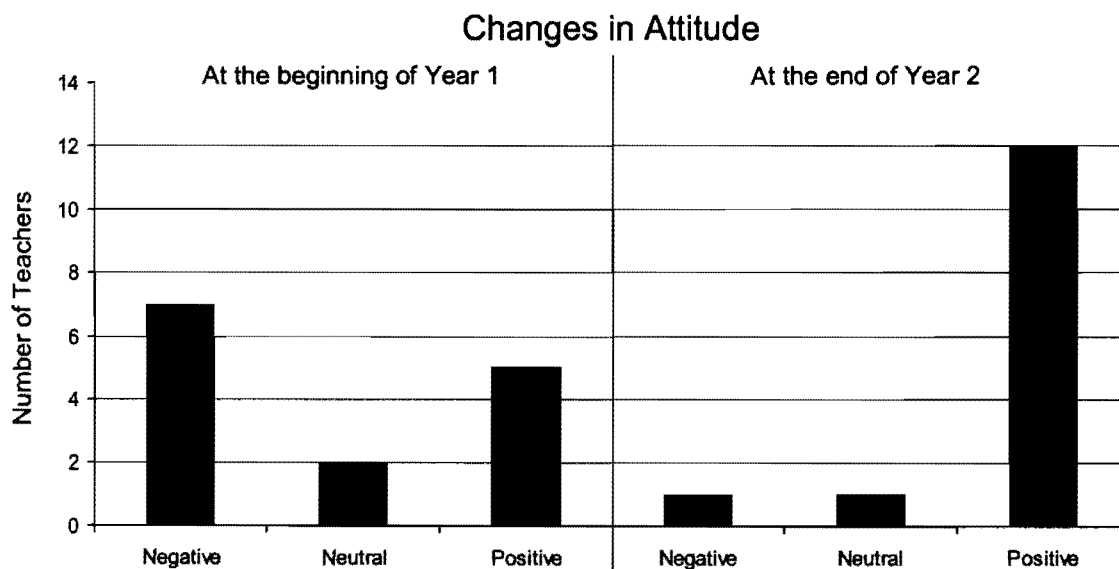


Figure 3. Self-reported attitudes. This graph depicts the breakdown of teacher responses when asked if their attitude toward the math innovation had changed from the end of year one to the end of year two.

Administrators

Subsidiary Question 2. What were the self-reported staff attitudes concerning the math innovation and the implementation process?

Principal participants discussed their attitudes related to the professional development activities associated with implementing the CMP2 program, the CMP2 program as the innovation, and the district's implementation process. A variety of qualifiers and descriptors exemplified the positive and negative attitudes self-reported by individual participants. The inductive analysis process allowed the varied responses to each research question to be clustered into thematic categories related to expressions of positive attitudes and negative attitudes. Figure 4 provides a summary of the findings related to this question and detailed examples of principal responses follow.

Guiding question 2a

What were the self-reported staff attitudes about the different professional development activities?

Professional development activities associated with implementing the CMP2 program were discussed during the principal focus group and participants' responses were analyzed using the inductive analysis process. This guiding question correlated with interview questions 6, 7, 10, and 15 on the Focus Group Protocol for Principals (see Table 7 and Appendix A for additional detail). Like the analysis of teacher responses, a variety of qualifiers and descriptors exemplified the positive attitudes expressed by individual principal participants. The inductive analysis process allowed the varied responses to be clustered into four categories

related to positive attitudes concerning the professional development program for CMP2. Participants in this group did not report negative attitudes about the professional development activities associated with the math innovation.

The positive attitudes about the professional development plan expressed by principals were attributed to one or more of three categorical explanations.

1. The professional development plan provided many and varied opportunities for participation. This theme was explicated in a variety of expressions during the focus group by all of the participants. Sample responses include: "...when it went to full adoption, I would say quite a bit - I think our support for that and the implementation were pretty strong"; "We were invited to attend all the professional development that teachers were receiving"; "Even though I am not teaching CMP2, seeing it in action has made me understand it and recognize what should be happening in classrooms"; "This year I have been able to take more advantage of opportunities to learn more about it (CMP2) and feel more comfortable with the expectations of the program"; and, "...it was important for me to see what it looked like in the classroom. And I was able to see that through the professional development (activities)."
2. The plan included onsite professional development opportunities delivered by experts from the program publisher. Sample responses descriptive of this theme include: "The key part of that (professional development) for me and what made the most sense involved having a coach from the program

Summary of Principals' Responses to Research Question2

| Summary of Principals' Responses to Research Question2 | |
|---|---|
| Positive <ul style="list-style-type: none"> • The professional development plan provided many and varied opportunities for participation • The plan included onsite professional development opportunities delivered by experts from the program publisher • The professional development opportunities provided school leaders with tools and protocols they could then use with their teachers in their buildings | Negative |
| Positive <ul style="list-style-type: none"> • The CMP2 program calls for higher expectations of students regardless of ability level • The CMP2 program demands a different approach to teaching mathematics | Negative <ul style="list-style-type: none"> • The required paradigm shift for implementing CMP2 was a challenge for many teachers |
| Neutral <ul style="list-style-type: none"> • Implementation and fidelity to CMP2 is varied and inconsistent | |

Figure 4. This figure provides a summary of the themes that emerged from the recorded responses of principals.

come and work in our schools in our classrooms”; “...the program consultant coach would come for a school session”; and, “It was very helpful to have someone come and oversee the implementation.”

3. The professional development opportunities provided school leaders with tools and protocols they could then use with their teachers in their buildings. This theme is evidenced in the following sample response, which received the nonverbal agreement of the others in the group: “It (the professional development) also provided us with protocols we could use in our building during PLCs.”

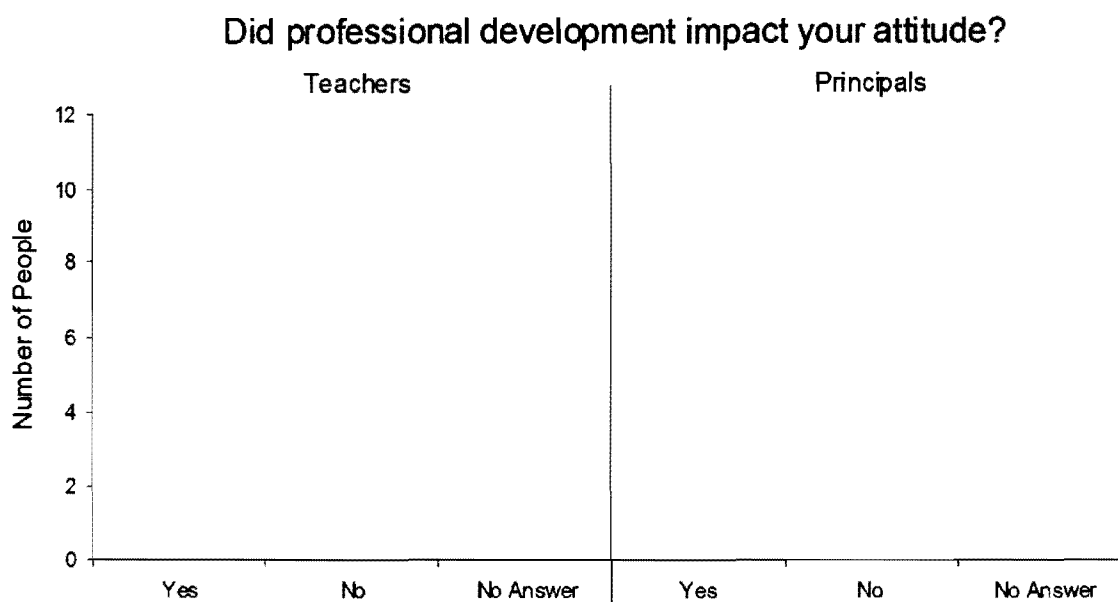


Figure 5. Professional Development and Attitudes. This graph depicts a breakdown of the responses from the teacher and principal participants when asked if professional development experiences impacted their attitude about the math innovation.

Guiding question 2b

What were the self-reported staff attitudes about the math innovation?

Participating principals self-reported positive and negative attitudes about the CMP2 program during the focus group guided discussion. This guiding question correlated with interview questions 2, 4, 8, 9, 12, 13, 16, and 17 on the Focus Group

Protocol for Principals (see Table 7 and Appendix A for additional detail). Two categories emerged from the inductive analysis that described and explained the positive attitudes reported by principals and one category surfaced explaining the negative attitudes expressed.

The positive attitudes expressed by principals about the math innovation are attributed to one or both of two categories.

1. The CMP2 program calls for higher expectations of students regardless of ability level – This theme was expressed by all four participants in varied ways, multiple times. Sample responses include: “...the expectations for students could be high ... with the CMP materials being used”; “...it pushes us, perhaps, beyond our beliefs about what kids can do and what we have in the past expected of the kids we serve”; “...doing the program on a daily basis, we can see evidence of higher expectations for students”; and, “We are really asking for more than a program change, it’s more like a strategy change and a change in expectations (for students).”
2. The CMP2 program demands a different approach to teaching mathematics. This theme was also expressed by all participants and sample responses include: “I think of the potential and the opportunities for the type and quality of teaching and research based curriculum that CMP has”; “...it has been really interesting to watch over these past three years the changes in their (math) teaching”; “...it is, in fact, not optional. It is the way we teach mathematics – to have some large, whole group and some small group work in every lesson”; and, “...math instruction ... means having the teacher up

working with those kids who are struggling, or those who need additional enrichment, while those students who are able, continue to work independent of the teacher.”

One category emerged in the analysis process connected to the negative attitudes expressed by principals about the math innovation.

1. The required paradigm shift for implementing CMP2 was a challenge for many teachers. All participants concurred with this theme. Sample indicative responses include: “I think there was a fear of having to rethink what I (teacher) am an expert in” and “...it (CMP2) is a hurdle for the staff - ...has not been as easy for the staff as they thought it would be and ... they are having a tougher time.”

Guiding question 2c

What were the self-reported staff attitudes about the implementation process of the math innovation?

This guiding question correlated with interview questions 2, 4, 5, 8, 9, 10, 11, 12, 16, and 17 on the Focus Group Protocol for Principals (see Table 7 and Appendix A for additional detail). When asked to focus on the implementation process, separate from the program per se, principals responded similarly around one common theme with a neutral quality.

- Implementation and fidelity to CMP2 is varied and inconsistent. All participants expressed this theme multiple times in varied ways. Sample responses include: “The first thing I think of is varied implementation to be honest. We have three grades implementing the CMP work, and in one of the

grade levels I would we have pretty consistent implementation as far as fidelity... Another grade level is more sporadic in the implementation"; "I think the first thing that comes to mind is also varied implementation. Part of that has to do with classroom practice and classroom implementation"; "...there is still a long way to go with differentiation, so I wonder where are we with implementing the program with fidelity"; "I would say also that it is varied, we have some folks who are really giving it there all..."; "...and we don't have, from where I am coming from, everybody on that continuum (of implementation) at the same place, I am not sure quite frankly, that everyone is even on the continuum"; "Another reason I say we have varied implementation comes from the requests for support"; and, "... (some teachers) are really just "doing it" (CMP2) – but not with the meaning that is behind it."

Subsidiary Question 3. What, if any, changes in attitudes were self-reported about the innovation?

During the principal focus group participants were asked if their attitude about the innovation had changed, and if so, why? This research question correlated with interview questions 4, 5, 13, 14, 16, and 17 on the Focus Group Protocol for Principals (see Table 7 and Appendix A for additional detail).

One principal reported a change in attitude from when the innovation was first introduced and the time of data collection for this research study 2 years later. Figure 6 provides a summary of how principals responded.

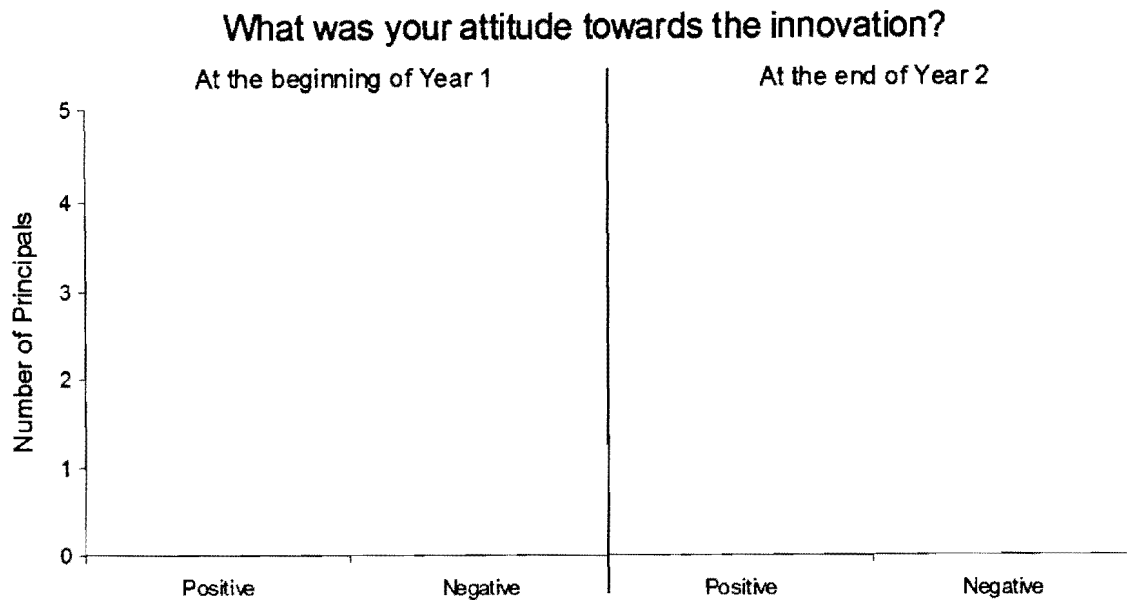


Figure 6. Self-reported attitudes. This graph depicts the breakdown of principal responses when asked about their attitude toward the math innovation

It is interesting to note the specific responses made by participants concerning changes in attitude about the innovation implementation. The principal participant who indicated a change in attitude based it more on her anxiety related to her knowledge base in mathematics when she responded, "...now here was one more thing I knew nothing about and I knew I had to get up to speed quickly on ... the expectations of CMP2. But again for me, though, I am glad for it now". A second participant self-reported her attitude as positive at the start of the implementation process and still positive at the time of the data collection for this study. This participant also make it clear that her positive attitude about implementing a new math program remained unchanged, however, she pointed out that her feelings about CMP2 were not positive, "I would have to say my attitude hasn't changed much – I was excited we were changing, but not thrilled with our selection. And I still

feel that way.” The two remaining principal participants reflected their unchanged attitudes about the innovation implementation in these sample responses: “...walking in and out of classrooms and seeing the different kinds of conversations students are having is very exciting. So I was positive and I continue to be positive about the adoption”; and, “It is encouraging to me that teachers, for the most part, are embracing it (CMP2) and feeling it is worth their investment. So I started with a positive attitude and I continue with a positive attitude.”

Central Office Staff

Subsidiary Question 2. What were the self-reported staff attitudes concerning the math innovation and the implementation process?

The three central office staff participants discussed their attitudes related to the professional development activities associated with implementing the CMP2 program, the CMP2 program as the innovation, and the district’s implementation process during one-on-one interviews. The inductive analysis process allowed the varied responses participants provided to be clustered into thematic categories related to expressions of positive attitudes and negative attitudes. Each of the three participants holds a different position in the district making it more useful to report each set of findings individually by position. Common themes and patterns shared by all three are commented on in a summary at the end of this section. Figure 7 provides a summary of the findings related to this question and detailed examples of central office staff responses follow

| Positive | Negative |
|--|--|
| Math Coach: <ul style="list-style-type: none"> • The professional development activities were well-planned and executed with strong trainers • The professional development activities increased teacher content knowledge • The professional development program provided opportunities for teachers to learn from each other | <ul style="list-style-type: none"> • The district should have done more “up front” to prepare teachers for the change that would be required by implementing CMP2 |
| Coordinator of Mathematics: <ul style="list-style-type: none"> • The plan for professional development plan was very strategic • Input from pilot teachers was used to inform and adapt professional development before the full implementation process rolled out. | |
| Director of Curriculum and Instruction: <ul style="list-style-type: none"> • The professional development was unique for the district and set a new standard • The professional development activities were helping to change the professional learning culture in the district | <ul style="list-style-type: none"> • Not enough attention was paid to the needs of special education teachers implementing CMP2 |
| Positive | Negative |
| Math Coach: <ul style="list-style-type: none"> • CMP2 provided a more rigorous course of study • Allowed for differentiated instruction. | <ul style="list-style-type: none"> • The pacing guide was too aggressive for a diverse group of learners. |
| Coordinator of Mathematics: <ul style="list-style-type: none"> • CMP2 offered a new way of teaching math focused on inquiry and problem • The math innovation provided opportunities for students to learn math more deeply • CMP2 focused on the processes of mathematics and the ability to communicate one’s understanding | |
| Director of Curriculum and Instruction: <ul style="list-style-type: none"> • CMP2 was changing the way students thought about mathematics • CMP2 was changing the way teachers taught mathematics | |

Summary of Central Office Staffs’ Response to Question2

Summary of Central Office Staffs' Response to Research Question2 (continued)

| Positive | Negative |
|--|---|
| Math Coach: <ul style="list-style-type: none"> Teachers were involved in the process from the beginning There was a plan for getting ready for the implementation. | <ul style="list-style-type: none"> There was a persistent lack of principal support for the expectations of the implementation process There was not enough time up front to learn about the program before implementing in classrooms Additional coaching support was needed once implementation in classrooms started Implementation support was not differentiated based on need |
| Coordinator of Mathematics <ul style="list-style-type: none"> The implementation plan was strategic, systemic and responsive Initial implementation was very successful with teachers using materials 100% of the instructional time with students. | <ul style="list-style-type: none"> There was not enough central office support for the implementation process The district did not do a good job of communicating with parents about the implementation of CMP2 The plan for implementation did not prove to be detailed enough for the process needed |
| Director of Curriculum and Instruction: <ul style="list-style-type: none"> The implementation process was thoughtful and deliberate starting with the Math Work Study Committee This type of implementation process had not previously occurred in the district | <ul style="list-style-type: none"> There was a lack of principal support for the implementation process |

Figure 7. Summary of Responses -- This figure provided a summary of the themes that emerged from the recorded responses of central office staff to research question 2.

Guiding question 2a

What were the self-reported staff attitudes about the different professional development activities?

Math coach. This guiding question correlated with interview questions 4, 6, 9, 10, and 13 on the Interview Protocol for the math coach (see Table 8 and Appendix A for additional detail). The math coach expressed both positive and negative attitudes about the professional development program. The positive expressions included:

1. the professional development activities were well-planned and executed with strong trainers,
2. the professional development activities increased teacher content knowledge, and
3. the professional development program provided opportunities for teachers to learn from each other.

The math coach expressed one negative attitude about the professional development program: Not enough attention was paid to the needs of special education teachers implementing CMP2.

K-12 Mathematics Coordinator. This guiding question correlated with interview questions 7, 9, 10, and 14 on the Interview Protocol for this central office staff participant (see Table 9 and Appendix A for additional detail). The math coordinator expressed two themes indicative of a positive attitude about the professional development program:

1. The plan for professional development plan was very strategic

2. Input from pilot teachers was used to inform and adapt professional development before the full implementation process rolled out.

This participant did not report any negative attitudes about the professional development program.

Director of Curriculum and Instruction. This guiding question correlated with interview questions 7, 8, 9, and 12 on the Interview Protocol for the Director of C&I (see Table 10 and Appendix A for additional detail). The director's positive attitudes about the professional development program were attributed to two categories expressed through her response.

1. The professional development was unique for the district and set a new standard
2. The professional development activities were helping to change the professional learning culture in the district.

This participant expressed one negative attitude about the professional development program: The district should have done more "up front" to prepare teachers for the change that would be required by implementing CMP2.

Guiding Question 2b

What were the self-reported staff attitudes about the math innovation?

Math coach. This guiding question correlated with interview questions 2, 7, 10, and 12 on the Interview Protocol for the math coach (see Table 8 and Appendix A for additional detail). The math coach expressed both positive and negative attitudes about the CMP2 program. The positive expressions included:

1. CMP2 provided a more rigorous course of study, and

2. allowed for differentiated instruction.

The math coach provided one negative expression regarding the CMP2 program:

The pacing guide was too aggressive for a diverse group of learners.

K-12 Mathematics Coordinator. This guiding question correlated with interview questions 2, 6, 9, 10, and 13 on the Interview Protocol for the math coordinator (see Table 9 and Appendix A for additional detail). The math coordinator expressed only positive attitudes about the CMP2 program. These positive expressions included:

1. CMP2 offered a new way of teaching math focused on inquiry and problem
2. The math innovation provided opportunities for students to learn math more deeply.
3. CMP2 focused on the processes of mathematics and the ability to communicate one's understanding.

Director of Curriculum and Instruction. This guiding question correlated with interview questions 2, 7, 9, 12, and 13 on the Interview Protocol for the Director of C&I (see Table 10 and Appendix A for additional detail). The director expressed only positive attitudes about the CMP2 program. These positive expressions included:

1. CMP2 was changing the way students thought about mathematics
2. CMP2 was changing the way teachers taught mathematics.

Guiding question 2c

What were the self-reported staff attitudes about the implementation process of the math innovation?

Math Coach. This guiding question correlated with interview questions 2, 5, 7, 8, 9, 10, and 12 on the Interview Protocol for the math coach (see Table 8 and Appendix A for additional detail). The math coach expressed both positive and negative attitudes about the implementation process of the CMP2 program. The positive expressions included:

1. Teachers were involved in the process from the beginning
2. There was a plan for getting ready for the implementation.

The math coach provided four negative expressions regarding the CMP2 program:

1. There was a persistent lack of principal support for the expectations of the implementation process
2. There was not enough time up front to learn about the program before implementing in classrooms
3. Additional coaching support was needed once implementation in classrooms started
4. Implementation support was not differentiated based on need

K-12 Mathematics Coordinator. This guiding question correlated with interview questions 2, 4, 9, 10, 11, 12, and 14 on the Interview Protocol for the math coordinator (see Table 9 and Appendix A for additional detail). The math coordinator expressed both positive and negative attitudes about the implementation process of the CMP2 program. The positive expressions included:

1. The implementation plan was strategic, systemic and responsive.
2. Initial implementation was very successful with teachers using materials 100% of the instructional time with students.

The math coordinator provided three negative expressions regarding the implementation process of the CMP2 program:

1. There was not enough central office support for the implementation process
2. The district did not do a good job of communicating with parents about the implementation of CMP2
3. The plan for implementation did not prove to be detailed enough for the process needed.

Director of Curriculum and Instruction. This guiding question correlated with interview questions 2, 7, 9, 10, 11, and 13 on the Interview Protocol for the Director of C&I (see Table 10 and Appendix A for additional detail). The director expressed both positive and negative attitudes about the implementation process of the CMP2 program. The positive expressions included:

1. The implementation process was thoughtful and deliberate starting with the Math Work Study Committee.
2. A strategic implementation process had not previously occurred in the district.

The math coordinator provided one negative expression regarding the implementation process of the CMP2 program: There was a lack of principal support for the implementation process.

Subsidiary Question 3. What, if any, changes in attitudes were self-reported about the innovation?

During one-on-one interviews central office staff participants were asked if their attitude about the innovation had changed, and if so, why? This research question correlated with the following interview questions:

- Math coach – questions 2, 5, 8, 12, 16, and 17 on the Interview Protocol for the math coach (see Table 8 and Appendix A for additional detail);
- Math Coordinator – questions 2, 4, and 11 on the Interview Protocol for the math coordinator (see Table 9 and Appendix A for additional detail); and
- Director of C & I – questions 2, 4, and 10 on the Interview Protocol for the Director of C & I (see Table 10 and Appendix A for additional detail).

One participant in this group reported a change in attitude about the math innovation from the beginning of the implementation process to the time of data collection for this study. Regarding her attitude about the math innovation at the onset of implementation she stated, “At first I had some trepidation – you know the old program was very easy to teach...this was going to be hard.” In the same interview, the coach also stated, “I think it (implementing CMP2) has been the best decision our district has made regarding mathematics. Both the K-12 Mathematics Coordinator and the Director of C and I reported positive attitudes about the math innovation at the beginning of the implementation and still so at the time of data collection.

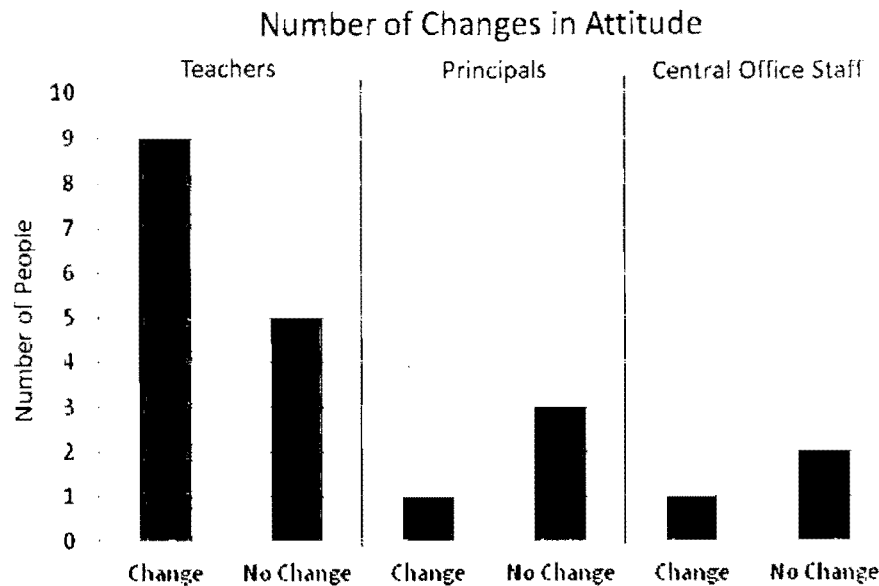


Figure 8. Changes in attitudes. This chart depicts the breakdown of responses from teachers, principals and central office staff when asked about a change in their attitude toward the math innovation.

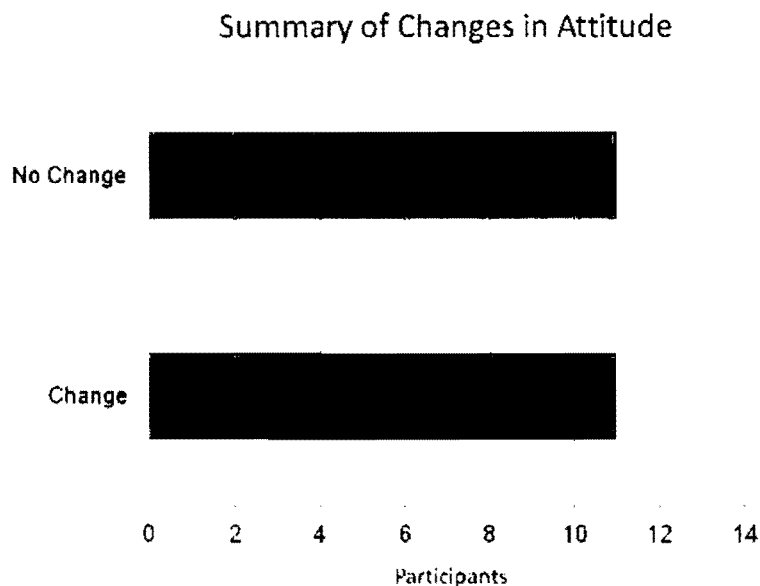


Figure 9. Changes in Attitude – This figure illustrates the total number of changes in participants attitudes about the innovation

Summary

The data collected from teachers, school administrators, central office staff, district archives, and district and state databases were analyzed through the use of qualitative research protocols (Krueger & Casey, 2009). As a result of the inductive

analysis process applied, common themes and patterns expressed by participants were identified and recorded. Document organization and review provided information about district context and the implementation process.

The school district under study included a robust standards-based professional development program to support the implementation of a math innovation. The analysis of self-reported attitudes about the professional development program and the implementation process of CMP2 indicate an influence of these two factors on each other among teachers and central office staff who participated in this study. Chapter V provides a summary of the research findings, including common themes that emerged from the participating groups and discussion of possible implications.

Chapter V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

This research inquiry sought to deepen understandings of persistent disappointing outcomes educational organizations face when implementing innovations in their schools. Specifically, the researcher studied the professional development program and self-reported staff attitudes associated with the implementation of CMP2, a middle school mathematics innovation, in order to address the primary research question: How, if at all, does participation in the professional development program associated with the Connected Math Project 2 (CMP2) influence staff attitudes on implementation activities?

Selected teachers and principals, the district mathematics coach, the K-12 Coordinator of Mathematics, and the Director of K-12 Curriculum and Instruction participated in the study.

This chapter assists educational leaders in the implementation of innovations in their states, districts, and schools. To accomplish this goal, this chapter provides: a summary of the research findings, common themes among the participating groups, conclusions that align with the four guiding questions of the study, and recommendations to the school district under study. Finally this chapter outlines future research topics and contributes to existing data on the topic.

Summary of the Findings

Analyses of the data collected indicates an influential relationship between the two factors of innovation implementation studied, professional development

program activities associated with the innovation and self-reported attitudes of staff about the implementation of the innovation. The professional development program was studied through a document review process and analyses of transcripts recorded during focus groups and one-on-one interviews. Several overarching themes emerged from the inductive analysis process regarding the professional development plan and staff attitudes about it. These themes are explored further in the next section of this chapter.

Two other aspects of the innovation implementation were also studied and are reported on: CMP2 as the math innovation and the implementation process to date. Here also the inductive analysis process allowed common patterns and themes to emerge from the data collected from the three groups studied. The common themes are described in detail in the section of this chapter labeled Staff Attitudes about the Innovation Implementation.

Teachers, principals, and central office staff participating in this study provided responses indicative of these common themes. Twenty-two staff members participated in this study. Twenty reported positive attitudes about the innovation at the time of data collection. Those who expressed explanations for their positive attitudes all mentioned the positive student behaviors and outcomes they observed in classrooms implementing CMP2. Participants did not report a direct correlation to student outcomes and their own attitudes, but did provide multiple expressions during data collection about the opportunities they were given in professional development to increase their content and pedagogical knowledge. Principal participants all reported observing evidence of these changes in classroom practice.

These findings are consistent with those of Guskey (2002) and Gatt (2009), who identified the primary motivation for change in teacher attitudes to be the evidence of improvements in student learning. Guskey's change model (2002) identifies the role of professional development in changing teachers' skills and classroom practice, which in turn leads to changes in student behaviors and learning outcomes, which in turn motivates teachers to a positive attitude about the innovation. These research findings raise an important consideration about Guskey's framework. As Guskey maintains, participants in this study indicated involvement in professional development activities prepared them to implement CMP2 with a level of effectiveness that resulted in increased student outcomes. It could be hard for teachers to sustain enthusiasm when professional development opportunities fall off without ongoing and reliable measures of how students are continuing to achieve. A system of formative assessments administered at important benchmark moments throughout the year would provide teachers with ongoing indicators of student performance based on reliable measures aligned with program expectations and Common Core State Standards. These concrete demonstrations of student outcomes would support the cycle of attitude development inherent in Guskey's theoretical framework.

The Professional Development Program

The district under study developed a standards-based, comprehensive plan to support the professional learning of staff members involved with implementing the innovation. Analysis of district documents and interview transcripts depicts the development of a strategic plan for professional development (PD) that was guided

by national standards and informed by the work of the MWSC. As a result, the professional development program to support the implementation of CMP2 was a system of “diverse processes and on-going activities that ensure all teachers have the skills and knowledge to effectively deliver highly effective mathematics content, instruction and assessment within well managed classrooms.” (School District of the City of Erie Mathematics Work Study Committee, 2008) This document review also indicated high levels of participation at all district sponsored PD events and activities. (Refer to Tables 11 and 12 for additional detail.) The only exception to this finding was the percentage of teachers who participated in the embedded coaching model. In this case, both the Coordinator of Math and the math coach reported low levels of teacher participation.

Professional development activities were discussed in focus groups and interviews with participants in all three sample groups, teachers, principals and central office staff. In all instances, expressions of positive attitudes about the PD program out-weighed negative expressions. In fact, principals and the K-12 Coordinator of Mathematics recorded no negative expressions about the PD program. Overall, there were twice as many positive themes recorded.

Six common themes were attributed to the positive attitudes expressed by participants:

1. Professional development activities associated with the innovation were well planned and executed with many opportunities for participation.
2. Professional development activities were enhanced by onsite visits from experts provided by the publisher.

3. Professional development activities allowed teachers to collaborate and learn from each other.
4. Professional development program increased staff content knowledge, understanding and practice effectiveness leading to greater confidence.
5. Professional development opportunities provided school leaders with tools and protocols they could use again with teachers in their buildings.
6. Input from teachers was valued and used to adjust the professional development plan the next year.

Three common themes expressed by participants reflecting a negative attitude about the professional development program.

1. The professional development plan did not provide enough support, modifications and adaptations for special education teachers and students they teach.
2. Professional development activities were not as effective in year two.
3. There was not enough attention paid to the shifts in practice that would be required of most teachers and school leaders to effectively implement CMP2.

Eleven of the 14 teacher participants reported professional development having an impact on their attitudes about the innovation; while none of the participating principals reported any impact. The design of the study did not address why a response of “no impact” was given. Inferences could be made about the role of special education in these responses given the frequent and common responses about the challenges faced by teachers given the special education inclusion policy in the district

Staff Attitudes about the Innovation Implementation

During focus groups and one-on-one interviews staff participants in all three groups were asked about their attitudes regarding CMP2, the math innovation, and the district's implementation process of the innovation to date.

Staff attitudes about CMP2. Teachers, principals and the math coach expressed positive and negative attitudes about the math innovation. The Director of C&I and the math coordinator expressed only positive responses about the CMP2 program. Common themes from the three groups of participants emerged from analysis. Six common themes reflecting positive attitudes were identified.

1. The math innovation demanded a different approach to teaching mathematics focused on higher expectations, inquiry, problem solving, and hands-on experiences.
2. The math innovation provided a systematic, logical approach to teaching mathematics with provisions for differentiation.
3. The math innovation added to teachers' mathematical knowledge and confidence in their subject matter.
4. The math innovation led to positive changes in student behaviors and achievement outcomes.
5. The math innovation provided a more rigorous course of study.
6. The math innovation focused on the processes of mathematics and the ability to communicate one's understanding.

Three common themes represent the negative attitudes expressed by participants about the math innovation.

1. The math innovation was not a good fit for special education students.
2. The math innovation did not provide enough practice for students at all levels.
3. The math innovation required a challenging paradigm shift for many implementers.

Staff attitudes about the implementation process

Data collection for this study occurred approximately 1-1/2 years into the full implementation process. Participant groups described different levels of implementation including such expressions as rocky, varied, inconsistent, and 100%. Teachers and central office staff recorded expressions reflecting both positive and negative attitudes about the implementation process and in this instance more negative themes emerged. Participating principals reflected neutral attitudes about the implementation process and all participants described it as inconsistent and varied.

Participants recorded two common themes that reflected positive attitudes about the implementation process.

1. The district did a good job preparing teachers for the innovation.
2. Teachers were involved in the implementation process from the beginning and the district was responsive to their input.

Six common themes represent the expressions of negative attitudes associated with the implementation process.

1. The implementation process did not take into account the particular adaptations necessary to meet the needs of special education students.

2. A lack of principal support for the expectations of the innovation implementation compromised the effectiveness of the efforts.
3. There was not enough time prior to implementing to fully understand the demands of the CMP2 program.
4. There was insufficient central office support for effective implementation.
5. The district did not do a good enough job of communicating with parents about the innovation implementation.
6. The implementation process did not prove detailed enough to support the process needed.

Summation

Innovations continue to be implemented in school districts across the country. Professional development programs play a critical role in the implementation process of any innovation and staff attitudes impact the outcomes of those implementation efforts. The findings of this study reinforce both of these research-based statements.

The professional development plan studied was strategic and robust in design. Staff members participated fully in the various events and activities that comprised the PD program. Their self-reported expressions of attitudes about professional development associated with the innovation were mostly positive and indicated congruent thinking amidst the three groups reported on. Of particular interest to teachers was the opportunity for collaborative learning from colleagues and increased confidence from deeper content knowledge and understanding in the academic discipline. Principals appreciated the support for extended learning in

their buildings from the use of PD protocols and tools. Central office staff regretted not providing more targeted support for the instructional and practice shifts required for implementing the chosen math innovation.

The math innovation under study was seen as a driving force in changing teacher practice, student learning behaviors and achievement, and for creating a different professional learning culture. Embedded higher expectations and levels of rigor allowed students to demonstrate unforeseen math abilities and problem solving skills. These measurable demonstrations caused teachers and school leaders to reconsider their expectations for students and themselves. Equally important in the findings was the common theme around adaptations and modifications to the program in order to better meet the needs of special education students and their teachers. According to participants adaptations would be required for student materials, pacing guides and assessment protocols.

All three reporting groups expressed positive attitudes about the inclusion of teachers in the implementation process; however, negative expressions of attitude dominated the recorded responses of staff related to the implementation process for the math innovation. The primary negative theme had to do with the lack of full support for the district's special education population. This common theme is threaded throughout the findings of this study and surfaces as a primary concern among stakeholders.

Conclusions

Based on relevant research and the realities of existing environments school districts and state agencies will continue to implement educational innovations.

One does not have to look farther than the current efforts underway in public schools across the country on a daily basis as they move quickly to implement the Common Core State Standards, now adopted by 45 states and the District of Columbia. Based on the findings of this study, school organization leaders would be wise to place considerable energy into developing an implementation plan for innovations that has at its core a strong and strategic system of professional learning that is ongoing and responsive to staff inputs. The conclusions reported here are limited, in part, by the retrospective nature of this study.

Despite that limitation, important themes emerged worthy of further exploration.

1. Teachers like to learn from teachers. Educational innovations requiring significant shifts in instructional practice, like the one studied in this inquiry, will require commensurate opportunities for collaborative learning and problem solving for effective implementation. Collaboration with others takes time. Teachers learning primarily from each other in professional learning marks a shift from the current professional development delivery systems most districts employ. School districts will have to rethink how professional learning takes place and assure new processes through appropriate policy actions that protect time and resources. There cannot be too much attention paid to this tenet of the implementation process.
2. Leadership matters when implementing innovations. As noted by Klein and Knight (2005) supportive managers overseeing implementation are a key condition to successful implementation efforts. All participating groups

recorded responses indicating the absence of this key condition in the innovation process studied here. The principal remains one of, if not the only, most powerful person in school organizations. As primary evaluators of teachers they yield unique opportunities to move initiatives forward that rely on teacher buy-in for success. Failure to address the role and expectations of principals will compromise implementation efforts from the start.

3. Systemic change takes time and implementation processes should be planned to address the support needed over 3-5 years, not the typical plan for 1-2 years. School organizations will need to deliberately and intentionally identify the most important and impactful levers of support needed to continue moving the work forward. The financial and human capital resources needed must be secured to assure such levers are institutionalized. At the same time district and school leaders will be prudent to address the issues surrounding fidelity of implementation. One of the challenges faced in this study was the inability to gage or measure the level of fidelity to implementation in the school district under study. Progress indicators aligned with expectations for implementation will provide important information on next steps and areas of immediate intervention.

The results of this study indicate an influential nature of participation in professional development activities on teacher staff attitudes about implementing innovations. Eleven teachers responded positively when asked if participation in

professional development activities influenced their attitude about the innovation. Increased knowledge and more effective practices were two of the outcomes of participation in PD activities, which led to positive changes in student behaviors and outcomes, which led to changes in beliefs of teachers about students' abilities. These changes in teachers' beliefs about students, will ultimately lead to a continuous cycle of improvement in understanding and practice (Guskey, 2002).

All of the participating principals reported only positive responses when asked about the professional development plan for the innovation. Three of the four participants in this category reported the professional development program as having no impact on their attitudes about the implementation, positive or negative. It was not revealed through data analysis why no such connections were made.

Twelve of the 14 teachers who participated reported a positive attitude about the innovation at the time of data collection, this was a change from five at the onset of the implementation process. Similarly, the four principals who participated and the three participating central office staff all reported positive attitudes when asked to self-report about the innovation. It is important to note that data collected in this study did not allow for conclusions to be drawn about the consequences of these positive and negative attitudes on the fidelity of implementation.

Recommendations

This section offers recommendations to school districts, in particular the one under study, policy makers and the broader research community. The following proposals are derived from the findings of this research project.

Practice Recommendations

The following list contains best practice suggestions for local school district:

1. Differentiate professional development activities to meet the needs of a diverse teaching corps.
2. Plan for and create professional development programs that are data driven in design and implementation.
3. Plan for and build internal capacity for teacher-led professional development.
4. Create a detailed communication plan about the implementation for parents and other community stakeholders.
5. Revise the innovations pacing guide for instruction to better reflect the varied student populations.
6. Create a list of progress indicators and milestones of practice that will measure the gage of fidelity of implementation of the innovation.

Policy Recommendations

The following list contains policy recommendations for local school districts and state education departments:

1. Recognize and support change plans based on 3-5 years of targets resource allocation.
2. Generate longitudinal data bases on implementation efforts and outcomes that could be used to inform the work of others.
3. Create new teacher evaluation tools that align closely with the expectations for practice required by the innovation being implemented.

4. Negotiate with existing stakeholders to create time and space within the contractual day for collaboration and planning with colleagues.

Research Recommendations

The research agenda for educational innovations is moving beyond change theory to a focus on the implementation process of innovations as a complex one uniquely defined by particular circumstances. Researchers are encouraged to pursue the following research topics:

1. the role of the individual in organizational implementation of innovations,
2. the attitudes of building leaders and other non-classroom teacher staff regarding innovations implemented in their buildings, and
3. the influence of central office structures on levels of implementation of educational innovations.

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Appendix A-1: Focus Group and Interview Greeting

(The following was read at the start of each focus group meeting.)

Introduction

Welcome and thank you for participating in this research study. Today, I am looking to learn about the possible influence that professional development activities and staff attitudes may have on each other during the implementation of an innovation. I am not here to sway you in any way, or pass judgment on you, but rather to truly understand your thoughts pertaining to the implementation of CMP with your students. Before we begin, I would like to establish some ground rules. First, it is my goal to ensure the accuracy of your words as you are being interviewed, so please speak as clearly as possible into the recorder. The questions will gradually become more thought provoking, and you will have ample time to construct your response. Please be sure to ask for a question to be repeated if necessary. Wait time is important so do not feel rushed. If at any time you feel uncomfortable, please let me know.

Structure

This meeting will include approximately ten questions. The questions will be easier in the beginning, and gradually become more challenging. There is no right or wrong answer, though – only opinions, so be sure to let me know what you think. In addition, the conversation is not necessarily intended to gather consensus, so do not hesitate to disagree and/or offer unique insights.

Each question will be presented to the entire group, and although some questions may ask that everyone give an answer, other questions are optional. You may choose to stop your participation at any time.

I will be recording this session. To prevent your name or identify from being shared, I will refer to you by the number on the tent card in front of you. Please raise your hand to answer a question and participate, so that I can clearly identify who is responding.

For example, I may ask, "What is your favorite hobby?" After seeing several hands raised, I would then say, "number 1, please respond now." This pattern would continue until all thoughts were shared.

If at any time you do not understand a question, please ask me to repeat or rephrase it.

Do you have any questions before we begin?

Appendix A-4: One-on-One Interview Protocol for Math Coach

1. Tell us who you are, where you are working with teachers, the grade level you work with, and something you like to do outside of teaching and coaching.
2. What is the first thing that comes to mind when you think of Connected Math Project (CMP) program?
3. How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?
4. Tell me about the opportunities created for teacher and coach input about the math adoption.
5. How did you feel about the idea of a math adoption when it was first introduced?
6. Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials.
7. How would you describe the way teachers feel about the new math program?
8. How would you describe the way the implementation has gone in your building?
9. What, if anything, could the district have done to better prepare teachers and coaches for the adoption of CMP?
10. Are there additional supports you need to successfully coach the implementation of CMP? If yes, what are they?
11. Did your knowledge and skills about the math innovation change over time? If yes, please explain?
12. Did your attitude about the math innovation change over time? If yes, please explain.
13. Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.
14. Is there anything else you would like to add about the implementation of CMP in your district?

Appendix A-5: One-on-One Interview Protocol for K-12 Math Coordinator

1. Please tell me a little bit about your current role and what other positions you have held in district.
2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?
3. How would you describe the district's math curriculum in grades 6-8 prior to the CMP adoption?
4. How did you feel about the idea of a math adoption when it was first introduced?
5. Describe the process used to select the new math program.
6. Describe the professional development plan for the implementation of this math innovation?
7. What did central office do to support teachers in using this new math program?
8. What, if anything, could the district have done to better prepare teachers for the math adoption?
9. Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they?
10. How would you describe the implementation process of CMP to date?
11. How would you describe the attitudes of teachers and coaches regarding the adoption and implementation of CMP?
12. Describe how, if at all, has the adoption of CMP has changed math instruction in the district in grades 6-8.
13. If you could change anything about the implementation process what would you change?
14. What data have you collected to measure the level of implementation of CMP? What have you found out so far from the data collected?
15. Is there any other pertinent information you would like included in this data collection about the implementation of CMP?
16. Have we left anything out?

Appendix A-6: One-on-One Interview Protocol for Director of K-12 Curriculum and Instruction

1. Please tell me a little bit about your current role and what other positions you have held in district.
2. What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?
3. How would you describe the district's math curriculum in grades 6-8 prior to the CMP adoption?
4. How did you feel about the idea of a math adoption when it was first introduced?
5. What did central office do to support teachers in using this new math program?
6. What, if anything, could the district have done to better prepare coaches for the math adoption?
7. What, if anything, could the district have done to better prepare teachers for the math adoption?
8. Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they?
9. How would you describe the implementation process of CMP to date?
10. How would you describe the attitudes of principals, teachers, and coaches regarding the adoption and implementation of CMP?
11. Describe how, if at all, the adoption of CMP has changed math instruction in the district in grades 6-8.
12. Is there any other pertinent information you would like included in this data collection about the implementation of CMP?
13. Have we left anything out?

Appendix B: Transcriptions

Focus Group Responses: Teacher Group A

Research Question 1

- Facilitator:** Tell us who you are, where you teach, the grade level you work with, and something you like to do outside of teaching.
- Participant 1: I teach 8th grade math and i enjoy working around my house.
- Participant 2: I am a learning support teacher in 7th grade working across all subjects. li enjoy working outside.
- Participant 3: I am a learning support teacher in the 6th and 4th grades, teaching across the curriculum. li am a musician.
- Participant 4: I am a learning support teacher in 8th grade and I like to stay well versed in current events and reading.
- Facilitator : Here at this school the support is offered across content areas by spec education folks?
- Participants: Yes.

Research Question 2

- Facilitator:** What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?
- Participant 3: Inquiry, that it's a program that instills inquiry in the kids being taught.
- Participant 1: In viewing it. it seems to have a logical flow, there's one than another, than another. Its circular - it's very systematic. You know what's coming next—there's a logical progression. You tend to hit things over again, but there is a flow to it.
- Participant 2: That the problem solving - the students work collaboratively to solve problems and I have seen an improvement in some of the students in the ways they are interacting with each other, and teaching each other - and of course you have the flip side as well - but it's really nice seeing the students stepping up and working together and helping each other understand the curriculum on their own level.

Participant 4: Adaptability - a lot of adapting over the years because of some resistance in the beginning from me and other professionals, but it's something in time as we've been able to adapt to it and institute and now it is common practice and common curriculum.

Research Question 3

Facilitator: How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?

Participant 1: I've taught two years and both were using CMP so I don't have a basis to compare.

Participant 3: This is my first year in this grade level and I taught high school math for the last 23 years - it was self-contained, sped education learning support math class in grades of high school. So, a lot of my past experience has been finding curricula through different text that were handed me down for lack of a better way to put it until the district went ahead and did order textbooks and a type of learning that was different than having to rely all on myself, so now, what I'm seeing at this grade level is a nice preparation of teaching for the high school level and a more hands on type of learning versus the old style of you know a lot of rote and memory and practice. Which I do think this program does lack in some regard. But, the way it's set up it does spiral back so that what was taught at one point will be revisited as time goes by.

Participant 2: I generally feel that we touch upon as many of the pre-algebra skills that the previous curriculum did, previous series did. but there is a lot more inquiry and problem solving that the kids are getting a little bit better doing that, however when I work with student that struggle I really do think they need more practice at the basic skills than they are getting.

Facilitator: Did you feel the program before provided that additional practice?

Participant 2: Yes.

Facilitator: Ok - so that's the difference you see?

Participant 2: Yes.

Participant 4: I came here 6 years ago to a K-8 setting and two years were self-contained. The next two years I was teaching pushing in to the classroom using a pre-algebra book. The last two years it was a bit more hands on group work - but there was also when we did word problems a couple of years ago - we just did word problems. Now, they are kind of every day.

Research Question 4

Facilitator: Tell me about the opportunities created for teacher input about the math adoption.

Participant 1: No response

Participant 2: I went to the same meeting number 4 referred to - the decision had already been made really.

Participant 3: I was on the math committee when it was chosen last year for the high school and middle school. The committee was made up of mostly teachers and we looked at a variety of different publishers and we weighed and debated the different programs. So, the math committee was a forum that lasted throughout an entire year. We met biweekly and as the weeks went by, different vendors came in with their packages - programs. CMP was the one that was chosen at the end of the year based on the idea of inquiry and I think teachers were - the teachers that were involved with it on the trial basis were a huge part of the process based on the fact of what they say, what they liked, the differences in the kids. We got to see it on a first hand basis by visiting classrooms and seeing teachers who were really excellent with the program. And seeing the response of the kids and how they were grouped and worked together - so it was basically the teachers who made the decision that this was going to be something beneficial to all.

Participant 4: When I went to that one meeting, I knew they had their minds made up. And I figured they knew what was best.

Participant 5: I wasn't working in Erie at the time.

Research Question 5

Facilitator: How did you feel about the idea of a math adoption when it was first introduced?

Participant 1: When they had first introduced it I had just graduated from college for teaching, and our classes were very inquiry based, group oriented and hands on, I had originally gone for elementary education and the things you do with young children tend to be very hands on. So, again, I was very comfortable and excited with the whole idea - and I still am very excited by the manipulatives - we use very hands on items, they can address concerns themselves, teach their peers, you know, its not direct instruction. There's a lot of flexibility so that students can figure things out. So when I first heard it, I was excited and enjoyed the idea that we would be approaching teaching more like I had learned about it in college.

- Participant 2: I was new to middle school anyway so I hadn't really been set with the previous series I had only spent one year with that so ... my only concern with it again, because I work with students that struggle, was the amount of reading involved and for them to be able to interpret the questions and what exactly is it they're being asked to do - so that was my primary reservation as far as that went.
- Participant 3: It was definitely an excitement about it - being in the math realm for a lot of years and seeing the high school kids struggle, I like the idea of the taking the ideas and expanding them - I thought that was really important. Some of the concepts, they spent a lot of time getting kids to really understand versus just rote and memorizing, but again, like 2 said I deal with the lower end of the spectrum and I concur with what she said that its difficult for the special education kids who have learning difficulties, grasp concepts - let alone understanding the process. sometimes basic algorithms work best for these students.
- Participant 4: I was very tentative when we first started last year and candid about my negative feelings. As 2 said I worried about my special education students who excelled in math, but not language arts and now they were going to struggle in math too. So that was a concern after almost two years of using it. I see evidence of the quality and the reason why we do this - I am not sure I've seen enough evidence to erase my initial fear.
- Participant 5: The ELL students also struggle with the program - they don't have basic English so a math program based on reading is going to be very difficult. So that is one issue. How I felt about it when it was first introduced... I student taught with it, which I entirely liked teaching it. A month later I was at the high school and it was clearly the other way - and I really didn't like that after teaching CMP. So, when I found out I was going back to it I was really glad. I really like it, it gives you the chance to go into different areas so that you can really reach them and what they need. so, either your higher achievers or your spec education students are able to get what they need.

Research Question 6

- Facilitator: **Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. How would you describe them?**
- Participant 5: We had a lot of opportunities - even when i student taught, i went to all the in-services. so there were called just in time trainings - that were people from the book series that came and pretty much went problem by problem and book by book with us - all the way through. So i was teaching 6th grade during student teaching and did two books and then it was fully implemented the following year and I was in-serviced on those books. i really liked it, i think it kind of depended on who you had as your facilitator - because some of the facilitators were much better than others. some of us had better people than others.

Participant 1: I would agree that our facilitator at the 7th grade was wonderful. He had taught the series and you good just tell that he embraced the series and on top of that he provided us with a lot of materials he used to supplement the series, like the notebooks. he had spent a lot of his own time creating these materials and now he is passing them on to us so we didn't have to start from scratch and then having the other teachers who had piloted it and they came and shared what they had found with each separate book - so I felt very well prepared to start it with my kids.

Again, it made a huge difference who you had for a trainer you had - the 7th grade teachers were able to have a teacher who had taught the series for a dozen years come in and tell them about the pitfalls and challenges and how to deal with different things, and had lots of good ideas for them about the process = you know, telling them this is effective, this is not as effective, skip a page here, you might want to spend more time here - you know adaptation and supply materials, make sure you do this here. we in the 8th grade had the completely opposite experience. we had a person who had piloted the program and literally went through and said lets read the book together and there was no 'OK, let's read this work it together' - so we read it and did all the problems - there was no real exchange. so we spent an hour reading the book and then you talked about what you read and then you spent another hour reading the book and talked about what you read, solved the problems, and then we spent another hour doing the same thing. What is was really was given the time to read the book and do the mathematical computations - that's fine but I mean I really could have spent 25 minutes by myself and gotten the same thing out of it and gone home.

Facilitator: May I ask a clarifying question ... so eighth grade all had the same trainer, and that was true for each grade?

Participant 5: At that initial in-service, that first two-day institute in the summer, yes. that was the first time we met Mr. G. - our trainer. And so not only did we have two good days of in-service, he then came back numerous times to co-teach with us too.

Participant 1: Like number 5 was saying, you had the same person as a trainer throughout the first year. and so if you had a phenomenal trainer the first year then you had all that input, and if you had somebody who knew as much as you did, um, it was, you know, the blind leading the blind - the uneducated leading the uneducated. and, you are literally going through the process together, seeing the pitfalls as you go, and the problem is you didn't really have a strong foundation of these are real pitfalls, this is something you can omit, how does this apply to the curriculum or how does this apply to your instruction or how do students get tripped up on this section - there was none of that input and I don't know about the sixth grade, but I know in speaking with colleagues that the 7th grade had a nice little edge in the implementation of the curriculum in comparison to those that were in 8th grade - that's not to say the teachers in 8th grade didn't try,

they did without a doubt. They just didn't have that level of education and background to be able to have that solid foundation with which to teach the program.

Participant 3: I was involved in the planning but at the high school level.

Participant 4: I remember the just in time trainings as always very good and entertaining. I have only gone to one training this year - I didn't go to the others. I am starting to lose my juice for it a little bit. Because I'm not sure that in the cases of like numbers 1 and 5, I'm not sure I should be taking training with them because they are a full step way ahead of me so I don't see how it can profit them to be in the same training with me right now.

Research Question 7

Facilitator: Describe how, if at all, CMP has changed your math instruction.

Participant 5: It's miles from, and we're only talking about a couple of months, from where I was at the high school level and pretty much standing at the board and having the students, pretty much all with a glazed look in their eyes at some point, so, rather than standing there saying this is how you do it - follow steps 1, 2, and 3 and now do numbers 1 - 20, and them being made to do it - I think they have kind of embraced the fact that this is different - and it takes the teachers to have, it sounds weird to say, but have the willingness to not help them through it, um, which is strange - usually you want to be there and say this is how you do it, you're making a mistake. But letting them make the mistake, letting them learn from their mistakes and for me I really like it - and I know there are some people who like it less than I do, which is obviously across the board going to be different. But for me, I really like it, and my students - I've seen a tremendous difference from Sept to Jan and Jan to now, where the tentative students in the beginning won't ever want to say anything because they're afraid they're wrong, they already know they're wrong - now they are the first ones to volunteer - they don't care if they're wrong - it creates that and it takes a lot of the teacher saying, you know what, I'm wrong too. Or to intentionally do a problem wrong and let them see you say "OK, I made a mistake too" - and for them to be able to see that, because we know at some point in math we are all going to screw up, and they see you not worry about it - but be able to help the person sitting next to them, if they can learn from them - I really like that aspect of the program.

Participant 4: Unfortunately it has been a big transition for me - probably because of my special education background, I've been somewhat enabling over the years. But it's a transition I am trying to do - I see a lot of merit in the ability of them to do things on their own - so, it's an adjustment for me, but you know, you have to work it out somehow.

Participant 2: I agree with number 4 on that aspect as well - because there are so many times where you catch yourself and not help them. But the one thing I want to point out too is the inquiry - it's one of the things we have been stressing over the past couple of years - there is not just that one way to solve a problem and it is so neat when - like yesterday is a prime example, there was one problem we were working on and there is at least three different ways that the problem can be solved. And you know having the kids sharing all of those ideas and then to hear "oh, I didn't think of it that way", and we keep saying, "as long as you know what you did, you understand what you did, you can explain what you did, it doesn't matter if you took this route to solve the problem, or this route, it doesn't matter - there's more than one way." I think that is probably one of the biggest things they've gotten out of it.

Participant 1: I completely concur with number 2. We had the same thing today when we were going over exponential relationships and there were four or five ways to solve the problem. At the beginning of the year when we started, once we put that answer up on the board all the kids would erase their answer if it was different and copy down our answer. Now they just kind of say, "no, I think mine's right too." And they will kind of wait around until I put mine up their too - and sometimes they are right and sometimes they're wrong, but it's really nice to see them not dismissing their answer just because it's not what someone else has.

Participant 3: My biggest concern is for the special education kids that I work with, who a lot of them are just not ready for certain topics in math because they don't know the basics - they don't know their factors, their multiples, you know the real nuts and bolts of moving on in math are just huge stumbling blocks for these kids. And you know it's frustrating because I am always dealing with it from a remedial standpoint trying to get them back up to par with the rest of the group, so many of them can't keep the pace of the class because their rudiments just aren't there. They're not ready for another level - I mean for lack of a better way to put it, and I see it at both grade levels I teach - 4th and 6th grades. Kids who can't even count past 39 and we're trying to teach them areas of parallelograms and you know higher concepts which in their minds may be intangible and I see it and it's a real frustration for me. Whether it's math by inquiry, whether it's rote repetition it's just that side of the brain doesn't seem to be working for those individuals and it's frustrating to see them moving along at a pace that is insurmountable for them.

Research Question 8

Facilitator: **What, if anything, could the district have done to better prepare teachers through professional development activities or other ways for the adoption of CMP?**

Participant 2: I felt, at least at the 7th grade level, when I started the school year, that I was as ready as I could be with a brand new program. And of course you're a little nervous - it's something new for you and for the kids, but I felt that I was as prepared as I could have been.

Participant 5: There was a negative connotation, I think, amongst the teachers coming in, about the program. So it mattered what the district did, but in some ways, it didn't matter what the district did because there were teachers dead set against it. I taught with teachers in 6th and 8th grades last year that hated it, hated every second of it - they had taught for a while, and they had been very successful - it's one of the higher achieving schools in the district - me being a new teacher, someone had bid out so I ended up there, so I got lucky. But all I heard for two weeks before school started was how much I was going to hate it, and I had already done it and they didn't realize that, well one of them realized it, but the others didn't... so it was an uphill battle for some of the teachers. And some of the teachers have done a complete 180 - but others are still focused on "we already were successful, why do we have to change?" So, I don't know - you know I taught 7th grade, so like number 2, I felt very well prepared. And that goes back to what we already talked about - the facilitator made a huge difference, so I thought we were very well prepared. But, again, it was also an uphill battle no matter what because some were set in their ways and they weren't going to budge, no matter what.

Participant 2: It really did depend on their willingness to accept the change and move forward with it.

Participant 1: Again like I said, the two things, and they've been pretty well addressed already, is the facilitator made a big difference, if they would have had a better facilitator I think it would have helped at the 8th grade, and in general. The other thing I was thinking about though - was the district really, from my perspective, they went out of their way to insure there was a lot of training. You know, it could have been a little bit better, but they offered a lot of training to make sure we got it - they took us out of class, made sure everyone was caught up on the books, anybody who had any trouble with the mathematics, concepts or basic understandings of it, they would teach it to you and make sure you understand it. Sometimes it could have been better, you know, but they provided that time. They provided time during the summer to come in and become more advanced in the teaching styles, and the idea and concepts and the flow of the curriculum from 6th grade to 8th grade. They really spent a lot of time, they offered a lot of courses and things that they would come in and do and they were quite good about it - so, I was really satisfied with the way that they did that. Again, they could have had a little better implementation - but the idea behind it and the things they were trying to do were right. The other thing I thought about was the people who had a lot of negative thoughts, I don't know if they could have somehow tried to watch those things. I realize, I know what they say about any kind of change - 20% of the people are positive about the change, 20% of the people are against it and 60% of the people are on the fence. And you're never going to change those 20% - they are always going to

be there and they always sound the loudest. But I just wondered if they could have somehow brought a little more of the 60% along. It just seemed as if they let the clamor of the 20% get to them first and if they could have been a little stronger to bring those people through change quicker.

Participant 2: I also liked having the opportunity as a learning support teacher to be working side by side with the classroom teacher - so we were bouncing ideas off of each other, discussing problems and before the school year even began we were working together.

Participant 3: My situation I feel as though, being in the 6th grade and the 4th grade, I've been trained just twice for 4th grade. The only problem I had with what was being done was I was being trained to teach whole class environments in the practice lessons and those sorts of things. I was going there with the notion that I would get training specific to my kids - how am I going to get this kid who doesn't know his multiplication or addition facts, or can't even count up to par - what remedial things are going to help. And I know when we listened to the programs, mainly CMP, most of the companies that came in really over-sold their programs as they were going to be great for all the populations across the board, and that the special needs kids were going to be able to go here and find this support for whatever they needed. Lots of different avenues that teachers could go to get those kids right up there with the rest of them. That's my biggest gripe - I get kids who have so many issues and roadblocks in their way to higher level thinking and after an entire year are still stuck.

Research Question 9

Facilitator: **Are there additional supports you need to successfully implement CMP? If yes, what are they?**

Participants: No comment

Research Question 10

Facilitator: **Did your knowledge and skills about the math innovation change over time? If yes, please explain.**

Participant 4: I never taught in a regular classroom pre-algebra, geometry, or whatever- I always had the freedom to teach whatever I wanted, I don't know if that was positive or negative. I always made my own rules, so I taught what I thought was necessary, what I thought was important. Trying to work with the kids through a regular pre-algebra book was a bit of an eye opener - I had taught math for 8 or 9 years before coming here, so it that was a bit of an eye opener, exposing how much I was lacking in teaching math. And now doing this for the past 2-3 years I feel I have been exposed to that much more. It's been a real struggle for me.

- Facilitator:** Do you see a change, from the beginning when you first implemented to now?
- Participant 4:** I would say that that varies from book to book. I feel pretty good, a little better, in some books rather than others. So sometimes my contribution level is low - I don't feel I am well versed in it, I think there is a confidence factor. It's just like the kids - sometimes I hear Mr. X ask a question and I know they know the answer, but they just sit there because they have a confidence crisis. Sometimes I think it is the same
- Participant 1:** I've always felt extremely confident about my mathematical abilities - I never worried about it personally. But you know, an interesting thing, I came into the classroom thinking I kind of thought it was going to be everything I already knew, but the connections that it showed... I was really surprised to see the connections and the flow from 6th to 7th to 8th - I had never personally put that together. I had always learned a very structured, formulaic approach - this is the formula, put in the numbers and solve it. And I excelled at it, I was great at it - I put it in, I solved it, it made great sense to me. But I didn't know what I was doing. The formula made sense - but for practical purposes - nothing. And now I am seeing this goes here, and this goes here and all of a sudden I can put them all together and I can see where everything fits and works together. And I knew them all to begin with, but I didn't see how they worked together. So, it's very interesting from that perspective. I came in thinking, OK, I know the math - this is no big deal. But seeing how everything flowed together was really cool. I had a very similar education as well. This is how you do it, now do them. And same deal, I can do it - that's not a problem. But why are we doing this, the math isn't the hard part for me, but why it works. And there are still some questions that kids ask that I don't really know the answer to, and I can tell them, I am not afraid to tell them I don't know the answer, I know it will work, but I have always done it that way is not a good answer. And I taught 6th grade, and now 7th grade and now 8th grade this year - so my 8th graders can't get away with anything. So if they say, we never did the sales tax thing - I can say, well if you did CD World and CD Warehouse last year than you did do the sales tax thing. And I like the way even the homework problems connect back to other books or the year before. There are problems that reflect what you did that day, but also problems that go back to other books or even last year. As a teacher last year I didn't use them at all, but this year I do and I think it is really beneficial to try and keep those things in front of them. Because if you do one book and then don't look at it for three months, it's hard. And now with 8th grade I've seen how the 8th grade curriculum works with 6th grade and 7th and now 8th. So it has increased my exposure to it and helped me understand how each of those years works together.
- Participant 2:** One of the things I've learned is to look at the problems in a different way - we get set in our own ways of what we are comfortable with and how we understand it, and only think of solving it one way, and then someone will come up with something that would never even remotely cross my mind and I think,

wow - and it helps to get to know the kids too, it helps you get a quick picture into their mind and how they are thinking.

Research Question 11

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

Participant 1: I don't know if it's really different. As I said before, I liked the idea when we started and I still really enjoy the program. There's a lot of pitfalls and a lot of things to be improved on to assess students and more practice for those students who need that repetition. There's a lot of little things that need to be addressed, but overall I really enjoy it - I really like the way it incorporates so many different aspects into it. And how many different ways to think, the answers that come up I would have never thought of - and it's like wow, what a different way of looking at that, and, it works! And I would have never thought of doing it that way. So I enjoy it - I think it allows the students a lot of creativity and openness and there's a lot of flexibility of their thought and for some students who don't have that mobility in the classroom or the curriculum itself, I think it's a great thing. So I enjoyed it from the moment I started teaching it because I liked the idea that it was inquiry based, and now that I am actually teaching it, yes there are some things that need to be improved on but I enjoy it for the most part, thoroughly.

Participant 2: I would have to say that I entered it open-minded and I probably like it more than I thought I would - because I was apprehensive of all the reading and writing. But I thought, this is my job as a learning support teacher - this is what we have to use and so I started making my modifications and I'm making it work for my students. I have to say it's been positive overall.

Participant 3: I taught at the high school level for 23 years and it was pretty much rote repetition and memorization. Now seeing different ways of doing the math, even at the basic levels - like with fractions, to see how they are employing benchmarks and how the kids can get a picture of what they are trying to do - whether it's greater than or less than sort of thing. It's given me, as a math teacher, a better appreciation of learning styles and the way we look at various types of math issues and solving math problems. I don't know if kids develop an appreciation as of yet, when they are still trying to learn the ways of doing things - but I think this probably opens up that path for them. I was for it because I was a part of the committee that picked it, but now I am even more for it. I just worry about the practice, but it's a lot better than here's 40 problems, do them tonight.

Participant 5: I liked it when I student taught it, I hated the way I taught in high school and now I am really happy to be teaching it again. This I liked right away. As I said, I am at the far end of the spectrum (of teachers who like it) - so I am not the most impartial about it. I still really like it.

Participant 4: I was tentative, apprehensive and somewhat nervous. Now in the second year of it, I see a lot of validity to it and its also one of those things, you know you have to do.

Research Question 12

Facilitator: Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.

Participant 1: I think it helped with the initial start - for the amount of time they spent, obviously I felt more comfortable with the math but for the implementation. Again, some might have had a better facilitator and that gave them a little bit better edge with the implementation - but it was nice to have the district support the program in such regards that they were a 100% behind it and were willing to give you everything to assure you have building supports for students in the best way possible and they were certainly behind it and that gives you confidence and feel better if you are faltering. Some of the coaches they had were very nice and you could ask them any questions - and that was really nice too, that you could ask questions and they would give you a no nonsense answer - it might not be the best, but here it is, this is why, you can take it or leave it and if you have more questions I'll try again to answer them. So I think it was nice that they were so gung ho because sometimes that's the best way - you know if you think you have the right system, you just have to push that agenda forward. Change is inevitable and you have to move forward and do it with a 100% and I think they did a good job of doing that and the professional development definitely helped that.

Participant 2: Had to leave the group

Participant 3: Just as an aside, I agree that any kind of realm when you are teaching - The reality of being in a self-contained special education classroom for 23 years and never actually seeing another math teacher teach didn't lend itself to trying new and innovative things. It definitely took a class here and a class there and it was talked about, and sometimes you definitely fall back into you same old teaching style. To be able to get new ideas and fresh innovative types of things to do really lends itself I wasn't used to collaborating and working with another teacher

Participant 5: This is going to sound strange, but I think when we went to those trainings prior to last year, I got nervous, more nervous then. I was pretty confident. I am a pretty confident person in general. I knew the principal, we grew up together, and he had told me he wanted someone who had taught the program, and knew I had student taught with it. But then listening to everyone talk about this and that, and they brought in the people who had piloted the year before, and that made me nervous. But once you get in the classroom and start doing it, every person has their own style. And they can give you ideas about this or

that, but until you have already done it, and I had already done it, so like number 1 said there was a limited time, but I had already had 7 people in my room when I was student teaching who really knew what they were doing, because they were 2 from the book series, 2 coaches, head of the math in the district, I mean people were in and out of that classroom all the time so they saw how it was being taught. The saw what you were doing, what you were supplementing from other books, if you were supplementing or whatever else - so I had that background. Maybe if you were a teacher who hadn't seen that - I was nervous after that. And again, to me, the facilitator made the biggest difference. Not only was it in that realm of those two days (summer training) - and he was new to us then. That was the first time we had met him - and since then, some of us have become friends with him and talk to him outside of this things. And to me, the pitfalls are the biggest things the facilitator can help with. And the facilitator - his own phrase to me was, "it's fine for me to stand here and say OK, this is how you solve this problem. But I see myself as someone who has already driven down the road and I know where the potholes are and can tell you about them." And I know that's what I wanted, and I think other teachers wanted that too. He's already driven down the road and know where's the potholes are. And that to me is a lot more valuable. Because now that in 8th grade we have moved away from having so much of the facilitation coming from the company, CMP/Pearson, and we've moved to having the coaches doing it, and to me it's a lot less valuable, to the point where I have asked not to go to them, which didn't turn out too well. I mean to go to a meeting for 7 hours to go do math problems that I have had done since September doesn't do me any good. We sat at that one meeting doing problems that had been done.

Facilitator: Is this your in-service days?

Participant 5: Not our in-service days, this is when they take us out to train us on the books (Just in Time Trainings). But to me it's not being trained on the book. I mean, it's professional development, I understand, but you're not being trained on the book to sit there and do 50 problems that I've already done - doesn't help me. And that's where I think it's being lost on whomever is making the decisions.

Participant 4: You want to know one of my problems, is the in-service grade day.

Participant 5: Well, that too, another example - we just sat together. I sat there and corrected papers; I did a variety of other things.

Facilitator: Can you please explain the professional development activity you are referring to now?

Participant 5: This is training for the sole reason that I was teaching 7th grade last year and I am new to 8th grade - so it is specific for teachers who have changed grade levels or are new to the program. It's taught by district coaches. So the development for the curriculum is done more at the in-services and those

thoughts of things, this is just training specific to the book - I have to go to another one in just a few weeks. These are the Just in Time trainings.

Participant 1: Most people do the training preparation before hand - typically we will have completed the book as number 4 alluded to and to go there and do it again, it's redundant and not only that and possibly pointless in some regards, it's wasting instructional time - and I don't know about anybody else, but I don't like to leave the class with a sub. And it's nothing against the subs - they do a phenomenal job as far as coming in, it's just a series that nothing gets accomplished - and typically the kids get more confused, they don't know what's going on. The sub will give them the formula or the answer from the beginning - and it's like, what's going on. Then I come back and we unlearn it and then learn it and it's just you know, hard.

Participant 5: The district has done a pretty good job of trying to train the subs specific to CMP - but it's hard to get them all. You can't get always get them

Participant 1: And you can't always get them, and sometimes they are only trained on 7th grade, and you need 8th grade. And just the whole idea of what is specific to grades - and even though you have the idea, you don't know the specifics. So, maybe if there was time to prepare, that would be much better.

Research Question 13

Facilitator: **Is there anything else you would like to add about the implementation of CMP in your district?**

Participant 1: I would really like to piggy back on a point I wanted to make earlier and didn't. Last year when I taught, I taught in a middle school, and I had a good 40% of one class that was ELL. You have kids who are from Nepal, the Philippines, African countries and in less than a year I had kids who came in for a week, a month, two weeks over the summer - and I had 40% of one class that was ELL - and you know, you have 20-some kids, how do you teach the kids, how do you teach 10 out of the 24, it becomes so difficult and what do those kids do? They want you to teach CMP and you can't let go back to ELL, and ELL is the first introduction to the mathematical classroom - and you have to work hand in hand with individuals. For some, they don't have any flexibility about what is right and it was they're here, in your class, and that's it. I don't know here, but in my last school it was a lot more difficult - you can't literally go and teach kids a form if we can't communicate. I don't know Spanish and I am not going to be learning it soon. How do we reach them when they have trouble with reading in general, they don't have that confidence. And it takes a long time for them to get comfortable with it's ok to be wrong, and there is more than one way to solve a problem. And they do get it, but it can take 3 months, some 5 months and then you have 4 months to try and teach them everything, before they leave and start all over with new teachers. And then you have to go through that whole thing again of learning that it's ok to be wrong, and the teacher doesn't care.

And you are losing so much instructional time. I just think for some kids it just works better if you just have the numbers. I know this year I have a young lady from Iraq who is probably the best mathematically, but she can't read the information so she doesn't know what we are doing because she can't read the word problems. But if I just give her just the mathematical problem, she's great, she can solve it in a heartbeat. I try to group her in ways that make her feel involved, but it doesn't always work out - it's really tricky.

Participant 5:

There's one big issue in this district - and it goes along with the ELL issue. It's different from school to school. So last year I had three ELL kids, they were probably the three highest achieving kids I had - they had been in the country for 4-5 years. But, they were three of the highest learners I had. This year 10% of my 8th graders don't speak a word of English. There's nothing I can do, they can't read, and it's not their fault - what do we do for that child? It kills me sometimes, because when you have 30 kids in your room, you don't have the time to help them, and can you really help them? I mean we are at the point where when they raise their hand, I know they want to go to the classroom - they can say that at least, and they can now say hello, and they are very sweet kids, but they can't read, and it's not their fault and what are we doing to help them? And so far, it doesn't seem like much. The second thing from school to school is the amount of time we have to teach. Number 1 was in a middle school last year with 54 minute classes. I was in a K-8 building last year where I had 65 minute classes - and I am in a K-8 building this year where I have 90 minute classes. So you're making judgments on how far we should get in these books based on what? And no one answered the question last year because I have asked it about 1000 times. The one thing they said was that when they made the curriculum guide that stated where you should be on such and such a day, they based it on 55 minute classes, so you could do one lesson in that amount of time. So I asked, does that mean I can do two of those in a day because I have 90 minutes? Oh no, it just means they are based on a 55 minute class, was the reply. Well is it 55 minutes, or is it one class - those are two hugely different things, and they just kept glossing over it. They said, OK, just make it work - I know you have 90 minutes and you have 55, just make it work. And that's not fair. My whole issue is how can you assign homework and never go over it. And I know that is what happens in most of the middle schools. Teachers just assign it, collect it, correct it, and give it back. There is never any chance for feedback - you never know why you got them wrong. I'll assign homework but I will go over every problem I assign - I did it last year and now I have even more time to go over everything in depth. You have groups of students at different schools that get different levels of instruction and to me that makes no sense. It's either everyone has 65 minutes or everyone has 90 minutes. And I understand that it is different from building to building. But there has to be a way in order to say we're doing math instruction for 75 minute class periods - you're the building principal, now make it work. That's why you're the principal - that's the way I see it. But they don't do it that way - every building has pretty much their own amount of time for math.

Participant 1: And last year I had 57 minutes and now I have between 104 in one and 120 in the other depending on the day, it fluctuates depending on the day and our special - yea, I have a lot of time. I almost doubled on the amount of time and I still am expected to cover the same amount of material. And the students, who I have this year, could really get by with the 57 minutes I had last year, and the kids from the other school needed the extra amount of time - it kind of flip-flopped. And it's great for the students here, and they are progressing at a good rate. Another thing that is going to be addressed unfortunately, or fortunately depending on how you look at it, is dealing with our current financial state within our district. We are going to be standardized by size and that we are going to be looking at 50-54 in a class, which is great that we are going to be standardized, but I think we should be standardizing in the other direction. And I don't think that's going to happen. They are interested in servicing vast amounts of students. Right now we are servicing 70-80 students and they want to get up to one middle school teacher servicing up to 120-150 students. It's great, except if you actually want to teach the students something. So now, we are going to have to accomplish the same amount of things, servicing more students in less amount of time, so I think that what is going to happen is that CMP is not going to work as effectively in years to come.

Participant 5: It can't.

Participant 1: Right, it can't. It doesn't lend itself to that shorter period of time. There won't be that inquiry, and if you can't accomplish it in that one class, it doesn't flow as well, you lose your momentum and that is what you are going to be doing. And you're going to be expecting better results, you want better test scores, and you want it all with less time, more students for each teacher, you're spreading teachers thinner, giving them less time to teach the students and wanting better results - it's not going to happen. You could put up a normal teacher and give them half the time and more students

Focus Group Responses: Teacher Group B

Research Question 1

Facilitator: Tell us who you are, where you teach, the grade level you work with, and something you like to do outside of teaching.

- Participant 1: 6th grade work in inclusion with the math teacher, with the learning support children.
- Participant 2: My name is _____. I currently work at _____ and teach 6th grade, CMP2. Outside of school I enjoy spending time and outings with my family.
- Participant 3: My name is _____ and I teach 8th grade learning support. My students are all fully included so I push in to the general education classes to support my students. Outside of teaching, I enjoy spending time with my friends and family, outdoor activities, exercising
- Participant 4: I am a 7th grade special education teacher at _____. We have a full inclusion model at Pfeiffer Burleigh, so I co-teach with the regular education teacher. I enjoy working out and playing basketball outside of school.

Research Question 2

- Facilitator:** What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?
- Participant 1: Hands on.
- Facilitator:** Tell me a little bit about what that means.
- Participant 1: The hands on was easier for my children to do whenever they could actually see the visual learning a lot of them, and with the box they had they could pick things out and actually work with them and that made it a lot simpler for them. And also the teacher who I taught with, she was very good at making packets for them that went along with it and she reviewed a lot and went over a lot - and that was really good
- Participant 2: The first thing that comes to mind is students working with each other in order to solve higher-order thinking skills. Students are beginning to develop and maintain cooperative learning skills.
- Students are also beginning to understand the reasoning behind how/why a problem is solved.
- Participant 3: Student inquiry- group work- student directed learning- real life situation and scenarios-
- Participant 4: A couple of things come to mind when I think about CMP. The 1st thing is group work. This program has the students doing a lot of group work. Also I think about a true understanding of math. For example instead of cross multiplying CMP uses the Horseshoe method so students can find the scale factor along with solving the proportion. It's all about understanding "why" instead of just the answer.

Research Question 3

- Facilitator:** How would you describe the math curriculum in grades 666-8 prior to the adoption of CMP?
- Participant 1: It was just math concepts - start up with place value, and adding, subtraction, multiplication, division, decimals, fractions and some geometry
- Participant 2: The curriculum was straight forward. Its focus consisted mostly of introducing concepts, providing example problems, students working on problems independently and then checking (typical skill and drill). Students mostly worked independently without a lot of focus on small group discussion and/or working skills.
- Participant 3: Direct instruction- teacher directed learning- students working individually and in rows- skill and drill
- Participant 4: The math program before was a lot of skill and drill. Teach a concept and have the students complete 30 of the same or similar problems.

Research Question 4

- Facilitator:** Tell me about the opportunities created for teacher input about the math adoption.
- Participant 1: I knew a lot of teachers liked it because there was a lot of hands on
- Participant 2: At the beginning of introducing CMP2 to the district teachers had an opportunity to be part of the implementation team. I myself was one of the teachers who took part in the development and structure of the curriculum map and allowed for teachers, administrators to come into my classroom and observe my lessons (this was a great learning experience).
- Participant 3: There were many trainings and workshops offered during the first year of piloting this series. There were also in-services, trainings, and workshops offered over the summer in preparation of adopting CMP2. They were very laid back and there was a lot of room for discussions and teacher input.
- Participant 4: This program allows for a lot of flexibility. As a teacher you are not leading the instruction but rather facilitating the learning.

Research Question 5

- Facilitator:** How did you feel about the idea of a math adoption when it was first introduced?

- Participant 1: When it was first introduced I didn't really care for it because I was old school - I had been here 18 years and you know, I was used to going with what I knew - you know, place values and stuff like that, and this kind of pushed everything a little bit further. so I was into the old math = place value, and adding, subtraction, multiplication, division, decimals, fractions - so this challenged the kids a little bit more and at first I didn't like it that much, but once I saw the challenges the kids really did need and the hands on focusing, it was a lot better for my kids
- Participant 2: My (honest) opinion after the school year started and for about the first 4 to 6 weeks I was somewhat skeptical about how the new series was going to be successful long term. BUT, after receiving proper training with the first two modules, the CMP2 series and its set-up began to make more sense to me. It became much easier to read the lessons and know the expectations for each individual lesson. It took about the first half of the school year (which I was informed of this time-frame from the book company) to become comfortable with developing and presenting my lessons.
- Participant 3: As a special education teacher, I was very hesitant of adapting CMP2. The series has intensive reading involved. All concepts are introduced in stories or scenarios. Being used to a textbook only full of numbers, I thought this series would be very intimidating and difficult for my learning support students.
- Participant 4: I was hesitant at first, just like I would be with any sort of change. Change is always hard

Research Question 6

- Facilitator:** Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. How would you describe them?
- Participant : We had conferences, seminars in the summer. we also had them throughout the school year to catch us up on where we would be at and what to expect next
- Facilitator:** How would you describe them?
- Participant 1: They were fantastic
- Participant 2: I have been presented with many opportunities to develop, learn and grow in order to successfully teach my students. The opportunities consisted of 'Just in Time' trainings. These trainings allowed for me (and other 6th grade math teachers) to meet and receive proper training for one day. We were able to

work throughout the student/teacher books and share ideas, thoughts and feelings about each lesson. The trainings were specific grade levels. We also had the opportunity to continue our training on district in-service days. There were opportunities for the presenters to actively take part in my classroom and provide suggestions and feedback.

Participant 3: There were many trainings and workshops offered during the first year of piloting this series. There were also in-services, trainings, and workshops offered over the summer in preparation of adopting CMP2. The trainings were put on by someone from Pearson, which was very helpful because they have had so much experience teaching and implementing CMP2. During this time, teachers worked with each other as well as the trainers to understand the material in the series and the best way to implement it in our classrooms..

Participant 4: We had a lot of in-service days as training days. We also had training days throughout the year. The trainers from PEARSON were around a lot helping out.

Research Question 7

Facilitator: Describe how, if at all, CMP has changed your math instruction.

Participant 1: I think it was the more hands on way - they seemed to have with every lesson stuff that was visual for the kids to use, and like I said, that was really helpful for my kids. and I also like the fact that they had them in groups and they could work together as a team.

Participant 2: CMP2 has completely changed my teaching style (and my overall feeling about math itself). The new math series has allowed for me to step back and allow students to make mistakes, at the same time, letting them work with other classmates in determining where they make the mistake and how they can go about fixing the problem in order to solve it appropriately. This math series has allowed for my students to learn how to cooperatively work with each other and share their individual strategies. I feel that with the old math series, I was the center of the lesson and the students worked out the problems as they were instructed to do and then we would check the answers and move on. The CMP2 series has allowed for my students to feel good about themselves, their individual accomplishments, and has allowed for them to step outside of their comfort-zone.

Participant 3: My math instruction is now less teacher directed and more student directed. I feel like my questioning skills have improved since we began implementing. I am forced to ask meaningful questions and teach my students to ask themselves questions to come to an answer. I also make students ask themselves and their group questions to come to an answer before they ask me for help. They have now gotten used to working with each other to come to a solution instead of always asking for help the second they don't understand something. From a

learning support standpoint, I have to help set up the problem and read a lot of it to my students.

Participant 4: I have to help the some of the special education students with reading and reading comprehension. This series has a lot of reading (word problems) with it.

Research Question 8

Facilitator: What, if anything, could the district have done to better prepare teachers through professional development activities or other ways for the adoption of CMP?

Participant 1: We did have some people come in and teach a lesson - I think we could have used more of that at first. you know, for us to get used to everything I think they could have brought in more people to work hands on with us through a lesson - do a lesson first to show us how exactly they want the lesson done, and then co-teach with us and then ease themselves out as we got better.

Participant 2: Since I was a part of the implementation team and witnessed first-hand for myself the steps the district took in preparing, developing and implementing the new CMP2 math series I would have to say that all steps were taken in order for the district to achieve the best results possible.

The implementation teachers were provided with an opportunity to go to _____ and observe a middle school that had been using CMP for several years. This was a great experience in order to see an actual set-up and how the lessons were presented.

Participant 3: I think they did a really good job of preparing us, however, I do not think that there is enough special education materials that go along with it. I think that there should have been more professional development for adapting materials. All the professional development was more geared toward regular education.

Participant 4: I wish our district would have had examples of adaptations and materials ready for us.

Research Question 9

Facilitator: Are there additional supports you need to successfully implement CMP? If yes, what are they?

Participant 1: No response

Participant 2: As of now I would have to say 'no'. The materials, in-services, and support the district has provided have allowed me to develop successful lessons/activities

over the last three school year. I would like to see our training continue as needed per teacher, grade level and building.

Participant 3: Students were given workbook pages to go along with the book. These are pages that they can write on since they cannot write in their books. These are very helpful to students, especially the learning support students. These pages have graphs and tables already provided for the students to save them a lot of time and trouble. Other then this workbook/notebook, there is nothing else that you really need to successfully implement CMP.

Participant 4: I think special education adaptations, materials and ideas are necessary for this program.

Research Question 10

Facilitator: Did your knowledge and skills about the math innovation change over time? If yes, please explain.

Participant 1: I thought it was easier for the kids to understand. it was easier and easier for me to pick up the pattern of how they were going to learn and what to expect next in the teaching.

Participant 2: Yes, I was taught the typical 'skill and drill.' Therefore, by teaching this particular math series it has allowed for me to grow and develop new thoughts and methods in regard to the subject area of math. I feel very fortunate that I have had this opportunity to take part in this new development.

Participant 3: This is not a series that you cannot prepare for and just jump right into teaching it without preparation. I feel much more confident and knowledgeable of the skills after teaching it for a couple years. I know what mistakes students are going to make and I prepare for those mistakes

Participant 4: Like any new program, you learn as you go. You make changes from class to class, day to day, and year to year. You learn from what works well and what doesn't work as well and make changes to try and make it better.

Research Question 11

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

- Participant 1: Now I like it a lot better and I like it better than the program I have to use in 4th grade
- Participant 2: Yes! By the first half of the school year my feeling and thoughts changed dramatically (in a positive way). Once again, I am very thankful that I was given the opportunity to take part in the original implementation of the new math series. Which overtime, I believe, has made me a better math teacher.
- Participant 3: Yes. I definitely have a much more open-mind about it. I think that the students really benefit from it because they are more likely to remember the concepts when it is taught in this manner. Now that I have been teaching it for a couple years, I definitely feel much more confident in it and comfortable teaching it.
- Participant 4: Yes it did. Over time I have seen a change in how some students work in groups and solve problems.

Research Question 12

- Facilitator:** Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.
- Participant 1: The people were very open to any questions; any changes we thought should be made. they did a lot of hands on things with us, it was really very good. You know, it was a real eye opener for me to have all the materials right there and I didn't remember some of this stuff - so they had to re-teach me some of the content and know exactly how they wanted it taught to the kids
- Participant 2: Yes! The more professional development activities that were offered (as well as any other support from the district) made the transitions into the new series much easier. There has been and continues to be appropriate and on-going support from the teachers, administrators and school district in order for the best teacher-student success.
- Participant 3: It definitely made me more nervous to implement because it was very overwhelming at first. But in the end, it was a worthwhile experience.
- Participant 4: No

Research Question 13

- Facilitator:** Is there anything else you would like to add about the implementation of CMP in your district?
- Participant 1: I think it should be brought to other grades - in 6th grade we co-taught and the teacher was fantastic. We created packets for my kids to go over so they could

keep up - it was a very positive experience. And I don't like math that much, but I enjoyed doing this with my special education kids. It made it seem a lot easier and less tense for them.

Participant 2: One major benefit the school district has gained is the consistency across the district (per grade level) in that every school is implementing the same math curriculum and skills. Therefore, when a student transfers from school to school the student is not experiencing different math series. This has allowed for a curriculum that is uniform and has been successful.

Participant 3: It definitely takes times to feel comfortable with. I would give it a few years before making judgment on the program. Overall, I think the benefits out way the disadvantages.

Participant 4: Like any new program it takes time to learn implementation techniques and with this program it takes time for students.

Participant 2: Thank you for allowing me to take part in your research. If there is anything else I can provide to you please let me know.

Participant 4: I would just like to tell you that like any program, this one has its advantages and disadvantages. It is still a new program to us so we are still learning about it as well as how to use it.

Focus Group Responses: Teacher Group C

Research Question 1

Facilitator: Tell us who you are, where you teach, the grade level you work with, and something you like to do outside of teaching.

Participant 2: I teach 8th grade pre-algebra and I enjoy playing tennis and cook.

Participant 1: I teach 8th grade pre-algebra and 7th grade mathematics, special education and I enjoy playing basketball outside of school.

Research Question 2

Facilitator: What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?

Participant 2: Intense. Intense as in the amount of time and effort it demands, not only on the instructor, the students - it's a completely different system for teaching math. I

enjoy it, but it's intense in the thought process, the writing. So many things go into math now that didn't go into it before. So it takes a lot to get used to and get a grasp and hold.

Participant 1: Frustrated. I chose frustrating because working with the special education students, and also I have a pull out classroom of students that are all learning support and this CMP program is really tough for these kids. They are still struggling with adding and subtracting and we're asking them to do this program and it's just frustrating more on the kids and then I am trying to find different ways to go through with this program for them and then that's when it gets frustrating for me. Some of these kids I still haven't found a way to get through to them. So it's frustrating.

Research Question 3

Facilitator: How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?

Participant 2: I did teach one year of math before CMP. It was straight out of the book - even, odds, basic worksheets, here's the book, and ok we're done. I gave you the formula; I taught you how to do it. You went on. I can give an exact example - we now do a whole book on the Pythagorean Theorem. Instead of giving them the equation, they literally drive it themselves. They figure out Pythagoras did it. In our new CMP series there is a book called Looking for Pythagoras. They start at the beginning and literally do three investigations before they are expected to figure out the Pythagorean Theorem. Before CMP, I would have said $a^2 + b^2 = c^2$. This is what you do; this is how you do it. OK here are the problems, now do it - go. Not so anymore - now there is so much reading, writing, activity and thought process that goes into CMP that I think it is exhausting for some of the students and it takes a lot more planning on the part of the teacher than prior. Before you just had a straight math book - here's a page we're doing it, here's a lesson, we're doing it. This is really hard core we're working - you have to see where the students are going to have issues, and sometimes you have to adapt what they have. But you still have to maintain the curriculum and you don't want to take away the answers because they're too hard because everything is spiraled and based on getting to these extensions. It's overwhelming at some point, but it does sort of get easier - this is my second year of teaching CMP so it is getting easier, but it's a lot more complicated than previously.

Participant 1: I didn't have an experience teaching math before CMP.

Research Question 4

Facilitator: Tell me about the opportunities created for teacher input about the math adoption.

Participant 2: Prior to reaching their decision there were a couple of committees formed and you could join those committees - and I think it took a year or two to reach their decision. I, however, was not on any of those committees. I am dual certified in secondary math and social studies, so I was teaching SS up until three years ago when they moved me into math. I had no choice in the decision; it was just given to me. But I also have the attitude that you tell me what to teach and I'm going to do it because that's my job. But there were focus groups and study groups for teachers to look at different curriculum to see what they wanted.

Participant 2: Not applicable.

Research Question 5

Facilitator: How did you feel about the idea of a math adoption when it was first introduced?

Participant 2: I was a little nervous, you know - something new with students is sometimes hard in 8th grade, just basic solving equations. I was worried about the amount of reading and writing students are expected to do, especially with our special education and ELL populations. You have to sort of give and take and grade so many kids differently because I do have kids who can't write a complete sentence in English - or explain all these mathematical theories. They can do the process, they just can't explain it. So that was cause for hesitation. I am very easy going - if you tell me I'm teaching this, and then I am teaching it. I know there were others who were very against it. I would say to them, "it's a job - take it! Do what you're supposed to do". I am still very hesitant when it comes to certain things - but given this is the second year, I like this program, and I like how it's forcing kids to get a deeper understanding of certain ideas and math concepts.

Participant 1: I had some mixed emotions about it. When I first saw it, I kind of thought why are they changing to a new program when I didn't find anything wrong with the original program. I didn't have any experience with teaching it, but from having it going through school. But then I started hearing that it was more hands-on, more group work and stuff, I thought it might work. But now we're more into it, and for special education kids it's just very frustrating for them because it's a very intense program - and if they can't get the basics, how do we expect them to get this work?

Research Question 6

Facilitator: Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. How would you describe them?

Participant 2: To get ready, I went to a three day summer intensive workshop for CMP. I went with one of my colleagues and we went through the first three books, some of the expectations for the program. We talked about how to keep everyone on leveled grading, how we grade and record things, how we approach the teaching - instead of direct teaching, more hands-on and engaging. For me that wasn't that hard because that's how I teach in the first place. I am not a big direct instructor, I like to guide them. After school started we started having PD days when we started going over just the next book coming up. So we actually go through all the lessons and problems before we teach it!

Participant 1: I didn't get the three days of intense training before I started. But before we start each book, I get pulled for a full day of training on just that book. So that's where I get my training.

Research Question 7

Facilitator: Describe how, if at all, CMP has changed your math instruction.

Participant 2: CMP has changed my math instruction. There were times before when I didn't let anyone struggle, you weren't supposed to let them struggle, you were supposed to help them, kind of give them the answer, show them the process. Now, I'm supposed to let them struggle. It's hard for me as a teacher to say, nope try it, struggle a little with it. And to say why don't you struggle- they look at me like I am so mean - you're supposed to be my teacher and help me. But that is the whole process - they want them to figure it out on their own. It's hard for me not to take the lead. But I have to step back and sometimes let them go up there and be like - OK, why are you correct, or why are you not correct. I try to take a standoff-ish approach with some kids and try to get them to do it themselves. For instance like when you're taking a test in high school - this is your test, do it, don't ask me any questions - that was how I was taught in high school and now I'm doing it myself. It's not my personality so much, so it's really hard for me because it's a change. Where before I would take the pencil and write it for them. Now it's really taking it off of me and having them do it for themselves.

Participant 1: I don't know as if I can say it has made a change. This is my first year in a secondary math program so I am not sure how I could say I have changed. They are totally different and so I can't really say I have changed.

Research Question 8

Facilitator: What, if anything, could the district have done to better prepare teachers through professional development activities or other ways for the adoption of CMP?

Participant 2: I would have liked to see more teachers that have recently implemented this program. I would have liked to be able to sit down with them and almost give them the third degree. I would have liked to have gone through, after a year, to have the same opportunity and ask them if the things I am experiencing happened to them, or is just my classroom. I get a lot from talking to other teachers. When we have PD days I gain the most knowledge, I benefit the most from talking to my colleagues, from talking to other 8th grade teachers around the district - I'm having trouble with this, can you tell me more about this. Not so much from listening to the presenters they bring in. I need someone who's in the classroom, who taught this three months ago - what did you do for this, how can I help kids with this problem, and then they can ask me for help with something that has worked for me. I would have liked to talk to more teachers who have recently implemented this. I think experience gives you the best preparation and help with a program like this.

Participant 1: Going along those same lines a bit... Coming in new into this program it would have been very helpful to have had those three days at the beginning of the year, this year. And those who taught it previously could have come in and helped to, going along with those lines, helped to present it to us. Rather than have someone from outside the district come in and just run through it. It would have been better to have teachers from Erie, teaching the same kids, come in and present to us.

Participant 2: I would have loved something like that. They piloted this program and a couple of teachers came in and talked about it - but they didn't give specific examples of what was going on. I have tried to take that upon myself and have made up my own lab sheets and I will share them with anybody. When we go to inservices, I am always bringing what I have made and folks can take it and make it better for themselves - if I have done it, there's no sense in others spending their time doing it too. I have taken the things that kids are really struggling with and tried to break it down - and I am getting good success with that - the kids are understanding it. For instance, questions written in a paragraph form - there's five questions. So, I break it down into the five questions and leave spaces for each one.

Participant 1: And the district is starting to bring us together to write the unit exams. We come together as a group for half a day and sit down and discuss which questions should be on it - or how we can modify the existing exam. So, I think we are starting to come together for each unit, which I think has helped.

Research Question 9

Facilitator: Are there additional supports you need to successfully implement CMP? If yes, what are they?

Participant 2: They have brought in math coaches and coaches from CMP and unfortunately it feels like you are under the microscope when they are in there. Instead of being as helpful and supportive as it could be, it feels more like you are being evaluated. Once again, I would prefer, and get more out of, going into my colleagues' classrooms rather than have someone else come in and even if it's not an evaluative process, it feels like that. I think there needs to be a better way to implement using coaches from outside the district. I enjoy having the ones who are still teaching - the ones who are able to take a day off and come to my classroom because they are teaching it now. But the ones who come who haven't been in a classroom in years - they are not so helpful. They sit there and watch you and it's nerve racking..

Participant 1: And also, they come in and teach a lesson - but kids respond totally

Research Question 10

Facilitator: Did your knowledge and skills about the math innovation change over time? If yes, please explain.

Participant 2: Yes. Teaching it for the first year, and not coming from a real strong math background because I was teaching SS for the last four years, was a big jump for me, but the second year of teaching CMP I am telling you I understand it more and am figuring out better ways to give them the information they need. The second year is definitely a different attitude about it, understanding it and how I feel about it. And I have noticed it is different with students too who have had it for two years. The first year was frustrating for me and them - it is still frustrating for them, but it is easier for me. I let them struggle because I know it is going to be OK and they will figure it out. I know some of the things to expect from them and how to best help them get it - so I've noticed a huge increase in my knowledge about the program and how to implement it. So I am hoping the third year is going to be even better.

Participant 1: For me in my first year, I am still learning as I go. Everything is new and since I never learned math this way, not even in college, every day is a new thing. I may be a teacher, but since I never learned this way each day is a learning process.

Research Question 11

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

Participant 2: I wasn't opposed to it in the beginning because it just was what I needed to teach. I have come to a different approach about what I expect from kids. Last year was the bare minimum - more from the kids than myself. We were both struggling and needed to get through it. This year I expect more, not just from the kids, but myself also to get some of what I have now understood through to them. But I am liking the program - I like some of the investigations because the kids can actually see how we get to some things - they can all tell me about the Pythagorean theory and exponential decay because we are always going back over them. But I can also see how some kids are still having so many troubles and so many difficulties - especially my special education students. I wish I could do more for them, and that is the only issue I still have with the program - the amount of reading and writing for some of those kids is just not going to happen.

Participant 1: I have two different situations because I co-teach with the regular ed kids where there are a few special ed kids and then my own pull out class of all special ed kids. And in my co-teaching class the light bulbs are going off - these kids are working together and things are coming together for them. And then I go into my pullout class and I'm expected to teach the same thing and these kids still can't add, subtract, tell time and they are completely shutting down. They are completely frustrated with this program and I can see it is not the right program for them at this time. They have to get the basics down first and then they can do the other stuff. So I kind of am seeing both ways - I see the positive things in the regular ed classroom and then I go into the pullout class and they don't want to be in there, they hate math and are just frustrated with the whole thing, which goes back to my first comment. So, I guess I see it both ways - the positives and the negatives.

Research Question 12

Facilitator: **Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.**

Participant 2: In the beginning, there were so many people that were against the new curriculum that it sort of jaded me, I wondered what I was getting in to. But then we began talking to other teachers who had piloted the program and hearing their first hand experience sort of alleviated my worries. Some of our most recent professional development doesn't do much for me either, it seems to repeat the same information over and over again, once again it is working with the other teachers that changes my attitude and keeps me motivated.

Participant 1: Not really

Research Question 13

Facilitator: **Is there anything else you would like to add about the implementation of CMP in your district?**

Participant 2: I think that they should included our co-teachers more in our professional development and training.

Participant 1: No comment.

Research Question 13

Facilitator: **Have we left anything out?**

Participant 2: I don't think so.

Participant 1: Nods agreement

Focus Group Responses: Teacher Group D

Research Question 1

Facilitator: **Tell us who you are, where you teach, the grade level you work with, and something you like to do outside of teaching.**

Participant 1: This is my 19th year, I'm a special education teacher. In my self-contained classroom I teach science, but I also push into a 6th and 7th grade regular math class. Outside of school I really enjoy cooking.

Participant 2: I am currently a 6th grade math period - from honors all the way to general math and this is my second year.

Participant 3: I teach 8th grade general math and outside school I enjoy water skiing.

Research Question 2

Facilitator: What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?

Participant 1: The first thing is not enough practice. Since I am primarily involved with the inclusion group, which includes many of the lower level learners, they don't get enough practice of the concept and that, it seem that would have helped. I know their idea is that if they come up with the idea on their won, that they will be more invested in it. But the truth is, in practicality, that doesn't work for them a lot of the time. They need more practice at whatever skill it is you are trying to get them to come up with. And once they have it, they need more practice still, because the carry over is minimal - sometimes, just between books is minimal.

Participant 2: The first thing, I believe due to my three years of training with the program, including two years of teaching it, is I like the communication between the students when they are discovering how their partner or their classmates do something explaining something to their partner - But my second thought, after coming from many, many years outside of the teaching field, and only knowing what I was taught I agree with number one, in that if homework was done and a consistent, regular basis that would take care of a lot of the practice. But in our setting, for whatever the reasons, homework is not done regularly and completed as we would like. And I totally agree with number one that we could give more practice during out time with kids to drill and be sure they get it.

Participant 3: Not present yet.

Research Question 3

Facilitator: How would you describe the math curriculum in grades 666-8 prior to the adoption of CMP?

Participant 1: I would say it was more like the original or the standard that everybody thinks of as the format. There was a textbook and the instruction was direct instruction with the students seeing examples, doing examples, usually being led through some problems and then doing them on their own. And I am partial to that approach. With CMP2 they get calculators for everything and my feeling is you should know your multiplication tables - if you don't know the simple things and that's your stumbling block, then the bigger concepts are much harder to get because you are worried about what 7×8 is, not using proportions to find equivalent ratios. you are stuck on what is 7×8 - that becomes your problem, not how do I find the scale factor? If they can't figure those simple things out quickly enough, they lose the concept immediately. And I understand they are going back into the grade levels and using Everyday Math and hoping that will bridge that gap. But, for right now, it's some tough sledding for some of the kids because they've been given the opportunity to use calculators and stuff like that.

Participant 2: I've only taught with CMP2 - I don't know what it was like before CMP2.

Participant 3: Not present yet.

Research Question 4

Facilitator: Tell me about the opportunities created for teacher input about the math adoption.

Participant 1: There was a committee I believe that got together and did it. All I know is that two years ago they piloted it in one class I pushed into that's where I was made aware of it. Until then, I had no idea. I heard they were coming up with a new math series and they were going to do something different.

Participant 2: I wasn't here when the process took place.

Participant 3: Not present

Research Question 5

Facilitator: How did you feel about the idea of a math adoption when it was first introduced?

Participant 1: They had changed textbooks several times in the past and it was just always, here's a new textbook. I wasn't quite aware of the breath of change that was going to come with CMP2. I mean it wasn't just here's a new textbook. It was more, here's a whole new philosophy on how to teach - I didn't realize that was what was going on. I mean I was accepting of it at the beginning, because you always want to try something that is going to help. When I went into the classroom and this was going to be all different - this isn't going to be teacher-centered, this is student-centered, they are going to have to come up with the concept themselves. Coming from a special education background, I was a little skeptical of the ability of the students to be able to come up with the concept because for many of them, their math knowledge is pretty limited. And as I said, the basics are the major stumbling blocks, they aren't even going to be able to see the big picture because they are worried about multiplying, and for some, even adding and subtracting is a problem.

Participant 2: Not applicable.

Participant 3: This was my first change in curriculum, it's my 6th year teaching and prior to this I had only taught out of one book here in the Erie school district. I heard from other seasoned and veteran teachers that this was nothing new - every 3-6 years there's something new. So, I thought OK, and since I was relatively new to the district, I was not on any of the committees to pick and choose. We

basically started having meetings about the new curriculum - little did I know they were turning into complaining sessions about why we shouldn't adopt this program. The people who knew what was going on were either OK with it and ready for this paradigm shift in how we teach math. They had seen all the brain based research on student-centered teaching - it was what I was trained to do as an educator in my graduate and certification courses. I literally had to unlearn everything I had learned in my masters program to be able to teach the basal textbook because it just went against everything I had been taught in my methods courses. So for me it was like going back to what I had been taught and trained to do, but those who were heavily vested in the basal textbook talked the loudest and the longest and they were often the most veteran teachers and they were being asked to change everything they had been doing for 30+ years and they were not happy. So there I am sitting in rooms with very angry people who seemed to have very valid points and instead of it being an informational meeting it turned into trying to convince people to give this a try. And trying to establish what had been done, the numerous hours of meetings, objective point systems, the goals setting and what we wanted and how that matched up with this program and there was real thought put into this. And that most people want this for our students and our children, to keep up with the times. They explained the numerous curriculums they went through with this detailed ranking system and I thought - wow, they go through this every 3-6 years? Little did I know this was not a typical curriculum change. It was taking everything they had done and flipped it on their head, and obviously people don't like that.

Research Question 6

Facilitator: Tell me about the opportunities for professional development and other supports that were available to get ready for the new materials. How would you describe them?

Participant 1: The original training sessions they set up for us were days they took you out of the classroom and had you meet in grade bands. They took you through the books you were going to be using. They were one book sessions and they would go through the book. At first they were much more detailed about how you should teach, what you should teach, what you should be expecting from the students. I have to say, I probably got more than most because I took a graduate class they offered too.

Facilitator: was that DMI?

Participant 1: No, it was through Edinborough University. We met once a week for so many weeks. They went through a lot of what we would be teaching and the philosophy behind it. I got more training and experience through that and thought that I got more from that than anything else. We met for 3 hours every week for 15 weeks. There was also feedback you would get from other teachers as well. There were 15-20 of us there. You had to work with different people,

they wouldn't let you sit in the same seat with the same people so you really had to stay with it. And you heard different points of view every week and that helped a lot - it really helped you know what it should be like in the classroom. The training sessions on the books near the end became kind of rudimentary - here's the book, do the problems, and if you have any questions, well - you got help.

Facilitator: Are those the just in time trainings you are talking about?

Participant 3: Yes, that's correct.

Participant 1: Could have been. Yea, every month or so before you got to a book you would have one.

Facilitator: Who led those?

Participant 2: The ones (just in time trainings) that I had, they were always run by a district person, but sometimes there would also be someone from Pearson there as well and they co-instructed our training.

Facilitator: Was there anything else you wanted to add #1?

Participant 1: I thought they did a nice job until the end and then it seemed to fall off. I guess they thought you knew by then. The first year the trainings were really nice. Because like number 3 said, this was a shift for most of us who had been here from everything we had done. Like I said, it used to be, when you said math instruction it meant direct instruction, teacher in the front of the classroom, do examples, go around and make sure everybody is doing it, quiz and then you move on to the next thing.

Facilitator: Anyone else want to share their thoughts about this question?

Participant 2: I actually came in immediately after the first 9 month trial run that number one mentioned and he was with the other 6th grade math teacher who was piloting it during that same time. Coming into the training, and from what I was told, they made a lot of changes in those nine months. And with anything new, you have to live with it, grow with it, and mold it and so a lot of the animosity, for lack of a better term, that the veteran teachers might have felt, was waning a bit when I came in because they had seen a lot change in those nine months and my training, I thought, was wonderful. They knew how the books were supposed to work. And I would sit there with a 30 year teacher or a 15 year teacher who had taught that way - and of course coming into teaching way later in life, that was all I had known as a math teacher - here's 50 problems, get them done by tomorrow, if you get it then we move on to something else and another 50. But I believe that all the trainers did a great job of making sure we worked with everyone in our groups, which was great for me because being knew it gave me a chance to hear all different perspectives - those from veteran teachers and also brand new teachers. Basically the way the training worked

was they had us do the problems the way our students would have to. Once we got passed that initial "oh this is never going to work" we would start working on a problem together, the way our kids are supposed to and we would be able to solve it. And then, in my training, at the same time we would talk about what we thought would work or not and be able to tweak the general worksheets to make them higher or lower levels as needed and now two and half years into it and two and half years of training I am very comfortable with it. But I do agree that there still needs to be more repetition in it.

Participant 3: I went through the just in time trainings as well - I did them last year and I think I have one this year. I had a mix between just working through the problems and our group just coming together. We do these just in time trainings together with the same group all the time. We just started sharing how you are going to deliver this. We became very focused on the goals of the lesson, just as number 2 said - we read through the problems first and then we work them like a student. I am not a math major, I was not a secondary math person - I am a lover of math and have my middle school certification. But going back to some of these concepts that I haven't done since I was in 10th or 11th grade and now we are doing them in 8th grade, there's a real push down of the material so even things I had taught in the old curriculum - were important. And I thought, quadratics - OK, I better brush up on this and I really felt like a student. It was refreshing to have this chance to learn. I would joke that I couldn't believe they let me teach this stuff before - because I really didn't understand it until we started with CMP. Now I was making connections between the different types of relationships that I had never seen before - even when I was taking calculus in college, I didn't know why. Now I understand why, I can see it, I can do it, I can show you four different ways to do it.

Participant 1: Yep.

Participant 3: Now I can teach others how to do it as well - and that was really eye-opening and took my understandings from my graduate methods courses even that much deeper. I really appreciated the give and take of the educators once we kind of got through the number crunching and working through the problems. Seeing them all for the first time and saying - OK, honors courses, would we summarize at the end as it's suggested, with general math would we have them do a mini-summary in a couple of places, and with our inclusion kids we are going need to hold their hand with these first four problems - problem, summarize for the first four problems and then the last two problems and summarize. We also decided if we liked things as one day or two day lessons. They often suggest one a half days - which really doesn't work for our schedule here so those became two-day lessons. We shared materials, made materials - if we said we didn't like the way the chart was, they would change it for the next time - it was a constant work in progress. Our lab sheets - the student note books have improved at least two times since we started all because of those just in time trainings.

Participant 2: Absolutely.

Participant 3: Because we had to do the problems right there the way the students were going to - we would think, geez, I teach this class and I can't even fit this in here. And then we would ask, can we adapt this part everybody and can we do this for the inclusion students? It has been very helpful professional development.

Research Question 7

Facilitator: Describe how, if at all, CMP has changed your math instruction.

Participant 2: My flat out experience comes from my now eighth grade son. He literally started the book I am teaching now when I started my last year of certification. He would come home with the very same book I am now teaching and I am finishing my schooling and we would do our homework together. He was asking me for help with a way I had never seen before. We would go on the computer or I would show him the way I had been taught that concept when I was in school - now that he's in 8th grade and I have been teaching it for just shy of two years, I sit down with him and when he says "I don't know", which is a very common comment in our classrooms, I say, "Well what do you know?" So instead of me telling him the answer and then in 5 minutes we are outside playing - now we stay for 30 minutes until he understands it and gets it so he will be able to use it in other situations time and time again. And basically, instead of catching fish for him, I'm teaching him how to fish. And it takes more time - but he still comes to me for help even knowing I'm not going to give him the answer because I want him to work something out on his own and discover something new.

Participant 1: Well, now when a kid asks me a question, instead of answering it for them, I now ask them questions. I try to make them come up with what they are supposed to be finding and doing on their own. I tell the kids that when they ask for help, help does not mean we are going to give them the answer - because that's what a lot of these kids think. That when they raise their hand and ask for help, you are going to come over and do the problem for them. At the beginning we had to explain to them, when you ask for help we aren't going to come to your desk, take your pencil and do it for you. Now we go to their desk and you start asking them questions about whatever it is they are supposed to be doing - what is the first thing you have to find? Like number two said, you get a lot of "I don't know, I don't get it". And you just keep asking them questions. Some of them (questions) are very leading, in the inclusion class you are really trying to help them do more than they think they are capable of. That is the biggest thing - they don't think they can do it - they have never done it before. Hopefully, EM will help with this because they will have done some of these things before. That is probably the biggest complaint about CMP, is that they started it with kids in 6th, 7th and 8th grade with kids who had never done this kind of math before. So we are trying to learn a new system and they are just so used to having someone stand in front of them and do the

problems - here are 10 problems, here's how you do it, now it's your turn to do it. And now we start out with a story and decide how we are going to solve it. And they look at us and say, aren't you going to tell us. And we say, no - not today, today you are going to tell us. But that is what has changed. You are not walking around the room to see if they are getting their problems right. They might only have one big problem to solve - and now you walk around and make sure they are going in the right direction - and hopefully they are.

Participant 3:

Oh boy - my old classroom was a big old snooze - I honestly don't know how kids didn't fall asleep. First of all the setting - one or both sets of lights were off because I sat in front of a projector working. Students came in on day one of the lesson and they had notebooks with pre-made notes on them that they would have to complete, fill in the blanks, always the definitions for that lesson which they would have to look up - they 5-7 minutes to do that type of thing every day and then we would walk through the 1-5 examples in their notebooks from the series and they would sit and copy as we went. We would always do one example because they always gave a spot to do one example. I would always walk them through it. Lights would come back on, I would assign 1-20 even numbers, the last 20 minutes I would walk around and see how they were doing. There might be some partner talk but it was all individual. And then I would assign the odd numbers for homework. And the next day would be the practice paper. And we would follow that same formula every day until we got to the end of a chapter or a section, and then we would take the chapter test and start the whole process all over again. Now, it is bell-ringer, openers that students have 5-8 minutes to do. They always have to show their work- tell me how they got that answer, why is that correct. Sometimes students will have two different answers and I will ask them to prove which is current. It is mostly them talking and doing things - I stand in the back of the room and assure that everyone is moving forward. Now we are in triads in my room. And if they have a question - I say, OK, read me the question and then I use our question poster to ask them... What is the variable in this? How would a graph, chart or table help you solve this? I keep referring back to that poster from Pearson that have questions for each book. And when they tell me they have a question, I will ask their teammates what the questions is. And if they can't tell me, I redirect them because as a group they should all know what each other's questions are. I tell them they need to be working together and if they don't know what each other is struggling with then I can't even begin to help you because you haven't done what you need to do. Or if the whole group is stuck I would ask if they have gotten help from another group who is farther along. That is also another important aspect of the program - that they work collaboratively to make sense. The newest thin I am doing this year is actually planning who is going to share their work. I had a lot of dead time, students who were unsure of their work, not confident about what they did, scared to share. Now I prepare them - after working with a group I will tell them they are ready to share what they have done and I am going to ask them to share part B. I then tell them to talk with each other and decide who is going to say what because they know it is coming. Then the summaries start - timer is done and I try to save 15 minutes at the end for summaries, and then they start to file up.

And once again, I intervene when I need to, but my rule of thumb is, the ones who talk the most, learn the most. I already know this stuff so I don't need to say it again. Are there are days when I teacher direct? Absolutely, but it's maybe one out of ten days. We're behind in the pacing guide, I need to get something else done, we took longer on something else, and like everyone we all have deadlines. But, for the most part, this is the way I teach now. I have a field student now and it is so strange for me to think that he is me two years ago - he is always talk, talk, talk, talk, talk. And I am not used to seeing that anymore. It's actually hard for me to watch him teach because it is so not CMP. He is brand new - this is his first time in the classroom and he is teaching the way he was taught. And even though he is having the same methods courses I did, you go back to what you know. I am kind of glad it's such a harsh difference between the way he teaches and I teach - it shows me how much I have changed in just two years. I have become a Connected Math teacher. It's very, very different. And, by the way, lights are on in my room now - no more lights off to see the projector. It's completely different - night and day, literally.

Participant 2:

I actually have a combination side bar from both participants one and three. As number one had said, this is the first time they are implementing EM in the lower grades. Being a sixth grade teacher this is my second year of having kids who have not had EM, and number two is in her first year of kids who have had CMP in 7th grade. I could make a point right off that the kids coming up to me are not used to working together, they are used to straight rows and doing everything alone. So I have tried groups of four or triads, but am now down to partners because they are still learning not to socialize. But with the partners I can do exactly what 3 said, ask them what their partner is having trouble with and if they can't answer that, I know they need to go back and revisit the problem again together. I have taken that from all of my training and listening to what works for others. Next year I will have students who did have EM and they will be that much better prepared for group work and this type of approach, and then the following year they will be that much more prepared and it will progress more quickly and it will be a great program. I would still say there is need for more practice.

Research Question 8

Facilitator:

What, if anything, could the district have done to better prepare teachers through professional development activities or other ways for the adoption of CMP?

Participant 3:

Adaptations for our special needs students really didn't exist and I think we are still trying to work with our special education department in adapting our assessments, specifically. They were adapted but not to the extent they need to be. Last year, if I had done this with you, I would have said assessments. We were all over the board - people were still making their own tests. And then you have rule followers like me - they told us to do the assessments that came with the program and I didn't change a thing. I copied

the unit assessments just like they were, I didn't change a thing. If they struggled it was more because they didn't have this approach before and were not able to explain themselves in a written way using graphs and tables and making connections.

Participant 1: Especially in the written way they have to now.

Participant 2: Definitely the writing, yes. But I left it the way it was because I wanted it to reflect where my kids were at. This was CMP's first year and my students are here. OK, so next year we should see them here - and see a gain in their writing abilities. But this year we moved away from that as well. I am not sure why people struggled with those "house" tests, but this year we are creating our own - using the tasks and questions from CMP question banks. We are not making them up, but we are picking and choosing which tasks will make up each unit text. And whatever test I am using, every teacher in 8th grade across the district is using the same unit test. We have such high rates of mobility across the district and we all should kind of be around the same spot in the pacing guide so that when someone moves we are jumping into the same book, in relatively the same place with the same expectations, getting ready to take the same test. That is improving, but we are not all the way there yet. So, those are the two things that could be better - assessments and adaptations.

Participant 2: Regarding the common core assessments that #3 is referring to, we are given an opportunity to review those and I think within a short amount of time we will have them tweaked in a way that every teacher will be happy for them for their students. I believe they are really taking our opinions to heart and I think they really matter because we are on the front line doing the work and that is a good feeling.

Participant 3: You have a bit of apathy in the 8th grade. So, there is actually a group of 3-5 who sit down and actually create the common core assessments, and the rest of the teachers complain that they don't like it. So, I started making general announcements to my colleagues - next time, if you didn't have a hand in creating them, please don't complain about them. I just feel people need to help if they want to have a voice in complaining about it. I also agree with #2 that we have a direct hand in the planning, we have a say in our pacing, how we are doing it. I feel our opinion is very trusted by the math department - we have flexibility in making decisions because we know our students the best, we are the ones implementing it and I think we are very fortunate that we have leaders who recognize that.

Participant 1: The one thing that should have been done right off the bat was the adaptations. A lot of the schools are going to total inclusion which means all special education students are in the regular classrooms. So that makes the adaptations even more important for the tests and some of the activities. What goes along with that is the way they are grouping the students. Homogeneous grouping for this series, I think, is ridiculous. In the inclusion classes I am in you have all the low end kids, so when you ask them to come up with this grand

concept, and, like I have said, they are struggling with what's 7 x 8, they just turn off and we are forever reminding them they have to get back to the math - because when you discuss with your group, they think they should talk about what they're going to do that night, and that is what they want to talk about. The district needs to interject some higher level students into every classroom - every classroom should be just a random mix of kids so that when you group kids, you'll have someone in the group who will say, "ah, this is what they're looking for" - because I know we are the teachers and we're the ones they're supposed to look up to for all the answers, but the truth of it is most of the time, I can tell a kid something, but if another kid tells them the same thing, it's like gospel.

Participant 2 and 3: both offer nods of agreement to this

Participant 1: That works alot more and that's what they need to do - take all the smarter kids and spread them around. That is going to help bring everybody up. There are people who say, "well, you know, you're not doing the smart kids any favors." But I would say that teaching is the highest form of knowledge, so if you can sit and teach someone else what you learned, that means you have really mastered the concept.

Participant 2: Yes, that way they are spreading what they know and helping to bring everyone along.

Participant 3: I fully support heterogeneous grouping - I am not sure it would work with honors, but for all other classes I agree.

Research Question 9

Facilitator: Are there additional supports you need to successfully implement CMP? If yes, what are they?

Participant 3: We have tried doing groups after work where we could come together and say "we need help with assessments, or the theme this month is going to be adaptations, or how are you doing with your summaries." And then, go and share. But, they were so lowly attended, people said it was not something we were paid to do, it was on your own time after school, people had after-school programs - and so they stopped doing them. I think we finished them up last year.

Participant 1: I never went to those so i am not sure when they ended.

Participant 3: They were deeper, so things have been tried. But what do we need now, (ha-ha) that's a very, very deep question. Because I know we are looking at the future here, and we don't evn know what's going to be going on. We are going to have much higher student numbers in our classrooms, different desks

(laughs), I mean, just looking at the logistics, of having 25 or more students in a classroom and doing group with that - you can't have the desk with the seat attached because we will be crawling over a sea of desks. I am kind of at full capacity with the 24 desks I have in my room - so the thought of adding six more desks is really tight - it's just going to be a sea of desks if we are in triads, or even pairs. So, I know that's not where you are going with that question, but I know that I am going to be looking at least two years until the maximum is reached and sorted through and during that time it's going to be the bare basics.

Facilitator: Are you referring to the current budget situation in your district?

Participant 3: Yes, I am. That is what I am referring to.

Participant 2: Due to the budget situation and knowing my status as it is at this point, I know I can say I hope I am back to teach sixth grade with CMP2 because I will be even better at it, I feel I get better and better and better. But at the same time, with it going down to the lower grades, and I have talked to a lot of the 5th and lower teachers, and I know they are struggling, as they did when they implemented it two years ago. That's normal. But now after 3/4s into the school year they are seeing things that are working, they are tweaking them and I am literally taking things from third and fourth grade from their program to teach my kids in sixth grade who are not used to this program yet - and it has worked. So, based on what your question directly asks, I think that the administration and our coaches, etc. are taking into account our experiences, even though mine is limited, taking that experience everyday in the classroom for two years, and using it to make changes based on what all of us are saying, from brand new like myself and those with 19 years - and that means a lot. So as a going out comment, just keep that up. And realize that there are going to be a lot of students in a small area and one teacher for the most part - and they are going to need a lot of support in the coming years.

Participant 3: Is it OK if I say one more things?

Facilitator: Of course.

Participant 3: Aside from the basics of sticking with the development of the curriculum, I think that phase one of implementation was stop the hemorrhaging of middle school math performance - and so it makes kind of no sense why they started in sixth, seventh, and eighth grade - it's because that's where we were the worst. so that's where they started the implementation. Ideally, it would have been K-1, then 2-5, but that would have taken 12 years to implement a program.

Participant 1: That's true.

Participant 2: And you are already seeing changes in eighth grade.

Participant 3: Absolutely, and so I think that phase 1. Phase 2 was Ok we have kind of

stopped the bleeding so now let's get better at teaching math and we have Connected Math which asks for a new classroom culture. And I think their next phase in the future was going to be that sharing across the grade bands. I know that I have reached out to find out how sixth grade and seventh grade teach proportions, they don't do cross multiply and divide, they use scaling up and scaling down. And I have to use that vocabulary so they know what I am talking about. But it's taking that extra effort to ask, can I borrow your scaling up book, but I need to know what you are teaching so that I am not talking a different language in 8th grade.

Facilitator: So, what you are suggesting is the notion of vertical articulation?

Participant 3: Yes, exactly, and I also need to know in the future what my colleagues are teaching in high school so I can give them a preview. I want to be able to say, hey, when you go to high school and you're doing this or that, you are going to need to know how to do "this", so they can see where there math is going to head.

Participant 1: And I can do that with my sixth graders because I have been with seventh and eighth graders training at the same time, so I know what the first two books in seventh grade are going to be and I am better able to prepare them for that.

Facilitator: How would you describe the way your knowledge and skills with CMP has changed, how is the way you manage, navigate and deliver the program different now than when you started?

Participant 1: This being my third year of working with it, it's gotten a lot easier. The first year when we were just implementing in the one classroom - I was in two different seventh grade classrooms at the same time, one of them was implementing and one wasn't. The difference was like night and day. In one room you had direct instruction going on and the other was CMP2. I think me and the other teacher in the CMP2 classroom were like two blind people walking around trying to find our way - we would look at each other and say... can we say that, do we tell them the answer, are we allowed to do that, do we even know the answer - we were just confused every day. And working with inclusion kids, it was even tougher to know what we could tell them and not tell them. There were so many times when they were dancing around the answer but couldn't see it and we were never quite sure how far we could go with telling them things. Now, we are more capable of doing it because we understand it. Now we are able to ask them questions and help them figure it out for themselves. We know what is OK with the program and when we are bending the rules. And there are still days when we have to rely on direct instruction because they just didn't get it. But now, the fear of doing something we aren't supposed to is gone. We realize that there is flexibility and understanding that we are still learning too. And with the pacing guide, if you spend too much time on one thing you are going to start falling farther and farther behind and people will let you know that you are falling behind. But if

they're not getting it, then you have to rely back on direct instruction to try and get caught up.

Participant 3: And the theme this year has really been intentionality. So that if we say "all right, today we are going to teach using direct instruction" - there's a reason for that. And we didn't just go, oh I didn't prepare today so I'm just going to work right out of the book. You can't always do that - there's too many materials, and a thought process to what questions you're going to ask, and who you're going to have come up when, OK-this one has the right answer, this one has the right answer, this one has the wrong answer, and this one has the right answer and did it in a totally new way that I have never seen before. What order do you ask those three groups to come up. It's all about intentionality and I loved when number one said we don't question ourselves as much anymore because we are confident with ourselves and the decisions we are making. When people come in and observe, and ask - "did you plan on doing that today?" I will say "no, not today. But I can tell you I am now going to do it intentionally with my other three classes because it really worked. And they appreciate hearing teachers being honest with their teaching. And this year it's all about being intentional.

Facilitator: Number 2 is there anything you would like to add?

Participant 2: I am really comfortable with what both 1 and 3 said. This being my second year, and it was totally out of my experience I realized this year it's OK to struggle a little bit when you are learning something new. And so now seeing kids struggle isn't so scary for me now. Last year was a very hard year - I was trying to find my way in the classroom with management and I also have this totally different program to the way I learned math. But now, if one of the people come in or a peer wants to come in and observe and something doesn't go right, I'm not panicking because I'm not getting my job done. I know my kids are learning and I know I am not going to move on if my kids aren't getting something. And like #1 said, the pacing guide was my bible last year and it was scary. Now I know where I can tweak things a little bit if I need to and where I can put in extra time on certain concepts. I am constantly going to be doing that - and with us being so comfortable with the coaches coming in, and as long as they recognize we will need to do that, it is really helpful to us teachers.

Facilitator: Two more questions. the next one has to do with your attitudes about the adoption - the last question had to do with your skills and knowledge. This one has to do with your attitudes - has your attitude about the adoption changed over time? And if yes, how and why has it changed?

Research Question 10

Facilitator: Did your knowledge and skills about the math innovation change over time? If yes, please explain.

- Participant 1: When we first piloted it I was much more hopeful for it than I am now and that has mostly to do with the groupings of kids. Like I said before, if the kids were grouped differently their whole attitude about everything would be much better. I was very hopeful, the kids will have stuff to do - they just won't sit in their seats and do problems. But rather, they were going to make a spinner and actually do the trials to help get them into the math. And that part is really good - because kids can't just sit anymore, they have to get involved. Now, after the third year in a row of being in an inclusion class, I can see what has to change. When you put all of the lower kids in one classroom it is really tough to implement this program.
- Participant 3: This issue of class make-up is a building dispute. We are pretty much split down the middle about this as a faculty - homogeneous v. heterogeneous groupings. The math and science people are begging for a change while ELA and SS teachers are saying what am I supposed to do with special education inclusion kids and honors kids while I am having them write a paper - how am I supposed to deliver instruction and assess with such a wide range. And the math and science teachers are saying we can't deliver our program with homogeneous groups of kids. So what is administration going to do? Right now they are doing nothing because if we change it, only half are going to be happy and I am going to have to deal with lots of glitches changing the schedule.
- Facilitator: OK, let's pull back here and refocus on the question. Number 3, can you please address the question concerning your attitude?
- Participant 3: When we first started implementing I was going to be on maternity leave most of the year. At first I was interested in piloting, but since I was going to be missing most of the year I declined. That was hard personally and professionally - I was really excited about it, I am a people pleaser and it was new and it reminded me of my methods courses and how I was trained to teach and I thought "cool - change", I was all about it. And then I came back from leave and the people who had piloted it for a year were mixed. Some of them were won over by the curriculum. Some had asked to pilot it because they hated the curriculum and they did that on purpose. They not only wanted to, but they were asked to - if they felt so strongly in a negative way, better to give them a chance to see what it was all about and if they can be won over, anybody can be won over. And some ended up liking it - it was like "holy cow they actually came up with that on their own, all right, I'll stop being so hard-nosed and there were still things I wish were different, but OK I'll give it a try". That was when I came into the conversation, at that point - that was my first year one of implementation, the negativity was waning a bit, but there was still a lot of talk and I realized I wasn't so excited and I thought I'm not sure how I feel about this. I was nervous about the materials and the Launch Explorer part of it. As they discussed earlier just getting your sea legs and there I am sitting with two timers on my projector going, "OK, I really need to be this strict with myself or else I'm just going to launch, launch, launch and be back in direct instruction!" And giving the second half of the class to explore, and be sure to have 5 minutes for summary - which is what I had always done and it wasn't right. And then

starting to feel bad about how I was teaching, coaches constantly coming in, which was good, but it's hard to have to ask for that much help, you start raising red flags. "She doesn't know what she's doing, we made a mistake putting her in that position." You don't want that kind of limelight when you don't know what's going on. Whereas this year has been more of a maturation for me of getting over the whole thing of asking for help, because really that's what our entire curriculum is asking our students to do. And now I know how uncomfortable that is, because I had to do it all last year. It's very humbling to feel like you don't know what you are doing - that your instruction is horrible, really that is how I felt. And it became a bit of a joke with my coach - I would tell her I can't believe they let me teach 8th grade math last year - really? I had no business teaching that class. It would make them mildly uncomfortable, but I wanted them to know how much I had grown and how now I truly understand what I am doing and should be doing to teach 8th grade math, I know where the students are coming from and how painful it is, and I am willing to do it. So, this year has been one of maturation and the feeling that there is new hope on the horizon again, this is good, I can see the fruits and benefits of it. We've worked through the muck and mire to get where we are trying to go, and there is still a lot to be done, and the word that number 2 is whispering in my ear is "budget" and you just hope that the work won't be crushed by decisions that people made about money and grants in the past year. There has been such an investment already and it will be very unfortunate if it all ends because of money. For sure this has been a roller coaster, as you can see - my highs and lows, but now I see how good it is and what it is doing for kids and I feel really sad it might not continue - that would be such a waste.

Facilitator: Any change in your attitude number 2?

Participant 2: Actually no. I am very positive about the CMP program - obviously having only taught this at this level. I am more comfortable in my own skin and in my room than I was last year - but I have always been positive about the program. I do think it will be a shame if they can't continue to fund the program and support. There is a lot of passion in our department, and for no fault of the students or the teachers, I am afraid that things will change. But no matter where we end up, we will always have the lessons that we learned and be able to use them anywhere. If we end up in a place that is just direct instruction, I think our kids will benefit from my two years using CMP wherever we go.

Participant 1: There have been benefits for everybody involved that will remain - I learned so much from the kids with this approach. I really feel I have benefited from that and for the kids it goes without saying that this is benefits them so much more than direct instruction.

Research Question 11

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

- Participant 1: I don't think the professional development had anything to do with the change. The actual classroom experience and seeing what was going on, seeing the kids struggling with trying to come up with an idea, not having the basics and then no one in their groups that could lead them and help the conversation get going. Attending all the professional development had led me to being optimistic in the beginning about the series. I thought it was going to be great, and then seeing it in practice with the groups that we had made it very different.
- Participant 2: My attitude has remained positive, but I did think the PD was great.
- Participant 3: After asking so many questions last year and feeling so vulnerable as an educator, I was more of a learner with my learners than anything else. There was obviously a connection between my district training and how I felt. At the time I was looking for any help and I am sure the PD helped me pull out of that feeling of complete incompetence to this place I am now with Connected Math. It's very humbling to be video-taped and watch yourself - wow. But to see the benefits of going through that process, and recognizing how gentle people were when giving feedback was very powerful. And then to watch others teach and realize it isn't about their teaching, it's about your own. And if you come in with that perspective, that is the most helpful in trying to change your practice. I know I still have things to work on, and I will and that always makes me better at doing it and then that makes a difference in how I feel about the program. So, it's that ongoing cycle of being willing to reflect and be vulnerable, make changes in what you are doing and then that makes your attitude more positive. It makes sense that when you think you are doing something well, you feel good about that and so when I didn't think I was doing a good job, I wasn't feeling so good about the program. And I know that the professional development had a hand in changing all that.
- Participant 2: My experience with the professional development has been very positive. I have always tried to ask questions before I make any big mistakes and the words that come to mind are constructive criticism. I mean I have tanked on things terribly and I will ask a coach to come in, and just like number three said - you ask them to help make you a better teacher. And I can say 100% of the time in my personal experience, all the input was constructive and helpful and respectfully done. That was very helpful.
- Participant 3: With that said, there are groups of teachers who refuse to let coaches in their room. Flat out refuse to let them in the door - and they are also the most negative about the program.
- Participant 1: And that group is both new and veteran teachers - what surprises me is that new teacher would say, "I don't need your help." That amazes me.
- Participant 3: And as I am reflecting on that, it tells me there must be a direct relationship between the professional development people got and their

attitude about the program. Wow - that is really interesting.

Focus Group Responses: Principal Group

Research Question 1

- Facilitator:** Please tell me a little bit about your current role and what other positions you have held in district.
- Principal 1:** Assist principal at a K-8 building, I have also been a kindergarten teacher, Title I teacher for reading and math, Reading Recovery, High School teacher and I also worked in another district for four years as a principal.
- Principal 2:** I am an assist principal, also in a K-8 building. I have also held a position as an activities counselor, high school teacher and an assist varsity basketball coach
- Principal 3 -** I am currently a principal at a K-8 school. Prior to that I was a math coach for the district, and also a classroom teacher in grades 2, 4, and 5 here in ____.
- Principal 4:** I am also currently a principal in a k-8 school. Before that I have held several positions - classroom teacher, Title I reading specialist, curriculum facilitator in primary grades and program coordinator.
- Facilitator:** Today our topic is the implementation of the CMP2 math program in your buildings.

Research Question 2

- Facilitator:** What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?
- Principal 4:** The first thing I think about is varied implementation to be quite honest. We have three grades implementing the CMP work, and in one of the grade levels I would say we have pretty consistent implementation as far as fidelity and all of that goes. Another grade level is more sporadic in the implementation - by that I mean when we have PD in the building and others are coming in from different schools, we see a pick up and an increase in the way the program is implemented for maybe a couple of days of a continuance of that and then a weaning back to old ways. In the third grade level I am thinking of now, I would say it's consistently a lower level of implementation - so doing the steps of the program without the understanding that other colleagues seem to have - so following the manual if you will, but not having the understanding so much, so that variability comes to mind first when I think of CMP2.
- Principal 1:** I think of the potential and the opportunities for the type and quality of teaching and research based curriculum that CMP has - just the expectations for

the students is/could be high for students - so the opportunity that presents is possible with CMP material being presented.

Principal 2: I would say the first thing that comes to mind is it is a hurdle for the staff - it's new and so that change that is taking place has not been as easy for the staff as they thought it was going to be. At the same time, I think that translates to the students and they are having a tougher time. But the first would be the hurdle it has been for staff.

Principal 3: I think the first thing that comes to mind is what number 4 alluded to. Part of that has to do with classroom practice and classroom implementation. I also feel that the program itself can be a bit uneven as far as going into less depth in some areas that need to be studied in more depth, and converse going into great depth with content that doesn't need that amount of focus or depth of treatment. So the program itself I find to be somewhat uneven and I am also unclear sometimes at how we have it structured. I don't know if we all fully understand the connections between the units we have selected and the order in which we have placed those units so sometimes that can back into classroom practice as well. We as leaders have some of those confusions and I think teachers do as well - they are not quite comfortable yet with how it all fits together and how the sequence fits together - is everything that needs to be covered being covered with the appropriate depth at the appropriate time to prepare students for their next steps - whether that's standardized testing or high school course work - it seems a bit uneven.

Facilitator: Can I ask a clarifying question? When you say the units that were selected, did the district have choice around sequence of the units.

Principal 3: It is my understanding that they did.

Research Question 3

Facilitator: How would you describe the district's math curriculum in grades 6-8 prior to the adoption of CMP?

Principal 3: I would say the program itself was just a traditional chapter on each concept approach - nothing unusual or different about it. And teachers as they do with every program use it to the best of their abilities and that varies - but in the main it was very traditional.

Principal 4: I agree and I think that part of what feels a little chaotic for us at our school is that it leveled the playing field has kind of been leveled, and so when we had a more traditional text book approach we got through as much as we could and in our building if our expectations were slightly lower than another building we got through less chapters than someone else and fewer concepts than other places - but now with CMP2 and the pacing guide that goes along with it, our teachers where we are with those lower expectations, sometimes think "oh, my gosh, we

have to back down. Our kids can't do that, we have to back off of the pacing guide." And for us, it has allowed us to say, "actually, no - we're not going to back off of the pacing guide", and so what we have seen in the one grade level I am specifically thinking about, is an actual increase in student achievement - and I want to say, "no kidding" - because what we have done is raise the bar and the students once again rise to our level of expectation. So for those of us in schools where we have consistently low achievement it has forced us to step up our game, different perhaps in schools that have consistently high achievement.

Principal 1: This is something that a teacher had shared. When they first heard about CMP2, they didn't like it, they thought the kids couldn't do it, they felt completely overwhelmed. And now, one teacher has shared repeatedly how it has changed his teaching, raised his expectations of the students and therefore their achievement. He always points out that shift in his attitude about it, and now uses it faithfully.

Research Question 4

Facilitator: How did you feel about the idea of a math adoption when it was first introduced?

Principal 4: One of the positions I failed to mention I have held in the district is that of Literacy Coordinator - and that was the position I held when this adoption initially took place. I wasn't quite frankly all that involved. When I came back to the role of principal it was slightly a feeling of panic - now here was one more thing I knew nothing about and I knew I had to get up to speed quickly with the training that had happened and the expectations of CMP2 - the all of it. But again for me, though, I am glad for it now - so I wasn't there when it first came in, but I am for it now because it pushes us, perhaps, beyond our beliefs about what kids can do and what we have in the past expected of the kids we serve, again at chronically underperforming schools. So while I wasn't involved at the beginning I am happy we have it now.

Principal 2: So, while not directly, I would echo many of the same sentiments. So for me, coming from high school, not knowing the CMP program, I would say that I would put my trust in the experts to make the right decision. So for me CMP2 was in addition to what 4-Block, and 6th grade Science looks like, and everything else that was all brand new.

Principal 3: I was excited. I knew we needed to move away from that traditional approach to teaching mathematics so I was really glad that we were making a change.

Principal 1: I wasn't a part of the district at the time of the adoption.

Research Question 5

Facilitator: How would you describe the feelings of teachers about the idea of a math adoption when it was first introduced?

Principal 3: They were upset. I can remember sitting in one of the libraries of our elementary schools when there was an in-service for 6-8 math teachers and this idea of a new math program was being introduced. They were very vocal - they didn't understand why they needed to be doing anything different because in their minds the 6-8 math scores were a strength for us as a school district. And they were at the time among the highest - so it was a tough sell at first to get them to think that anything different needed to happen.

Principal 4: I think there was a fear of having to rethink what I am an expert in. I am used to drill and practice - and saying now practice it until you know it. And now, I know for so many people they are wondering why are we focusing on this when once we had thought of this as a strength in the district. And also, I am so nervous - even though that isn't what it sounds like - of changing my practice or even considering changing my practice.

Research Question 6

Facilitator: What support did principals receive in readying for the math adoption in your building?

Principal 3: Actually, it was piloted at first so I wasn't involved in the initial pilot. So it came on board the second year when it went to a full adoption. I would say quite a bit - I think our support for that and the implementation was pretty strong. We were invited to participate in all the professional development that teachers were receiving. The key part of that for me and what made the most sense was part of the PD involved having a coach from the program come and work in our schools and in our classrooms. And we were invited to sit in on those sessions and were able to actually do that which was a nice piece. We had quite a bit of support to get it up and running.

Facilitator : My understanding is that everyone else was not in their current role at the onset of the adoption?

Principals (1, 2, 4): Acknowledge with an affirmative. No further responses were offered.

Research Question 7

Facilitator: What professional development did teachers receive in using this new math program?

- Principal 2: It was termed "just in time" training, teachers would be pulled just before they were starting units. That, I think, rolled over into us as new administrators into learning walks where we are participating in observations of classrooms in 6-8 grades.
- Principal 4: A combination of what both folks have said so far - from my perspective there are the just in time training with the whole group, a larger group setting. On the in-service days already scheduled into our district calendar, so it wasn't in addition to any existing work days - and then the follow up from the coach in the building. I think, from what the folks in our building said, the combination of the two together was obviously more powerful than either one or the other - the coach alone would never have been able to cover everything with everybody - and the large group couldn't allow for the live demo with "our" kids - the teachers at our school really appreciated that.
- Principal 1: It (the PD) also provided us with protocols we could use in our building for PLCs, and the coaches encouraged our teachers to gather together a couple of times a year to talk math and work through the challenges.
- Facilitator : Did someone come and facilitate those conversations?
- Principal 1: There were two kinds of meetings - one where our district coach came and facilitated the conversation with teachers during a PLC time and then sometimes the program consultant coach would come for a school session.
- Principal 3: One other PD piece that I think has made a big difference for our teachers have been the content courses (at this point in the recording there is an audible affirmation from each of the 3 other participants to this comment) - the DMI courses offered in the summer and during the school year and to be honest, I have found those to have much greater impact on teacher practice then just the CMP2 program professional development.
- Principal 1: And I believe that those are taught by the school district coach.
- Principal 3: So that is the content professional development that came along with this program that has made a real difference too.
- Principal 4: I agree with you - and it has made a real difference not just for the teachers in 6-8, but also for anybody else in the district who chooses to go, and I think some folks have taken advantage of that - not only those teaching CMP2.

Research Question 8

- Facilitator:** How would you describe the way teachers feel about the new math program in your building?

- Principal 1: I think a higher comfort level, it has been shared with us that they are embracing it more. I think now there is more of a focus on kids and what to do with those children who aren't making progress or do need different supports. Teachers have not yet become masters of using it yet - we are still delivering the program, we are better at delivering it, but we really are backing it more - so our attitude is better about it, but now there's this piece of "what to do" with the children - but we are making progress.
- Principal 4: And what will be really interesting to watch over time now is how students promoted through the grades come as different mathematicians - it will be interesting to see if in fact teachers who are in those grade levels over time, how do they see a change in the students as mathematicians.
- Principal 2: I would say they have taken on ownership of the program. We are far from mastery, but I observe a sense of ownership. Our 6th grade teachers still haven't seen a group of students that have had any of the new math - next year will be their first year of having students who have had any of the new math programs. But you hear 7th and 8th grade teachers talking about how it has been easier this year because students knew the routines of the program - the notebook setup, the games are familiar, and I think there is now also ownership on the part of the teachers and that is evidenced in how the students are prepared for the program.
- Principal 3: I would agree. I still think the most important thing is the content - of our three teachers the most effective one had the DMI training and it is really interesting to see how differently her kids achieve. And one of our three teachers, the one who was involved in the original pilot so this is her fourth year of teaching the program, is still not as strong as the one teacher who had that content course. And it wasn't always that way - it has been really interesting to watch over these past three years the changes in their teaching.

Research Question 9

- Facilitator: **Describe how, if at all, the adoption of CMP has changed 6-8 math instruction in your building.**
- Principal 3: I would have to say I don't think it has had a significant impact in and of itself. It can be used badly - the same thing as any program and it can be used well. But if asked to single out CMP2 as the single factor - I would have to say no. Other things have impacted practice I think, but from my perspective this program is not one of them- at least not as much as one would hope given the investment.
- Principal 4: I am interested in the relationships over time among our math teachers - because while I have had conversations with the teacher in the middle of those grades about students coming to the grade prepared differently. But then what is happening when they leave that grade and the next teacher is doing things the old way, there's no way that we are putting all this investment into them

becoming better mathematicians and then the year following they're just going to do what they have always done. So if that same trio of folks is still there, it will be interesting to see what kinds of pressures they put on themselves and one another to make changes and if in fact those vertical teams keep happening how will that play out with the folks in the younger grades pushing those in the upper grades over time.

Principal 2: To the same comment about ownership of the teachers as they understand what might work best for the kids - but I don't think they have put their total trust in the program yet at the same time. We can always fall back on what we are most comfortable with and forever we've been direct instruction and drill and kill in math, and we still fall back into that - and for sure when we see gaps in what kids know.

Research Question 10

Facilitator: What, if anything, could the district have done to better prepare teachers for the math adoption?

Principal 1: When number 2 mentioned direct instruction, it reminded me of how you can still present CMP2 as direct instruction and so that is something we need to address (other participants are all acknowledging with nodding heads their agreement). I wonder if there should have been more conversation about instructional strategies and practices in general, not just in the context of math instruction or this content area or program.

Principal 2: I may be off, but I think that CMP2 has a lot of differentiation in its instruction - and I don't know if we do that in full spectrum in our practice - I think for the most part in our craft we are still teaching to the middle. So, to answer your question, in trainings for CMP2 there needs to be professional development about how that differentiation should look like in the classroom.

Principal 4: I agree, and that it is, in fact, not optional. It is in fact the way we teach mathematics - to have some large, whole group and some small group work in every lesson - and that math instruction doesn't mean having pairs working at their table - it means having the teacher working with those kids who are struggling, or those who need additional enrichment, while those students who are able continue to work independent of the teacher. It also means the teacher uses note taking of some type to indicate who needs more help, who doesn't - so that the next day we know where to begin. And we still struggle with this and have a long way to go - even in the classroom where I would say there is a high level of fidelity to the implementation, there is still a long way to go as far as that differentiation. So I wonder where are we in implementing the program with fidelity if we don't understand the differentiation - it's kind of like saying we are reading without comprehending - you know what I mean?

- Principal 1: But still that person is doing the program on a daily basis, and we can see evidence of that - higher expectations for students, they have embraced the program and then what is the next step going to be or need to be in the implementation.
- Principal 3: As a district I think we can do better. We are really asking for more than a program change, it's more like a strategy change and a change to their expectations - so that on the front end we need to adjust our evaluation tool to reflect these changes in expectations. The evaluation tool that we use as administrators is very vague as far as what is good practice, it is not specific at all - and that allows a teacher to perceive success with what they have been doing and to make the case that it is satisfactory practice and then it is very hard (for principals) to refute that given the current tool. So I think we could do better job of updating our evaluation tool at the time of implementation, so that from the very beginning we are in a position to get folks in the correct habit of instructing in that program. I think that is something we could do.

Research Question 11

- Facilitator:** Are there additional supports needed to successfully implement this adoption in your building? If yes, what are they?
- Principal 3: I would say a better way to evaluation tool teachers using this program.
- Principal 4: I agree with the evaluation tool comment. As we continue with the just in time trainings and have the coaches for a little bit of time - as we grow in our understanding, we still need to have someone that we can go to check how we are doing, someone who can push our thinking to the next step. I would say we still need that coaching support - both from internal and external coaching support. Also the continuation of the DMI classes - if we are going to have the expectation that those teachers in 6-8 and below understand the mathematics they are teaching, then we have to be sure we are offering them a way to know the content differently than they may have had.
- Principal 3: One of the incentives for teachers to attend the DMI classes originally was they received a piece of technology that was very useful to them in their practice - that was a very effective carrot for getting folks to those trainings.
- Principal 4: It's interesting though - that when we tie that in to the attendance of a training - when in fact we say, this is a good tool for your teaching, but we don't give it to you al. It's like when kids have to "earn" the right to work in groups - we know that small group work is a very effective learning strategy - but if you have to earn the right to have it - so that's interesting to think about. If in fact that allows for on the spot student sharing and effective demonstration - then why is it tied to getting the tool that you need?

Research Question 12

Facilitator: How would you describe the implementation process of CMP to date?

Principal 4: I would say, again, that it's varied. I would say again, that we have some folks who are really giving it their all - whether they started because they were asked and now chose to continue because they believe, or they believe that a change is necessary first and then some benefits of the change will come - and we don't have, from where I am coming from, everybody on that continuum at the same place, I am not sure quite frankly that everyone is even on the continuum.

Facilitator : May I ask a qualifying question - what would be the evidence of someone not being on the continuum at all - using different materials, or just from an attitude?

Principal 4: I have not seen the use of other materials. I mean that they have a toe on the spectrum. The other reason I say we have varied implementation comes from the request for support. We have other internal folks who are supporting mathematics at that level, or I am a special education teacher supporting mathematics at that level, there are some of those folks who are absolutely adamant that if there is going to be any small group work going on, there are two folks in their team teaching so that there are two adults in the room to manage learning needs. There are other folks where it doesn't seem to matter if there is one person, two people, 7 people, because it is the same no matter what. So the request from other folks who are specials in mathematics causes me to say the implementation is varied.

Principal 1: I also think about what our teachers are telling us. They talk about going to this math training, or this math training - but we really are just doing it - but not with the meaning that is behind it. I am not sure how you create that awareness in others - but I don't think we should stop offering support in the ways that people are asking for it - and to keep offering it as long as they ask.

Principal 3: I keep coming back to the money business - it has cost so very much money and with such varied results it doesn't seem worth it.

Research Question 13

Facilitator: Did your knowledge and skills about the math innovation change over time? If yes, please explain.

Principal 2: Well, for sure mine did - but that was almost impossible not to happen. Like I said earlier, I never saw myself as a math person so I really had a lot to learn. And then coming from high school, it was all new. Going into classrooms and

doing the learning walks really helped me make sense out of the program - what it was based on and how it worked with the students.

Principal 3: Yes, in the way that you get more comfortable with anything as you do it. Even though I'm not teaching CMP2, my math background and seeing it in action has made me understand it and recognize what should be happening in classrooms.

Principal 4: I felt like last year I was trying to catch up because I was coming from a literacy position back into a school setting and hadn't paid much attention to the adoption when it was first talked about. This year I have been able to take more advantage of opportunities to learn more about it and feel more comfortable with the expectations of the program.

Research Question 14

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

Principal 1: Coming back to the district I was glad to see we had something in place so I was embracing it. It is encouraging to me that the teachers for the most part are embracing it and feeling it is worth their investment. So I started with a positive attitude and I continue with a positive attitude.

Principal 2: I became an English teacher because of math and so all I knew was the old math and doing a 100 problems. I knew when I got 30 out of 100 right that pursuing English or social studies was better for me. So, like number 1 when I found out we were doing something different than the traditional approach I had known, I was encouraged and thought it was a good thing. And now walking in and out of classrooms and seeing kids' faces and the different conversations that students are having it's very exciting. So I was positive and I continue to be positive about the adoption.

Principal 3: I would have to say that my attitude hasn't changed much - I was excited we were changing, but not thrilled with our selection. And I still feel that way.

Principal 4: I would say my attitude has changed a bit - at first I was nervous and got a bit sucked into the hype of "can our kids do it". And over time I am reminded again and again and again, that not only can they - but we must provide them the opportunity to do so. I don't feel worried at all about the students' ability to do it - what makes me nervous is whether we can get our act together as the adults to do what needs to be done for kids.

Research Question 15

Facilitator: Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.

- Principal 1: No impact
- Principal 3: Nodded with agreement.
- Principal 4: No impact for me either.
- Principal 2: Still, being the only high school person coming in with a LA background it was important for me to see what it looked like in the classroom. And I was able to see that through the professional development. And it made me more positive about the program, from seeing what was happening in classrooms with students.

Research Question 16

- Facilitator:** How would you describe the attitudes of teachers and coaches regarding the adoption and implementation of CMP?
- Principal 3: More positive than they were at the beginning. I think folks have realized it's not as bad as they had first heard. The people I am working with definitely feel more positive and comfortable with it now than right before they got the materials.
- Principal 4: I would agree.
- Principal 2: There were thoughts that we might go back to the old ways - but now that they have reached the point of no return, they are taking more ownership of it.
- Principal 1: I agree that there is less negativity, less fighting. Now there seems to more of an acceptance that this is what we do so I need to get better at it. I would like to see more excitement about the coaching possibilities from teachers, but... takes time.

Research Question 17

- Facilitator:** Is there any other pertinent information you would like included in this data collection about the implementation of CMP?
- Principal 1: Just the positives that people have mentioned about implementation that should be kept going - the walk throughs, the coaching, the DMI training, what to look for - should all be kept going. It should not just happen during the first two or three years - those practices help us go deeper and be better administrators and is our professional development that allows us to support teachers in a different way.
- Principal 3: It is probably relevant and important to note that this initial implementation, this first couple of years, received tremendous financial support from a grant.

Most of the money used these first two-three years may not be there in the future. Nor, it may not be there in the immediate future. It was a unique situation that we had adequate funding to be able to do the implementation the way we wanted, and best practice dictates. Participant 4 - It was also very helpful that there was someone there to oversee how the implementation was going - that was their job. Now in this next year - when we will have so many people in new positions and the funding may not be there. So how will they continue the PD as it was intended to be - will we have the just in time trainings, the internal and external coaches. What will that all look like - and what will happen to so many teachers in new math positions if we don't have those kinds of supports in place?

Focus Group Responses: Coach

Research Question 1

Facilitator: Tell us who you are, where you are working with teachers, the grade level you work with, and something you like to do outside of teaching and coaching.

Coach: I am the sole middle school math coach for the city and so was very involved in the implementation. I work with 42 teachers if you include the special education teachers, who are heavily involved with CMP classrooms in 14 different buildings. I am not responsible for any of the trainings or in-services this year, even in the planning of those. My job is really providing all the job-embedded professional development. Something I like to do outside of school, I grew up a runner, so I still try to do that, and triathlons. I have an event coming up called the warrior run, where you run 3.5 miles through a variety of obstacles including rivers and woods and all kinds of things.

Research Question 2

Facilitator: What is the first thing that comes to mind when you think of Connected Math Project (CMP) program?

Coach: I think it's been the best decision our district has made regarding mathematics. Most of my career teaching career has been at high school. At Collegiate Academy I developed two freshman courses because we had kids coming from 55 different sending locations and what I discovered was that they had a wide disparity in skills that they brought - so when I developed these two courses to try and level the playing field among these kids I taught them and so that was my first experience with teaching freshman. I had always taught sophomore geometry, junior algebra II and some senior electives - and I found the 9th graders so fascinating at that point I decided to move to down middle school. So I taught in a middle school for 3 years and then was hired for this job. So coming from that longitudinal direction of 6-12, I think that it's a wonderful program. I think our implementation has been rocky, which is typical throughout the country. I think we have some teachers stuck - I think we actually had more forward movement in our first full year of implementation last year than now. Teachers are falling back into some old habits. So, it's a wonderful program with a difficult implementation.

Research Question 3

Facilitator: **How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?**

Coach: I made up a word - very "baseley" - we don't think that's a word, but very direct instruction. What I told the teachers is - I could walk into any 6th-8th grade classroom, not know what the lesson was for that day, and stand up in front and teach the lesson relatively well, it was that kind of approach. It was not in the best interest of our kids - especially our large populations of minority and special education kids, to have teachers lecture, do a couple of practice problems and then do some individual practice and then homework - it was just not working for too many of our kids - it was very direct instruction, which is the way we were taught, that is one of our problems - it is the way we were taught, and the way we were taught to teach - and that is why the transition has been very tough.

Research Question 4

Facilitator: **Tell me about the opportunities created for teacher and coach input about the math adoption.**

Coach: When we first were looking at a middle school program we had a number of teachers on the math committee - we spent two years, the first year researching what a highly effective math program looked like and was - and the second year looking at different math programs, before we picked CMP. There were teachers on that committee - special education teachers, elementary, middle and high school teachers - there were also principals and coaches - so that was some teacher input. Before we fully implemented, I was coaching and went into different classrooms and modeled different lessons and asked teachers for feedback and input. We had a couple of interesting information sessions - they turned out to be, in a lot of cases, gripe sessions - but for many of the teachers we explained the program and why we were doing the program.

Facilitator: Regarding the information sessions - who was invited to those?

Coach: Every teacher - it was part of our in-service program. So we brought them in, explained the program, explained the research behind the program, explained the work of the math committee. We had them do a sample problem to get a sense of the program and allowed them to give us feedback. What a lot of the teachers who were against the program did was go online and did research. You know there was angst among teachers and parents whose districts had supported CMP, even to the point of legal suits against the implementation of CMP in Texas, so they latched onto that and once they did that it was very hard to get anything but negative feedback from them and that is still the case today. So one of those teachers who was the most vocal hides algebra I textbooks in the SS classroom and brings them out to use them, and when she knows I am in the building she locks the door to be sure I don't come in. So we have some of that still.

Facilitator : Was there any difference in the coach impute from what you have explained? When I was in the classroom modeling different lessons, I asked a lot of the teachers what they thought about it. I would try to make them feel better, it seemed like that was a lot of my work.

Another thing we did, when we got it down to the final three programs, we invited every teacher to see the presentations by the sales reps and the publishers about that program and they were actually able to vote, which a lot of people did not agree with because they were not part of the committee for two years - so we did have their input there as well.

Research Question 5

Facilitator: How did you feel about the idea of a math adoption when it was first introduced.

Coach: I at first I had some trepidation - you know the old program was very easy to teach, but we had to stop the bleeding in middle schools. Our scores were terrible - the PASSA tests are obviously not the be all and end all, but we were not sending kids prepared for high school. So from a personal standpoint, it was like - dang, this is going to be hard. But from a professional standpoint, it was really a no-brainer. I was one of the teachers at Roosevelt, before we even piloted it, we got some of the books and we tested out different units - but we hadn't been trained, at that time we didn't even know the books were supposed to be taught in a certain order and so what we did was used the 6th grade books and taught it to our lowest 8th graders and I got to see the beauty of the manipulative and group work - but since we hadn't been trained and didn't have the books in order, that was hard and it didn't give us a good sense of the program until we realized, but I could see the benefit to that group of struggling students and that was important.

Research Question 6

Facilitator: Tell me about the opportunities for professional development and other support that were available to get ready for the new materials.

Coach: We were very lucky to have excellent trainers from Pearson and that made it much easier. Jacob was our first and primary trainer and he was excellent - everyone quickly liked him. He had a great way of answering questions from teachers who were not supportive in a very kind and calm manner - that was very helpful. We had two summers of what we called math institutes because a big problem for our middle school teachers is certification. There are only two teachers who are actually 7-12 math certified. Most of our middle school teachers are K-6 certified that went ahead and took the praxis and passed. Many of them took the praxis to protect their jobs because that was another certification in math. Many of their content knowledge was very weak. With CMP the program was much more rigorous and going much deeper and many of

our teachers struggled with the content knowledge required as well as the pedagogy and that was another reason we had some push back as well. So when we did those math institutes a lot of it was a lot about content knowledge, some pedagogy, but mostly about content knowledge. We worked really hard on that and even after we implemented, our sole first year was a lot about content knowledge. I still run into content issues almost every time I am in a classroom. That was the PD before we started.

Coach: That first year we implemented with those 11 pilot teachers we had a hard time - we didn't get the books on time, it was definitely a little rocky. But we learned so much that first year - we got such great feedback from those teachers.

Facilitator: Let me clarify... first there was the pilot year with the 11 teachers, then there was the first year and now this is the second year.

Coach: Yes, that is correct. But, before the pilot year, the four middle school math teachers at _____ tried out different books. Because the decision was not made until the summer before we implemented, we were rushed and had to quickly put the math institutes together quickly. They were voluntary - most of the teachers came however, they were paid. And then we did the just in time trainings which we did ongoingly as the program was being implemented for the first time.

Research Question 7

Facilitator: **How would you describe the way teachers feel about the new math program in your building?**

Coach: We have many teachers implementing it well, are firmly behind it and excited about it. and then we have a small group of teachers who are very, very vocal against it and always will be. and all those teachers have power because those principals don't support the district in making them implement. And so we have that difficulty with that group of teachers and unfortunately they've been in the district a long time - not necessarily older teachers, but they have been in Erie for a long time and they are some of the leaders among the teachers and so that makes it difficult. you know, i was talking to someone - I forget who it was, but i was very frustrated. i had changed my coaching model focus, i have six teachers i work with extensively and then I try to hit as many others as i can. But, with 42 teachers, we need at least one more math coach in order to do embedded PD the way it should be done. O call it passing the "_____" test - _____ is the youngest of my four children and she always struggled with math. So I always say to myself... would I want _____ in that teacher's classroom? And you know, we have a third, a third, and a third - a third of our teachers are really strong, implementing with fidelity, very reflective, spend a lot of time planning and are very vested in the program. A third of the teachers are adamantly against it. And a third are not vocally against it, they're just not doing the work that's required to implement the

program. So, I would say there are a third of the teachers I would put my daughter in their class.

Facilitator: Let me ask you a follow up question... you talked about in that mental model you have made with percentages, you would say that 2/3 of the 42 teachers are making some attempt to implement the program

Coach: Yes, that makes sense - and a third are resisters. And the problem is we are not moving the resisters the way i would like. and that is in my mind, mainly due to the lack of principal support in insisting they implement the program.

Facilitator: And when you refer to the six that you work with intensely, which category do they fall in to.

Coach: They are in the top third. When ____ (the math coordinator) and I discussed who to focus on we decided to build capacity and focus on those who were positive. so we work with them and ask them what we should focus on across the district. So right now one of things we are doing is error analysis - where making the kids responsible for their learning, and instead of having the teachers correcting the homework, we have created a matrix where the kids have to do that for themselves. And that is something I can take to that middle third of teachers that they will really like. So I worked with that top tier of teachers to develop the matrix and then take it to the next audience. And then I am having some success taking that practice into other classrooms because we are seeing some success with the first classrooms and so it is easy to see the benefit to kids and that becomes a reason why teachers will do it.

Research Question 8

Facilitator: How would you describe the way the implementation has gone in your building?

Coach: I said before it was a bit rocky - and I don't want to sound too negative. We have some teachers doing magnificent work. I guess my biggest concern is the lack of principal support. and until we get the principals on board, and again this is a district issue, that will be the primary reason why it has been rocky. And unfortunately, the teachers who are in the bottom third tier with implementation are in the buildings where principals are not requiring them to do it. That's been difficult. We have made a lot of progress in the area of content knowledge with our teachers. one of the things I didn't mention is I have been doing a lot of work with the DMI curriculum - Developing Mathematical Ideas. I teach three graduate courses through Gannon University so the teachers get credit - and that has moved a lot of teachers' mathematical understandings. We used the DMI books to create three graduate courses: 1)

Numbers and Operations, 2) Algebraic Concepts and 3) Geometric Concepts. These are K-12 teachers and principals who take it. It is huge professional development for teachers and school leaders. We had a teacher who had 30 years' experience and took the class last year and at the end of the class she said "I used to think that if my kids knew the algorithms they would be fine, but now I know that they didn't know anything." This class has really helped the implementation. I also think it would help if there was more than one of me. I just can't get to the teachers the way I should. My contention all along has been that everyone doesn't need the same support, but still everyone needs some help.

We have pockets of problems I am really curious to see how our test scores do this year. Some of the benchmark tests have shown a big jump and I think that is going to make a big difference in what teachers do moving forward. I think the implementation is uneven and I think part of the reason is because in this district the culture is we live and die by the scores and a lot of the resistance comes from a worry that this program will reflect negatively on how kids do on the standardized tests.

Another problem we've had with implementation comes from the fact that we started in 6th grade, so many of the kids that are in 6th grade have never had to think this way or do this type of problem solving, collaborative inquiry-based learning or working this way and the background knowledge was not there. So hopefully with 5th grade implementing Everyday Math, those skills will come along as well and make it easier for our 6th grade teachers, but that will carry all the way through. And so we had some of our schools using the Saxon program in elementary and so that has been a huge shock to the system for them, but even those using the Scott Foresman will find huge changes in how they are teaching. So many of the implementation issues are working themselves out. I think we have done a pretty good job and have received a lot of positive feedback on the just in time trainings and how those have helped them with implementation. And to have those opportunities outside the classroom to work through every single problem and talk with their colleagues about what will be hard, and how to better meet kids' needs has been very helpful. We have tried to facilitate that learning community conversation across buildings which has helped with teachers who are willing to try different things.

Another thing we have found is the need to adjust the pacing guide. The pacing guide was very aggressive and last year we brought the teachers together and asked them how we needed to change it. Teachers revised the pacing guide grade by grade and that helped a lot with the implementation - but it is only as good as teachers use it.

So, I would say we have had high points and low points. Sometimes I feel really confident and positive and sometimes it's you wonder what the heck teachers are thinking.

We make assumptions about what teachers are doing because we know we have trained them and assume they are doing what is expected, but we know that is not always the case - some of them just choose not to do it.

Research Question 9

Facilitator: What, if anything, could the district have done to better prepare teachers and coaches for the adoption of CMP?

Coach: I would liked to have had more time to go through the books ahead of time. I had the opportunity to review and teach several snapshot lessons at each grade level so I felt like I had the vertical piece understanding. But I didn't have the chance to get the flow of the books at each grade level. It would have been better if we had the program earlier, but that wasn't going to happen. We were pushing, pushing, pushing and there were lots of issues, not bad issues, but things we had to work through. Other than that, thinking about it now - and maybe this is something we could do next year to build capacity... I would like to send the top tier teachers to the users conference at Michigan State where they would get a lot of ideas and be energized. I went myself, but not until after we had started implementing. Perhaps if I went before that might have been helpful.

Research Question 10

Facilitator: Are there additional supports you need to successfully coach the implementation of CMP? If yes, what are they?

Coach: More time. There is just not enough time to do this job the way it needs to be done. _____ (math coordinator's) expectation is that I am always in buildings, which is my primary responsibility - in the classrooms with teachers. I need time to do the other stuff that is also part of my job, so that becomes very stressful. Her expectation is unrealistic. I would also like more time to meet with her - she's just overwhelmed and I get that, but there have been issues that I communicate to her but don't hear back from her. There seems to be a lack of communication.

There is also a personality issue at this point. The person doing the just in time trainings and the common core assessments is not responsive to the teachers. And teachers know this and are put off by her sarcastic responses and messages to them. And so now the teachers ask me for some of the information that would come from her so I continue to be the delivery girl. And that is fine because it is getting teachers what they need, but based on our coaching training, this materials deliverer role is not what the coach role should be and it

should have gone away by now. So that had been a difficult thing and while she is very good at what she does - she's very organized, attentive to details, but I feel like I am in the middle. I have tried to work that piece out with ____ (math coordinator) but feel like I have not gotten support on that. I would like the opportunity to work more with principals and have ____ (K-8 Director of Curriculum and Instruction) demand that they be supportive of the program, that they supervise the implementation of the program in their building so that the hiding books in another room stuff doesn't happen. I think those things would make my work more effective - the time, communication and principal issue would make it better.

The other thing I have been upset about - the fact that I have been taken out of that loop of providing input to the in-service days. I have knowledge from my time in classrooms about what teachers need. my colleague who is in charge of those days is not amenable to input and this is another example for that flawed communication loop. I am not sure why I became separate from that part of the work - my job is more than just being in classrooms, it's not a black and white thing.

Facilitator: Has your knowledge of the math adoption changed over time?

Coach: Absolutely. My content knowledge was pretty solid since I had taught high school math for so many years - but the depth of understanding piece was huge for me. The depth of my content knowledge has improved. I often say I would like to go back into the classroom for a couple of years because I know I would be such a better teacher. I have learned so much from my colleagues - it really is a two-way street. The opportunity to be in so many different classrooms has allowed me to understand the vertical 6-7-8 piece has been huge and that is going to be one of our foci for professional development for next year. It will give all teachers the opportunity to better understand what happens the year before and where the program has been and is going. This program is based on stories and situations - and being able to understand those connections has been huge for me.

Research Question 11

Facilitator: **Did your knowledge and skills about the math innovation change over time? If yes, please explain.**

I feel bi-polar sometimes - my feelings can change classroom by classroom, hour by hour. So, no, instead of my feeling changing over time it's very crucial. I'm tired. It is a very intense job, a very important job - but I am tired. So for example, right now, I am teaching two graduate courses after school which is a huge commitment. I see that as a very important part of my job and I wouldn't want to take that away, but it makes me tired. I am hoping this summer will give me a chance to rejuvenate.

Has your knowledge about the math innovation changed over time?

Oh yes, absolutely.

Research Question 12

Facilitator: Did your attitude about the math innovation change over time? If yes, please explain.

Coach: We still have a lot of work to do with our Sp Ed teachers and the implementation. Many of our special education teachers continue to act like aides, not co-teachers. Many of our special education teachers don't make adaptations and that is an area we need to address. We try to discuss the intentional decision making when adapting for students. When we look at those teachers we know many of them go back to old behaviors of doing it for students and not allowing them to problem solve for themselves.

Facilitator: Do you think the institutes and just in time had an impact on teachers' attitudes about the implementation?

Coach: Yes, most of the time, depending on the teacher. I think the teachers were so appreciative of the training that was provided. A lot of our teachers know of places where implementation has not been supported with quality training, so the teachers are appreciative of all the training they've had has been powerful and has positively impacted their attitudes about the implementation. They have been very dissatisfied, however, with our in-service trainings this year and they don't get it.

Facilitator: So let me ask a clarifying question - you are distinguishing between the just in time trainings and the in-service trainings?

Coach: Yes. They found the just in time and the DMI institutes very beneficial, but thought the in-service trainings were a waste of time. But, honestly, that was because they didn't get the importance of analyzing student work and that was what the in-service days were all about.

Facilitator: What was the setting for in-service trainings?

Coach: These are district release days where teachers are in professional development all day.

Research Question 13

Facilitator: Did professional development activities you participated in impact your attitude about the math innovation? If so, please explain.

Coach: One thing we started to do and got stuck on - because so many of our teachers are not doing adaptations we decided to create a math portal and have 6-8

special education teachers create the adaptations and the notebooks and they would be posted on the math portal, but that work was stopped. I would like to see that work continued. The set-up is already there, it just needs to be loaded with teacher inputs.

And this goes back to the notion that teachers like to learn from teachers. Why are we reinventing the wheel? We can learn from each other and do it in a distant way without needing to bring teachers together.

Facilitator: A follow-up question about the capacity building group you described earlier - their enthusiasm and success with the implementation, do you feel that was connected to their early on professional learning, is it just who they are as people - what do you think?

Coach: It's both - they all share some of the same personality traits - same strong interest in kids, they are go-getters. And so these people were on that higher end of the scale to start with. But I also believe that some of their enthusiasm was impacted by the training they had. But for sure their personalities play a huge role, their willingness to do the extra work and put themselves out there. And yes, those same folks were very appreciative of the professional development and I do believe it had a positive impact and so there is a correlation there.

Research Question 14

Facilitator: Is there anything else you would like to add about the implementation of CMP in your district?

Coach: No

Research Question 15

Facilitator: Have we left anything out?

Coach: No

Focus Group Responses: Math Coordinator

Research Question 1

Facilitator: Please tell me a little bit about your current role and what other positions you have held in the district.

Coordinator: My current role is K-12 math coordinator which includes and involves anything to do with mathematics district-wide, every aspect including curriculum, classroom instruction and some supervision, including supervising the math coaches.

Facilitator: Can you elaborate and add background and context to what it means in this district to be involved in every aspect of mathematics district-wide?

Coordinator: For the past two years we have been implementing CMP 6-8, the implementation of Everyday Mathematics in two cycles - first was K-2 last school year and this year, 3-5. At the same time that is going on, at the high school we are changing their instructional practices and we adopted a new program.

I have been a teacher for 12 years, high school math. I was then a mathematics coach at the high school level, and then a facilitator of mathematics which meant I was responsible for observing and supervising just mathematics as part of an administrative team just at that one high school.

Research Question 2

Facilitator: What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?

Coordinator: I think of excitement and teaching math in a new way from the students' perspective - and by that I mean no longer focusing on the algorithms, but going deeper in understanding the math.

Facilitator: Tell me a little more about the excitement you mentioned first.

Coordinator: The excitement comes from getting to walk into classrooms and seeing kids excited about what they are doing in mathematics - hearing more talking from students and less talking from teachers. Listening to students communicate mathematically and having conversations about math versus the whole focus of many math classes in the past was on obtaining a correct solution.

Research Question 3

Facilitator: **How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?**

Coordinator: It was very much a basal type approach to math instruction. You would have seen a very traditional approach- teacher-centered, stand and deliver model. Students worked on math worksheets and worked out of the book. The whole focus of the classroom was on teachers delivering the material and students sitting quietly and receiving that information and applying it only in the sense that they were applying it to use an algorithm - not in the true sense of application - they did not have to think about what they had learned in order to apply it in a new way.

Research Question 4

Facilitator: **How did you feel about the idea of a math adoption when it was first introduced?**

Coordinator: Well, I guess I thought about it from a logistical standpoint. I knew that where we needed to go was a huge change from where we were. I immediately immersed myself into the research and literature about students' ability to learn, and then focused specifically on students' ability to learn mathematics. So initially I wasn't focused on a program at all, but rather on how students learn. And then I pulled in the planning committee and the initial teachers to involve them in that process of learning about how students' learn mathematics. And that process went on for a year before we even looked at programs. So, that's where we started.

Facilitator: So what you just described is almost a process to get ready to select a math program?

Coordinator: Yes, absolutely. What I described was the getting them ready to make an informed choice.

Well, I guess I thought about it from a logistical standpoint. I knew that where we needed to go was a huge change from where we were. I immediately immersed myself into the research and literature about students' ability to learn, and then focused specifically on students' ability to learn mathematics. So initially I wasn't focused on a program at all, but rather on how students learn. And then I pulled in the planning committee and the initial teachers to involve them in that process of learning about how students' learn mathematics. And that process went on for a year before we even looked at programs. So, that's where we started.

Facilitator: So what you just described is almost a process to get ready to select a math program?

Coordinator: Yes, absolutely. What I described was the getting them ready to make an informed choice.

Research Question 5

Facilitator: Describe the process used to select the new math program.
Coordinator: OK, so now describe the process that was used to actually select the new math program.

The next step was after we reviewed the research and they had compiled their own list of what they values in a math program, and then we went to the content - what did we want our students to learn in each grade. And we did a strand analysis of K-12 math and we looked at what we would want out students to be learning when in each of the K-12 strand of mathematics. We used the NCTM standards to do this work, and from there, we took all of the programs that were matched with components that the committee of 30 came up with and we set up to design a rubric based on all the things we valued. Once the rubric was designed we had to put weights to the criteria listed - we had to put categorical and content weights. and we designed a statistical system that would allow us to utilize a fair unbiased, as far as you can possibly be unbiased in an adoption process, and we refined that system the second time by using the analysis for competing hypotheses - a tool that is used by the military and the FBI, and they use it in what they consider war games - which means you are taking two or three hypotheses and you are stating every possible outcome and then going through and rating every component of each outcome. And there is a program from a company in California i believe, that allows you to enter your hypothesis and all your scenarios - and we used that tool to basically select the program.

Facilitator: I have some background knowledge about getting ready for an adoption process, but would like it described in your own words. You referred earlier to a learning experience, a getting ready if you will. Can you explain the composition of the group that experienced that initial work and then continued in the process?

Coordinator: So, those people were not hand selected. They were posted positions. I wanted a committee that k-12 so I posted positions on this committee indicating that the work would be extensive, after school, in the summer and the expectation was that everyone would attend all of the time. They were from every walk of life because it was by seniority, so whoever was interested could bid, so as i said, they were not hand selected - we initially posted for 20 on the committee, we ended up with 30 people who wanted to get on the committee so I was given permission to let everyone on, because I didn't want to refuse anyone out who wanted to be on, and then I opened it up to administrators as well who wanted to participate and I ended up with 4 principals who were interested in being on the committee. So that's how people ended up on the committee.

Facilitator: And what was the name given to that committee?

Coordinator: The Math Work Study Committee.

Facilitator: And so now you have brought me up to the hypothesis testing and then how did you move from there in the adoption process?

Coordinator: So, we selected the programs that matched what was on our list of what we highly valued in mathematics. After we selected the programs that we were interested in investigating - in middle school i believe there were six of them, we had a standardized process that we developed upon which we would send a specific letter out to a publisher with specific criteria they had to abide by and they had to come on a certain day to present certain material - they were not allowed to bring any gifts or bring complimentary items of any sort and they were very carefully restricted about what they could and couldn't say - we outlined that's very carefully in the letter and proposal guidelines. They came and presented. We applied the rubric or the matrix to each presentation - and we did that item by item. We did not just do a voting procedure because that does not work. We did each item on the rubric and it was 6 pages, each page about 10-15 items. We went through them individually, discussing each item. We had the committee members present evidence and then we all had to come to some consensus so after the evidence from each item was presented, I asked if the committee was ready to vote and then we would vote. Our matrix ended up being a 0 if it didn't exist, a 1 if it existed but was below our standard, a 3 if it was at or met our standards, and a 5 if it exceeded our standards. And that way it would work out mathematically. So, then that process was repeated for every publisher we were interested in, and that was round one.

Facilitator: A clarifying question please - the hypotheses step was applied to determine who to invite to present, is that correct?

Coordinator: Correct, and then it was used again to assist us developing the rubric we used to review the programs.

Facilitator: So it was used to first weed out and then it was also used to deliberately look at each program that was invited to round one.

Coordinator: Yes, and that eliminated all the programs that we were not interested in. And that left two programs for middle school that rose to the top and met our criteria. Then we repeated the process, but we refined the rubric after we had enough knowledge about the programs so we asked questions and re-weighted, omitted and added to the rubric much more precise information about getting into the professional development, the program components, and more in-depth about materials, and then we repeated that process again with those two programs and then one clearly rose to the top.

Research Question 6

Facilitator: Describe the professional development plan for the implementation of this math innovation.

Coordinator: This was a massive change for our district so we adopted the program, Connected Math.

Facilitator: Please describe what you mean by "massive change". It was moving from a totally teacher-centered learning environment to a student-centered learning environment that would be a great way to describe the change. The plan for professional development was very strategic. I carefully selected 5 schools where I would pilot the program prior to full adoption so that I could see any of the bugs, the problems, the issues that were going to arise. I employed just in time trainings, which meant the five buildings which ended up being 11 teachers; they all agreed they wanted to take part in the pilot. The pilot was not to say yes or no to the program - the pilot was to work out the bugs. They misinterpreted that to some degree and that was a point of clarity. So they agreed to that, they had a week long summer institute that they all attended; they had just in time training for each unit prior to teaching it; they received technology equipment that was far and above anything we had experienced in the classroom (document cameras, lcd projectors, smart boards, anything to make their classroom more student-centered); they received all manipulatives - everything they needed in every way, shape or form was provided to them. That was intentional to address that this was such a big change that we had to figure out some of the problems before we did it district wide, so that was the intention of that. And of then course to see the scores go up, was essential - it helped with buy in from the naysayers. So the second year we went to full district and made some modifications to some learning pieces and then the second year all of our teachers received the just in time trainings, the embedded job coaching, from within the district and I hired a coach from outside of the district from the company to come into the district to work with each of the staff individually twice a year.

Facilitator : I want to make sure I understand what you mean by job embedded coaching - twice a year with each teacher in their classroom?

Coordinator: Yes, working in their classroom, with their kids, on their issues.

Facilitator: And that was shared by an outside person and an inside person?

Coordinator: No, that was both. Each teacher received both - they had an outside consultant twice a year, and an inside math coach available all year long.

Facilitator: How much did teachers take advantage of that particular professional development inside coaching available all year?

Coordinator: The inside coaching - I would say, it would be a guess, but I would say about 2/3 took advantage of that.

Facilitator: Can we go back just a bit on this professional development question? I know I read about summer PD, so we've talked about just in time trainings, the ongoing opportunity for coaching, and the summer institute? Can you tell me about that? The summer institute?

- Coordinator:** Yes, the first summer and the second summer we offered an academy for teaching - they were not paid to attend, but they would receive the technology for attending. So they were attending to work on changing their practice from a very much teacher-centered approach to a student-centered one.
- Facilitator:** Is there anything else you want to add about the learning opportunities for teachers or others?
- Coordinator:** I would add that the principals were also trained on the program - what to expect, what to listen for in the classroom, what it would look like - so they were aware of the changes that would occur. In addition to that we have common core unit assessments - so for each unit there is a common assessment that was created so we can see how kids are doing across the system. We also did some training for our special education teachers who push into the classrooms and a little of work, not enough with our ELL teachers.
- Facilitator:** Can you tell me more about the training for special education teachers?
- Coordinator:** They were included in the just in time trainings, but in addition to that they also had training on differentiation and what that looks like within the program - what they should be doing, what is their job.
- Facilitator:** You have mentioned special education teachers who push in, are there any special education teachers who are teaching a self-contained class or a pull out, replacement program?
- Coordinator:** Only for our ES classes - all others follow an inclusion model for mathematics.

Research Question 7

- Facilitator:** **What did central office do to support teachers in using this new math program?**
- Coordinator:** There was not a lot of support there - there was nothing they did intentionally I guess I want to say. That was one of our weak areas. Another area of weakness was parental communication - we should have done a better job with parental communication. So, those two areas were ones we could have done better with. Central office really didn't do anything to support this work. My direct supervisor supported the program completely publically through communication, but aside from the public communication, nothing else.
- Facilitator:** So, would you say there are additional supports needed to help support this effort successfully in middle school?

Coordinator: Just parental communication - that would be the only thing. It needs to be much stronger, better. We did math nights and other things, but they were not successful. We did a lot of items, but they were not successful - we just didn't have the parental interest and support. Now, we are seeing the exact opposite with the elementary adoption - lots of parental interest. At the mid-level they were not interested in coming to the math nights; they were just interested in complaining about the change because it was very different.

Facilitator: So, they expressed a frustration

Coordinator: Yes, because they did not know how to help their children because the depth of math was beyond them and they did not learn it that way.

Research Question 8

Facilitator: **What, if anything, could the district have done to better prepare teachers for the adoption?**

Coordinator: It's interesting; this adoption was supported by a grant so almost happened outside of central office so it's hard to say what the district could have done. Central office leadership has been very successful but they really haven't been involved in the implementation process.

Research Question 9

Facilitator: **Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they?**

Coordinator: Probably the same supports that anyone would ask for - more time and financial resources. It would be helpful if we could have additional coaching support but that is not possible. We have had all the supports we asked for up to this point.

Research Question 10

Facilitator: **How would you describe the implementation process of CMP to date?**

Coordinator: Painful - any change of this magnitude, I can't imagine going into such a process without a very thoroughly developed strategic plan, year to year, down to every detail. We did create a plan, but still, it wasn't enough - the detail was missing - we needed more detail in our plan. And, we were so thorough in what we did - all the stakeholders we involved, just every aspect - but no matter what we did, we could have done it better simply because that process of change when it is so dramatic requires an extensive amount of work and time - we could have extended that implementation out one year at a time, but our HS were failing so we really couldn't have extended it out any further for that reason.

Research Question 11

Facilitator: How would you describe the attitudes of teachers and coaches regarding the adoption and implementation of CMP?

Coordinator: I would say that most of the teachers at this point expressed their gratitude for the training - they also feel they have learned their math completely differently in a different way. Many of them are starting to fully grasp the potential of inquiry-based learning perhaps. But, as a whole staff we have a very long way to go. One year of training and one year or two years of implementation is so far from being finished. And based on how our district usually works, it's been done and now we are finished with that - and that is how they are feeling now... I've had that training so I am finished with that now - that is our district culture so we are dealing with that now. Overcoming that culture is going to be a challenge now because our training is going to move into more analysis of student work, looking at data, analysis of teaching moves, videotaping each other and collaborative learning.

Facilitator: Have they seen that aspect of the professional development plan yet? They have, but they are still wedded to that culture of it's going to go away.

Research Question 12

Facilitator: Describe how, if at all, the adoption of CMP has changed math instruction in the district in grades 6-8.

Coordinator: I would definitely say that the teachers understand what a teacher-centered classroom is v. a student-centered classroom. It's a continuum and we have made small steps each year - we are nowhere near where we need to be to be effective in an inquiry based learning environment. What I mean by that is the teachers need to fully develop their skills in questioning, analyzing student work, task analysis and other components. We still have a lot of work to do - and I am not sure teachers realize the amount of work that is ahead of them based on the culture of the district.

Research Question 13

Facilitator: If you could change anything about the implementation process what would you change?

Facilitator: Looking back are there any stakeholders looking back that you would have engaged differently - you mentioned parents, but I am wondering are there any others that we deal with in school districts that you would have tried to engage differently?

Coordinator: Certainly, special education and ELL - I would have had a whole separate focus on just the special education population - the supervisors, teachers and district administration - I would have engaged them differently and I would have done the same for ELL.

Research Question 14

Facilitator: What data have you collected to measure the level of implementation of CMP? What have you found out so far from the data collected?

Coordinator: I am tracking student achievement based on the common core student assessments that we have - so I have that data and I am very pleased with movement we are making with making some movement with the achievement gap and spec ed. So, that is very encouraging, and of course our state scores have also gone up. As far as tracking the implementation we have had two outside audits are reviews by companies that have come in and gone through our buildings and looked at the level of implementation - from those audits and reviews was somewhat like confirming what you thought you knew - it confirmed what I thought I knew. From there we developed implementation matrices that allowed building principals to look at implementation and highly effective math instruction with Connected Math to see where each of their teachers is. They are being provided training and tools that will help this practice grow. The initial implementation has been highly successful; it is this next step that is the hardest.

Facilitator: Please explain what you mean by "the implementation has been highly successful".

Coordinator: The level of training was outstanding - we are being used as a model by the publisher, many of the trainings were developed here, they are using us as one of their model districts in many ways. The data, the training and the use of the materials are all factors I am thinking about. The teaching staff are using the materials 100%, now to what degree of success I can't say exactly - but they are not using old materials, they are not supplementing, and if they are doing that they are doing it very covertly and have not yet been caught, so it seems as if everyone is using the program correctly. And _____, our charter-like school within the district has revamped their entire testing system for testing out in their school based on an inquiry based mathematics approach and Connected Math so that is a huge indicator.

Facilitator: Is there anything else you want included in this recording of your implementation of CMP.

Research Question 15

Facilitator: Is there any other pertinent information you would like included in this data collection about the implementation of CMP?

Coordinator: I would like to state that I recognize that change is not a 1-3 year piece; it is more like a 3-5 year piece so I don't expect the data to make any huge jumps, and it didn't. It increased and that's what I can hope for. Likewise, I don't expect the state assessments to make any huge jumps. I feel like the system needs to continue to work and improve as we continue to feed into our 6-8 grades with students who have had an inquiry based approach to learning and we will continually see through the years that scores are continuing to improve and improve.

Research Question 16

Facilitator: Have we left anything out?

Coordinator: I think your questions were very thorough and I have nothing else to add.

Focus Group Responses: K-8 Director of Curriculum & Instruction

Research Question 1

Facilitator: Please tell me a little bit about your current role and what other positions you have held in the district.

Director: My current role is director of K-8, responsible for all of the elementary and 2 middle schools for a total of 18 schools at this time - this includes anything from working with the principals, working on personnel issues, handling angry parent phone calls or even ordering buses for field trips - everything that has to do with running those schools comes out of this office.

Facilitator: May I ask a clarifying question - you mentioned working with principals - do you evaluate the principals in the system?

Director: Yes, I evaluate all of the principals in these schools.

Facilitator: And, please tell me how long you have been in this position?

Director: This is my second year in this position. Prior to that I was the GE Grant Manager. In April, 2007 the district received a 15M grant and Dr. Barker (former superintendent) asked me to be the program manager from the administrative side, it is a co-administered grant between administration and teachers. Prior to assuming the grant manager position, I was principal at Roosevelt middle school, prior to that I was an AP at Wilson middle school and prior to that I was a spec ed teacher in the district for many, many years.

Research Question 2

Facilitator: What is the first thing that comes to mind when you think of the Connected Math Project (CMP) program?

Director: I think of excitement and teaching math in a new way from the students' perspective - and by that I mean no longer focusing on the algorithms, but going deeper in understanding the math.

Facilitator: Tell me a little more about the excitement you mentioned first.

Director: The first thing that comes to my mind is that we are changing the way students feel about math. After observing some classes, sitting in on trainings and in my role with the GE grant, being in on the first steps of this program, I believe we are giving students a heads up, the stepping stones they are going to need to not be afraid of math, not worry about math and actually like math. After that, I think it has not been an easy program.

Research Question 3

Facilitator: How would you describe the math curriculum in grades 6-8 prior to the adoption of CMP?

Director: I can describe this because I was a middle school principal at that time. We had just started a new text series, pre-algebra and algebra series - a big fat book, it was clearly a textbook driven approach, today we are on page 200, do the problems, bring them back, we'll check them and then we will be on page 202, we'll do the same thing and then we will be on page 204 and that's the way it went.

Research Question 4

Facilitator: How did you feel about the idea of a math adoption when it was first introduced?

Director: Because I was part of the GE grant I was intricately involved from the beginning with the math coordinator's work and the math work committee. The math coordinator was the lead, she drove the process and had the vision, but in my role as grant manager I had the opportunity to sit in on meetings and stay aware of what was happening and then was more involved when it came time to choosing CMP over the other programs.

Facilitator: And how did you feel about it?

Director: Very good - whether it was CMP or another program, the process that we went through as a district, to determine this math curriculum was something I had never seen before in our district. That was due to the leadership of the math coordinator for sure. But I also thing the GE grant funding gave us the latitude to bring the committee together and do the deep work that was done prior to this adoption.

Research Question 5

Facilitator: What did central office do to support teachers in using this new math program?

Facilitator: You have mentioned that work process a couple of times, and now here again in a positive manner. Can you describe that process, what about it was unique for your district?

Director: Yes, first of all it started with an in-depth look at what good math would look like in this district. And it was a deep, long-term look with a collaborative committee made up of various stakeholders and this was a push from GE. Historically when we did a textbook adoption there would be an adoption

committee of teachers and they would look at a lot of programs. And whatever vendor gave them the most stuff, or the best stuff or whatever would be the one they picked. In this process none of that was allowed. So, it was a collaborative committee and it was a long term committee - I have never seen a group stay together since day 1 the way this group did. She started with 30 members and almost two years from the start, there were still 30 members - have never seen that before. And it was because of this group that she built - it was the best part of learning to work together as a team - and it was not always easy - they struggled, but they worked through it. She had a real vision for this and it was obvious that she did a lot of up front work about how these people would work together. They were motivated, called their own meetings and did such research around all the areas of effective math and they stayed with it. So when they came together to go "shopping" they knew what they were looking for, and then they built this amazing rubric of how they were going to compare and benchmark the different vendors - they had quite a process for that. It was a consistent process for every vendor and at the end of the day they chose CMP2 and it was a seamless process with no holes to be found.

Facilitator : You have mentioned that work process a couple of times, and now here again in a positive manner. Can you describe that process, what made it unique?

Director: Yes, it started with an in-depth look at what good math would look like in this district. It was a deep, long-term look. It was a collaborative committee - administrators and teachers, and that was a push from GE. Historically in our district, there was an adoption committee made up of teachers - they looked at whatever vendors brought and they chose the one that gave them the most stuff, the best stuff - or whatever. None of that was allowed in this process. So, it was a collaborative committee, and it was a long term committee that stayed together. I had never seen that before - she started with 30 members two years ago and at the end, there were the same 30 people, never saw that before. And that was because of the group she had built, the work she did up front about working together as a team. And they struggled; it was not always easy work. But she had a great vision for this work and she did the important work up front and it paid off. They did such research - they identified all the different areas around effective math. So when they were ready to go "shopping" they knew what they wanted and what they were looking for. Then they built an incredible rubric to compare and benchmark all these different programs against each other. It was a consistent process for every vendor and at the end of the day they chose CMP2 and there were no holes to be found in the process. Not a one.

Research Question 6

Facilitator: What, if anything, could the district have done to better prepare coaches for the math adoption?

Director: No response.

Research Question 7

Facilitator: What, if anything, could the district have done to better prepare teachers for the math adoption?

Director: That was a bit of a struggle - there was a struggle between central office and the math work study committee. That was a big struggle, and I was part of the GE grant at that time.

Facilitator: Can you describe that struggle?

Director: The struggle came from the principals - they didn't want to move, and some of them still don't want to move, off of a text book driven curriculum or approach. They don't believe it is going to work. And we were so PSSA driven, what's going to happen to our scores, they're going to go down, what we will do, this is just _____ (math coordinator's) thing. And the committee ended up being dismissed in some cases, even though principals were on that committee. So there was a lot of tension, and I am not sure that even today, that tension is gone. It took the head of the GE grant from GE to come out and ask the district if they were going to support this adoption - and if they wanted it they had to support it all the way. It took the "GE God" to say "you're either doing this or not - but we're not giving you millions of dollars if you're not going to do it all the way."

Facilitator: Did it seem more to you that the support for teachers in this work was coming out of the GE supported work?

Director: 100%, yes.

Facilitator: So, in that regard, at that time you could say central office was separate from the effort.

Director: Yes, absolutely.

Research Question 8

Facilitator: Are there additional supports needed to successfully implement this adoption in middle schools? If yes, what are they?

Director: More coaches.

Well, that's a good question. What happened was we piloted it in a few schools. We devoted in-service time for the teachers who were not piloting to learn about inquiry, differentiation and what math instruction could look like. We

held district meeting telling them what was going to happen next year - summer training, support in the fall - but we sent the message to say "we are moving forward with this". It took the outside to come in and say it was going to happen. So, we should have backed it up and done more upfront work with the teachers and principals. It was such a struggle - we were fighting to keep it alive, so it was hard to keep it alive and do the work at the same time.

Research Question 9

Facilitator: How would you describe the implementation process of CMP to date?

Director: I would say the same thing - we need more principal support. We talked about this yesterday and it made me think differently about some things. Whether it's an implementation, or a sustainability piece, I would like to see myself with the coordinators to develop some milestones. So if we say, we are a year and half into CMP, what should we be seeing - where are the milestones? We don't think that way - to benchmark against ourselves by documenting - it is so simple, we could do this. So, if these are the milestones, where is each school - where is central office. So I am thinking we should create milestones that would be a support we could do without it being an onerous experience.

Research Question 10

Facilitator: How would you describe the attitudes of principals, teachers, and coaches regarding the adoption and implementation of CMP?

Director: I don't hear anything about it.

Facilitator: Well that says a lot in public education.

Director: I don't think we are at the point where this is just the way we do math at the middle level in Erie - we're not there yet, but we are pretty close.

Facilitator : Your role has changed, so you have a different lens and vantage point, do you notice anything about this particular innovation and implementation compared to other implementation efforts currently underway in the district - is there anything that stands out, any striking comparisons.

Director: One comparison that I can share - it is typical in our district to give up when it gets hard, or difficult. We give up. And we haven't given up, and that is a very different thing for us in the district. We have followed through and it really took an outside person to get us unstuck. The professional development is unparalleled - it is unique. Science started this type of an approach to professional development and this math work built on it. It's much deeper PD, here's everything you need to do this - and that was because GE was able to fund the materials and assessments and the technology. The implementation has been well resourced. There were DMI classes to get teachers started and it turned

out to be huge and has helped to change the culture about what professional learning can look like. It has almost created a new expectation about what professional development should be like.

Research Question 11

Facilitator: Describe how, if at all, the adoption of CMP has changed math instruction in the district.

Director: From my vantage point I would say it is very positive - but again, I don't hear the negatives. Part of me thinks that if it was terrible I would hear about it - I think now that we have the Connected Math, it's not just sitting there by itself. We have the Everyday Math coming under it - the teachers in the EM are saying I never thought my kids would be able to do that, I never believed that we could do that. So some of that is helping what's going on - you know they were the first group and that made sense. You could put your hands around that number and figure it out, not try to do it for all 500 (teachers) at once. From the principals' point of view, I think there is still some skepticism as to whether this way of teaching is a good change. There is still some of holding on to the traditional way of teaching math - you know, I liked it that way, it was fine for our kids, I don't want to change. We still have some of that with some of the principals. They are waiting to see where achievement scores go - are they going to go up, down, stay the same. So the jury is still out on that one.

Research Question 12

Facilitator: Is there any other pertinent information you would like included in this data collection about the implementation of CMP?

Director: I think it has upped our teachers' game - they can't just open the book anymore and do the same thing. When I was a principal and observed a math lesson it was - OK here are the 10 math problems. You go put them up on the board and you go put them up on the board. You didn't get it, too bad - I taught it and you didn't get it so too bad. I could never understand how central administration and the principals could argue about this approach. If we are giving teachers better skills, regardless of the program - we are upping their instructional game - how could that be a bad thing? So teachers have to know more math content - so they have to go to DMI classes, or go back to school, or take some after-school classes, because many of them are only one step ahead of the students, and in CMP that doesn't work so well. They have to be prepared for students pushing back on them, and they do push back on them. We have heard, and principals have observed, inaccurate information - where it was obvious the teacher didn't have a clue what she was talking about. When you put the inquiry out there and let students push on the learning they come up with all kinds of stuff and you have to be very secure in your content. So we are

definitely upping the teachers' game and I like that, I think that is a great thing. How could you argue with teachers pushing their own practice, and that is what CMP is doing. What we have to think about is what will happen when the 8th graders go to the HS, where this is not the way kids will be taught and it will be back to open your text book, do the problems, check with your neighbor stuff. So we have to figure out how we are going to bridge that - it's going to be some really hard work, but what is so cool is that the students now want more and they are saying it. And that is very exciting.

Research Question 13

Facilitator: Have we left anything out?

Facilitator: Has there been any other big ah-has from CMP?

Director: My biggest ah-ha was the committee work. That I believe has changed the culture in our district, and literacy has mirrored that work. It actually started with Science and then Tammy took it to another level with the math adoption. Another would be the professional development approach. We are almost at a point where we say this is the way we do PD in our district around content.

Facilitator: Is there a concern about dwindling resources and the ability to meet that standard of PD moving forward?

Director: Yes, we have one more year of the grant; we will have to get as much done as possible in this coming year. We are hoping they will re-up us. Our next work will be cross-curricular.