The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students

A Dissertation by

Nancy Barbara Ward

Submitted in Partial Fulfillment of the Requirements for the Doctor of K–12 Administration Program Seton Hall University

November 2009

Dissertation Committee

C.M. Achilles, Ed. D., Mentor
Charles Mitchel, Ed. D.
Christine A. Johnston, Ed. D.
Robert Kottkamp, Ph. D.
ABSTRACT

The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students

The researcher investigated the influence of a metacognitive learning system, the Let Me Learn Process® (LML) on the writing achievement of third grade students. The researcher conducted a program evaluation to establish fidelity of implementation. Utilizing a mixed methods, non-experimental, cross-sectional, explanatory design, the researcher compared data from one group of students who were instructed with LML with the data of a group who were not instructed with LML, in the 2007-08 school year. The results of the New Jersey Assessment of Skills and Knowledge (NJASK) and the local timed writing assessment were analyzed. The researcher also conducted visual analysis of the 2008-09 school year NJASK results.

The researcher identified in the literature that writing achievement is a concern for males and students with low socio-economic status. Both subgroups of students, those categorized as low socio-economic status, and male students, who were instructed with LML showed scores that were statistically significantly better than those who were not.

Findings demonstrated that implementation of LML® was conducted with fidelity in the research setting and that it influenced the writing achievement of the group of third grade students who were instructed with the process. Based on the results from the two data sources, the researcher determined that there was statistically significant influence on writing achievement for students who were instructed with LML compared to those who were not in the 2007-2008 school year. In addition, the students categorized
as low socio-economic and males and were instructed with LML also showed scores that
were statistically significantly better than those who were not instructed with LML. The
researcher concluded, based on visual analysis, that results of a statistical analysis of the
2008-09 school year data would have shown significance to a higher degree than the
results demonstrated in the 2007-2008 school year.
Dedication

Almost 13 years ago, we were taught a lesson about the confluence of time, space and circumstance and, my darling husband, I have cherished that moment ever since. Ed, your support and encouragement of my dreams have given me the courage to become the person I was once afraid to be. Please know that I am steadfast in my love for you and in giving to you all that you have given me. It’s time to embark on many more adventures together.

It truly took the support of my entire family to endeavor this work. My beautiful daughters, Kristin and Lisa you are my joy, my blessing. Who could ask for more talented and kind people who share so many sensibilities with me and at the same time provide me with challenges to my entrenched thoughts and beliefs? Sisters and brothers, Lydia, Adrianne, Emile and Michael and their wonderful spouses, Jack, Ken, Diane and Michele, you made room for me in your homes, made time for me in our conversations and filled in when I did not have the time or energy. Your wit and wisdom are savory sustenance for me that I cannot live without. I love you all more than you know.

Mom, your belief in me has given me support when I needed it. Your love of music and the beautiful things in nature is a gift I will always value. Well I’ve done it, dad. I’ll never forget when you looked at me after eighth grade graduation and said, “This is not the last graduation you will attend. You have many more to go”. This one will be the last and I know you will be with me to beam with pride.
Acknowledgements

This study would not have been possible if not for the generosity of many wonderful and dedicated people. Being surrounded by the kinds of educators I value and emulate has enriched my life’s work. I am indebted to all of you and in your names I pledge to give back to educators who reach out to me in the future.

Dr. Charles Achilles, as chair of my committee your timely and critical feedback always kept my wheels of progress moving forward. I am ever amazed at your knowledge and deep understanding of what is important in education and in life. Your robust nature and great sense of humor are remarkable. I am so privileged to have worked with you. My gratitude also to Dr. Charles Mitchel as a member of my committee who was always encouraging and a perfect balance for feedback and support.

Dr. Robert Kottkamp, your dedication to the process and getting it right coupled with patience and dedication of time and energy is most appreciated. I consider myself fortunate to know you and have benefitted greatly from our work together.

When we first met nearly eighteen years ago Chris, I knew that you were an extraordinary person, who would teach and challenge me to reach higher and delve deeper. You have introduced me to learning that goes beyond the walls of school into the pathways of life. Dr. Christine Johnston, I am truly blessed to call you, colleague, mentor and friend. “Pie on the porch” has spurred me into a new love, research and writing.

Dr. John Collins, a timely rescuer, when my less than mathematical brain needed a refresher on the all-important statistical analyses you graciously gave time, teaching and patience. I would have traveled many more miles to tap into your expertise. You have my sincere appreciation.
I could not have completed this work without the help of dedicated people in the school district that I studied. Thank you to Jane, Judy, Phil and Chris who shared critical information just when I needed it. You are good for children and should be so proud of the work you do.

My wonderfully understanding family and friends have been so essential to me in all of the successes I have achieved. Always interested in my work and continually reaching out to stay in touch, I value all of you and feel so fortunate that you have chosen to be in my circle of important people. Loren, you introduced me to the program at Seton Hall and are a wonderful colleague and friend.

I know some of you may have thought the time and energy required in this work was a bit crazy. Thank you for your unwavering encouragement and patience.
# TABLE OF CONTENTS

Introduction......................................................................................................................1  
Background and National Context for the Study.......................................................1  
History of Metacognition.................................................................................................3  
Accountability and No Child Left Behind.................................................................5  
High Stakes Testing and NAEP - The Nation’s Report Card.................................6  
Socio-Economic Factors.................................................................................................9  
Gender Factors...............................................................................................................9  
The Concerns of Educators............................................................................................10  
Statement of the Problem and Purpose of the Study.............................................11  
Summary, Design and Methods in the Study...........................................................13  
Questions to Guide the Study.......................................................................................14  
Brief Description of the Let Me Learn Process®......................................................16  
District Context.............................................................................................................18  
Limitations and Delimitations......................................................................................18  
Definition of Terms.......................................................................................................19  
Summary of Chapter One and Organization of the Study.................................21  

Chapter Two - Review of Relevant Research and, Theory and Literature........24  
Introduction...................................................................................................................24  
Analyses of the Writing Achievement of Students in the United States............24  
Individual Learning Differences in the Literature...................................................29  
Explanation of Metacognition in Terms of the Present Study..........................31  
The Let Me Learn Process® (LML)..........................................................................37
Theoretical Framework for the Study………………………………………40
Summary of Chapter Two and Organization of the Rest of the Study……..42
Chapter Three – Design and Methodology……………………………………..44
  Introduction………………………………………………………………….44
  Research Design………………………………………………………………47
  Hypothesis……………………………………………………………………48
  Research Methodology………………………………………………………49
  Participants……………………………………………………………………53
  Research Procedures…………………………………………………………53
  Data Collection and Analysis………………………………………………54
  Validity of Research Instruments and Reliability of Results………………...57
  Summary of Chapter Three and Description of Chapter Four……………59
Chapter Four – Presentation and Analyses of the Data………………………61
  Introduction………………………………………………………………….61
  Qualitative Analysis of the Data for Research Question # 1………………..63
  Quantitative Analyses of the Data for Research Questions Two, Three and
  Four…………………………………………………………………………67
  Descriptive and Demographic Information…………………………………68
  Analyses of Group One Compared with Group Two Test Scores for the
  2008 NJASK 3 Language Arts Literacy (LAL)………………………………..70
  Analyses of Group One Compared with the Group Two Test Scores for the Local
  Timed Writing Assessment………………………………………………………76
  Visual Analysis of 2009 NJASK 3 LAL Data…………………………………81
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Interactive Learning Patterns that comprise The Let Me Learn Process®</td>
</tr>
<tr>
<td>2</td>
<td>Summary of Steps for Data Collection and Analyses</td>
</tr>
<tr>
<td>3</td>
<td>Grade 3 Student Demographics by School for the 2008 NJASK 3 LAL</td>
</tr>
<tr>
<td>4</td>
<td>Grade 3 Students Demographics by School for the 2008 Local Timed Writing Assessment</td>
</tr>
<tr>
<td>5</td>
<td>Mean Scores of Groups One and Two (LML and Non-LML respectively)</td>
</tr>
<tr>
<td>6</td>
<td>Statistical Output for Comparison of Group One and Group Two on the 2008 NJASK 3 LAL</td>
</tr>
<tr>
<td>7</td>
<td>Comparison of 2008 NJASK 3 Mean Scores by DFG with Total and SES Group Scores</td>
</tr>
<tr>
<td>8</td>
<td>Comparison of the Mean Scores of All Students on the 2008 NJASK 3 LAL by SES and Not SES</td>
</tr>
<tr>
<td>9</td>
<td>Mean Scores of SES and Not-SES students in Group One</td>
</tr>
<tr>
<td>10</td>
<td>Mean Scores of SES and Not SES in Group Two</td>
</tr>
<tr>
<td>11</td>
<td>Statistical Output for Comparison of Group One and Group Two Recorded on the NJASK 3 LAL With the Variable SES</td>
</tr>
<tr>
<td>12</td>
<td>Comparison of 2008 NJASK 3 LAL Mean Scores by DFG for the State and District by Gender</td>
</tr>
</tbody>
</table>
Mean Scores of Male and Female Students Comparing Groups One and Two ................................................................. 75

Statistical Output for Comparison of Group One and Group Two as recorded on the NJASK 3 with the Variable Gender (Male) ........................................................................................................... 76

Cronbach’s Alpha Test of Reliability ................................................................. 77

Comparison Between the First and Fourth Local Timed Writing Test Scores ........................................................................... 77

Comparison of Groups One and Two Male Timed Writing Mean Scores .................................................................................. 78

Comparison of Groups One and Two Female Timed Writing Mean Scores .................................................................................. 78

Comparison of SES and Not SES Timed Writing Mean Scores........... 79

Statistical Output for Comparison of Group One and Group Two as recorded on the Local Timed Writing Assessment Results ........ 80

Statistical Output for Comparison of Group One and Group Two as Recorded on the Local Timed Writing Assessment with the Variable Gender ............................................................................................... 80

Statistical Output for Comparison of Group One and Group Two as recorded on the Local Timed Writing Assessment with the Variable SES .................................................................................................... 81
Comparison of the 2009 NJASK 3 Language Arts Literacy Assessment by School…………………………………………………………………82

Comparison of the 2009 NJASK 3 Language Arts Literacy Assessment by Groups……………………………………………………83

LIST OF FIGURES

1 How Does Learning Occur?.............................................................18

2 Similarity of Two Concepts of Improving Neighborhoods and Schools for Future Generations........................................37

3 Theoretical Framework for the Study..........................................41
CHAPTER ONE

Introduction

For preschool through twelfth grade educators, achieving the goal of providing students with an education that will prepare them for the challenges of the 21st century is elusive. Dominated by the standards of accountability, reports of failing schools, and poor performance of United States students on international assessments, educators look to research and theory for answers.

At times, theory drives educators’ practice because empirical evidence is difficult or impossible to obtain in the K–12 setting. The purpose of this study is to advance theory in the absence of empirical evidence until that evidence can be obtained to support its validity.

A pragmatic approach by educators to address student achievement may be the creating of local policies and programs and to incorporate a learning tool that gives students ownership of their learning, into the instructional program. In this study, the researcher has explored the relationship between student achievement and the use of a metacognitive process that is interwoven into the teaching and learning dynamic in the elementary school setting.

Background and National Context for the Study

Public education in the United States has deep roots and common threads. At its inception, the primary goal was to produce good citizens capable of making informed political decisions. Thomas Jefferson defined this purpose comprehensively including the import of developing the powers of reasoning, wise judgment and moral virtue as essential components of a proper education (Honeywell, 1931). In a letter written in
1816, he proclaimed, “If a nation expects to be ignorant and free, in a state of civilization, it expects what never was and never will be.”

The Joint Committee of the City and County of Philadelphia, a group comprised of workingmen, produced a report in 1830 that examined the urban public schools and denounced the instruction as limiting, proclaiming that the typical instruction of the day was too limited to “words” and “ciphers” and lacked attention to “self self-governing character.” The committee also addressed concerns brought about by inequality between the poor schools and their wealthier counterparts (as cited in Rothstein & Jacobsen, 2006 p. 3).

In 1837, Horace Mann, the newly elected Secretary of the Massachusetts Board of Education proclaimed after a visit to Europe that universal basic education in reading and arithmetic was not a guarantee of democratic values among a country’s citizenry citing the support of autocracy by Prussian students. Mann also espoused more comprehensive goals for education than did the Joint Committee or Jefferson. He included physical, intellectual, political, moral, and ethical objectives in his view of public education’s purpose (Hinsdale, 1898).

These standards continued past the turn of the century with the advent of the Seven Cardinal Principles of Secondary Education. Developed in 1918 by the Department of the Interior Bureau of Education, these seven goals reflected a comprehensive approach to the educational process, reflecting the evolution of the educational process commensurate with the times. In addition to their similarity to previous objectives, they also included vocational education, preparation for the
traditional division of labor, appreciation for art and music, and personal, as well as civic responsibility (Department of the Interior, Bureau of Education, 1918).

In 1938, the National Education Association (NEA), at that time a quasi-governmental agency, followed the concerns raised years earlier calling for scientific evidence that the money spent on schooling was commensurate with the accomplishments of the schools. The report, *Educational Costs and Their Analysis* also addressed an achievement gap of four to five years between poorer schools and wealthier ones, citing fewer resources and teachers who were not as well trained (Soper, 1941). Concerns about the achievement gap between wealthier and poorer schools and groups of students who are considered poor regardless of their school setting have continued. Their achievement is discussed throughout this study.

In 1979, a landmark court decision out of West Virginia defined a “thorough and efficient education” specifically expanding the scope of education to include “self-knowledge and knowledge of his or her total environment to allow a child to intelligently choose life’s work—to know his or her options” (Pauley v. Kelly, 1979).

**History of Metacognition**

Self-knowledge, in the context of education, has evolved considerably. In fact, the term metacognition entered the vernacular in reference to a student’s true self-awareness. It seems that other aspects of metacognition addressing the goals of public education have been taught in some manner throughout the history of education.

Metacognition has been described, referenced, and explored, since the sixth century B.C., by Greek philosophers Plato and Aristotle. Locke (1690) used the term “reflection” in *An Essay Concerning Human Understanding* describing the human
“perception of the state of our own minds” (as cited in Georghiades, 2004, p. 367).

Spearman (1923) pointed out that,

Such a cognizing of cognition itself was already announced by Plato. Aristotle likewise posited a separate power whereby, over and above actually seeing and hearing, the psyche becomes aware of doing so. Later authors such as Strato, Galen Alexander of Aphrodisias, and in particular Plotinus, amplified the doctrine, designating the processes of cognizing one’s own cognition by several specific names. Much later, especial stress was laid on this power of ‘reflection’, as it is now called by Locke. (as cited in Georghiades, 2004 p. 367).

Metacognitive processes, though not termed as such, were reflected in the writings of early educational psychologists, Dewey (1910) and Thorndike (1914), thereby bridging cognitive science with the field of education. Flavell introduced the term metacognition to the modern world in 1979, defining it as “knowledge and cognition about cognitive phenomena,” (p. 906). Advancing the work of cognitive psychologist Piaget in the United States, Flavell extracted from that influence the study of metacognition. By 2006, the term was used to refer to the process of thinking about one’s own thinking and has been described as the monitoring and control of thought (Martinez, 2006).

Concurrent with Piaget, between the years 1924 and 1934, Russian psychologist Vygotsky was a major figure in the development of post-revolutionary Soviet psychological research. He is credited with formulating the major principles of Cultural–Historical Theory in response to the common theories of the day that were dominated by psychoanalysis and behaviorism (Bodrova, 2001). Vygotsky’s work originated the study of the social cognition learning theories. He studied cultural factors in all human development and determined that tools of intellectual adaptation are developed from the culture surrounding the child, thereby influencing development and educational
processes. According to Georghiades (2004), Vygotsky was one of the first to introduce the notion of conscious reflective control and deliberate mastery as essential factors in school learning through the engagement of self-talk. The significance of this school of thought is that it reflects deliberate and conscious development of a person’s ability to think, thereby activating a systematic process as opposed to the commonly held notion of the day that learning was a passive byproduct of growth and development.

The system of education has advanced to frontiers that were never envisaged by Vygotsky, but social–cultural factors have never been more salient than they were in 2009. With the advancement of technology, the availability of information on a global scale has turned from an easily controlled trickle from the tap to a careening waterfall. Turning that information into useful knowledge has become the shared responsibility of both teacher and learner. In order for contemporary students to navigate the information highway and reach their destinations as successful and productive citizens, instructional practices that are inclusive of a metacognitive “toolbox” is a logical step in the evolution of the work of schooling. Martinez (2006) concluded that, “Metacognitive ability is central to conceptions of what it means to be educated. The world is becoming more complex, more information rich, more full of options and more demanding of fresh thinking.” (p. 699). While the motivation for meeting this demand is applicable to all students, the concern for those who are in elementary school in this information-rich, increasingly complex world is grave.

Accountability and No Child Left Behind (NCLB)

Despite the efforts of school reformers and the mandates under the No Child Left Behind Act (NCLB) (US Department of Education, Public Law 107-110), which
supposedly addressed student achievement in general, and the gap between the academic successes for students with low socio-economic status (SES) and their peers, “It is evident that test-driven external accountability, whether it is a state or federal initiative, has not advanced equity on a large scale, as the disparity in achievement among different racial and socio-economic groups persists before and after NCLB” (Lee, 2006, p. 57). Lee’s evidence regarding the significant weakness of this mandate’s structure and intended outcome is not the only concern. Six years later, in 2008, NCLB, which was signed into law on January 8, 2002, was found unconstitutional. On January 7, 2008, the United States Court of Appeals ruled on a suit brought by The National Education Association (NEA) in Michigan, Texas, and Vermont that the federal government failed to provide clear notice, as required by the Constitution, as to who bears the additional cost of implementing the mandates under NCLB. This supported the claim originally brought by the NEA in 2005 that portions of NCLB were unconstitutional. This 2008 ruling also asserted that because the states have been required to spend state and local money to comply with NCLB, injury had already occurred (Dillon, 2008). NCLB continued to fail to fulfill the intended rationale for its genesis, the Elementary and Secondary Education Act (ESEA) P.L. 89-10 of 1965. President Johnson designed this initiative to address the educational needs of low-income families and the impact of these families on the overall educational program by providing federal assistance to local educational agencies. (Section 201, Elementary and Secondary School Act, 1965).


The National Assessment of Educational Progress (NAEP) is the federal mechanism used to report on the performance of samples of fourth, eighth, and eleventh
grade students across the country in reading and mathematics. This measurement, operating under the United States Department of Education (USDOE), and the auspices of the National Center of Education Statistics (NCES), has been charged, since the mid 1960s, with the responsibility of gathering data about the country’s educational programs by assessing its students (Lee et al, 2007).

The 2004 long-term trend NAEP results indicated that while over time, the progress of the fourth grade U.S. students, including those with low SES, had improved in reading, but the academic outcomes of those with low SES remained significantly below the reported outcomes of their peers. That same data report indicated that the progress of eighth and twelfth grade students remained virtually unchanged in Reading since the inception of NAEP in 1973 (NAEP Long Term Trend Assessment Report, 2004).

As reflected in the Progress in International Reading Literacy Study (PIRLS), when U.S. students were compared with those of other countries in reading literacy (PIRLS, 2006), the U.S. ranked 18th of 45 participating countries for 4th grade students. The difference between the U.S. and the top country, Russian Federation, is 25 points, the U.S. scoring 540 on a scale of 1000, and an international average of 500.

Despite its widespread use in reporting national student outcomes as well as its influence on policy, employing the NAEP assessment results as a standard of predictability is problematic. Since the inception of this national assessment, its purpose has not been clearly identified and has been constantly debated. Applying a single, homogenous measure to the complex diversity reflected in the population tested, is a dichotomy that defies reliability. The National Academies of Education and Sciences concluded that the results are unstable and fundamentally flawed (Bracey, 2003).
Questions remain. Is NAEP designed to measure ability or achievement? Is it possible to assess either with a single instrument? Is it appropriate to use such an assessment for the purpose of policy making (Stake, 2007)?

In a review and analysis of NAEP, Stake (2007) discredited the use of high-stakes testing. “High-stakes testing—including NAEP testing—detracts as much as assists our mechanisms of review, meta-evaluation, and the validation implied in our professional standards. It curbs our efforts to be rational about the assessment of teaching and learning” (p. 18).

As shown by Amrein and Berliner (2002), the practice of states with high-stakes testing exempting students from taking NAEP has become all too common. In fact, “between 0% and 49% of the gains in NAEP scores can be explained by increases in rates of exclusion” (Amrein-Beardsley & Berliner, 2003, p. 5). Extensive use of high-stakes testing in America and elsewhere has accompanied an effort to treat teaching and learning in a simple but fair manner. However, education, as said here repeatedly, is hugely complex, partly because of inequitable distribution of opportunity.

Even with flaws and criticism as unfair and less than comprehensive, the USDOE has titled the public presentation of these data as “The Nation’s Report Card.” The NAEP is a widely employed measure of the progress of the nation’s students. And despite the fact that NCLB’s mandate of national outcomes that demonstrate 100% proficiency in reading and mathematics by 2014 is a statistical impossibility, these data are commonly used by the full continuum of analysts ranging from supportive to critical, to report on the progress of the nation’s students. As an example, NAEP data are used by the Harvard’s
Civil Rights Project, the Organization for Economic Co-operation and Development (OECD) and the USDOE for analysis and reporting academic progress.

**Socioeconomic Factors**

Economist Rothstein (2006) observed that a variety of quantifiable variables such as health, nutrition, community influences, child-rearing patterns, and cultural beliefs affect academic achievement.

Academic achievement between lower class and middle class children requires not only better schools, although those are certainly needed, but also reform in the social and economic institutions that prepare children to learn in different ways (p. 1).

While the argument that changing the social factors might hold great promise for bridging the education gap and as demonstrated in the Tennessee STAR study, a large-scale randomized experiment, “small class advantages appeared for all types of students participating in the study and were quite similar for boys and girls. Those advantages were greater for impoverished students, African-American students, and students from inner-city schools” (as cited in Biddle & Berliner, 2002).

**Gender Factors**

Recently, researchers have given attention to the gap that exists in the achievement of males and females in literacy. This gap has been highlighted in literacy with evidence from results of national and state assessments. Results of proficiency in the NAEP Writing Assessment demonstrated a gap of 16 points in 1998 and 17 points in 2002, with females scoring higher than males. Eighth grade writing was measured in 1998, 2002, and 2007. In each case, females outperformed males. The difference was 20 points in 1998, 21 in 2002, and 20 in 2007 (NAEP, 1998, 2002, 2007). There was no significant improvement in male performance that showed the gap narrowing.
In New Jersey, the state in which the school that is the subject of the study is located, the New Jersey Assessment of Skills and Knowledge (NJASK) is the state assessment. The Language Arts Literacy Assessment, which is comprised of reading and writing, reflects a similar gap between males and females. In third grade, females outperformed males by 7.9 points in 2006, 6.3 points in 2007, and 6.7 points in 2008. The eighth grade scores reflected a more significant gap than the one in third grade, with females outperforming males by 11.6 points in 2006, 13.7 points in 2007, and 10.2 points in 2008.

Some Progressive educators and thinkers such as King and Gurian, assert that introducing more “boy friendly” classroom strategies that target the natural aspects of each gender, promote improved male performance (King & Gurian, 2006). Even critics of using gender-specific fixes have recommended that since there is an identified gap between males and females researchers should endeavor to find out why it exists and home in on the “specific problems… that disproportionately affect boys” (Mead, 2006).

**The Concerns of Educators**

Teachers continue to conclude that they have little or no influence over the ultimate outcome of student achievement, whether or not they are measured by high-stakes tests. Research has shown that there are promising programs and interventions such as Project STAR, a large-scale randomized experimental study conducted in Tennessee between 1985 and 1989. Researchers concluded that class sizes of between 13 and 17 in grades K–three demonstrated a significant effect on student achievement (Egelson et al., 2005). Teachers and administrators who are not in a position of authority to make policies that determine class size, or are unable to design schools with small
classes due to structural limitations, are left to pursue other ways to ensure that their students are prepared to successfully face the demands of higher education or the expectations of the workforce upon graduation from high school. These educators are faced with questions such as: Does a narrow curriculum that focuses on skills measured by standardized tests prepare students and meet our moral obligation to groom them for their future? What instructional methods are effective in addressing the complex needs of our learners?

School leaders may find answers in implementation of instructional programs that employ the social–cognitive theories introduced by Piaget and Vygotsky. Further exploration of metacognitive processes is found in the writings of the 20th century philosopher Wittgenstein, who described “private talk” in which students consciously and deliberately self-coach and problem solve (as cited in Martinez, 2006). Flavell (2000) examined the use of metacognition and concluded that children as young as age five invoke metacognitive processes during structured tasks. Zimmerman (1988) studied self-regulated learning and the relationship between teacher observation of self-regulatory behaviors and student achievement and concluded that teacher observation is an important source of information about student self-regulation (p. 11).

Statement of the Problem and Purpose of the Study

The performance of elementary school students, as reported by NAEP, and international assessments such as PIRLS data, continues to indicate that reading and writing outcome measures do not reflect improvement. In addition, during the portion of the collection period for the present study (2008), the New Jersey State Assessment of Skills and Knowledge (NJASK) reflected mean scores in the writing section of the
language arts assessment for third grade students of 8.8 of 20 possible points or 44% proficiency.

Regardless of the transient mandates that drive policies and the work of educators, the moral and legal obligation to provide a free and appropriate education (FAEP) to every student remains connected to the structural environment of the school and the instructional program. Brophy et al. (2001) concluded that teachers have a profound effect on student learning. A school leader should study, research, and apply all viable structural and instructional practices to improve student learning.

The problem driving the present study is the performance of elementary school students in the writing component of literacy. Writing has been identified as an area of academic weakness, but it has also been identified as an element leading to success in almost all post-secondary pursuits (Graham & Perin, 2007). After examining gender differences in an article for Science magazine, Hedges and Nowell (1995) stated: “It seems likely that individuals with such poor literacy skills will have difficulty finding employment in an increasingly information-driven economy. Thus, some intervention may be required to enable them to participate constructively” (p. 43).

Research conducted to establish the relationship between measures of metacognition and self-regulation in children following deliberate classroom instruction of a metacognitive learning strategy has been limited. Likewise, there is inadequate quantitative evidence explicitly linking metacognition and the academic performance of elementary school students.

In this study, the researcher’s purpose was to examine a relationship between the performance of elementary school students in writing and the explicit instruction in a
metacognitive learning system, the Let Me Learn Process® (LML Process®).

Summary, Design, and Methods in the Study

Results of the present study should help to determine whether the use of the LML Process® influenced the writing ability of third grade elementary school students when comparing the writing outcomes in the school where the LML Process® was implemented and the other schools where the LML Process® was not implemented. School leaders, consistently faced with this concern as well as those in the district who were the subject of the study, seek data to inform school and district policies to address student achievement. Writing has been selected as the content area used in the study because, in addition to the concerns about performance in state, national, and international assessments, the district that is the subject of the study places considerable emphasis on the writing portion of the language arts program. In fact, timed writing assessments are holistically scored at four separate intervals each year for students in grades two through eight.

The researcher intended to test the theory that the implementation of the metacognitive learning system, the LML Process®, influenced the writing achievement of elementary school students. Given that the elementary school was the setting for the study, there were limitations within the school environment for experimental research. The researcher sought to examine the relationship between the metacognitive intervention, the LML Process®, and student outcomes and to predict whether those outcomes were applicable to the population of all elementary school third grade students from the results of the sample. A cross-sectional, explanatory nonexperimental design was appropriate for this purpose (Johnson, 2001). It should also be noted that although
flaws in the NAEP and the NJASK assessments were considered, student outcomes on the tests were used by education decision-makers for policies and practices and therefore were included in the review of the literature and data that were analyzed.

Use of both quantitative and qualitative methods made the study a “mixed-methods” approach (Patton, 2006). Quantitative data in the form of state and local test results were used to establish whether or not there were differences between the assessment results in writing for students who were instructed with the LML Process®. The influence of the LML Process® on language arts, specifically on writing assessment outcomes for third grade elementary school students, was reported, analyzed, and used.

There were three independent variables in this study: the LML Process®, SES, and gender. The dependent variable is student language arts achievement as measured by the NJASK and the local writing assessment.

Questions to Guide the Study

1. To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which the LML Process® was implemented?

In order to determine whether the intervention, the LML Process®, influenced the writing achievement of the students in the school district, the researcher first needed to establish whether the process was implemented with fidelity. If not, then validity and reliability of all other data are questionable. Because the school district personnel seek results from this study to make changes that apply to the total student population and because the researcher’s goal is to provide information to extend knowledge about the use of the metacognitive learning strategy, the LML Process®, program-implementation evaluation was the initial data collection phase of the study. This was accomplished via
interviews with a program expert and the school superintendent utilizing a set of questions that were previously determined.

The program expert was the principal researcher for the LML Process®, the author of two books and many articles and presentations on the topic of LML and was the author of a National Science Foundation (NSF) grant to fund LML Process® implementation in the school district that is the subject of the study. It should be noted that although the NSF did not fund the grant for the implementation of the LML Process® in this district, the district implemented LML with local funds and in the same manner as was detailed in the grant application. The superintendent has been in his position since 2003, when the grant was initially written.

A qualitative analysis using a naturalistic method inclusive of both interview and observational data collected by the program expert and superintendent was conducted. The method was employed to establish the district’s original goals for implementation and program evaluation related to the intended outcomes as well as fidelity of implementation. This provided data to accompany the quantitative assessment thereby establishing a degree of variable control.

1. How does the explicit instruction of the metacognitive learning system, the LML Process®, influence the writing achievement of elementary school students?

Assessment data from the 2008 and 2009 school years in the form of both state language arts and local writing scores were collected and compared with the third grade students of the district’s four elementary schools. The 2008 data were analyzed with inferential and correlational statistics. Due to the lack of a full data set for analysis from the 2009 administration and changes the state imposed in test administration and scoring, the
2009 data were superficially analyzed and an “eyeball test” was used to observe and report on the influence of the LML Process®. In one of these schools, teachers implemented the LML Process® and teachers in the other three did not. The results of students instructed with the program for at least two years were compared to those who had not been instructed with the program.

Two subsidiary questions also framed the study: a. What is the influence of the LML Process® on the writing achievement of students when SES is the independent variable? b. What is the influence of the LML Process® on the writing achievement of students when gender is the independent variable?

_Brief Description of the Let Me Learn Process® (Intervention)_

“The LML Process® defines learning as taking in the world around you and making sense of it” (Johnston, 2007). It is an advanced learning system that is also metacognitive in that it invokes a process of self-talk, reflecting four learning patterns that each individual possesses (Johnston, 2009). In the classroom, strategies are designed to provide learners with the means of articulating who they are as learners and guide teachers in developing the learning environment necessary for students to employ their personal learning strategies with intention (Johnston, 2002). Teachers and learners “operationalize” the learning patterns, create self and peer awareness of unique learning processes, intentionally plan opportunities to work collaboratively with that awareness, and develop teacher–learner partnerships (p. 13).

The theoretical basis of the LML Process® is a model of intentional learning (Johnston, 2009). Key characteristics of the model are the brain–mind connection, the mental processes required for learning, and the operational tools the learner student
employs in the learning process. Included in the process are four stable filters or patterns that exist universally across race, gender, and ethnicity (p. 2.) When the brain takes in stimuli, the stimuli pass through the patterns in a unique way for each individual. The internal process also incorporates simultaneous interactions of cognition (thinking), conation (acting), and affectation (feeling) (p. 3) within our mental processing as the four synchronous patterns (Sequence, Precision, Technical Reasoning, and Confluence) engage. Learning occurs in an individual manner when each learner student sees the world, takes in stimuli, integrates the stimuli through the brain, filters the stimuli through their own patterns, and formulates a timely, effective, and efficient response to them (p. 3). The effect of the intentional use of the patterns with the learning system, The LML Process® embedded into the instructional program in the area of writing, is the focus of this study. A more detailed description of the LML Process® is presented in Chapter 2 and in Appendix C of the present study.

Learning patterns are determined through the administration of the Learning Connections Inventory (LCI) (Johnston & Dainton, 1997), a validated instrument that identifies the individual’s learning patterns (p. 4). The theoretical model is depicted in Figure 1.
District Context

The participating school district includes students in Pre-K–12 with an enrollment of approximately 3700 students within a suburban community in Mercer County New Jersey. District demographics are culturally diverse, with Caucasian and Asian students predominating. About 10% of the student population is eligible for free and reduced lunches, qualifying them as low SES according to the national standard. The LML Process® was introduced in one of four district elementary schools. The assessment data were compared for third grade elementary school students of all four schools.

Limitations and Delimitations

A limitation of the study is the use of a nonexperimental design and archived data for the population of students. Additional limitations include variables such as external
factors that may have occurred during the time span in which data collection took place, such as teacher behavior and quality, family situations, and unforeseen events affecting the culture of the school and/or classroom such as the occurrence of students with low SES. The use of other remedial interventions, which tend to be employed more extensively for the elementary school population, may have created another variable that would have obfuscated the research results.

Delimitations include a focus upon students who have been in the school district and have, or have not, been instructed with the LML Process® for at least two years. In addition, the exclusive analysis of the outcomes for third grade elementary school students in the writing portion of the language arts subject area is delimitation. The researcher incorporated only the 2008 and 2009 NJASK\textsuperscript{1} state assessment results as a quantifiable outcome measure of progress. The local writing assessment, which is a holistically-scored writing prompt designed by a committee of teachers and administrators, was used. This instrument is collected and assessed over each of four marking periods and has been used in the district for the same three years. It was used to establish an additional measure of consistency.

\textit{Definition of Terms}

The following terms are used through the study. Their contextual definitions are included for the purpose of precision in language.

\textsuperscript{1} The analysis of the NJASK conducted by Tienken (2008) suggested that subscale levels (clusters) reflected serious limitations in reliability due to the small number of test items used to measure each area. Educators are cautioned not to use the data as a sole measure of student achievement or program evaluation. This, however, is the test New Jersey uses to assess student achievement under NCLB.
The Confluent interaction is that aspect of our learning which has us avoid conventional approaches; seek unique ways to completing any learning task; gives us permission to start before all directions are given; and permits us to take a risk, fail and start again (Johnston, 1994; 1996).

District Factor Group—In 1975, the NJDOE developed district factor groups. DFGs equalize reporting and provide a demographic standard. This reflects each community’s socioeconomic status (SES) as indicated by the census of every ten years. There are eight DFGs that represent the gradients from low to high SES, ranging from A to J (NJDOE).

Elementary school students are defined by the virtue of their qualification for free or reduced lunch in school. Qualification is determined by family income and weighed by the number of dependent members of the family living on that income.

Intention describes the purposeful use of personal learning patterns on the part of teachers and students during instruction. Teachers construct lessons and assessments that reflect their own patterns as well as the students’ patterns. Students create strategies to analyze and approach learning tasks with their own patterns in mind.

The Interactive Learning Model (ILM) represents the interaction of our mental processes as 12 intersecting circles and names of each of the interactions using terminology understandable to children as young as six years of age.

Learning patterns are defined as relatively stable schemas of behavior that are comprised of the interaction of cognitive, affective, and conative tendencies (Johnston, 1996).

Metacognition is defined as monitoring and control of thought (Martinez, 2006). As it is used in this study, metacognition means a student’s reflective understanding of his or her learning pattern and connection to purposeful learning.
Socioeconomic Status (SES) is defined as the economic level of a student’s family income and the scale used to determine qualification for free or reduced lunch in the Federal Nutrition Program as administered by the Department of Agriculture. SES is a proxy for poverty.

The Let Me Learn Process® is defined as an advanced learning system that empirically determines the learning patterns of the individuals. The Learning Connections Inventory (LCI) (Johnston, 2006) is administered to individuals and learning patterns are revealed through scoring the inventory.

The Precise interaction “is that aspect of our learning that needs to process detailed information carefully and accurately; take detailed notes; ask questions; know exact answers; and write in a highly specific manner” (Johnston, 1998).

The Sequential interaction, that aspect of our learning which needs to follow step-by-step directions; organize and plan work carefully; and complete the assignment from beginning to end free from interruptions (Johnston, 1998).

The Technical Reasoning interaction is that aspect of our learning that requires practical application and relevance to any learning task. Technical reasoning is the individual’s non-verbal process that sees the mechanics of operations; the function of pieces; and needs to work “hands on,” unencumbered by paper and pencil requirements (Johnston, 1998).

Summary of Chapter One and Organization of the Study

Chapter One presents an overview of the historical framework for the genesis of metacognition in education. The researcher also detailed the problem statement and purpose of the study with a focus on the academic achievement of third grade elementary
school students in writing. It also laid the groundwork for the rationale to study this population and the relationship between the use of a metacognitive system and academic outcomes in the form of state and local assessment measures. Limitations and delimitations are also presented for clarification.

Chapter Two consists of a review of the relevant research, theory, and literature, beginning with identification of the problem of weak writing achievement among students in the United States and in the school district that is the subject of the study. It continues with examples of the rationale for metacognition as an intervention in the instructional program and the theoretical framework of the LML Process®, the intervention used by the students in the district that was the subject of the study. Research results that define the elementary school student population, their performance in school, and longitudinal trend data from NAEP and PIRLS, as well as the NJ Assessment of Skills and Knowledge are presented.

Chapter Three, Design and Methods, is linked to Chapter One in its description of the research design, which is cross-sectional, explanatory, and nonexperimental. Research questions, the hypothesis statement, the sources of the data, and steps for analysis are presented.

Chapter Four includes a presentation and analysis of the data. Data are analyzed for significance detailing the result of the use of the metacognitive system, the LML Process® for the elementary school population.

Chapter Five presents a summary with conclusions and recommendations related to the research questions: To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which the LML Process®
was implemented? How does the explicit instruction of the metacognitive learning system, the LML Process®, influence the writing achievement of elementary school students? Subsidiary questions are: a. What is the influence of the LML Process® on the writing achievement of students when SES is the independent variable? b. What is the influence of the LML Process® on the writing achievement of students when gender is the independent variable? The chapter culminates with implications for policy, practices, and future research.
CHAPTER TWO
Review of Relevant Research, Theory, and Literature

Introduction

Analyses of the Writing Achievement of Students in the United States

“Writing well is not just an option for young people—it is a necessity” (Graham & Perin, 2007, p.1). Literacy, which encompasses reading and writing, is an essential skill often making the difference between staying in school and dropping out. Whether graduates enter the workplace or post-secondary education, literacy is the key to their success. The National Writing Commission (2003, 2004) reported that the majority of public and private employers focus on writing proficiency as essential for a full range of jobs from manufacturing and service industries to professional careers.

The United States has participated in a variety of projects designed to assess student performance in literacy in general and writing specifically. The National Assessment of Academic Progress (NAEP) has assessed academic achievement within the borders of the U.S. since the 1960s. The U.S. has also participated in Progress in International Reading Literacy Study (PIRLS), which assesses student progress among participating countries.

In 1998, the NAEP was first used to assess writing. The test was administered three times (1998, 2002, 2007) to fourth, eighth, and twelfth grade students in participating schools. All three grades were tested in 1998 and 2002. Only eighth and twelfth grade students were tested in 2007. NAEP categorizes results into three levels, Basic, Proficient, and Advanced. Basic indicates partial mastery of prerequisite knowledge and skills that are fundamental for the grade. Proficient indicates solid
academic performance, with students demonstrating competency over challenging subject matter. Advanced indicates superior performance (NCES, 2008).

In 1998, between 22 and 27% of students scored at or above the Proficient level, with twelfth grade at 22%, eighth grade at 27%, and fourth grade at 23%. In 2002, the results of the writing assessment were improved, but still discouraging. Only 24–31% of students across all three grades scored at or above the Proficient level, with twelfth grade at 24%, eighth grade at 31%, and fourth grade at 28%. The majority of students across all three grade levels did not meet NAEP writing proficiency goals, with 72% of fourth grade, 69% of eighth grade, and 77% of twelfth grade scoring at or below the Basic level (NAEP, 2002).

In 2007, fourth grade students did not participate in the writing Assessment; only eighth and twelfth grade students participated. While NAEP reported progress comparing scale scores of students who performed better overall with students who attained the Basic level, the percentage of students who reached the Proficient level reflected no statistically significant change for either grade level (NAEP the Nation’s Report Card, Writing, 2007).

The achievement gap between eighth grade students of low SES and their peers remained 23 points nationally, with the low SES students scoring below peers who are not considered low-income. The male–female gap for the same group was 20 points, with females scoring higher. The racial/ethnic gap comparing white students to an average of the four ethnic groups that were measured (Black, Hispanic, Asian/Pacific Islander, and Native American) was 21 points, with white students scoring higher (NAEP the Nation’s Report Card, Writing, 2007).
The PIRLS test assesses the reading, math, and science performance of fourth grade students in the Group of Eight (G-8) countries. This assessment was administered twice, in 2001 and 2006. Reading literacy was assessed in seven separate countries: England, France, Germany, Italy, Scotland, Russian Federation, and the United States (U.S.). The U.S. ranked fourth, behind the Russian Federation, Italy, and Germany and ahead of England, France, and Scotland in the average scale score of fourth grade students. There are four international benchmarks: Low, Intermediate, High, and Advanced. The percentage of U.S. students who attained the High benchmark was 47%, ranking the U.S. 5th behind the Russian Federation, Italy, Germany, and England. Results of the Advanced benchmark revealed a ranking for the U.S. of fourth out of seven countries. In that instance, the ranking was behind England, Italy, and the Russian Federation and ahead of France, Germany, and Scotland. In total, the percentage of students tested in the U.S. who attained the High and Advanced benchmarks was 59% and were ranked fifth behind the Russian Federation, Italy, England, and Germany (NCES, 2009, p. 16).

Both NAEP and PIRLS results indicated that literacy performance of American students from the U.S. demand attention. Assessment results, whether students are compared state by state, over time, or with other G-8 countries revealed benchmarks that do not reflect the level of reading and writing proficiency required for students to successfully obtain and retain full-time employment in the 21st century. Long-term trend data reveal minimal growth. School leaders faced with disconcerting data such as these must research new instructional strategies to meet the challenge of preparing students for adult success.
The states are mandated to administer an annual assessment to establish a benchmark of progress. The school district that is the subject of the present study is located in New Jersey, a state whose Department of Education administers the NJASK to all students in grades three–eight annually. This criterion-referenced measure is designed to establish student mastery of language arts literacy (LAL) and mathematics (Math) in the specified grade levels. The LAL subtest consists of reading and writing. The results are presented in clusters for both components of literacy. Writing consists of two sections: Writing about Pictures and Writing about Poems. The picture prompt is speculative for a story-writing task. The poem prompt is explanatory for a composition task. Students are allotted 25 minutes to complete the tasks in each section. Trained scorers at the state level (NJASK Technical Manual, 2007) holistically score responses on the five-point NJ Registered Holistic Scoring Rubric. In 2008, the Total Possible Points for the writing cluster were 20, with a Just Proficient Mean of 7.4. The Just Proficient Mean is the statewide raw score mean for students whose scale scores are 200, the cut score for proficiency (NJASK, 2008). The state mean for writing in 2008 was 8.8. Of 20 possible points, the average was 8.8. This represents an average of 44% proficiency for the state’s third grade students in writing. When compared to reading, with an average of 62% proficiency, writing proficiency presents focus for intervention.

The achievement gap for SES and gender identified in the NAEP was also evident in the NJASK. For third grade students, there was an achievement gap between students of low SES and those who were not, as measured by the percentage of proficiency on the NJASK 3 (the third grade assessment). Students who were not categorized as low SES outperformed students who were considered low SES by 12.5 points in 2006, 20.7 points
in 2007, and 17.1 points in 2008. On the same tests and using the same measure of
proficiency, females outperformed males by 7.9 points in 2006, 6.3 points in 2007, and
6.7 points in 2008.

The literature points to writing skill as essential to academic success within and
beyond the school setting, as clearly stated in the opening paragraph of this chapter.
Writing results for elementary students as evidenced on state and standardized
assessments do not demonstrate the degree of proficiency that is required for such
success. There is an obvious need for programmatic intervention to enhance elementary
students’ writing skills. Particular attention should be paid to subgroups such as SES and
gender due to the identified gaps in assessment results. With the need for writing
intervention demonstrated by assessment data, the focus of the literature review now
shifts to an examination of some intervention programs and strategies that have evolved
from research on using individual learning differences in instructional programs.

In this chapter, the researcher provides a review of the philosophical
underpinnings of programs employing student awareness of his/her mental operations
when learning, as central to the introduction of metacognition into instruction for
elementary school children, by discussing the evolution of metacognitive strategies as
they apply to improved academic achievement for elementary school children. The focal
school district for the present study is implementing The LML Process®, an advanced
learning system in which metacognition plays a central role. It is described in general
terms in this chapter to provide a context for the report and analysis of data reported in
Chapters Four and Five. Greater detail about LML program implementation is found in
(Appendix C).
Individual Learning Differences in the Literature

Learning differences have been characterized as styles, preferences, patterns, and intelligences in the literature. Most studies are concentrated on post-secondary settings where institutions of higher education are charged with the responsibility of preparing students for access to the job market. For the purpose of this review, personality indices, which reflect individual preferences and tendencies, have not been described in detail. Since the focus for the present study is the elementary school classroom, the review of the literature highlights the most prominent theories that concentrate on individual learning differences designed to improve instruction in K–12 settings.

One of the most widely recognized theories is Multiple Intelligences (MI). Combining research on brain study, genetics, anthropology, and psychology, Gardner developed a taxonomy of human capacities that were first termed the Seven (now 9) (Existentialism is the 9th) Multiple Intelligences (2003, p. 3). Rooted in psychology and reflecting a new and perhaps controversial definition of intelligence, Gardner’s theory became interesting to the education community due to its implications for instructional programs. Subsequent case studies reflected some degree of success in using MI as a whole or school within a school model for public schools, most of which were magnet or charter schools (Campbell & Campbell, 1999). Narrowing the achievement gap between racial, ethnic, and SES groups as well as significant growth in student achievement on state assessments were noted. Other factors, such as small class size, teacher beliefs, varied assessments, student choice, and parent involvement may have affected the reported outcomes, but were not considered in review of the data. Gardner addressed identification of the intelligences in children via the Spectrum Battery (Gardner, 2003, p.
Armstrong offered an observational “Checklist for Assessing Multiple Intelligences” in Children (1994). Working with Sternberg and the Educational Testing Service (ETS), Gardner created a middle school curriculum and a set of assessment instruments which “document learning in three art forms” (Gardner, 2003, p. 7). Taking care not to conflate MI with Learning Styles, Gardner was also careful to limit the permutations of its use to certain subjects rather than for all content and every learning goal. He also rejected the potential for MI to stand the test of empirical research in favor of “design experiments” (p. 11).

MI Theory is said to describe the “what of learning and” and Learning Styles is the “how” (Silver et al., 2000). The emergence of Learning Styles is rooted in the psychological types or personalities as introduced by Jung in 1923 (p. 24). Jung’s four personality dimensions: sensing, thinking, feeling, and intuition formed the prototype of the Learning Styles introduced by Dunn & Dunn (1989), as well as those introduced by Hanson & Silver (1998). Some believe that, when matched to responsive instruction, identifying learning styles can have a positive effect on students’ learning (Dunn, 1999).

Little empirical evidence of Learning Styles having a positive effect on student learning has been generated (Cassidy, 2004). Critics contend that attention to instruction that reflects developmental stages and instructional goals makes more sense (Stahl, 1999). Debate exists among theorists, due to the myriad of definitions and practices reflecting the diverse theories of learning styles. Educators struggle to “ operationalize” the theories because the field is so vast and reflects little agreement characterizing learners and prescribing solid practice (Cassidy, 2004).
On a practical plain, incorporating Learning Styles or MI creates significant work for the teacher with little assurance that the work will yield results. Snow suggested after completing his compendium on the research on learning, “If there is to be a common theoretical base for the concept of the learning style, it will be found in an integrated model of personal-situation interaction and adaptation.” (Snow & Jackson, pp. 84–85).

Perhaps using a systematic approach to learning, which encompasses a holistic model of the brain and mind and teaching the learner to understand his or her own learning differences (as opposed to simply developing instructional methods for teachers that may or may not benefit learners every day) would serve educators in a more practical way. In her research on self-regulated learning, Corno explored strategy training for young children that incorporates the cognitive and metacognitive with affective and volitional constructs and that this training will “....involve a kind of naturalistic guidance, or participant modeling instruction (Corno, in Zimmerman and Schunk, 2001, p. 200). In fact, Corno found that such strategies could not only be trained, but that they are particularly promising in young children.

Explanation of Metacognition in Terms of the Present Study

Flavell (1979) first introduced metacognition citing, in addition to his own work, that of Brown, (1975); Kreutzer et al. (1975); Flavell & Wellman (1977); and Markman (1977), which pointed to conclusions that metacognition plays an important role in problem solving, memory, social cognition, and self control as well as oral and written communication, language development, and reading comprehension (p. 906). Invoking education psychologists Thorndike (1914) and Dewey (1910), Brown (1987) cited
processes that would probably be described in contemporary literature as metacognitive, that both stalwarts of public education advocated, especially in reading and writing.

Research in metacognition has incorporated three components. Knowledge about:
(a) strategies—including when, where, and why they should be used; (b) independent strategy use by students, and “cognitive monitoring” or understanding the limits of knowledge and evaluation; and (c) flexibility of strategy use (Georghiades, 2004).

Research has revealed three important conclusions about metacognition: (a) “knowing about knowing develops, (b) both children and adults often fail to monitor cognition; and (c) some strategies are easy to learn and difficult to abandon” (Garner & Alexander, 1989, as cited in Georghiades, 2004, p. 375). Swanson (1990) found that aptitude was not as important a factor as metacognition in problem solving tasks. Learners were more effective when they understood their own strengths, and weaknesses, and repertoires of learning (p. 376).

While Flavell and others began by analyzing metacognitive experiences that were naturally occurring in the mind and how they affected individual learning, the logical progression of this research eventually led to understanding that metacognitive strategies could be explicitly taught to the advantage of the learner. Martinez (2006) likened metacognition to a “toolbox” serving many diverse functions. When an individual understands one’s own “knowledge state,” one has the tool to employ predictive power for future learning. That is metamemory. A close relative of metamemory is metacomprehension, the state of knowing whether one comprehends the input, whether written, oral or some other form. Problem solving is another tool in the metacognitive toolbox. Separating humans from other beings, solving problems can be viewed as an
evolutionary process that employs continuous appraisal of whether the methods are working with persistent readjustment to reach an eventual solution. Humans employ critical thinking, such as evaluating ideas for quality or deciding whether they make sense, using metacognitive processes. They engage metacognitive standards by asking whether the ideas or messages are stated clearly, follow a logical sequence, are coherent, contradictory, or backed by evidence. (p. 698).

Teaching such metacognitive strategies, or providing the “toolbox,” enables students to take control of their own learning instead of being relegated to the role of passive recipients of what others tell them (Kuhn, 1999). Employing metacognition, because it encompasses both the “skill and will,” engages affective as well as motivational variables, which are essential for learning (Paris & Winograd, 1990, p. 19). The metacognitive model promotes active participation and student ownership of their performance (Marzano, 1990) thus presenting a heuristic framework that encourages student self-discovery of solutions by employing metacognitive strategies that have been explicitly taught and consistently reinforced within the instructional program (Borkowski et al., 1990).

Hennessey (1999) added to the understanding of metacognition in a study of elementary school students ages 6–12, entitled Project META (Metacognitive Enhancing Teaching Activities). Three major aims were the foci of the study: (a) To enhance the existing knowledge about the nature of metacognition and characterize facets of metacognitive thought; (b) To examine changes in metacognition, specifically the process by which students change their capabilities with experience and explore the growth of their personal awareness and control over their thinking; and (c) To determine productive
practices for facilitating change in metacognition and students’ conceptual understanding (p. 3). Study outcomes demonstrated that young children (grades 1–6) were capable of metacognition, that their metacognitive ability is multifaceted and can be “probed and teased apart,” and that changes in metacognitive erudition are possible with active engagement in the process. Hennessey concluded that changes in the students’ metacognitive ability might be linked to their epistemological stances (p. 1). Her conclusions provided a pathway for future research to delve into the descriptions of students’ epistemological stances and pedagogical practices that facilitate students’ epistemological views (p. 22).

In fact, The National Reading Panel (NRP) (2000) identified metacognitive strategies as an important factor in the academic achievement of third grade students in reading instruction. NRP’s eight promising strategies for teaching reading are: comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure, question answering, question generation, summarization and multiple-strategy use. Using this framework and focusing on multiple-strategy use, researchers conducted a five-week study to determine the effectiveness of direct instruction of multiple metacognitive strategies for comprehension and vocabulary of third-grade students (Boulware-Gooden, et al., 2007). In this experimental study, researchers used a pre- and post-test design to measure progress in comprehension and vocabulary development. All students were instructed with the same curriculum and for the same amount of time. The classes in the intervention school also included direct instruction of metacognitive strategies. These included use of vocabulary webs, visual maps, thinking aloud, activating prior knowledge, and writing summaries to distill the essence of assigned-
writing passages. Students in the school in which the metacognitive interventions were used demonstrated a statistically significant advantage over students in the comparison school, with a 40% difference in gains in vocabulary and 20% difference in gains in comprehension (p. 7).

With results such as these, it is no surprise that metacognitive strategy development has gained popularity in recent years. Hennessey (2003) and Boulware-Gooden et al. (2007) examined the ability of primary-age children to employ metacognitive strategies. They all found that although there were some limitations mostly related to command of language, young children were able to engage metacognitive strategies and use them successfully. These strategies were more likely to be useful when they were explicitly taught in a learning environment.

Metacognitive teaching strategies have in common a focus on the individual students in that they are designed to facilitate understanding rather than impart knowledge. The process is active and that activity extends beyond the cognitive into conative dimension of the mind. Where the cognitive construct represents procedural and declarative knowledge and skill, the conative construct represents will, volition, and motivation. Hilgard (1980) advised modern psychologists to seek understanding of three human functions: cognition, affection, and conation. When a student is presented with a task, all three functions may be engaged in a self-regulated model of learning (MacLeod et al., 1996).

Students are successful when they engage knowledge about themselves as students in conjunction with motivational and epistemological beliefs and knowledge about strategies in a feedback loop that analyzes tasks, sets goals, and monitors progress.
(Macleod et al., 1995, as cited in Macleod, 1996, p. 4). The most widely endorsed approach to invoke this engagement is direct, explicit instruction of strategies (Pressely et al., 1987, as cited in MacLeod, 1996, p. 4).

Research findings connect the use of specific strategies to address the achievement of the subgroups of students who are the focus of the present study (SES and Gender). Citing brain science research, King and Gurian (2006, pp. 2–3) addressed ways to engage males in their own learning, recommending several potentially helpful tools. Two of the strategies to support literacy for males are the use of visual–spatial representations and establishing authentic purpose and meaning. Both elements are in an instructional program that includes the LML Process®.

In September 2008, Kappan, Boyd-Zaharias, and Pate-Bain used the paradigm of Maslow’s Hierarchy of needs. Figure 2 represents their work and that of Molnar et al. (2000) who present a similar paradigm for reforming neighborhood schools. The pyramid depicts the many barriers of a self-actualized society. Immediately preceding the pinnacle of the pyramid, in the segment that Maslow labeled “esteem,” are structural reforms such as small class sizes and instructional improvements including aligned curriculum and differentiation (p. 41). Citing Deborah Ball of the University of Michigan, Boyd-Zaharias and Pate-Bain asserted that in order for teachers to be effective they must adapt to the different learning needs of each student, and “teach the way they learn” (p. 43).
Figure 2. Similarity of two concepts of improving neighborhoods and schools for future generations. Adapted from Boyd-Zarharias, J. & Pate-Bain, H., 2008, p. 41 and from Molnar, et al. (2000).

The Let Me Learn Process® (LML)

This researcher has sought to clearly depict how the literature reflects the evolution of metacognition since Flavell introduced it in 1979. The intentional development of metacognition within an explicit instructional framework has also been examined. The gap in the research identified by those who have studied metacognition in young children (Flavell, 1979; Green & Flavell, 2000; Hennessey, 1999) was the use of a common lexicon surrounding direct instruction of metacognitive strategies. When teacher and learner share the same understanding of their own learning patterns and a common language with which to express the operation and interaction of those patterns, they can use strategies for decoding learning tasks (Johnston, 2009). The LML Process®’s theoretical basis is the Interactive Learning Model (ILM), which depicts four internal
learning patterns, each embedded with three mental operations: cognition, conation, and affection (Hilgard, 1980; Snow, 1992) as filters within the brain–mind interface, which regulate the degree to which stimuli pass from the brain to the mind when learning is occurring. These individualized patterns, or schemas, first introduced by Sander (1930, as cited in Johnston, 2002) are “relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment” (Keefe & Languis, 1983, as cited in Johnston, 2002 p. 3).

The LML Process® uses a common lexicon to describe the patterns and the process with which they interact and affect learning. While each pattern is distinct, all patterns concurrently interact with each of the others, resulting in convergence of the thoughts, actions, and feelings of the learner forming the schema or team of learning patterns. Understanding the patterns enables the individual to analyze the learning task, determine which patterns are associated with it, and identify how to use his/her specific learning processes to respond. The patterns—Sequence, Precision, Technical Reasoning, and Confluence, are depicted individually and synchronously in Table 1.
**Table 1. Interactive Learning Patterns that Comprise The Let Me Learn Process®**

*adapted from A Guide to Implementing the Let Me Learn Process® (Johnston, 2001)*

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Conative</th>
<th>Affective</th>
<th>Likely to say:</th>
</tr>
</thead>
</table>
| **Sequential Process** | • Organize information  
  • Mentally analyze  
  • Break tasks into steps | • Make lists  
  • Plan before action  
  • Organize | • Appreciate consistency and dependability  
  • Need tidiness organization  
  • May I see an example?  
  • I need more time to check my work  
  • I would like to review the directions |
| **Precise Process** | • Research information  
  • Ask lots of questions  
  • Always want to know more | • Challenge statements  
  • Prove that I am right | • Thrive on knowledge  
  • Feel good when I am correct  
  • I need more information  
  • Let me write up that answer  
  • Did you know that…? |
| **Technical Process** | • Seek concrete relevance (real world significance)  
  • Only want the information I need | • Get my hands on – tinker  
  • Solve problems  
  • Do | • I enjoy knowing how things work  
  • Need real world relevance  
  • Do not need to share my knowledge  
  • I can do it myself  
  • Let me show you…  
  • How is this useful for me?  
  • I would like a little space |
| **Confluent Process** | • Read between the lines  
  • Think outside the box  
  • Brainstorm  
  • Make obscure connections | • Take risks  
  • Not afraid to fail  
  • Talk about things a lot  
  • May start things and not finish | • I enjoy energy  
  • Feel comfortable with failure  
  • Feel frustrated by people who are not open to new ideas  
  • What do you mean that’s the way we’ve always done it?  
  • The rules don’t apply to me  
  • I have an idea… |

LML is an organic process, beginning with the teacher understanding his or her own combination of learning patterns and culminating in explicit instruction of students’ understanding their own patterns. Teachers interweave reference to and explicit teaching
about the learning patterns into instruction, but more importantly, students are taught to understand their own patterns and use that knowledge to de-construct any assignment to determine what they must do to be successful in completing it. Metacognition in its traditional use refers to thinking about one’s thinking. Within the context of the LML Process®, the term refers to the ability to hear the “talk” (sometimes referred to as internal chatter) among one’s learning patterns and respond to the “talk” by using personal strategies to intervene when negative “talk” about the given assignment or task ensues. The learner then uses the strategies that he or she has been taught to counteract the negative “talk” with a positive response, engaging the learner’s student’s learning processes with intention (Johnston, 2009, p. 28). The metacognitive process, as applied by LML, is described in greater detail in [Appendix C].

Theoretical Framework for the Study

The theoretical framework for the study is inclusive of the Brain-Mind Connection depicted in Chapter One, Figure 1, and earlier in this chapter, Table 1. It represents teaching the learner student writing methods, and the LML Process® inclusive of learning patterns and metacognitive strategies. The learner’s understanding of his or her learning patterns, the metacognitive strategies associated with learning in general, and writing achievement, specifically, are depicted in the lower portion of the framework in Figure 3.
Figure 3. Theoretical framework for the Study.
According to the literature, student achievement in writing should be influenced by instruction in metacognitive strategies. The literature also suggests these strategies are best employed with a framework that encompasses three human functions as presented by Hilgard (1980) and Snow (1992): cognition, conation, and affection. The learner invokes thinking, doing, and feeling when presented with learning tasks. Direct instruction of metacognitive strategies through the LML Process® should provide learners with the tools to analyze tasks, filter them through personal learning patterns as identified by the results of the LCI, and successfully accomplish learning goals according to curricular expectations.

This framework guided the development of the study, including the interview questions and data analysis, and assisted the researcher with the interpretation of the results. If LML was implemented with fidelity in the school district that is the subject of the study, one may anticipate improved writing outcomes as evidenced by the state test scores and local writing assessment for the students with whom the LML Process® was used.

Summary of Chapter Two and Organization of the Rest of the Study

In Chapter Two, the researcher has presented a review of the relevant research, theory, and literature showing that student writing achievement as evidenced on the international, national, and local levels demands attention. The literature points to writing achievement in the U.S. that appears to be less than adequate; raising concerns about how students will fare relative to the demands of the 21st century workforce and a global economy. Metacognition and the direct instruction of metacognitive strategies have
demonstrated promise in student achievement in general and in literacy achievement specifically. Providing learners with a “toolbox” inclusive of three human functions (cognition, conation, and affection) has been suggested, as well.

In Chapter Three, the researcher presents the design and methods linking to Chapter One in its description of the research design, which is cross-sectional, explanatory, and nonexperimental. Research questions, the hypothesis statement, the sources of the data, and steps for analysis are presented.
CHAPTER THREE
Design and Methodology

Introduction

The researcher’s purpose for conducting the study was to determine the influence of the metacognitive learning strategy, the LML Process®, on the writing achievement of elementary school children in general and focused on students from low SES. In addition, results of males and females were also studied. The performance of elementary school students in the United States in the writing portion of the language arts program has been identified as low in comparison with their same-age peers in other countries (PIRLS). Their performance continues to indicate that scores in reading and writing are not improving for this age group. Writing has been selected as the content area used in the study.

An achievement gap in writing exists between students of low SES and same-age children who are not low SES. These data are reflected in the national, state, and local testing results, and require examining instructional methods that are likely to affect improved results. The achievement gap as reported in NAEP 2007, between eighth grade students of low SES and their peers, remained 23 points nationally, with the low SES students scoring below peers who are not considered low-income. The male–female gap for the same group was 20 points, with females scoring higher. The racial/ethnic gap comparing white students to an average of the four ethnic groups that measured (Black, Hispanic, Asian/Pacific Islander, and Native American) was 21 points, with white students scoring higher. The researcher examined and reported these comparisons in the present study.
Various programs are designed to address the achievement of elementary school students. Most are either 1) whole school reform models that include institutional change or 2) societal reform models that include stabilizing the job markets and increasing affordable housing.

Employing metacognition may help students, including poor and minority children, navigate the vast information highway, by facilitating understanding of their own learning patterns and preferences. Differentiating instruction by adapting to the needs of individual students, as referenced by Boyd-Zaharias & Pate-Bain (2008), and Molnar et al. (2000) can be accomplished via a model that provides students with personal understanding of themselves as learners.

Metacognition, while new to the world of education, has roots in Greek philosophy with an evolution applied in contemporary times by Flavell (1976). Martinez (2006) connected metacognition to education, deeming it integral to the information-rich landscape of contemporary education (p. 699). Research has been limited due to the originality of Martinez’s connections and the absence of programs that explicitly implement metacognitive learning strategies.

A differentiated instructional program model, which is learner-centered and metacognitive, is the focus of this study. The LML Process® emerged from research conducted by Kluwe (1982), exploring individual ability to monitor and self regulate personal cognition through learning tasks, thereby becoming "agents of their own thinking" (p. 222). Subsequent research pointed to self-understanding of one’s mental processes as transferable and able to be generalized when approaching learning tasks. White and Frederiksen (1998) connected the use of metacognition to improved
performance in low achieving students and Hennessey (1999) connected the intentional use of metacognitive processes to children as young as 6 years of age. One gap that was identified in the implications for future research was a common lexicon or formal vocabulary (Hennesey, p. 21, Flavell 2000, p.108) for learners to explicitly express their own learning experiences.

For the present study the researcher sought to augment the insufficient research published which explicitly links metacognitive teaching strategies and the academic performance of elementary school students. While metacognitive strategies have been examined in the research, Flavell and Hennessey found that a common lexicon or vocabulary for the study subjects to describe the metacognitive processes they were using was not identified. This researcher sought to fill that gap with a study of an instructional process, which includes the vocabulary that was missing from previous studies. The LML Process® incorporates a common metacognitive vocabulary and was used by one of the elementary schools in the district that was the subject of the present study, thereby facilitating an opportunity for analysis of metacognition and elementary school students.

The setting for this study was a K–12 school district with four K–3 lower elementary schools. Students at one elementary school were instructed with the LML Process® while students of the other three elementary schools were not. While generally high-performing according to NCLB Adequate Yearly Progress (AYP) standards, this district missed the mark for the low SES subgroup for three years—2005, 2006, and 2007. The school district is considered by the state district factor grouping (DFG)
classification to be a GH, or in the top three of wealth in the A–J rankings\(^2\). Despite its DFG ranking of GH, which is near the top of socioeconomics in the state of N.J., the performance of the low SES students on the NJASK3 test has been consistently lower than the performance of students who are not low SES within the district and as compared to the state averages from 2005–2007.

*Research Design*

The development of research follows a logical sequence of design and methods. While the problem and the purpose drive the design, the design dictates the methods of the study. Design is essential to the validity and reliability of the results and ensuing conclusions. Since the aim of most education research is the extension of current knowledge in the field, the structure or design of the study must facilitate clear and precise analysis and interpretation.

In the present study, the researcher’s intention was to identify the influence of factors associated with the phenomenon, the LML Process®, with no manipulation of the variables and at a single point in time. An explanatory, nonexperimental, cross-sectional design was employed (Johnson, 2001). A nonexperimental design was chosen due to the difficulties associated with an experimental study in the school setting. None of the three categorical independent variables was manipulable. These were the groups of students who had been instructed with LML and those who had not been instructed with LML, gender, and SES (comparing test scores of males and females and students of low SES with those who were not low SES). “Were the researchers trying to explain how the

\(^2\) DFG was established in 1975 to rank school districts by socio-economic status in order to compare results of state assessments. The ranking of A is the poorest and J is the wealthiest SES grouping (NJDOE).
phenomenon operates by identifying the causal factors that produce change in it? If the answer is “yes” (and there is no manipulation), then the term explanatory nonexperimental research should be applied.” (p. 9).

**Hypothesis**

The null hypothesis (H₀) statements were as follows: There is no difference in the writing achievement of elementary students after being instructed with the metacognitive learning system, the LML Process®. There is no difference in the writing achievement of elementary students of low SES after being instructed with the metacognitive learning system, the LML Process®. There is no difference in the writing achievement of males after being instructed with the metacognitive learning system, the LML Process®. If the null hypotheses are not accepted, then the researcher can assume that there was a positive association between the variables, implementation of LML and writing achievement as assessed by the scores on the NJASK 3 test and local assessments. If the null hypothesis is not accepted, then the probability of a positive influence on writing achievement for elementary students, low SES, and males who were instructed with the LML Process® does exist. However, if the null hypothesis is accepted (H∅), there is no positive association between the variables, implementation of LML, and writing achievement as measured by the scores on the NJASK test and local writing assessment.

In preparation for the study, the researcher first engaged in a process of review and analysis of research, theory and literature relative to the population and sample and the LML Process®. Identifying the problem of low achievement in the writing component of the literacy dynamic as applied to national and local outcomes was the initial step in the process. Low achievement for U.S. students was evidenced by research
reported in NAEP and PIRLS. Achievement weakness for the school district that was the subject of the present study was reported on the state NJASK 3 results.

Understanding metacognition and its potential influence on academic achievement for elementary school students followed identification of the problem. The researcher found clear links between metacognitive strategies and student achievement in literacy, specifically writing achievement. The LML Process®, the metacognitive strategy used in the study, was described and explained in detail. The researcher then connected metacognition and writing instruction in the review of the literature. After identifying the problem, and determining through the literature that metacognitive strategies have been found as beneficial in elementary student achievement in literacy (Boulware-Gooden et al., 2007), the researcher’s next step was to determine the relationship between the specific metacognitive strategy, the LML Process®, and elementary student achievement in writing.

Research Methodology

According to Johnson and Onwuegbuzie (2004), essential to the methods is the formulation of the research question (p. 17). Two prevailing questions representing both quantitative and qualitative cross-validation framed the study. Question #1: To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which LML was implemented? Question # 2: How does the explicit instruction of the metacognitive learning system, the LML Process®, influence the writing achievement of elementary school students?

Greene et al. (as explained in Johnson & Onwuegbuzie, pp. 21–22.) noted that the five major purposes for using mixed-method research are: triangulation,
complementarity, initiation, development, and expansion. Denzin focused on triangulation as useful to compare information and determine corroboration (as explained in Wiersma, 1991, p. 232). “Mixed method research is formally defined as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, and approaches concepts or language in a single study” (Johnson & Onwuegbuzie, 2004, p. 17).

The researcher determined that mixed-method research was effective for the purpose of the present study combining the qualitative interview format, which was conducted to establish program fidelity with quantitative analysis of the assessment data. Following the mixed-method approach as espoused by Johnson and Onwuegbuzie (2004, p. 18), combining both quantitative and qualitative data and analyses offered the researcher the best of both methodologies. The quantitative results provided “deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardized data collection, and statistical analysis” (p. 18), while the qualitative focused on “induction, discovery, exploration, theory/hypothesis generation, the researcher as the primary instrument of data collection, and qualitative analysis” (p. 18). This approach puts “the researcher in a position to mix or combine strategies and to use what Johnson and Turner (as cited in Johnson & Onwuegbuzie, 2004, p. 23) called the fundamental principle of mixed research…which is likely to result in complementary strengths and nonoverlapping weaknesses” (p. 18).

Question #1: To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which LML was implemented? The researcher tested the theory that the implementation of the LML Process® would
influence writing achievement of third grade elementary school students. Recognizing that it was important to determine the fidelity with which “the ‘program’s operations conform to those specified in the program plan,’” (Kremper & Achilles, 1979, p. 21) this researcher chose to employ the interview format and a phenomenological perspective, consulting an expert on the LML Process® and the school superintendent for evaluation of program fidelity.

*Question # 2: How does the explicit instruction of the metacognitive learning system, the LML Process®, influence the writing achievement of elementary school students?* Two subsidiary questions followed: 3. What is the influence of the LML Process® on the writing achievement of students when SES is the independent variable? 4. What is the influence of the LML Process® on the writing achievement of students when gender is the independent variable? All of these were addressed through quantitative analysis. Statistical analysis of quantitative data, including the annual state assessment (NJASK 3 Language Arts Literacy or LAL) and the local writing assessment scores, were two outcomes studied to test the influence of the LML Process® on writing, hence the use of mixed-method research (Johnson & Onwuegbuzie 2004 p. 14).

*The Local Timed Writing Assessment.* To address writing achievement, a critical component of literacy, the school district that is the focus of the study placed considerable emphasis on the writing portion of the language arts program. In fact, four separate writing samples were collected and holistically scored annually for students in grades two–eight during the data collection period of the study (2008–2009). This provided the district with both formative and summative assessment results for comparison and to establish growth through the school year. It provided data that enabled
the researcher to conduct a statistical analysis comparing the writing results of students in the four elementary schools; specifically comparing the results of the school which implements LML with the three that do not implement LML.

Project STAR was a large-scale, randomized experiment. Researchers examined the effects of small class size for students in grades K–3 in Tennessee from 1985–1989. Because of its size and scope, it is frequently used in policy discussions (Schanzenbach, 2006). Moesteller described Project STAR as “one of the most important educational investigations ever carried out” (as cited in Schanzenbach, p. 22). Based on a re-analysis of Project STAR completed by Boyd-Zaharias (1999), students gained advantages in attending small classes in grades K–3 as they proceeded through those grades. Advantages in reading were measured in months ahead of their peers who were not in small classes. In her re-analysis, the advantage grew from .5 months in kindergarten to 4.7 months by the end of third grade, leading the researcher to posit that a statistically significant difference in the achievement of students who had been instructed with a specific intervention would be more likely to grow in subsequent years of program implementation. Most of the students who were in third grade in the 2007–2008 school year had been instructed with the program for almost four years by the end of their third grade year. All student data in the present study were obtained from those who had been instructed with the LML Process® for at least two years. The researcher decided to perform statistical analyses with the assessment results from the 2008 school year and create a table of results to visually compare the results of the 2009 NJASK 3 and local writing assessments. The three sets of data were analyzed to provide answers to the research questions.
In 2008, the NJASK 3 test was administered in the last week of March. In 2009, it was administered in the first week of May. The local writing assessment was administered four times through the course of the 2008–2009 school year. Only results of students with four scores were used. Data for both years were employed, not for the purpose of comparative analysis over time, but to strengthen validity and answer the research questions; therefore, the study was cross-sectional, not longitudinal.

Participants

The only participants in the qualitative portion of the study were the program expert and the superintendent of schools. To establish program fidelity, the researcher interviewed the program expert. The superintendent was interviewed to establish both program fidelity from his perspective and to report on goal attainment for implementation of the LML Process®.

Research Procedures

The researcher was granted approval by the Institutional Review Board (IRB) of Seton Hall University to conduct the research and evaluation in the study. This permission testified to the fact that the procedures established by the researcher protected all study participants and maintained appropriate anonymity [Appendix A].

The researcher was granted permission from the Superintendent of Schools to conduct the research using the archived assessment data. The superintendent also agreed to be interviewed regarding the district’s goal attainment for the LML Process®. The researcher submitted a letter to the superintendent to request permission for the superintendent to be interviewed and to explain the nature and anticipated outcomes of the study [Appendix A]. The superintendent interview protocol was designed to
determine, from his perspective, whether the program goals originally established for implementation of LML were met as well as program fidelity from the administrative point of view [Appendix B]. The Elementary School and Intermediate School Principals were appraised of the data collection methods and process, including specific data required and the anonymous format. By permission [Appendix B], an interview was conducted with the program expert. The interview with the expert consisted of questions designed to establish, from her unique perspective as principal researcher of the LML Process®, fidelity of program implementation.

Data Collection and Analysis

Data triangulation, employing a qualitative method for program evaluation and quantitative methods including two data sets (NJASK 3 LAL and local timed writing assessment) comprised the mixed-methods approach. This was done to strengthen internal validity.

Descriptive data and background information were collected. These consisted of district demographics, including DFG. The data were disaggregated between and within the four elementary schools, and were further disaggregated by student gender and low SES subgroups in addition to those who were instructed with LML and those who were not instructed with LML.

Program fidelity was established through qualitative inquiry. In-depth interviews were conducted with the program expert for the LML Process® and the superintendent of the school district that was the subject of the study. A naturalistic format utilizing open-ended questions was employed. Their responses were recorded and analyzed for common responses using “bracketing.” This approach enabled the researcher to obtain the
information about the program from their individual perspectives and identify noteworthy elements, thereby formulating relationships of those elements to each other and to the larger context (Jones et al., 2006, p. 87).

Assessment data were gathered for the 2008 and 2009 school years for all third-grade students in the district’s four elementary schools. One group was instructed using the LML Process® for two years (n = 82 in 2008 and 61 in 2009) and one was not instructed with the LML Process® at any time (n = 209 in 2008 and 244 in 2009). One dependent variable was language arts performance as measured by the scores on the NJASK3 and by writing performance as assessed by the scores on the local writing assessment.

The researcher disaggregated data by groups who were instructed with the LML Process® and those who were not instructed with the LML Process®. Further disaggregation included independent variables of gender and SES. The researcher used a continuous collection of categorical data by school; comparing the assessment results of the school in which the LML Process® was implemented and of students in the three elementary schools where LML was not implemented.

Data were evaluated to explore a possible relationship between the implementation of the LML Process® and achievement of third-grade students on the NJASK 3 and on the local writing assessment. A one-way ANOVA, using the results of the 2008 NJASK 3 assessment, was conducted with a significance level set at p ≤ .05. This test was used to determine the influence of the main effect of the LML Process® on the writing achievement of the district’s third grade students, comparing LML with non-LML results. One-way ANOVAs were also used to determine the influence of LML for
the independent variables gender and SES. To compare the independent variables SES and gender, t-tests for independent samples were used.

One-way ANOVAs were used to estimate the influence of the main effect, the LML Process®, on writing results as assessed by the local writing assessment administered four times through the course of the school year. Results of the fourth attempt, administered in the spring of 2008, were used for this analysis because it was determined that after three previous attempts to obtain the best score the fourth attempt was likely to produce the best results. Significance was set at $p \leq .05$. The ANOVAs were used to estimate the influence of the independent variables gender and SES. To first establish whether the difference between the first and fourth attempts were significant for the groups as a whole and for the groups represented by the independent variables of LML, gender and SES, t-Tests for paired samples were used.

A statistically significant test indicates that the null hypothesis may be rejected but does not determine the size of the effect (Witte, R. S. & Witte J. S., 2007, p. 350). Effect sizes were also calculated using the following equation:

$$\text{Effect size } n^2 = \frac{\text{SS between groups (LML and non-LML)}}{\text{SS total (total sum of squares)}}$$

The qualitative portions of the study consisted of expert interviews to establish whether or not the superintendent was satisfied that implementation of the LML Process® met the district’s goals of differentiation of instruction and improved test scores. Interview with a program expert was employed to establish whether the LML Process® was implemented with fidelity. Set questions were used for the interviews [Appendix B]. An open-ended interview format facilitated obtaining the authentic
perception of the superintendent and the knowledge of the program expert to inform the research. Results of the interviews are analyzed and reported in Chapter Four.

Validity of Research Instruments and Reliability of Results

This study included two quantitative components. One component was the use of the NJASK 3 scores from 2008 and 2009. This criterion-referenced test is aligned with the New Jersey Core Curriculum Content Standards (NJCCCS) used at the NJDOE to comply with the NCLB requirements of attaining the “AYP” standard. The test is administered statewide to every pupil in grade three at the same time each year during a two-week period. It was administered in March of 2008 and May of 2009. The NJASK scores are reported as scale scores and include performance levels in each of the content areas of language arts, mathematics, and science. The present study focuses on language arts scores, which are comprised of reading and writing. The score ranges and their associated performance levels are:

- 100–199 Partially Proficient
- 200–249 Proficient
- 250–300 Advanced Proficient

The state minimum of proficiency is 200 and all students who score at that level or above have attained proficiency. Those who score below 200 may be in need of instructional support. Those who score above 250 are considered advanced in the content areas (New Jersey Technical Report, 2008).

The NJASK is accepted as valid because a) experts in the field of education, specifically the writing portion of language arts created the instrument, and b) the NJASK is the statewide measure currently used in New Jersey to meet the NCLB “AYP”
standards. The NJASK 2007 Technical Report, the most current report available, states that the reliability estimate based on Cronbach’s coefficient alpha estimate of internal consistency is .67 for the writing portion of the NJASK 3, which is quite low, but adequate for this research.

In a second quantitative portion of the study, the local writing assessment was used. This assessment was developed by a committee of teachers at the school district to align with the writing portion of the NJASK 3 state assessment. A test of reliability using Cronbach’s Alpha Estimate Based on Standardized items was conducted for the local writing assessment using all scores revealing a rating of .837. To establish consistency, the same writing prompt was administered to every third-grade student in the district and collected during the same four intervals throughout the school year.

**Limitations**

Internal validity is affected by the limitations of research design. A limitation of this study is the use of a nonexperimental design and archived data with statistical analysis for only one year of collected data (2008). Individual student data were not available during the time of data collection for the present study, thereby preventing statistical analysis of the 2009 assessment results.

The choice to use the selected data was driven by the researcher’s purpose to examine the results of elementary school students who were instructed with the LML Process® as compared with their peers who were not instructed specifically with LML. Additional limitations included variables such as external factors that may have occurred during the time span when data collection took place, such as teacher behavior and quality, family situations, and unforeseen events affecting the culture of the school and/or
classrooms. Use of other remedial interventions, which tend to be employed more extensively for the district’s low SES population than for non-SES populations, created another variable, which may obfuscate the research results.

**Delimitations**

Delimitations, which may affect external validity and impinge upon generalizibility of the results, include a focus upon students who have been in the school district and have, or have not, been instructed with the LML Process® for at least two years. The researcher incorporated 2008 and 2009 NJASK 3 state assessment results and the local writing assessment for 2008 as quantifiable outcomes to measure progress.

The local writing assessment had not been tested for validity or reliability before administration. It was a holistically scored writing prompt, designed by a committee of teachers and administrators. It was used as a statistical measure to test the hypothesis and determine statistical significance. This instrument was administered with results collected and assessed over each of four marking periods during the 2007–2008 school year.

**Summary of Chapter Three and Description of Chapter Four**

In Chapter Three, the researcher explained the design, methods and procedures with which data were collected. Validity of the assessments and plans for analysis of the data were detailed. This chapter provided the link between the research methods and the guiding questions that were set forth at the outset of the study.

In Chapter Four, the data are presented and analyzed. Qualitative analysis of the interview questions was completed to establish program fidelity through the perspectives of a program expert and the school district superintendent. Was the LML Process® implemented in the way that the program developer intended? This analysis consisted of
“bracketing” responses to uncover patterns revealing similarities and differences in their answers to the same set of questions. Student data in the form of NJASK 3 and the local writing assessment scores were analyzed to determine if there was an influence on student writing achievement for students who were instructed with the LML Process®, inclusive of the results of students disaggregated by SES and gender.
CHAPTER FOUR

Presentation and Analyses of the Data

Introduction

The researcher’s purpose was to determine the influence of a metacognitive learning process on the writing achievement of students in an elementary school in suburban central New Jersey. The questions guiding this research were:

1. To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which the LML Process® was implemented?

2. How does the explicit instruction of the metacognitive learning system, the LML Process®, influence the writing achievement of elementary school students?

3. What is the influence of the LML Process® on the writing achievement of students when SES is the independent variable?

4. What is the influence of the LML Process® on the writing achievement of students when gender is the independent variable?

The following report of the research findings follows the sequence of the research questions and summarizes the results of all data sources. While LML was used across the curriculum in one elementary school in the district that was the subject of the present study, writing was selected as the content area for the purpose of the study. It is reported individually in the analyses of the local timed writing assessment and as a component of the language arts literacy assessment of the NJASK 3 language arts literacy (LAL). It should be noted that during the period of data collection (2008–2009) no specific method of writing instruction was introduced other than the LML Process®. Table 2 contains a summary of the steps for data collection and analysis.
## Table 2. Summary of Steps for Data Collection and Analyses

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source</th>
<th>Analyses Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which LML was implemented?</td>
<td>Interviews</td>
<td>Bracketing</td>
</tr>
<tr>
<td>How does the explicit instruction of the metacognitive learning system, the LML Process® influence the writing achievement of elementary school students?</td>
<td>NJASK 3 LAL Local Writing Assessment</td>
<td>One-way ANOVA t-test</td>
</tr>
<tr>
<td>How does the explicit instruction of the metacognitive learning system, the LML Process® influence the writing achievement of elementary school students when the independent variable is SES?</td>
<td>NJASK 3 LAL Local Writing Assessment</td>
<td>One-way ANOVA t-test</td>
</tr>
<tr>
<td>How does the explicit instruction of the metacognitive learning system, the LML Process® influence the writing achievement of elementary school students when the independent variable is gender?</td>
<td>NJASK 3 LAL Local Writing Assessment</td>
<td>One-way ANOVA t-test</td>
</tr>
</tbody>
</table>

Research Question One: *To what degree was the LML Process® implemented with fidelity for the students in the area of writing in the school in which LML was implemented?* The question was designed to establish fidelity of program
implementation. With the question of implementation answered, the research questions analyzed qualitatively had a solid basis for examination. The results, whether the null hypothesis is accepted or rejected as a result of the statistical analysis in the quantitative method, could not be valid if the program was not implemented in accordance with the process that was designed by the program’s creators, or the school district personnel who intended that the program be implemented for a certain purpose. Therefore, both a program expert and the superintendent were interviewed to establish program fidelity. “Program implementation evaluation techniques are typically nonexperimental and include direct observation, interviews….” (Kremper & Achilles, 1979, p. 21).

The school district did not have an established method to determine fidelity of program implementation. Therefore I developed a protocol designed to ascertain the perceptions of two key individuals—a program expert for LML and the school district superintendent. A set of open-ended questions was developed for each interviewee (Appendix B). The questions were grounded in the theoretical framework (see Chapter Two, pp. 38–39). The protocol was designed to facilitate a naturalistic inquiry approach. Responses were transcribed and analyzed by the researcher, using the bracketing method (Patton, 2002, p. 106), looking for themes and patterns within each interviewee’s perceptions of program implementation. Common phrases and agreement about the key aspects of implementation were found.

**Qualitative Analysis of the Data for Research Question # 1**

The researcher interviewed each person separately and at separate times. Neither respondent was aware of the answers given by the other. The questions and responses are shown in Appendix B. The first question in the interview protocol was added for the
program expert and was answered exclusively by her. That question was, “Why was the program called the ‘Let Me Learn Process®?’” Her response was, “When the first book, *Unlocking the Will to Learn*, was published (1996), very little was available in the literature about metacognition. Those who worked on this project recognized the need for learners to be able to articulate their internal learning experiences and explain to others what worked and what did not work for them in the classroom. In other words, learners needed to understand what was actually preventing them from learning. The phrase, ‘let me learn’ became the central message of student metacognitive-driven learning. It seemed a natural phrase to use as an outgrowth of what students were identifying as their personal need” (Johnston, C.A., personal interview, September, 2009).

The interview proceeded with each respondent answering the same questions. The researcher recorded and bracketed responses to find common reported words, phrases, and perceptions that would ascertain agreement and ultimately establish program fidelity. The first common question in the protocol was “What were the district goals for implementation of The Let Me Learn Process® in 2008 and 2009?” Both respondents answered it similarly. They stated that the goals for implementation in the years of data collection, 2008 and 2009, were to collect data to support the model, enabling rationale to continue the growth of the LML Process®. The program expert reflected upon early staff narrative reports and student assessment data that seemed to show that LML was making a difference.

The second question, “In your opinion, were the district’s intended goals met?” again yielded similar responses, with the program expert answering with a qualified “yes” because the goals for the school that implemented the process were chiefly met, but
the original goals for LML to be implemented in all schools had not been met at this time. The superintendent responded “yes,” continuing the response by sharing his plans for growth.

The third question, “What was the process of implementation? Please include validation of the LML inventories (the inventory that established individual learning patterns), professional development, and implementation timelines.” While the program expert provided more detail due to her involvement with the teachers, classrooms, and students, the superintendent included some of the same activities. The program expert added the specific elements of professional development, noting those that helped to provide consistency and those that were individualized to accommodate differences in teacher development and student progress.

The fourth question, “What were the benchmarks of implementation, including degree of participation and adherence to the timelines?” may have not been clearly stated because it drew no clear common responses. However, it did, reflect each interviewee’s feelings that as teachers began to understand the process and use it in their classrooms, their enthusiasm grew. The superintendent emphasized that, in his opinion, the voluntary nature of the implementation contributed significantly to its growth.

The fifth question, “What were the indicators of benchmark attainment?” reflected commonality in that the respondents discussed the students. The program expert said that the students were observed using the metacognitive language and developing personal strategies of LML, therefore the child “owns” the process. The superintendent said that teachers began to “listen to the learner” and looked at student work. He also said that the students took “ownership” of their work.
For the sixth question, “In your opinion, what other factors such as administrative support, personal health, and/or changes of staff, financial resources, and parent involvement affected program implementation?” The respondents were in agreement, citing parent support, financial resources, and administration as the most important factors in program implementation. Neither the superintendent nor the program expert indicated that any of the other factors were salient in the implementation process. Both indicated that parent involvement was consistently supportive, noting that parents had asked why LML was not in their children’s classrooms after they left the LML School. They also agreed that school leadership in the LML School played a prominent role in program implementation. Financial resources were also consistent with the materials and fees for the consultant services associated with the professional development for teachers available for any number of teachers who volunteered to be trained in any given school year.

The seventh and final common question was, “Has the LML Process® continued to be used in the district (Why/why not)?” Both the program expert and the superintendent answered resoundingly in the affirmative. Perhaps more important than the yes or no response were the reasons why it was still being used. The program expert indicated that responses from teachers and parents were very positive with professional staff reporting that there were fewer classroom management problems and that many could say that they resolved difficult student problems with LML in the classroom. The superintendent indicated that there were plans to expand the program into all of the district schools. He is working to incorporate LML into individual learning plans, an initiative planned for the high school.
Common phrases and reported perceptions emerged from the analysis, linking the responses and demonstrating agreement between both parties. The reported common words, phrases, and perceptions included, *data collection, plans for growth, voluntary participation, summer professional development, student ownership, parental support, administrative and financial support*, and finally, an affirmative *yes* response to the question, “*Has LML continued in the district, Why/Why not*”? While the perspectives of each person were somewhat different, with the program expert responding with more specificity due to her deeper understanding of the process, many key words, phrases, and reported perceptions emerged from the interviews, establishing agreement and reflecting program fidelity. In some cases, the terms were identical. In all cases, the reported perceptions were sufficiently similar to ensure that the program was implemented with fidelity.

*Quantitative Analyses of the Data for Research Questions Two, Three, and Four*

The quantitative data collection method for the study, addressing research question two and subsidiary questions three and four, included the influence of the metacognitive learning system, the LML Process®, on the writing achievement of elementary students, students in the SES category, and gender (male/female). These data were analyzed to establish evidence of the influence of the LML Process® in writing for one school district’s third grade students. The researcher analyzed the 2008 NJASK 3 test scores of 270 students. In the case of the local writing assessment, only the scores of students who had followed the district protocol of four timed writing samples were included. That number was 257. The outcomes for three variables, LML, SES and gender (male/female) were analyzed.
The analyses consisted of gathering student test results for the 2008 NJASK 3 LAL and the local writing assessments for the same year. While the 2008 NJASK LAL was analyzed statistically, the 2009 NJASK 3 LAL data were analyzed and reported with a data table for visual comparison. Mean scores for individual students on the 2009 assessments were not available during the data collection period of the present study. Changes in the 2009 NJASK 3 test and its administration (content, time of school year, and scoring) may have rendered the results meaningless because the 2008 and 2009 NJASK 3 assessments were non-equivalent measures.

Descriptive and Demographic Information

Quantitative analyses of data for third grade students was initiated with descriptive and demographic analyses of the 2008 NJASK 3 LAL and the local timed writing assessments. The total N for analyses of the two assessments were different because every third grade student took the NJASK 3 (N = 270). However, not every student completed four timed writing assessments. Students who did not have four scores were removed from the original list, yielding a new number (N = 257) to be used for those analyses. The total N for the LML School, coded as Group One, was consistent for both assessments (N = 72) and the total for the non-LML Schools, coded as Group Two, were not. More student scores were recorded for Group Two for the NJASK 3 (N = 198) than for the local timed writing assessment (N = 185).

Demographic characteristics for the total populations and the subgroups, gender and SES for both assessments, were included in the analyses of the data. In Tables 3 and 4, the school whose faculty used the LML Process® was labeled LML School and the other schools, whose faculty did not use LML, were labeled by number (#2, #3, #4).
Table 3. Grade 3 Student Demographics by School for the 2008 NJASK 3 LAL

<table>
<thead>
<tr>
<th>Demographic</th>
<th>LML School</th>
<th>School #2</th>
<th>School #3</th>
<th>School #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>72</td>
<td>82</td>
<td>61</td>
<td>55</td>
</tr>
<tr>
<td>% Male</td>
<td>53</td>
<td>54</td>
<td>44</td>
<td>53</td>
</tr>
<tr>
<td>% Female</td>
<td>47</td>
<td>46</td>
<td>56</td>
<td>47</td>
</tr>
<tr>
<td>% Low SES</td>
<td>11</td>
<td>15</td>
<td>11</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 4. Grade 3 Students Demographics by School for the 2008 Local Timed Writing Assessment

<table>
<thead>
<tr>
<th>Demographic</th>
<th>LML School</th>
<th>School #2</th>
<th>School #3</th>
<th>School #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>72</td>
<td>76</td>
<td>60</td>
<td>49</td>
</tr>
<tr>
<td>% Male</td>
<td>53</td>
<td>49</td>
<td>45</td>
<td>51</td>
</tr>
<tr>
<td>% Female</td>
<td>47</td>
<td>51</td>
<td>55</td>
<td>49</td>
</tr>
<tr>
<td>% Low SES</td>
<td>11</td>
<td>14</td>
<td>10</td>
<td>24</td>
</tr>
</tbody>
</table>

When comparing the outcomes of analyses of the NJASK 3 LAL scores and the scores of the local timed writing assessment, the Ns and percentages were the same for the LML School but were different for the other three elementary schools. Along with total students, gender and SES are represented. The SES label represents students who were considered economically disadvantaged as determined by their qualification for free or reduced lunch.

Two groups were initially compared to test the influence of the independent variable LML on the dependent variables, the NJASK 3 LAL and the local writing
assessment. The groups were those students instructed with the LML Process® and those who were not instructed with LML. All students who were instructed with LML were in one school and all students who were not instructed with LML were in the other three schools. For the purpose of these analyses, the scores of the students in the LML School were analyzed and labeled Group One, and the scores of the other three schools, those not using LML, were combined, labeled, and analyzed as Group Two. The variable SES was measured by labeling students who received free and/or reduced lunch and those who did not receive free and/or reduced lunch. Those groups were labeled SES and not SES respectively. Gender groups were also analyzed and labeled males and females. The outcome measures of the SES and gender groupings were analyzed and compared to each other as part of their inclusion in Groups One and Two.

The LML School had the highest percentage of males and, along with School #3, had the lowest percentage of students with low SES for the NJASK 3 LAL and ranks third when comparing highest to lowest SES percentage for the local timed writing results. Effect sizes were calculated for each group to estimate the size of the effect for each statistically significant difference.

Analyses of Group One Compared with the Group Two Test Scores for the 2008 NJASK 3 Language Arts Literacy (LAL)

Descriptive Statistics. As represented in Table 5, the mean score for Group One for the 2008 NJASK 3 was (µ = 226.28) and the mean for Group Two was 9.82, below that of Group One (µ = 218.46).
Table 5. Mean Scores of Groups One and Two (LML and Non-LML, respectively)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>LML</td>
<td>72</td>
<td>226.28</td>
<td>14.347</td>
<td>1.691</td>
<td>189</td>
<td>250</td>
</tr>
<tr>
<td>Non-LML</td>
<td>198</td>
<td>218.46</td>
<td>18.985</td>
<td>1.349</td>
<td>163</td>
<td>257</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>220.55</td>
<td>18.173</td>
<td>1.106</td>
<td>163</td>
<td>257</td>
</tr>
</tbody>
</table>

Inferential Statistics. A one-way ANOVA was conducted to estimate the influence of the main effect the LML Process® had on third grade students who attended the school in which LML was used for instruction. The dependent variable was the result of the Spring 2008 NJASK 3. The significance level was set at \( p \leq 0.05 \). From the results shown in Table 6, instruction with the LML Process® has a significant \( (p = .002) \) effect on student achievement as recorded on the NJASK 3 assessment. The effect size of this difference was estimated at .04, or between a small and medium effect.

Table 6. Statistical Output for Comparison of Group One and Group Two on the 2008 NJASK 3 LAL

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3223.177</td>
<td>1</td>
<td>3223.177</td>
<td>10.089</td>
<td>.002</td>
</tr>
<tr>
<td>Within Groups</td>
<td>85615.70</td>
<td>268</td>
<td>319.462</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>89838.87</td>
<td>269</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analyses of Subject District and State 2008 NJASK 3 LAL by Total Students and SES. While the total student population of the subject district performed slightly below the total state commensurate with DFG, the SES students of the subject district performed better than the state SES students of the same DFG. This is represented in Table 7.
Table 7. Comparison of 2008 NJASK 3 State Mean and SES Scores by DFG with Total and District SES Scores

<table>
<thead>
<tr>
<th>District Factor Group</th>
<th>State Total</th>
<th>State SES</th>
<th>Gap</th>
<th>District Total</th>
<th>District SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>206.3</td>
<td>205.6</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>211.3</td>
<td>207.8</td>
<td>3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>214.3</td>
<td>209.4</td>
<td>4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>218.7</td>
<td>211.3</td>
<td>7.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FG</td>
<td>220.5</td>
<td>211.0</td>
<td>9.5</td>
<td>220.85</td>
<td>210.85</td>
</tr>
<tr>
<td>GH</td>
<td>222.4</td>
<td>209.8</td>
<td>12.6</td>
<td>220.85</td>
<td>210.85</td>
</tr>
<tr>
<td>I</td>
<td>225.7</td>
<td>211.7</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>229.2</td>
<td>208.6</td>
<td>20.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparing the mean scores of the subject district to those of the state, the following analyses are pertinent. The difference between the lowest DFG, A, and the highest DFG, J, was almost 30 points. The statewide DFG GH mean, (the DFG of the subject school district) was 16 points higher than that of DFG A. The statewide difference for SES students between DFG A and J was only three points. The difference for SES students between DFG A and GH was more than four points, actually greater than the gap between that of A and J. When comparing the mean scores of the subject district to the means of DFG A and GH for the total and SES populations, the subject district means varied.

*Descriptive statistics.* When comparing the results of the subject district students by SES with non-SES students, the mean of the non-SES group was 11.3 (μ = 222.28) points higher than the mean score of the SES group (μ = 210.85). This is represented in Table 8.
Table 8. Comparison of the Mean Scores of All Students on the 2008 NJASK 3 LAL by SES and Non-SES

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>41</td>
<td>210.85</td>
<td>16.467</td>
<td>2.572</td>
<td>167</td>
<td>238</td>
</tr>
<tr>
<td>Not SES</td>
<td>229</td>
<td>222.28</td>
<td>17.948</td>
<td>1.186</td>
<td>163</td>
<td>257</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>220.55</td>
<td>18.173</td>
<td>1.106</td>
<td>163</td>
<td>257</td>
</tr>
</tbody>
</table>

The mean score of the SES students in Group One was ($\mu = 211$), virtually the same as the mean score of the SES students in Group Two ($\mu = 210.82$), as represented in Tables 9 and 10.

Table 9. Mean Scores of SES and Non-SES students in Group One

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>8</td>
<td>211.00</td>
<td>8.976</td>
<td>3.174</td>
<td>202</td>
<td>230</td>
</tr>
<tr>
<td>Not SES</td>
<td>64</td>
<td>228.19</td>
<td>13.772</td>
<td>1.722</td>
<td>189</td>
<td>250</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>226.28</td>
<td>14.347</td>
<td>1.691</td>
<td>189</td>
<td>250</td>
</tr>
</tbody>
</table>

Table 10. Mean Scores of SES and Non-SES Students in Group Two

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>33</td>
<td>210.82</td>
<td>17.925</td>
<td>3.121</td>
<td>167</td>
<td>238</td>
</tr>
<tr>
<td>Not SES</td>
<td>165</td>
<td>219.99</td>
<td>18.871</td>
<td>1.469</td>
<td>163</td>
<td>257</td>
</tr>
<tr>
<td>Total</td>
<td>198</td>
<td>218.46</td>
<td>18.985</td>
<td>1.349</td>
<td>163</td>
<td>257</td>
</tr>
</tbody>
</table>

Inferential Statistics. A one-way ANOVA was conducted to estimate the influence of the main effect of the LML Process® on the independent variable SES for the third grade students. The dependent variable was also the 2008 NJASK 3 scores.
From these results, the data show that instruction with LML has a significant ($p = .000$) influence on student achievement for students in the subgroup SES as recorded on the NJASK 3 assessment. This is represented in Table 11. The effect size of this difference was .05, or between a small and medium effect.

*Table 11. Statistical Output for Comparison of Group One and Group Two Recorded on the NJASK 3 LAL With the Variable SES*

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4543.202</td>
<td>1</td>
<td>4543.202</td>
<td>14.444</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>84295.67</td>
<td>268</td>
<td>314.536</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88838.87</td>
<td>269</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Analyses of Subject District and State 2008 NJASK 3 by Total Students and Gender.* When comparing the male and female student outcomes for Groups One and Two to the state DFG, the mean scores of the students in Group One signified a male/female gap of 5.38, which was 1.62 points less than the state DFG male/female gap of 7. The Group One gap was 3.18 points less than the 7.57-point male/female gap of Group Two. These results are depicted in Table 12.

*Table 12. Comparison of 2008 NJASK 3 LAL Mean Scores by DFG for the State and District by Gender*

<table>
<thead>
<tr>
<th>Gender</th>
<th>State DFG -</th>
<th>GH</th>
<th>District</th>
<th>Group One</th>
<th>Group Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>225.9</td>
<td>224.42</td>
<td>229.12</td>
<td>222.79</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>218.9</td>
<td>216.85</td>
<td>223.74</td>
<td>214.23</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>7</td>
<td>7.57</td>
<td>5.38</td>
<td>8.56</td>
<td></td>
</tr>
</tbody>
</table>
Comparing the mean scores of the subject district to those of the state and between Groups One and Two, the following analyses are pertinent. The gap between male and female performance on the 2008 NJASK 3 was almost the same between the state DFG and the district total scores, with the state gap being slightly less. Comparing the mean scores between Groups One and Two shows that while the male/female gap of Group Two was substantially more than that of the commensurate state DFG, the male/female gap of Group One was notably less.

Descriptive Statistics. When disaggregating outcome data of Groups One and Two by gender, the mean score for the females in Group One (μ = 229.12) was 6.33 points higher than that of Group Two (μ= 222.79). The mean score for male students in Group One (μ = 223.74) was 9.51 points higher than the scores of Group Two (μ = 214.23). These data are shown in Table 13.

Table 13. Mean Scores of Male and Female Students Comparing Groups One and Two

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>LML</td>
<td>Female</td>
<td>229.12</td>
<td>14.017</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>223.74</td>
<td>14.343</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>226.28</td>
<td>14.347</td>
<td>72</td>
</tr>
<tr>
<td>Non-LML</td>
<td>Female</td>
<td>222.79</td>
<td>17.700</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>214.23</td>
<td>19.330</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>218.46</td>
<td>18.985</td>
<td>198</td>
</tr>
<tr>
<td>Total</td>
<td>Female</td>
<td>224.42</td>
<td>17.006</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>216.85</td>
<td>18.540</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>220.55</td>
<td>18.173</td>
<td>270</td>
</tr>
</tbody>
</table>

In the case of both comparison groups (Group One and Group Two) and in total, the male scores were substantially lower than the female scores, underscoring the need for research to explore programs that address the male/female achievement gap.
Inferential Statistics. A one-way ANOVA was conducted to estimate the influence of the main effect the LML Process® on the independent variable male gender for third grade students. The dependent variable was also the 2008 NJASK 3 scores. From these results, the data show that instruction with LML has a significant (p = .001) influence on male student achievement on the NJASK 3 assessment. This is represented in Table 14. The effect size of this difference was estimated at .04, or between a small and medium effect.

Table 14. Statistical Output for Comparison of Group One and Group Two as recorded on the NJASK 3 with the Variable Gender (Male)

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3864.986</td>
<td>1</td>
<td>3864.986</td>
<td>12.190</td>
<td>.001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>84973.89</td>
<td>268</td>
<td>317.067</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88838.87</td>
<td>269</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analyses of Group One Compared with the Group Two Test Scores for the Local Timed Writing Assessment

To estimate the reliability of the locally constructed writing assessment, a Cronbach Alpha estimate of internal reliability was conducted, including all scores of all four administrations of the assessment. The result of this analysis shows reliability for the local assessment (.837). It is depicted in Table 15.
To establish that the fourth timed writing score was an accurate growth measure for writing during the school year, the first attempt on the timed writing assessment was compared with the fourth attempt. In order to estimate the difference between the scores on the first and fourth attempts on the local writing assessments, a t-test for paired samples was used. The result of that analysis is shown in Table 16.

Table 16. Comparison Between the First and Fourth Local Timed Writing Test Scores

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std Error Mean</th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TW3rd 1st Attempt - TW3rd 4th Attempt</td>
<td>.521</td>
<td>1.601</td>
<td>.100</td>
<td>-5.221</td>
<td>266</td>
<td>.000</td>
</tr>
</tbody>
</table>

From this test, the difference between the first and fourth administration of the local writing assessment was shown to be significant (p = .000). This set up the analysis of writing scores, indicating that the fourth attempt was the best set of scores to demonstrate growth by all third grade students.

Descriptive Statistics. The scoring for the timed writing assessment was valued on a ten-point scale, with ten being the highest score. There was a difference of .52 between the first and fourth attempts for all students regardless of whether they were in Group One or Two (first attempt: $\mu = 7.52$), (fourth attempt: $\mu = 8.04$).
There was also a difference in the mean scores between Groups One and Two in the timed writing assessment for both attempts. In the first attempt, the Group One mean ($\mu = 8.39$) was 1.21 points higher than Group Two ($\mu = 7.18$). In the fourth attempt, the Group One ($\mu = 8.43$) was .54 points higher than the Group Two mean score ($\mu = 7.89$). While Group Two showed more growth (.71) than Group One (.04), Group One scores remained higher.

When disaggregating outcome data by gender and comparing the results of the fourth attempt of the writing sample, the means were also different between Groups One and Two. The mean for Group One females was ($\mu = 8.63$) .45 points higher than Group Two females ($\mu = 8.18$). The mean for Group One males was ($\mu = 8.24$) .66 points higher than the Group Two males ($\mu = 7.58$). These analyses are shown in Tables 17 and 18.

Table 17. Comparison of Groups One and Two Male Timed Writing Mean Scores

<table>
<thead>
<tr>
<th>Group Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>TW3rd 4th Attempt</td>
</tr>
<tr>
<td>LML</td>
</tr>
<tr>
<td>Non-LML</td>
</tr>
</tbody>
</table>

Table 18. Comparison of Groups One and Two Female Timed Writing Mean Scores

<table>
<thead>
<tr>
<th>Group Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>TW3rd 4th Attempt</td>
</tr>
<tr>
<td>LML</td>
</tr>
<tr>
<td>Non-LML</td>
</tr>
</tbody>
</table>

These analyses reinforce evidence of the achievement gap between males and females. In each analysis, NJASK 3 LAL and Local Timed Writing, females scored higher than males.
When disaggregating outcome data by SES and comparing the mean scores of students with low SES and non-SES scores, there is also a difference on the fourth attempt of the writing assessment. The mean score of students who were coded non-SES ($\mu = 8.14$) was .98 points higher than the scores of students who were coded SES ($\mu = 7.46$). This is shown in Table 19.

*Table 19. Comparison of SES and Non-SES Timed Writing Mean Scores*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>35</td>
<td>7.46</td>
<td>1.358</td>
<td>.230</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Not SES</td>
<td>222</td>
<td>8.14</td>
<td>1.401</td>
<td>.094</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>8.04</td>
<td>1.412</td>
<td>.088</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

When comparing the scores of the students who were SES and non-SES in Groups One and Two, the mean scores were higher for Group Two for students with lower SES ($\mu = 7.55$) by .55 points than Group One ($\mu = 7.00$). The small N may have affected these results for SES in Group One (N = 6) as compared with the SES in Group Two (N = 29).

*Inferential Statistics.* A one-way ANOVA was conducted to estimate the influence of the main effect the LML Process® on third grade students in Group One. The dependent variable was the result of the 2008 local timed writing assessment fourth attempt. The significance level was set at $p \leq .05$. From these results, the data show that instruction with LML has a significant ($p = .006$) influence on student achievement as recorded on the local writing assessment. These results are shown in Table 20. The effect size of this difference was also estimated at .03, or between a small and medium effect.
Table 20. Statistical Output for Comparison of Group One and Group Two as recorded on the Local Timed Writing Assessment Results

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TW3rd 4th Attempt</td>
<td>Between Groups</td>
<td>15,039</td>
<td>1</td>
<td>15,039</td>
<td>7.739</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>495,491</td>
<td>255</td>
<td>1.943</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>510,529</td>
<td>256</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A one-way ANOVA was conducted to estimate the influence of the main effect the LML Process® on the independent variable gender for third grade students. The dependent variable was also the 2008 local timed writing assessment. From these results, the data show that instruction with LML has a significant (p = .003) influence on student achievement for students in the subgroup gender as recorded on the local timed writing assessment. These results are shown in Table 21. The effect size of this difference was estimated at .03, or between a small and medium effect.

Table 21. Statistical Output for Comparison of Group One and Group Two as Recorded on the Local Timed Writing Assessment With the Variable Gender

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TW3rd 4th Attempt</td>
<td>Between Groups</td>
<td>17,362</td>
<td>1</td>
<td>17.362</td>
<td>8.977</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>493,167</td>
<td>255</td>
<td>1.934</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>510,529</td>
<td>256</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A one-way ANOVA was conducted to estimate the influence of the main effect the LML Process® on the independent variable SES for third grade students. The dependent variable was also the 2008 local timed writing assessment. From these results, shown in Table 22, instruction with LML has a significant (p = .008) influence on student
achievement for students coded SES as recorded on the local timed writing assessment. The effect size of this difference was estimated at .03, or between a small and medium effect.

*Table 22. Statistical Output for Comparison of Group One and Group Two as recorded on the Local Timed Writing Assessment with the Variable SES*

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>13,898</td>
<td>1</td>
<td>13,898</td>
<td>7.136</td>
<td>.008</td>
</tr>
<tr>
<td>Within Groups</td>
<td>496,632</td>
<td>255</td>
<td>1,948</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>510,529</td>
<td>256</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Visual Analysis of 2009 NJASK 3 LAL Data*

As stated in the opening of this chapter, the 2009 NJASK 3 LAL data were analyzed and reported with a data table for visual comparison because individual scores were not available. In addition, changes in the test and its administration (content of the test, time of school year, and scoring) may have rendered the results meaningless because the 2008 and 2009 results were non-equivalent measures. The N.J. Department of Education recalculated the cut score, changing the percentage of correct answers from 40–45% to 50% in order to obtain the score of 200, to reach the state-established minimum score for proficiency. The proficiency ranges are reported in greater detail in Chapter Three, p. 59.

While there was no statistical test conducted to estimate the significance of the influence of LML on the achievement of third grade students during the 2008–2009 school year, in the school district that was the subject of the study, an “eyeball” test revealed that there was a considerable difference between the NJASK 3 LAL scores of
Group One and Group Two. Group One, depicted in Table 23 as LML, scored with 8.3% higher proficiency than the next highest scoring school in the Advanced Proficient range and 16.6% higher than the lowest performing school in the same range. Group One scored 23% higher than the next highest scoring school in Total Proficiency, and 43% higher than the lowest scoring school. These results are depicted in Table 23.

*Table 23. Comparison of the 2009 NJASK 3 Language Arts Literacy Assessment by School*

<table>
<thead>
<tr>
<th>School</th>
<th>LML</th>
<th>School # 2</th>
<th>School # 3</th>
<th>School # 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Proficient</td>
<td>18%</td>
<td>2.70%</td>
<td>9.70%</td>
<td>1.40%</td>
</tr>
<tr>
<td>Proficient</td>
<td>72.10%</td>
<td>64.30%</td>
<td>50%</td>
<td>45.70%</td>
</tr>
<tr>
<td>Total Proficiency</td>
<td>90%</td>
<td>67.00%</td>
<td>59.70%</td>
<td>47.10%</td>
</tr>
</tbody>
</table>

The results for male and female students were reported using the proficiency scores of Group One and an average of the scores of the three schools in Group Two. The male–female gaps were 1.9% in the Advanced Proficient range (scores of 250–300 points) and 3.8% in the Total Proficient range (scores of 200–300) in Group One. The male–female gap for Group Two was .1% in the Advanced Proficient range and 6.8% in the Total Proficient range. The gap between Group One and Group Two males was 12.4% in the Advanced Proficient range and 31.3% in the Total Proficient range. The gap between Group One and Group Two females was 14.6% in the Advanced Proficient range and 27.9% in the Total Proficient range. In each case, the scores of students in Group One reflected a higher percentage of proficiency than the scores of the students in Group Two. These are depicted in Table 24.
Table 24. Comparison of the Male and Female 2009 NJASK 3 Language Arts Literacy Assessment by Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Advanced Proficient Males</th>
<th>Total Proficient Males</th>
<th>Advanced Proficient Females</th>
<th>Total Proficient Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group One</td>
<td>17.1% n = 6</td>
<td>88.5% n = 35</td>
<td>19.2% n = 5</td>
<td>92.3% n = 24</td>
</tr>
<tr>
<td>Group Two</td>
<td>4.7% n = 5</td>
<td>57.2% n = 121</td>
<td>4.6% n = 5</td>
<td>64.4% n = 82</td>
</tr>
<tr>
<td>Difference</td>
<td>12.4%</td>
<td>31.3%</td>
<td>4.6%</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

The results for SES are reported using total proficiency scores for SES and non-SES for both groups. The scores were not averaged. There was only one SES student in each group who scored in the Advanced Proficient range, affecting the percentages and comparison of the groups. The total of Advanced Proficient SES and non-SES represented the total number of students in both groups who attained scores in the Advanced Proficient range. The difference between Advanced Proficient scores for students in Groups One and Two was 3.8%, with Group One again scoring with higher Proficiency. The comparison between SES students in Groups One and Two in Total Proficiency was notable, with Group One scoring 44.1% higher scores on the proficient range than those in Group Two. These are reported in Table 25 below.

Table 25. Comparison of SES and Not-SES 2009 NJASK 3 Language Arts Literacy Assessment by Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Advanced Proficient SES</th>
<th>Advanced Proficient Not-SES</th>
<th>Total Proficient SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group One</td>
<td>11.1% n = 1</td>
<td>19.2% n = 10</td>
<td>77.8% n = 7</td>
</tr>
<tr>
<td>Group Two</td>
<td>12.5% n = 1</td>
<td>15.4% n = 9</td>
<td>33.7% n = 13</td>
</tr>
<tr>
<td>Difference</td>
<td>(1.4%)</td>
<td>3.8%</td>
<td>44.1%</td>
</tr>
</tbody>
</table>

Summary of Chapter Four and Description of Chapter Five

The researcher analyzed the data reported in Chapter Four in relationship to the research questions stated at the beginning of the chapter. I initiated the analysis with a qualitative measure to establish program fidelity through an interview protocol and
“bracketed responses.” Once the program, or the case of LML, process fidelity was determined, quantitative methods were employed. The researcher then conducted significance testing for the influence of three separate independent variables (LML, gender, and SES) upon student achievement as evidenced by the dependent variables NJASK3 LAL and local timed writing assessment. The researcher also conducted a Cronbach Alpha Estimate of Reliability to establish an estimate of reliability for the local timed writing assessment. In addition, a \( t \)-test for paired samples was conducted to find out whether or not the assumption that the final timed writing assessment would be the best measure to compare the results between Group One and Two was accurate.

Data analysis of the 2008 assessments clearly indicated statistically significant influence for each independent variable when using the metacognitive instructional program (LML Process®). Due to the limitation of no availability of individual students’ scores, the researcher visually analyzed and reported on the results of the 2009 NJASK3 LAL. This analysis depicted higher achievement for students in Group One, the group of students who were instructed with the LML Process®, to a potentially higher degree than the results found in the statistical analysis of the 2008 data.

Chapter Five provides a summary of the findings presented in Chapter Four. It also links the results of this study to the literature review presented in Chapter Two and previous research results. Recommendations for policy, practice, and future research are also included in Chapter Five.
CHAPTER FIVE
Summary of Findings, Conclusions, Discussion, and Recommendations for Policy, Practice, and Future Research

Introduction

“Writing today is not a frill for the few but an essential skill for the many.” (The National Commission on Writing in America’s Schools and Colleges, 2003). Proclamations such as this urge educators to take responsibility to make certain that both sides of the literacy dynamic, reading and writing, are taught in a way that ensures outcomes such as high school graduation, success in college, and productivity in the workforce. Unfortunately, those outcomes and assurances have not been attained by students in general, and specifically for males and those with low income. State, national, and international assessments reveal poor performance and minimal growth, highlighting the persistent achievement gaps often reported in news media and research (NJASK, 2008, NAEP the Nation’s Report Card, Writing, 2007). The gap between male and female writing scores “is comparable to that between Whites and racial/ethnic groups who have suffered systematic social and economic discrimination in this country” (Newkirk, 2002, p. 295). With mandates such as attaining AYP on state assessments to meet the standards of NCLB (2002–2009) and important social imperatives such as high school graduation and job skill preparation, educators are compelled to find answers that address these unacceptable results.

One answer to the problems stated above, is to use an instructional intervention that focuses on learners and teaches them with a set of metacognitive tools that will help them to navigate the expectations for learning tasks. For learners to understand and
deconstruct tasks that are presented, teaching methods must be changed, shifting the focus from teaching to learning. Looking to the learner in new ways, “…students make their own sense of what they are taught. Effective teaching requires teachers to be able to assess what students are taking from instruction and adapt their instruction to meet the differing needs of students” (Boyd-Zaharias & Pate-Bain, 2008, p. 43). Using the metacognitive tools, such as those embedded in the Let Me Learn Process® (LML), offers possibilities for teachers and learners that may improve results for writing achievement.

The researcher’s purpose was to determine the influence of the metacognitive strategy, the Let Me Learn Process®, on writing achievement of elementary school students in one suburban New Jersey school district. The data sources were intentionally triangulated, including results of the state assessment, the local timed writing assessment scores, and interviews with a program expert and the superintendent of the school district to establish program fidelity.

For the purpose of the study, results were assessed qualitatively and quantitatively. Program fidelity was established qualitatively via analysis of the responses to interviews conducted with a program expert and the superintendent of schools. The quantitative analyses used student achievement in writing as shown by two measures, the results of the NJASK 3 LAL (the state assessment for New Jersey administered to all third grade students in the state’s public schools once a year), and the local timed writing assessment administered to all third grade students four times each year. In addition to the two assessment outcomes, two additional factors were taken into consideration: the students’ socioeconomic status and gender. Determining socioeconomic status was
accomplished by the school district, identifying students on the basis of who received free and/or reduced lunch and those who did not receive free and/or reduced lunch. Those groups were then labeled SES and non-SES, respectively. Gender groups were also analyzed and labeled males and females. The outcome measures of the SES and gender groupings were analyzed and compared to each other and, in comparison as part of their inclusion in Groups One (students instructed with LML) and Two (students who were not instructed with LML), yielding four comparative analyses with the subgroups. The findings related to those groups are discussed in the section headings for research questions three and four.


The Let Me Learn Process® is a research-based advanced learning system that began in 1996 with implementation in school systems, chiefly in New Jersey (Johnston, 1996). The LML model promotes a learner-focused process that incorporates explicit instruction of metacognitive tools or strategies. These tools were designed for learners to apply not only for assignments in classrooms each day, but to internalize and be used with each new learning task that individuals encounter throughout their lives. The LML Process® shifts the paradigm from teaching to individual learning, seeking to develop understanding of personal learning patterns and intentional engagement of metacognitive skills, thereby facilitating success. A quote that resonates with educators is, “If a child cannot learn the way we teach, maybe we should teach the way they learn.” (Ball, as cited in Pate-Bain & Boyd-Zaharias, 2008). The LML Process® is one approach to differentiating instruction and teaching students “the way they learn.” This system, embedded within the instructional program begins with teaching; however the result is to
empower learners to take responsibility for their own learning using metacognitive tools they have acquired.

The participant school district began implementing the LML Process® in 2002—2003, when a few teachers became interested and volunteered to learn how to use LML for classroom instruction. From 2003–2004 through the 2008–2009 school year, the program expanded and is now (2009) integrated into almost every classroom in one of four elementary schools in the district. The program implementation process is described in detail in [Appendix C] of the present study.

District goals of implementation. Interviews conducted with a program expert and the superintendent of schools to establish program fidelity revealed the district goals for the program, which included incorporating “brain-based” research methods into instruction and continuously collecting data to support the LML model. There were no specific goals to improve test scores or to address achievement gaps. District administrators and the implementers of the Let Me Learn Process® consistently evaluated its implementation. While no statistical analyses were conducted, visual analyses of student outcomes on the NJASK and local timed writing assessments over the years in which LML had been implemented suggested that the elementary school that implemented LML was achieving better results than the other three. Thus, the superintendent welcomed the opportunity provided in the present research study to analyze statistically the data that had been collected, especially in the fifth year of implementation when the program was likely to show whether or not it was influencing student achievement.
**Limitations and delimitations.** The present study had several limitations in design and methodology. Due to the school district setting, a nonexperimental design was used. Archived data for the population of students were analyzed. Data from two separate groups of students were used (2007–2008 and 2008–2009 third-grade students). A multiyear, longitudinal cohort study was not conducted. External factors that occurred during the time span in which data collection took place, such as teacher behavior and quality, student family situations other than SES, and unforeseen events affecting the culture of the school and/or classroom presented uncontrolled variables that may have contributed to the results. The use of remedial interventions, which tend to be employed more extensively for the elementary school population, especially students with low SES, may also have affected results. Only timed assessments were used. Since writing tends to be a creative endeavor, the results may have been different if untimed assessments were administered. Individual student data for 2009 NJASK 3 results were not available in time for a statistical analysis. Only the scores reported by proficiency percentages at the school level were reported and analyzed.

A delimitation was designed to strengthen generalizibility. The researcher compared nonexperimental data from one school to results in other district schools. Results, because they came from the only four elementary schools in the same district, may be generalizable to other settings and most probably to other district schools. Examination of the data in the fifth year provided outcomes, however it did not provide a longitudinal analysis of the process, demonstrating the progress of implementation or setbacks and dips.
Summary of Findings

The researcher focused on two main research questions and two subsidiary questions. All questions were related to student achievement in writing as a result of the influence of implementing the metacognitive learning system, the Let Me Learn Process®.

The first question was devised to establish fidelity of program implementation. The researcher developed an interview protocol and conducted interviews with a program expert and the school superintendent. As described by both the program expert and the superintendent, the purpose of implementing the LML Process® was not to increase test scores but to promote learner-focused instruction. School district personnel had already been implementing LML for four years with some degree of consistency before the 2007–2008 school year, the first year of data collection. Their stated purpose for continuing the LML Process® within the district was to collect data to support program expansion, aligning with the original goals of implementation. School staff reported success with children who were struggling for both academic and behavioral reasons. Teachers volunteered to participate in the professional development offered through the district. According to the superintendent, teachers were not provided with additional compensation for participation. He expressed pleasure with the number of teachers who had been trained on a voluntary basis, noting that 68 of the district’s 366 teaching staff members (19%) had taken advantage of the training. He was enthusiastic about the expansion of LML into the middle and high schools and concluded, in agreement with the program expert, that teachers found the process beneficial to them as well as their students.
Both participant responses illustrated substantive alignment with the implementation process. Neither participant raised concerns that may have affected fidelity. The analysis clearly demonstrated that the program was implemented with fidelity.

Research Question Two

This question was designed to determine how the implementation of the metacognitive learning strategies found in the LML Process® influenced the writing achievement of the group of third-grade students who were instructed with the process. The LML School was coded as Group One and the other three schools that did not implement LML were coded as Group Two. The NJASK 3 LAL and local timed writing assessment results for both groups were analyzed statistically to determine if any difference between the groups was significant at p ≤ .05. In addition to establishing a statistical significance between the two groups, the researcher estimated an effect size for each result that was statistically significant.

As presented in the literature, students achieve more success when they engage the knowledge about themselves as learners, including their motivational and epistemological beliefs and knowledge about strategies in a feedback loop that analyzes tasks, sets goals, and monitors progress. (Macleod et al., 1995 as cited in Macleod, 1996, p. 4). Citing Pressely et al. (1987), Macleod (1996, p. 4) reported that students’ knowledge about themselves as learners is most effectively achieved through a system of direct, explicit instruction of strategies.

This premise was supported in the research conducted by Hennessey (1999) and Flavell (2000) with findings that demonstrated explicit instruction of metacognitive
strategies as promising methods by which to increase student achievement with students as young as third grade. Findings from quantitative analyses of the present study reinforced evidence reported in the literature. Explicit instruction of metacognitive strategies, in this case with the Let Me Learn Process®, promoted student achievement.

The researcher tested the null hypothesis; there is no difference in the writing achievement of elementary students after being instructed with the metacognitive learning system, the LML Process®, with an analysis of variance (ANOVA) to test the influence of the main effect, LML, on the dependent variables a) NJASK 3 and b) the local timed writing assessment. These two quantitative measures of student achievement were accepted because the former is the measure used throughout the state where the school district is located and the latter is the measure used throughout the district’s four elementary schools and reaching an estimate of reliability of .84 with a Cronbach’s Alpha Estimate of Reliability test.

2008 NJASK 3 LAL. When comparing the 2008 NJASK 3 mean scores of Group One (LML) with the scores of Group Two (non-LML), the Group One mean was substantially higher than that of Group Two. Inferential statistics for the same variable revealed a statistically significant ($p \leq .05$) difference between Group One and Group Two with Group One outscoring Group Two. The effect size was calculated at .04, demonstrating that implementers of LML can expect a small to medium effect or (4%) on test scores for the NJASK 3.

Local Timed Writing Assessment. The local timed writing assessment was analyzed in three stages. First, a reliability test using Cronbach’s Alpha Estimate of reliability was conducted using all scores for four administrations. Results strengthened
subsequent statistical analyses. A $t$-test for paired samples strengthened the assumption that the fourth attempt, which was the final attempt using the same prompt, was the appropriate set of scores to analyze. Descriptive analysis showed that the means of Group One was higher than the mean for Group Two for both the first and the fourth attempts. While Group Two demonstrated growth that narrowed the gap, Group One remained higher, also demonstrating growth between test administrations. An analysis was also conducted using an ANOVA to test the influence of LML on the dependent variable the local timed writing assessment. This result revealed statistical significance ($p \leq .05$) between Group One and Group Two. The calculated effect size for this difference estimated a range of effect that was between small and medium at 3%. Educators can expect a small to medium effect on the writing scores of the local timed writing assessment on student population where the LML Process® is implemented properly.

These analyses were sufficient evidence to not accept the null hypothesis for the independent variable, LML. The metacognitive learning system, the LML Process®, influenced the writing achievement of third grade students positively as student scores were measured on NJASK 3 LAL and local timed writing assessments.

Research Question Three

Analyses for this question determined how implementation of the metacognitive learning strategies found in the LML Process® influenced the writing achievement of the group of third-grade students who were instructed with the process, when SES was the independent variable. The researcher tested the null hypothesis; there is no difference in the writing achievement of elementary students after being instructed with the metacognitive learning system, the LML Process®, when SES was the independent
variable. The 2008 NJASK 3 LAL and local timed writing assessment results for groups (Group One and Group Two) were analyzed statistically to determine whether any difference between the groups was statistically significant ($p \leq .05$) and to examine the influence of LML on students of low SES families.

2008 NJASK 3 LAL Analysis. Descriptive statistics revealed that the mean score of SES students in the district was higher than the state mean for SES students in the same DFG, revealing that the district students performed above the state average for their subgroup. While the mean scores for the SES students of Group One and Group Two were virtually the same, an analysis of inferential statistics (ANOVA) revealed a significant influence for SES students in the LML group with the NJASK 3 as the dependent variable. Again, a small to medium effect size, or 5% on the NJASK 3 scores of SES students, can be expected with implementation of LML. Results demonstrated a clear positive score difference for SES students who were instructed with the LML Process® on the NJASK 3 LAL.

Local Timed Writing Analysis. The timed writing assessment was holistically scored using a scale of 1–10, where ten was the highest score and one was the lowest score. Descriptive analysis, comparing the mean scores of Group One and Two, revealed a difference in the means of the groups, when comparing students coded SES with those who were coded non-SES. The scores of Group Two were higher than those of Group One. The low N (6) for Group One may have affected that result. While the comparison of mean scores reflected a higher mean for the Group Two scores, inferential statistics (one-way ANOVA) revealed a statistical difference between Group One and Group Two, indicating that LML influenced the performance of Group One. A small to medium effect
size, or 3%, for the local timed writing assessment, when correctly implementing the LML Process® with low SES students, was also estimated.

These analyses were sufficient evidence to not accept the null hypothesis for the independent variable LML with students coded SES. Clearly, the metacognitive learning system, the LML Process®, positively influenced the writing achievement of third grade SES students not only for the NJASK 3 LAL, but also for the local timed writing assessment.

Research Question Four

Answers to Question Four determined how implementation of the LML Process® influenced the writing achievement of third-grade students who were instructed with the process, when gender was the independent variable. The researcher was particularly interested in whether LML influenced male writing performance because male performance is generally lower on writing tests than is female performance. This research question tested the null hypothesis; there is no difference in the writing achievement of elementary students after being instructed with the metacognitive learning system, the LML Process® when gender is the independent variable. The NJASK 3 and local timed writing assessment results for both groups (Group One and Group Two) were analyzed statistically to determine if any difference obtained between groups one and two was significant (p ≤ 0.05). This was accomplished via descriptive and inferential statistical analysis between the scores on the 2008 NJASK 3 LAL test and on the local timed writing assessments.

NJASK 3 Analysis. Comparing the mean scores of students in the district to those of the state and between Groups One and Two, provided several important findings. The
gap between male and female scores on the 2008 NJASK 3 LAL was almost the same between the state and district with the state gap being slightly lower. When comparing the groups to the state and to each other, the mean scores of the students in Group One signified a gap that was less than that of state students and substantially less than the mean scores of Group Two. An analysis of inferential statistics (ANOVA) revealed a statistically significant influence for male students in the LML group with the NJASK 3 LAL as the dependent variable. Again, a small to medium effect, (4%) on the NJASK 3 scores of male students, can be expected with correct implementation of LML.

*Local Timed Writing Analysis.* Descriptive analysis revealed a difference in the means of male and female students and in those of Group One and Group Two when comparing the scores of male and female students. The district-wide mean difference between males and females was consistent with what is reported in the literature. Females scored higher than did males. The mean difference or gap between Group One males and females was less than the gap between Group Two males and females, with females scoring higher each time. Group One females scored higher than Group Two females and Group One males scored higher than Group Two males. Again the difference between Groups One and Two was statistically significant ($p \leq .05$), demonstrating that LML influenced the performance of Group One in the desired direction. A small to medium effect, (4%), on the local timed writing assessment can be expected when implementing the LML Process® with male students. These analyses were sufficient evidence not to accept the null hypothesis for the independent variable LML with students coded by gender. Clearly, the metacognitive learning system the LML Process® influenced the
writing achievement of third grade male students as measured by the NJASK 3 LAL and local timed writing assessments.

2009 NJASK 3 LAL Analysis. Findings for the 2009 NJASK 3 assessment were especially noteworthy. Results are depicted in Chapter Four, Tables 23, 24, and 25. The Educational Testing Service constructs the NJASK for the NJDOE. In 2009, the cut scores were recalculated so that students were required to answer at least 50% of the questions correctly to obtain a cut score of 200 or above, resulting in Proficiency or 250 and above to achieve Advanced Proficiency. The percentage of correct answers had been 40–45%. This effectively raised the bar, potentially resulting in lower scores for the state’s third-grade students. School district personnel noted a substantial difference in scores for the 2009 assessment between those of Groups One and Two. The scores for the students in Group One were 23–43 % higher than the scores for the students in the schools that made up Group Two. The percentage of Advanced Proficient scores for Group One was 8–17% higher than the scores for the students in the schools in Group Two. Scores of low SES students and of males showed significant differences ($p \leq .05$) between Groups One and Two were apparent. Group One males outperformed Group Two males by over 12% for the Advanced Proficient range and by 31% for overall Proficiency. Group One SES Proficiency scores were 44% higher than for Group Two. While this did not represent statistical analyses, the visual test was powerful. Students in the school where the LML Process® had been implemented with fidelity over a five-year period showed that those students may not have been as vulnerable to the changes in the state test as were their district peers.
Discussions and Conclusions

The initial purpose for conducting interviews with the program expert and the superintendent was to establish program implementation fidelity. While accomplishing the goal, the interviews also yielded deep insights that actually provoked more internal questions for this researcher that were not posed to the interviewees. The program expert and superintendent were sufficiently aligned to establish program fidelity. However, they showed different perspectives on the process of implementation. Both explained that the original intention for the Let Me Learn Process® was for it to grow and expand into all of the schools. That growth still had not been realized.

The program expert explained the reason for the program name, Let Me Learn. She called it the natural response to the outcry of so many learners, “What is preventing me from learning?” Hence the development of a metacognitive process that was designed to facilitate that universal need for all learners. The superintendent’s perspective was founded in personal involvement with brain-based research and programs. He stated that understanding how the brain works addresses the needs of learner. Let Me Learn expands the premise of brain-based research to a brain-mind connection for the process. This was represented in Figure 1 (p. 18), *How Does Learning Occur?* The researcher wondered, How important is it that implementers of the LML Process® understand the Brain–Mind model depicted in Figure 1? This figure clearly shows that, according to the framework of LML, the input, which enters the brain, is filtered through the patterns and enters the mind. When learners are taught to use processes related to the patterns with intention, input embeds in memory with the strategies that link the patterns to output. If
district administrators had a limited understanding of the process, how may this have explained the lack of growth that contravened the original plan?

The program expert and superintendent both indicated that teacher participation in implementing the process was voluntary. The superintendent strongly believed that the voluntary aspect promoted active “buy-in” on the part of the teachers and facilitated its growth in the LML School. If the initiative was part of the district goals and participation was mandatory, would results have been different?

The existing and planned growth is a reflection of limited data analysis and the personal support of a group of administrators. Financial resources did not appear to present a barrier for the expansion that was originally planned. Related questions this researcher did not ask were: What barriers have prevented expansion? Would statistical analyses and reports such as those presented in this study have hastened program growth? What future barriers may arise that will prevent what is now planned? How important was the support and personal interest of the principal in the LML School? Did a lack of support from the other principals create a barrier for growth?

In the initial phase of implementation, teachers identified their own learning patterns and those of their students. This must have represented a prominent force to be reckoned with. Teachers undoubtedly looked at that information and said, “now what?” The instructional changes brought about by that knowledge would have symbolized a “sea change” for classroom practice. Teacher decisions to implement the changes in practice were likely to have been related to their own metacognitive development (McSweeney, 2005, dissertation). “Taking the temperature” of each cadre as they participated in the LML implementation was the responsibility of the program expert as
consultant, the principal as school education leader, and superintendent as district educational leader. Studying these things could have provided an interesting analysis, if a qualitative action research study of teacher and administrator perceptions during the implementation process were conducted. Such information could have signified enlightenment for other school district personnel who are planning to implement the Let Me Learn Process® and the significant change that this process represents.

The researcher chose to examine the data from 2008 and 2009 test administrations. As described in Chapter Three of the present study, in her re-analysis of Project STAR, Boyd-Zaharias cited that the advantages of program implementation tend to grow with years of schooling and the influence of the same intervention (1999, p. 4). While the same conditions available to the program implementers and the researchers in Project STAR were not available to this school district personnel and researcher, similarities can be found. In the present study, data were analyzed beginning in the fifth year of implementation. Both studies included lower elementary-aged children and both were designed with voluntary inclusion in the intervention groups. In Project STAR, individual schools located in one school district were offered the opportunity to participate. The personnel of one school agreed to participate in the study. In the school district that was the subject of the present study teachers were introduced to the LML Process® and personnel from one school volunteered to implement LML in their classrooms.

The quantitative analyses yielded statistical significance in every category with every set of data. Whether analyzing assessment results for all third grade students or the subgroups SES and gender, the students instructed with LML performed better. And in
every case, at least a small to medium effect size was a clear outcome, giving this superintendent evidence that the program he had believed in, based on anecdotal reports, personal beliefs and visual analysis of data, was working for the district’s students.

Test results from the NJASK 3 LAL for 2009 hold equal or better promise to demonstrate the positive influence of the LML Process® for students in the elementary schools. Those results provided promising evidence that LML makes a positive test score difference for students in general and for students from low SES backgrounds and males, specifically. If the superintendent seeks a rationale to provide the resources for growth he can clearly demonstrate that the program is worthy of resource allocation.

Implications for the Let Me Learn Process® as an intervention to meet the needs of all learners and “let them learn” are certainly positive. Results of both the statistical and visual analyses unmistakably demonstrate that implementation of the advanced learning system the Let Me Learn Process® influences writing achievement for students in general and for males and for students from low SES families, specifically. Considering the achievement gaps noted through the literature and in the assessment results for New Jersey, specifically, the data presented in this research study provide a compelling rationale for educators to consider.

The following salient points for those who would replicate the results occurring in the school district are: Consider the length of time that the process required in order to yield these results. Although positive results may have been found before the year of data collection, the district focused implementation for five years before the reported results were realized. It is important to monitor the progress of implementation, selecting appropriate growth targets and collecting data to analyze and report. Resource allocation,
a typical concern of school administrators and Boards of Education, is best served by collection and analysis of data to support the continuation and expansion of programs designed to improve student achievement.

The program expert indicated that teachers of the school that implemented LML were attracted to it because the initial implementers reported fewer classroom management problems, fewer students required special services and referrals to the Child Study Team for review than before LML. If those are areas of concern, consider the potential for improvement with LML. Identifying students who require and Individualized Educational Program (IEP) and labeling them as “Students with Disabilities” holds moral, social, and financial implications. In many cases, “Students with Disabilities,” or special education, is a life-long label requiring specialized programming and accommodations. Collecting and analyzing data for student referrals and Child Study Team classification in LML classrooms compared to those who are not in LML classrooms is another important area of focus. If implementing LML with fidelity yields a deeper understanding of learning differences for teachers and learners, and may prevent the label of special education in certain cases, it is worthy of consideration?

Teachers reported that they were able to solve difficult problems when implementing LML in their classrooms. Teachers may find answers to quandaries when they implement LML. Student performance that does not meet grade-level standards and

---

3 For the purpose of establishing Adequate Yearly Progress (AYP) among subgroups of students, using the NCLB standards, students who have an IEP and receive Special Education services are labeled “Students with Disabilities.”
does not appear to be a function of cognitive ability may be addressed through implementing the LML Process®.

In the district studies, participation was voluntary. That may have contributed to the results due to the personal investment of developing skill and knowledge to put LML into practice in their classrooms. Implementation of the LML Process® represents a considerable change in classroom practice for many teachers. A voluntary implementation model was given a positive review by the district superintendent. Both he and the program expert indicated that the program grew because the teachers self-reported in annual surveys that positive indicators, such as those mentioned above, were occurring in their classrooms. LML is an organic process and natural growth may have contributed to its success.

Recommendations for Practice, Policy, and Future Research

Based on the findings presented, this researcher imparts the following recommendations, which are valuable to professional colleagues, concerning the implementation of the Let Me Learn Process® in the elementary school. Additionally, implications of and direction for future study follow.

Program Evaluation

Fidelity of program implementation was important to determine in this study to ensure that the program was implemented with fidelity in order to make the claim that LML students had actually received a treatment different from usual practice. Only with such confidence in implementation do the results obtained through quantitative analysis have valid meaning.
District leaders would do well to observe program implementation and have frequent discussions with program experts and consultants to ensure that the intended goals of the program are in alignment with actual practice. “Walk-throughs” at important points in the process are valuable to help school leaders understand how teachers are functioning and making decisions and to observe the effectiveness of the professional development efforts associated with program implementation (Downey et al., 2004). Administrative “walk-throughs” provide an opportunity to observe and hear evidence of the metacognitive processes occurring in classrooms. Students use the common lexicon of metacognition of LML during instruction. Therefore it can be observed and probed by school and district administration as a measure of evaluating the stages of implementation.

The “walk-through” method can assist district administrators with valuable, on-the-spot data collection that an outside researcher is less likely to obtain. Data collection efforts also help the leader with all phases of implementation from the planning to the outcome phases (Kremper & Achilles, 1979, p. 20).

Voluntary Teacher Participation

When providing his perception of the success of the LML Process, the superintendent emphasized his belief that the program grew out of the voluntary nature of participation. The program expert also indicated that teachers became interested in LML because other teachers reported that they were realizing benefits, from classroom management to solving difficult problems in the classroom. The researcher strongly recommends voluntary participation, at least in the initial phases of program implementation for LML.
Administrative Support

The program expert and superintendent both highlighted the importance of administrative support for implementing LML in the school in which it was implemented. Although LML was available for all schools, the principal of the LML School strongly encouraged it and supported it through the provision of substitute coverage for professional development during the school day.

Ongoing and timely analysis

The principal, program expert, and superintendent had collected anecdotal data and visually analyzed test scores throughout LML implementation in the classrooms. This led to the plan for growth in the district. If ongoing analyses had not been conducted, the LML process may not have continued, given the challenges of competing resources in today’s education environments. At the juncture of the fifth year of implementation, a statistical analysis was conducted in order to provide evidence to support the significant growth that the superintendent had included in the strategic plan for the other schools.

Expand Implementation of the Let Me Learn Process®

Given that school administrators in Pre-K–12 education often navigate the problem of developing instructional budgets with limited resources, it is important to use data to evaluate the potential effect of any program. Based on the evidence shown in the present study, LML has a positive influence on the writing performance of elementary school students in general, and for those who are considered to be from low SES families and for males, specifically.
The school superintendent and program expert agreed that LML was not implemented in this district as a test-preparation strategy. They both asserted that while improved test scores are one potential positive result of LML implementation, it was never the goal. Instead, LML was introduced and continuously supported as a broad metacognitive approach to all learning situations. The teachers in the school that implemented LML did so in all subjects in their classrooms. While writing was the only content used for the purpose of the present study, it is appropriate to project that LML, because it is not subject-specific in nature, is a worthwhile intervention for all subject areas. New research conducted to examine results in other subject areas is warranted. The 2009 NJASK 3 analysis supports the statistical evidence of 2008 and shows promise for even more remarkable results. School leaders beyond the boundaries of this district would do well to consider implementing the LML Process® in their schools and districts. The results of the present study indicate that the LML Process® has the potential to influence the futures of students in all post-secondary endeavors, from college to the workplace. Metacognitive learning systems such as LML, given the statistical significance established in the present study, are found to benefit students in this area and should be given serious consideration.

*Other promising initiatives to improve student writing achievement*

There are links to research indicating that there are at least two initiatives that should be considered and may be used in conjunction with the LML Process®. These are small class size and writing workshops.

Small class size is recognized as an intervention with a long-term positive effect on student achievement. The effects of small class sizes last throughout the formal years
of schooling and into adulthood, regardless of socioeconomic class (Schanzenbach, 2006). While this intervention dictates structural changes, no specific professional development was required for teachers, and no new curriculum was used (p. 4). The STAR experiment results have continued to be used to drive policy due to the sustained gains realized from this model. Given the results of the present study, future research linking LML and small class size is also warranted. Teachers implementing the Let Me Learn Process® and students using the metacognitive tools with intention in small classes may prove to hasten and deepen the function of the process. Results such as those found in this study may be achieved more quickly and may sustain for more students and over a longer period.

The writing workshop instructional method has been shown to influence the achievement of middle school male students. The findings of a mixed method study of the writer’s workshop on male student achievement yielded promising results that this intervention related to the elements of choice, one-on-one conferencing, and peer editing that are incorporated in the writing workshop program (Oates-Santos, dissertation, 2008). The Let Me Learn Process® has also demonstrated statistically significant influence for males in writing achievement. These two methods are not mutually exclusive and can be used in conjunction with each other. Important elements of the writing workshop model include students’ writing about individual interests, participation in the writing process, and regular, direct instruction based on individual writing needs (Atwell, 1987; Calkins, 1986; Graves, 1983). These elements coincide with the metacognitive tools associated with LML. These models, interwoven into writing instruction, are worthy of examination for use to improve male writing achievement.
Future Research

The present investigation has initiated questions that the researcher recommends for future research:

1. What is the long-term effect on student achievement for students instructed with the Let Me Learn Process®?

2. Determining the long-term effects of LML is important for educators and researchers concerned with using metacognitive strategies to improve achievement. Future studies may probe whether students instructed with LML would sustain the gains made in writing in future years, once they were instructed in classrooms where LML is not used. What is the effect of LML on student achievement for those students who were instructed with the LML Process® initially and have moved on to classes in which LML is not used? What is the effect on students of low SES families and of male students?

3. Similarly, examining the effects of LML upon student regression over long school breaks, establishing whether the use of the metacognitive strategies associated with LML would promote timely recoupment of the skills they had lost. Questions to pose include: When studying classroom assessment results what is the effect on regression when comparing students instructed with LML and those who were not instructed with LML? Would they experience more, less, or the same amount of regression than their peers? What is the effect on students instructed with LML who sustained regression? Would results indicate that they recoup their losses more, less, or at an equal pace in comparison to their peers not instructed with LML?
4. What is the effect of the use of metacognitive language on the social dynamics in the classroom? What is its effect on the behavior of students? What is the effect on peer relationships?

In the present study, the researcher examined a variety of assessment data for one year with statistical analyses. Complete data for 2009 were not available for analyses. The partial but powerful 2009 data analyzed in this study are the harbinger of additional information that will assist school leaders in their self-study, as well as other school leaders, as they embark on creating goals to address writing achievement. The researcher analyzed data collected from one population of students, all third grade students residing in one district. No effort was made to follow a cohort of students who had been instructed with the LML Process® for more than two years. Future studies following students as they move through more grades may prove beneficial.

Recognizing that the LML Process® incorporates intentional instruction and use of metacognitive skills for students, future studies could include classroom observations to obtain a personal view of LML in action. Prior research into the use of metacognitive teaching strategies indicated that a specific language for metacognitive processes and associated strategies was a missing link that LML includes (Dawkins, 2008; dissertation Dawkins et al., in press). Classroom observations would enable a researcher to make note of that language and examine its influence on instruction. It would also be of interest to school leaders and policy makers concerned with the link between student behavior and school culture to see if there is an influence on the social dynamics of the classroom, facilitating different peer relationships because of the language associated with the metacognitive processes in the LML Process® (Dawkins, 2008).
Summary

The problem of writing achievement lagging behind the mandate of effective writing skills required for success beyond high school exists locally, nationally, and internationally. Likewise, the achievement gap for low-income and male students in writing mirrors the literacy achievement gap that has been omnipresent in the literature. “Policymakers almost universally conclude that persistent achievement gaps must result from wrongly designed school policies—either expectations that are too low, teachers who are insufficiently qualified, curricula that are badly designed, classes that are too large, school climates that are too undisciplined, leadership that is too unfocused, or a combination of these” (Rothstein, 2006, p. 22). Teaching the way students learn and giving them lifelong metacognitive tools to own their learning shows promise. Embedding a metacognitive advanced learning system, such as the LML Process®, into the school instructional program holds important answers for educators.

The challenges of a 21st century education program are as similar as they are different from those of the past. Educators must set the same goals for their students as they did in the past, but must navigate the plentiful programs that promise to help them attain their targets. Those who seek ways to prepare all students, especially those who are in danger of dropping out or not reaching full potential to take their place as productive members of the workforce do well to understand that research results, as reported in the present study, show promise to support them as they set the course to their destinations.

Effective communication, whether spoken or written, is essential to the success of students and adults, as they become productive members of society. The Let Me Learn Process® is a metacognitive learning system that augurs well for educators’ consideration
when planning for present and future success. It is the hope of this researcher that instructing students with LML is given priority as a potentially useful intervention.
References


Retrieved [01/02/08] from http://epaa.asu.edu/epaa/v10n18/.


gbracey@erols.com mailing list, archived at www.intversity.org/lists/arn-l/archives/Nov2003_date/msg00195.html


http://jan.ucc.nau.edu/~mid/edr720/class/methodology/delimitations/reading3-3-1.html


Honeywell, R. J. (1931) The educational work of Thomas Jefferson, "Report of the commissioners appointed to fix the site of the University of Virginia, etc.,"
Appendix J. PP. 248-260, retrieved [03/09/08] from
http://www.openlibrary.org/details/educationalworko012284mbp


Retrieved [03/098/08] from http://www.gse.uci.edu/


http://www.state.nj.us/education/assessment/es/njask_tech_report06.pdf


Schanzenbach, D., (2006), What have researchers learned from Project STAR?. No 0606, Working Papers, Harris School of Public Policy Studies, University of Chicago.


REQUEST FOR APPROVAL OF RESEARCH, DEMONSTRATION OR RELATED ACTIVITIES INVOLVING HUMAN SUBJECTS

All material must be typed.

PROJECT TITLE: The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students

CERTIFICATION STATEMENT:

In making this application, I (we) certify that I (we) have read and understand the University's policies and procedures governing research, development, and related activities involving human subjects. I (we) shall comply with the letter and spirit of those policies. I (we) further acknowledge my (our) obligation to (1) obtain written approval of significant deviations from the originally-approved protocol BEFORE making those deviations, and (2) report immediately all adverse effects of the study on the subjects to the Director of the Institutional Review Board, Seton Hall University, South Orange, NJ 07079.

RESEARCHER(S) OR PROJECT DIRECTOR(S) Nancy B. Ward

April 1, 2009
DATE

**Please print or type out names of all researchers below signature. Use separate sheet of paper, if necessary.**

My signature indicates that I have reviewed the attached materials and consider them to meet IRB standards.

Charles Achilles Ed.D.

RESEARCHER'S ADVISOR OR DEPARTMENTAL SUPERVISOR

**Please print or type out name below signature**

The request for approval submitted by the above researcher(s) was considered by the IRB for Research Involving Human Subjects Research at the meeting.

The application was approved not approved by the Committee. Special conditions were not set by the IRB. (Any special conditions are described on the reverse side.)

M. D. Seton Hall University

DIRECTOR, UNIVERSITY INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECTS RESEARCH

DATE: 6/8/09
Researcher’s Affiliation:
Nancy Ward is a doctoral candidate at Seton Hall University in South Orange, New Jersey. Her professional responsibilities are included in her role as Superintendent of Schools for the Runnemede School District in Runnemede, New Jersey.

Purpose/Duration of the Study:
Her dissertation, The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students, is focused on the implementation of the Let Me Learn Process® in an elementary school setting and its influence on the writing performance of third grade students. For the purpose of the study, student achievement will be evidenced by scores of the New Jersey Assessment of Skill and Knowledge (NJASK 3) and the “Best Attempt Average” of the local writing assessment administered in 2007 and 2008 to all third grade students in the school district that is the subject of the study. A heightened focus on student achievement has led to research aimed at factors influencing their progress.

In addition to the analysis of the assessment data, a program evaluation will be a component of this study. This evaluation is designed to establish whether the Let Me Learn Process® was implemented with fidelity during the school years referenced above. This will serve to validate the results of the data collected.

Description of the Procedures:
The researcher will first arrange for a time to interview a program expert in the Let Me Learn Process® and the superintendent of the school district that is the subject of the study. This will occur at a set place and time and utilizing the attached set of interview questions. Responses will be recorded using a recording device and later transcribed. Privacy will be ensured with no direct reference to the school district, students or the interviewees at any point in analyzing and/or reporting the research findings.

Instruments:
The interview will consist of a set of questions designed by the researcher to establish fidelity of program implementation. These questions have been given to you in the letter of solicitation.

Voluntary Nature of the Project:
Individuals signing the Informed Consent Form agree to participate in the research study. The portion that is addressed by the Form is the interview required to conduct the program evaluation. Participants may discontinue their involvement at any time without penalty, loss or repercussion.
Anonymity:
There is no anonymity in this study. Face to face interviews will be conducted.

Confidentiality of Records:
No names or identifying information will be used in recording, analysis or reporting of any data, including that which is obtained through the interview process. The school district will not be mentioned in discussion or reporting. Quotes or vignettes will not be connected to any identifiable source other than by title.

Subject Data Confidentiality:
The researcher and her committee will have access to the research analysis and findings. No names or identifying information will appear on the interview data. All data, interview recording, discussion notes and records will be recorded and reported anonymously.

Foreseeable Risks or Discomfort:
No risks are involved in this researcher study.

Direct or Potential Benefit:
There are no direct or potential benefits from participating in this study.

Alternative Procedures to Research Study:
The interview will be arranged at a time that is convenient for the interviewee. All efforts will be made to accommodate the interviewee and will be discontinued if such a time cannot be arranged.

Contact Information:
Information can be obtained by contacting the researcher, Nancy Ward, 835 Canvasback Drive, Mullica Hill, N J 08062. (856) 478-2583 (856) 981-5919.

Questions, concerns or requests for related queries can also be directed to the researcher’s academic advisor, Charles M. Achilles, Ed. D. (973) 275-2728 or at the Department of Education, Leadership Management and Policy, Jubilee Hall Seton Hall University, 400 South Orange Avenue, South Orange, NJ 07079.

Additionally, The Institutional Review Board may be contacted at (973) 313-6314 or at the Office of the IRB, Presidents Hall, Seton Hall University, 400 South Orange Avenue, South Orange, NJ 07079.

Acknowledgement of the Informed Consent Form:
I have read the material above and I agree to participate. I am aware that I will be given a copy of the Informed Consent Form for my files.

Name: _______________________________ Date: ________________________

A-1b
Dear (Superintendent Name)

You will recall that you have previously granted permission for me to conduct an analysis of the Third Grade NJASK test administrations for 2007 and 2008 and local writing assessment data in the same years as part of my doctoral study with Seton Hall University, entitled *The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students*. I am writing to request your permission to interview you as part of the study. The purpose of the interview is to ascertain, from your perspective, whether the implementation of the LML Process® achieved the district’s intended goals as part of the Program Evaluation Phase of the research. Program Evaluation is a critical aspect of the study in order to validate the results of the quantitative analysis.

Your name and any identifiers of the district will not be used in the dissertation. The interviews questions and responses will also be maintained confidentially on a separate storage device in my home, where I am producing the dissertation. An interview is also being conducted with Dr. Christine Johnston, the Program Expert in order to ascertain, from her perspective, whether the program was implemented with fidelity. That information will also be stored and reported with strict confidentiality.

Attached are the original letter of solicitation and the consent you provided for your reference. Thank you very much for your cooperation in this matter. I await your written response to this request. Please feel free to contact me with questions for clarification. The interview can be conducted in person or on the phone.

Sincerely,

Researcher name
Researcher contact information

cc: Seton Hall Faculty Advisor
June 15, 2009

Ms. Nancy Ward
835 Canvasback Drive
Mullica Hill, New Jersey 08062

Dear Ms. Ward:

I understand that you are engaged in the dissertation process in the Executive Ed.D. Program with Seton Hall University. You have requested to use archived data including state assessment and local writing assessment results for the purpose of evaluating the performance outcomes of students who were instructed with the Let Me Learn program used by our district for several years. I understand that you will not use any district, staff, or pupil names or identifiers in the analysis of the data.

I welcome your analysis of our implementation of this program and the outcomes. You have permission to access and use the assessment data as indicated above for the purpose of your doctoral dissertation.

Sincerely,

Philip J. Meara
Superintendent

PJM:lcm
Dear (Program Expert Name)

I am seeking your permission and assistance for a doctoral study entitled *The Influence of a Metacognitive Learning System on the Writing Achievement of Elementary School Students*. The purpose of the interview is to ascertain, from your perspective, whether the LML Process® was implemented with fidelity. Your name and any identifiers of the district will not be used in the dissertation. The interview questions and responses will also be maintained confidentially on a separate storage device in my home, where I am producing the dissertation.

An interview is also being conducted with Philip Meara, School Superintendent to ascertain from his perspective, whether implementation of the LML Process® achieved the district’s intended goals. Both of these interviews are being conducted as part of the Program Evaluation Phase of the research. Program Evaluation is a critical aspect of the study in order to validate the results of the quantitative analysis.

The interview questions are attached for your reference. Thank you very much for your cooperation in this matter. I await your written response to this request. Please feel free to contact me with questions for clarification. The interview can be conducted in person or on the phone.

Sincerely,

Researcher Name
Researcher contact information

cc: Seton Hall Faculty Advisor
June 15, 2009

Dear Ms. Ward:

I would be happy to respond to your questions concerning whether I believe the LML Process® was implemented with fidelity among the elementary students whom your study addresses. Please let me know a time when we can meet in person to complete the interview. I am comfortable with you doing a digital or electronic recording on my interview responses.

Christine A. Johnston, Ed.D.
H (856) 358-0542
O (856) 358-0039
johnstcai@comcast.net
This is to certify that

Nancy Ward

has completed the Human Participant Protections Education for Research Teams online course, sponsored by the National Institutes of Health (NIH), on 10/08/2007.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should exist in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants in research.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.
Appendix B

The Let Me Learn Process® (Program) Evaluation - Program Expert
Interview questions used for the purpose of establishing program fidelity:

1. Why is the metacognitive intervention named The Let Me Learn Process®?

2. What were the district goals for implementation of The Let Me Learn Process® in 2007-2008 & 2008-2009?

3. In your opinion, were the district’s intended goals met?

4. What was the process of implementation? Please include:
   - Professional Development
   - Timeline
   - Validation of LML inventory scores by experts (certified in the LML Process®)
   - Use of materials

5. What were the benchmarks of implementation? Please include:
   - Degree of participation in the professional development (number of teachers and grade levels).
   - Adherence to the stated timelines (number of teachers and grade levels)
   - Did variations in the timeline effect implementation?

6. What were the indicators of benchmark attainment?

7. In your opinion, what other factors/impressions effected program implementation? Please discuss:
   - Administrative support (time, financial resources)
• Parent/community involvement to the extent that is necessary for effective program implementation

8. Is the LML Process® still being used in the school district? Why/Why not?
The Let Me Learn Process® (Program) Evaluation – School Superintendent
Interview questions used for the purpose of establishing program fidelity:

1. What were the district goals for the implementing The Let Me Learn Process® in 2007 & 2008?

2. In your opinion, were the district’s intended goals met?

3. What was the process of implementation? Please include:
   • Professional Development
   • Timeline

4. What were the benchmarks of implementation? Please include:
   • Degree of staff participation in the professional development. (number of teachers and grade levels).
   • Adherence to the stated timelines (number of teachers and grade levels).

5. What were the indicators of benchmark attainment?

6. In your opinion, what other factors/impressions effected program implementation? Please discuss:
   • Administrative support (time, financial resources)
   • Parent/community involvement to the extent that is necessary for effective program implementation

7. Has the LML Process® continued to be used in your school district? Why/Why not?
### Interview Protocol and Responses of the Program Expert and Superintendent

<table>
<thead>
<tr>
<th>Question</th>
<th>Program Expert Responses</th>
<th>Superintendent Responses</th>
<th>Common Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals for 2008 &amp; 2009</td>
<td>Data collected from early stages showed a difference</td>
<td>Collect data to support the model</td>
<td>collect data</td>
</tr>
<tr>
<td></td>
<td>Plan for implementation was to follow students as they moved through the grades.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were Goals met?</td>
<td>Yes and No. Yes for school where LML was implemented. No for growth in the district.</td>
<td>Yes. Not in keeping with original plan. There are plans for growth in the district.</td>
<td></td>
</tr>
<tr>
<td>Implementation Process</td>
<td>Voluntary staff participation overview/summer institute/calendar peer coaching, small groups. Timeline in classrooms varied by teacher. Students were observed using strategies.</td>
<td>Voluntary staff participation Summer institutes train the trainer mentoring/&quot;acceleration&quot; program</td>
<td></td>
</tr>
<tr>
<td>Benchmarks of Implementation</td>
<td>Acceleration Process teachers understood that they taught the way they learned and understood the learner/incentive to focus on development</td>
<td>Training grew. 68 were trained by 2008-09.</td>
<td>No common phrases. Positive perception</td>
</tr>
<tr>
<td>Attainment</td>
<td>Students using metacognitive language on LML/developed personal strategies. Child owns it.</td>
<td>Teachers listened to learners and looked at student work. Students took ownership of their own work.</td>
<td>ownership</td>
</tr>
<tr>
<td>Other factors</td>
<td>Parent interest/administrative and financial support</td>
<td>Parent involvement/administrative support/financial resources/time voluntary</td>
<td>Parent administrative financial resources</td>
</tr>
<tr>
<td>Has LML continued?</td>
<td>Yes. Response from parents, positive. Teachers reported fewer classroom problems and resolving a difficult problem because of LML in their classrooms.</td>
<td>Yes. Plans to grow to all schools.</td>
<td>Yes</td>
</tr>
<tr>
<td>Why?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why Not?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Program Expert Credentials

Christine A. Johnston is a retired Associate Professor of Educational Administration at Rowan University in New Jersey. She earned an Ed. D. in administration and supervision from Rutgers University, an MA in urban planning from the University of Wisconsin-Madison and a BA in secondary education from the University of Wisconsin-Eau Claire. Her career has also included internships with the Ford Foundation, the National Science Foundation and a New Jersey Governor’s Teacher’s Grant. During four decades of professional life she has successfully built bridges connecting local, national and international educational agencies. As a researcher and presenter Dr. Johnston is the primary researcher of the Let Me Learn® Process and has authored 3 books dedicated to communication and the development of the student-centered classroom. These are: Empowering the Organization Through Professional Talk (1994), Unlocking the Will to Learn (Corwin Press, 1996), the genesis of the process now known as the Let Me Learn Process® and Let Me Learn (Corwin Press, 1998). Dr. Johnston completed the Human Participants Protection Education for Research Teams online course sponsored by the National Institutes of Health (NIH).
Appendix C

Detailed Description of The Let Me Learn Process®

The teacher initiates The Let Me Learn Process® in the classroom by administering The Learning Connections Inventory (LCI) (Johnston & Dainton, 1997). When a classroom teacher begins to implement LML he/she takes the inventory either with a web-based product or on paper. When the inventory is taken via the Internet product it is validated electronically. When the paper product is used an expert validates it in order to ensure that the results are accurate. The inventory is self-scoring, however validation takes place upon examination of three short answer written responses that confirm the 28 forced choice responses. The forced choice responses are presented in a “Likert-like” five-point scale ranging from “never ever” to “always.” All responses are designed to establish the degree to which individuals use each of the four processes.

Examples of the responses include, “I like coming up with my own ideas instead of doing things like everyone else” and “I like to figure out how to make things by myself”. The short answer responses include items such as, “What frustrates me about doing an assignment is…” Once tallied, the LCI reveals three possible degrees with which the test taker uses each process, Use First, Use as Needed and Avoids. Scores that are in the 25-35 range indicate, Use First, between 18 and 24 are Use as Needed and between 7 and 17 are in the Avoid range (Johnston & Dainton, 1997).

Through the entire implementation of the LML Process® teachers receive professional development in a consulting/coaching model. This consists of whole group instruction, observation, lesson modeling and small group and individual conferencing for reflection and feedback. Once the teacher has determined his/her own learning
processes and has participated in the initial instruction of the LML Process®, direct instruction with the class commences.

The teacher initiates the LML Process® in the classroom by first introducing the continuum of choices required for LCI administration. Once the LCI is administered and scored the students then become aware of their own learning patterns. The teacher creates a class profile so that he/she begins to understand the predominant patterns of the class as individuals and as a whole. This understanding is woven into the lexicon of the instructional program. Instructional support items such as a Word Wall with words that coincide with each pattern is used for task analysis. Additionally, explicit instruction in the metacognitive process invoked by learners as they approach and move through a learning task takes place. Learners are taught the characteristics of a series of seven verbs, which include a process known as the Metacognitive Drill (Johnston, 2009). The phases of the drill are: Mull, Connect, Rehearse, Express, Assess, Reflect and Re-visit. Mull is defined as an activity which takes place over a period of time that is unique to learners, dependent on their patterns, in which consideration of the present learning task leads to understanding its expectations and developing a way to approach it. Connect is the activity in which the learner galvanizes the current learning task to prior experiences, possibly entailing reading, researching and partnering with a peer who can show the learner what and how the task is to be completed. Rehearse is the activity that the learner executes privately preparing him or herself for the accomplishment of the learning task. Express is the activity that moves rehearsal from private to public and opens the learner to public feedback. Assess is the activity that is performed by the learner when he/she examines performance on the learning task and “weighs it” against the expectations of
the task. Reflect is the personal experience when learners specifically ask what they did and did not do to meet the expectations of the learning task. This is the pivotal moment of intentional learning. Revisit is the activity in which the learner comes back to the original learning task or a similar one and applying the learning associated with the assess and reflect phase of the process with a goal of moving down the path of measurable improvement that reflects implementation of the new learning strategies (Johnston, 2009).

Elementary School instruction, assessment and grade-level expectations invoke the use of all four learning patterns. To that end, teachers must facilitate student engagement in all patterns regardless of whether they Use First, Use as Needed or Avoid them. Metacognition plays a critical role in this phase of implementation. Teachers’ understanding their own patterns facilitates the realization that they may operate very differently from many of their students and are likely to instruct with their predominant patterns. When they understand their own and their classes’ patterns the groundwork for intentional and mindful teaching is laid. The learning patterns and behaviors associated with them become transparent through direct instruction of their characteristics and the learner voices, depicted in Table 1. Teachers design lessons with all students in mind and openly demonstrate how the lessons incorporate all patterns. Learner choice is interwoven into the instructional program. As LML implementation continues, teachers guide the learners toward using metacognitive strategies designed to approach assignments that require them to operate within and outside of their learning patterns. These strategies may be assignment and/or subject specific at first, however the goal is to provide learners with the “toolbox” to understand themselves as learners, analyze
expectations, and use metacognitive strategies to meet with success in a variety of learning environments regardless of expectations. In fact, the lexicon of the LML Process® incorporating all of the terms used in this chapter, are woven into the instructional program. The goal of LML is also to transfer these metacognitive understandings and accompanying skills to a multitude of expectations through each learner’s life experiences.

For example, a learner who uses Technical Reasoning first and avoids Precision is less apt to be successful, according to curricular expectations, to produce an assignment that requires extended writing. Given choice the learner with the above referenced pattern would select a writing assignment about something that is relevant and interesting or not write at all. If a choice is not given then the learner’s next step is to “decode” the learning task and plan to forge, intensify or tether the personal learning patterns to temporarily modify them and align with what is required. Forge is related to the Avoid level of a specific pattern calling upon the learner to increase its use, focusing energy on intention and using specific strategies to succeed in the given task. Intensify relates to the learner’s use of the Use as Needed pattern and requires the learner to focus energy on intention and the specific strategies required to be successful in the given task. Tether deals with restraint of the Use First pattern, requiring the learner to consciously limit its use and not allow it to dominate the actions related to successful task completion.

The learner then invokes the metacognitive process, understanding that the given assignment will cause him or her to work outside of the natural processes and frame a writing passage that includes more detail and explanation. The learner would invoke the metacognitive drill, mulling the task, connecting it to prior learning and gathering
additional information, privately rehearsing what he/she will do, express through writing, examine, or assess the work, reflect, consider the amount of detail used and the use of grammar and punctuation and revisit which may include revision and editing. A strategy card, developed during the direct instruction phase of the LML Process®, containing the prompts for writing that a learner with his/her pattern possesses is used to assist in the course of completing the assignment.