The Effects of the *Everyday Mathematics* Curriculum and *Measures of Academic Progress* on Third Grade Students and At-Risk Third Grade Students

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A Special Project

Presented to

Audrian Huff

Heritage University

In Partial Fulfillment

of the Requirement for the Degree of

Masters of Education

Nicki Sams

Spring 2008

FACULTY APPROVAL

The Effects of the *Everyday Mathematics* Curriculum

And Measures of Academic Progress on Third Grade Students and At-Risk Third Grade Students

Approved for the Faculty

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Note: type in enough lines for the number of people that review the project. This should be persons with involvement in the project.

ABSTRACT

A study was conducted to determine if the *Everyday Mathematics* curriculum improved student learning for all third grade students and at-risk third grade students, according to the *Measures of Academic Progress* test in mathematics. Twenty-two students were used for the study. Fall and winter *Measures of Academic Progress* scores were compared to determine statistical significance. After comparing the fall and winter *Measures of Academic Progress* scores, the researcher determined that all third grade student and at-risk third grade students did make greater than expected growth.

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TABLE OF CONTENTS

Page

Page

Page

LIST OF TABLES

Page

CHAPTER 1

Introduction

Background for the Project

The *Measures of Academic Progress* tested students in the areas of mathematics and reading. In the elementary school of the researcher, the third grade teacher used the *Measures of Academic Progress* as a formative assessment. In the school of the researcher, mathematics was an area of concern. The curriculum, *Everyday Mathematics* was adopted in the spring of 2004. "The *Everyday Mathematics* curriculum was based on the belief that children could learn far more mathematics with deeper understanding than had been expected in more traditional programs" (Fuson, Carroll, Druek, 2000, p.2).

The *Everyday Mathematics* curriculum was rich in manipulative usage and student centered activities (Fuson, Carroll, Druek, 2000). The Washington Assessment of Student Learning data from the 2005-2006 school year stated that third grade students from the school of the researcher scored 32.1% on the mathematics portion of the Washington Assessment of Student Learning. In addition, data from the 2006-2007 school year stated third grade students from the school of the researcher scored 43.5% on the mathematics portion of the Washington Assessment of Student Learning (OSPI, 2007). Due to the increase of mathematical scores on the Washington Assessment of Student Learning, the

question was if the *Everyday Mathematics* curriculum was aiding in the improvement of student learning?

Statement of the Problem

In the school of the researcher, the *Everyday Mathematics* curriculum was adopted for kindergarten through the 5th grade. The curriculum adoption took place in the spring of 2004. The researcher was curious if the *Everyday Mathematics* curriculum improved mathematical skills of at risk third grade students and all third grade students. Data was collected from surveys, student homework logs, and scores from the *Measures of Academic Progress* in mathematics.

Purpose of the Project

The special project was developed to analyze the effects of the new mathematics curriculum of *Everyday Mathematics* on the *Measures of Academic Progress* scores for the fall of 2007 and winter of 2008. The purpose was to determine if the *Everyday Mathematics* curriculum improved student learning for all third grade students and at-risk third grade students.

Delimitations

In an elementary school, twenty-four students enrolled in one particular third grade classroom were considered for the study. The classroom consisted of eleven boys and thirteen girls. Of the twenty-four students, eleven students spoke only Spanish in the home while thirteen students spoke only English in the home.

During instruction time, all students spoke in English. Two boy students who left during the 2007-2008 school year longer than twenty consecutive school days were excluded from the study. According to a survey obtained at parent-teacher conferences, nine parents had less than an 8th grade education. Five parents had received a high school education. Three parents had received some college. Finally, five parents had a college degree or master's degree.

The community of the researcher was a small town in Eastern Washington. The rural community consisted of 5,847 people. Within the community, the median income for a family was $31,282. Within the community, 63.76% of the people were Hispanic, 33.6% were Caucasian, and 2.64% were of a different race (Wikipedia, 2007).

Assumptions

Before *Everyday Mathematics* was adopted, *Addison-Wesley Mathematics* was used for seven years in the school of the researcher. Teachers taught *Addison-Wesley Mathematics* with little use of manipulatives and students were expected to memorize formulas to solve problems. Scope and sequence was not a part of the program. When the school district decided to adopt a new program, the *Everyday Mathematics* curriculum was the choice of all teachers. *Everyday Mathematics* was beneficial to all students because the program offered many approaches to problem solving and manipulative usage. The *Everyday Mathematics* program was developed upon a scope and sequence theory (Fuson,

Carroll & Drueck, 2000). *Everyday Mathematics* was also aligned to the National Council of Teachers of Mathematics content strands (Fuson, Carroll & Drueck, 2000). Along with the adoption, teachers were provided with training on how to use the program. However, after the first year of the curriculum adoption, no other training was provided. The researcher taught the third grade for three years, 2005-2008, using the *Everyday Mathematics* as the curriculum of choice.

Since the fall of 2004, teachers in the researcher's school taught *Everyday Mathematics* to all students, kindergarten through fifth grade. To determine if the *Everyday Mathematics* curriculum improved student learning in the classroom of the researcher, the researcher compared the *Measures of Academic Progress* scores from the fall of 2007 to the winter 2008 scores.

Hypothesis

The researcher's third grade students that received *Everyday Mathematics* instruction would make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

The researcher's at-risk, third grade students that received *Everyday Mathematics* instruction would make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

Null Hypothesis

The researcher's third grade students that received *Everyday Mathematics* instruction would not make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

The researcher's at-risk third grade students that received *Everyday Mathematics* instruction would not make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

Significance of the Project

The purpose of the project was to determine the appropriateness of the *Everyday Mathematics* curriculum with all third grade students and specifically at-risk third grade students. Parents were involved with homework on a weekly basis. Homework was sent home in the form of a packet. The student was to complete one sheet of homework each night. Parents were informed of the mathematics vocabulary used for each unit and students reinforced skills by playing games and using manipulatives in class.

Procedure

All twenty-two 3rd graders in the researcher's classroom were given the Measure of Academic Progress test in mathematics. The test was administered in the computer lab by the computer lab teacher. The researcher stayed with the students while students completed the test. Students visited the computer lab once a week prior to taking the *Measure of Academic Progress* test in

Mathematics. The test was not timed. However, seven students stayed longer to complete the test as compared to the rest of the class. Results from the fall, 2007 *Measures of Academic Progress* scores were as follows: five students scored at or above grade level; four students were approaching grade level; twelve students scored 1 grade level below the third grade; and three students scored 2 grade levels below the third grade. A score of 178 was considered one-grade level below the third grade and a score of 166 was considered two-grades below the third grade. For the researcher's study, students that were one or two grades below grade level were considered at-risk students (please see appendices for class *Measures of Academic Progress* scores).

Results from the winter, 2008 *Measures of Academic Progress* scores were as follows: eight students scored at or above grade level; two students were approaching grade level; nine students scored one grade level below the third grade; and three students scored 2 grade levels below the third grade. A score of 183 was considered one-grade level below the third grade and a score of 171 was considered two-grades below the third grade. For the researcher's study, students that were one or two grades below grade level were considered at-risk students.

During the fall 2007 parent-teacher conferences, parents completed a survey pertaining to mathematics homework. The students completed a similar survey after parent-teacher conferences (see appendices, pg 38-41). During the fall conferences, parents were notified of the mathematics homework students would

be receiving. Homework was sent home each Monday in the form of a packet. Each night, parents were to help the child complete the homework of the day. Homework was returned to the teacher the following Monday. Throughout the first semester of school, 65% of all homework was returned to the researcher. Throughout the second semester of school, 43% of all homework was returned.

The school of the researcher implemented an after school mathematics club. Students in attendance were invited to the club based on low mathematic scores according to the *Measures of Academic Progress* or lack of homework completed. Of the 23 students in the class, 5 students attended mathematics club.

Each unit that was taught from the *Everyday Mathematics* curriculum was begun with a pretest. Areas of concern were addressed by the researcher while teaching the unit. After each unit was taught, the same unit test was given to students. Once tests were corrected, the students were able to see areas of growth obtained from the test. During each unit games, journal activities, and manipulatives were used to increase learning of the *Everyday Mathematics* curriculum. Students also worked in partners or individually while completing activities in class.

Definition of Terms

at-risk students. At-risk students were students that performed at one or two grade-levels below the third grade, according to the *Measures of Academic Progress* test.

MAP. *Measure of Academic Progress* was a computerized assessment that allowed students to complete a test at the ability level of the students. Students demonstrated the knowledge of each skill because the computer altered the type of questions until each student was successfully answering questions at the ability level of the students.

manipulative. Manipulatives were tools that were provided to students when completing mathematical tasks. Examples of manipulatives that were used were games, base-10 blocks, graphic organizers, calculators, rulers, and pictures.

reliability. The degree to which a test or quantitative research data consistently measures whatever it measures (L.R. Gay, g. Mills& P.Airasian, p. 601, 2006).

validity. The degree to which qualitative data accurately gauge what the researcher is trying to measure (L.R. Gay, g. Mills& P.Airasian, p. 603, 2006).

Acronyms

EM. *Everyday Mathematics*

MAP. Measures of Academic Progress

NCTM. National Council of Teachers of Mathematics

NWEA. Northwest Education Association

OSPI. Office of Superintendent of Public Instruction

UCSMP. University of Chicago School Mathematics Project

WASL. Washington Assessment of Student Learnin

CHAPTER 2

Review of Selected Literature

Introduction

Mathematic curriculum has changed over the course of many years. In the past, curriculums or the methods teachers used to teach mathematics consisted of learning standard computational algorithms with very little understanding (Brown & Burton, 1978; Van Lehn 1983, 1986 as cited in Isaacs, Carroll & Bell, 2001). Educators discovered that children learned best by doing. According to Vygotsky, (Isaacs, Carroll & Bell, 2001) "Language, tools, and social interactions assisted children in acquiring skills and concepts" (p. 2). Vygotsky later described the learning potential of children as the zone of proximal development. Children experienced the zone of proximal development while problem solving. The children used manipulatives and discussed problem solving, either aloud or on paper (Isaacs, Carroll & Bell, 2001).

Everyday Mathematics Curriculum

The *Everyday Mathematics* curriculum was created by the UCSMP staff in the mid 1980s. The first draft of the curriculum was developed for kindergarten (Isaacs, Carroll & Bell, 2001). "The *EM* curriculum was extensively field tested and information from classroom observations, teacher feedback, and student tests were incorporated into the revisions" (Hedges& Stodolsky as cited in Fuson,

Carroll & Drueck, 2000, p. 3). Overall, the process took over 10 years for the first edition of *Everyday Mathematics* to be published (Isaacs, Carroll & Bell, 2001). The *Everyday Mathematics* curriculum was developed to reflect a spiral approach as well as supporting the ideas of the NCTM standards. As part of the spiral approach, ideas and subjects were intertwined with the curriculum and taught or practiced within a year and across years. The curriculum was developed to support student learning while incorporating manipulatives. Manipulatives used were calculators, rulers, and other mathematical tools. Students frequently worked in small groups or pairs while solving problems. Connections were made while students solved problems. The curriculum also supported teachers in aiding students to solve problems using mental activities, graphic organizers, games, and paper and pencil activities (Fuson, Carroll & Drueck, 2000).

Manipulatives

Manipulatives were hands-on tools students or teachers used to solve problems. Manipulatives were important tools in helping students to think and reason in meaningful ways. Tools that were considered manipulatives were calculators, rulers, coins, counters, base-ten blocks, and any other item used to aid the learning of a student (Stein, Bovalino, 2001). To aid a lesson with manipulatives, teachers incorporated the following steps into the mathematics lesson plans. First, manipulatives used had to correspond or complement the lesson's objectives. Second, manipulatives and the arrangement of the students

had to be prepared in advance, prior to teaching the lesson. Third, students were monitored during the lesson to insure students were actively participating and problem solving, while using the manipulatives. Finally, students were evaluated to ensure student learning took place (Ross & Kurtz, 1993).

NCTM Standards

The NCTM standards were created to help teachers identify topics and skills that students needed to know. Three different standards were created to aid teachers. The curriculum standards, teaching standards, and assessment standards were developed to improve student learning. "Until the NCTM standards, much of the K-8 curriculum focused on arithmetic and mastering arithmetic procedures…" (Burrill, 1997, p. 1). The curriculum standards provided a set of content topics that were important for all students to learn, along with a framework of what the content topics should look like in the classroom. The teaching standards provided methods of how teachers should address the curriculum standards. Methods teachers used to address curriculum standards were hands-on activities, guided practice, and independent practice to all students. The assessment standards provided goals that were attainable after teaching the content and teaching standards (Burrill, 1997).

Measures of Academic Progress or Northwest Evaluation Association

Measures of Academic Progress were state-aligned computerized adaptive tests that accurately reflected the instructional level of each student and measured

growth over time (NWEA, 2007). Schools used MAP tests in mathematics to determine strengths and weaknesses of the students' abilities. When a student took the MAP test, higher performance of the student resulted in difficult questions, while lower performance of the student resulted in less difficult questions (Kingsbury & Hauser, 2004). When the MAP test was administered, schools had the option to use the short test or the long test. The short test consisted of 20 questions and the long test consisted of 52 questions. The long test was suggested because the test provided an accurate picture of the students' knowledge. During the long test, all state standards were tested. The test was administered in the fall, winter, and spring.

Each time a student was tested, longitudinal data was developed. "Longitudinal data represented a set of time-stamped scores across different points in time for an individual student" (NWEA, pg. 1, 2004). Each year a student took the MAP test, the teacher was able to observe previous and current scores of the student. The longitudinal data allowed the teacher to observe areas of growth of the student. The teacher also used the longitudinal data to determine interventions based on the strengths and weaknesses of the student (NWEA, 2004).

To ensure the MAP test was aligned to the state standards, regular state alignment studies were conducted by NWEA to examine the relationship between the state standards and NWEA (Northwest Evaluation Association, 2007). While

conducting the studies, state tests and MAP scores were used. Studies were completed quarterly after obtaining data from spring state scores. Each state that used the MAP for assessing mathematics used the MAP test that was aligned to the state's standards (Northwest Evaluation Association, 2007).

In addition to aligning the state standards to NWEA, the content validity of NWEA was created by mapping existing content standards from a district or state to a test. The test items were selected based on the match of the test items to the content strands. The difficulties of test questions were also considered. According to a validity study in 2001, conducted on the *Stanford Achievement Test* in mathematics for third grade students, the validity was determined to be, .85. A strong concurrent validity was considered to be in the mid .80's (NWEA, 2004). According to the study, the validity of the NWEA test was valid.

According to NWEA (2004), "Reliability was essentially an index, or more precisely, a set of indices of a test's consistency" (p.1). Reliability across forms was referred to as parallel forms reliability. Traditional parallel forms reliability meant two tests were considered equivalent in every way, except that the test items deferred from test to test. NWEA's parallel forms reliability was two tests were similar in content and structure but the level of difficulty of test items were different for each test. Traditional reliability over time was referred to as test-retest reliability. A span of two to three weeks separated the test-retest period. NWEA's test-retest reliability or reliability over time was spread across seven to

twelve months. In addition, the correlation that told the reliability of a test was 1.00; .80 was considered minimally acceptable. According to a *NWEA Norms Study* in 2002, the test-retest reliability of the mathematics portion for third grade was .87 (NWEA, 2004). According to the reliability test, the NWEA test was considered reliable.

Teaching Mathematics to At-Risk Students

Students learned mathematics in many different ways. Some students excelled while listening to the teacher lecture. Other students excelled while working through the problem, step by step. To understand the process of how children learned the following aided the teacher in helping children be successful in the classroom: professional development, high quality curriculum materials, and preplanning of lessons (Smith & Geller, 2004). According to Karen Smith and Carol Geller (2004), "Many children, particularly those with learning disabilities and other processing problems, were not able to meet the standards necessary because teachers either lacked or did not implement effective strategies to foster understanding…"(p.2). Effective procedures and cognitive strategies that would aid in the learning of at-risk students were teacher modeling, self-questioning, guided practice, determining prior knowledge, providing feedback, instruction, hands-on-experience (manipulatives), review, and mediated scaffolding of the lesson (Smith & Geller, 2004). A major part of teaching mathematics to at-risk students was providing manipulatives to work through problems. While

considering the manipulative aspect of the mathematics lesson, Karen Smith and Carol Geller suggested, “using Bruner’s three levels of representation, (i.e. concrete, pictorial, and abstract)” (Smith & Geller, 2004, pg 26). During the concrete level, students used manipulatives to solve a problem. Students talked through the problems while using the manipulatives, either alone or with a partner. The pictorial level allowed students to draw pictures to explain the thinking of the student. While completing a problem at the abstract level, students solved a problem using a graphic organizer (Smith and Geller, 2004).

Summary

Within the past twenty years, mathematic instruction had changed due to the National Council of Teachers of Mathematics standards. Since the NCTM standards, curriculums had been adjusted to meet the needs of students. Teachers were trained to teach students the necessary skills to become proficient mathematicians. Different types of manipulatives were used to help the learning of all students. State tests were also created to monitor the progress of student learning. As a result of the many changes, mathematic instruction and student learning had become a hot topic in the educational setting.

CHAPTER 3

Methodology and Treatment of Data

Introduction

In an elementary school, in Eastern Washington, the researcher wanted to determine if the *Everyday Mathematics* curriculum improved student learning, according to the *Measures of Academic Progress*. In the school of the researcher, the *Everyday Mathematics* curriculum was adopted for kindergarten through the 5th grade. The curriculum adoption took place in the spring of 2004.

Methodology

The study was conducted in a third grade classroom. The project was a quantitative study. The researcher used fall of 2007 and winter of 2008 *Measures of Academic Progress* scores to determine if the *Everyday Mathematics* curriculum improved student learning in mathematics. The researcher also used parent and student surveys to determine the overall perspective of the *Everyday Mathematics* curriculum.

Participants

In an elementary school, twenty-two students enrolled in one particular third grade classroom were considered for the study. The classroom consisted of eleven boys and thirteen girls. Two boys who left during the 2007-2008 school year longer than twenty consecutive school days were excluded from the study. Of the twenty-two students, ten students spoke only Spanish in the home while

twelve students only spoke English in the home. During instructional time, all students spoke English. According to a survey obtained at parent-teacher conferences, nine parents had less than an 8th grade education. Five parents had received a high school education. Three parents had received some college. Finally, five parents had a college degree or master's degree.

The community of the researcher was a small town in Eastern Washington. The rural community consisted of 5,847 people. Within the community, the median income for a family was $31,282. Within the community, 63.76% were Hispanic, 33.6% were Caucasian, and 2.64% were of a different race (Wikipedia, 2007).

Instruments

Fall and winter scores from the *Measures of Academic Progress* were used to determine if regular education and specifically at-risk students that received *Everyday Mathematics* instruction would make greater than expected growth in mathematics. According to a validity study in 2001, conducted on the *Stanford Achievement Test* in mathematics for third grade students, the validity was determined to be .85. In addition, according to a *NWEA Norms Study*, conducted in 2002, the test-retest reliability of the mathematics portion for the third grade was .78 (NWEA, 2004). The class of the researcher was tested once in the fall and once in the winter, using the *Measures of Academic Progress* test. Twenty-two students were tested. After the fall *Measures of Academic Progress* test, five

students out of twenty-two students were tested at grade level. After the winter *Measures of Academic Progress* test, eight students out of twenty-two students were tested at grade level.

Each unit that was taught from the *Everyday Mathematics* curriculum was begun with a pretest. Areas of concern were addressed by the researcher while teaching the unit. During each unit games, journal activities, and manipulatives were used to increase learning of the *Everyday Mathematics* curriculum. After each unit was taught, the same unit test was given to students.

During fall conferences, parents were notified of the mathematics homework students would be receiving. Homework was sent home each night in the form of a packet. Each night, parents were to help the child complete the homework of the day. Homework was returned to the teacher the following Monday.

The school of the researcher implemented an after school mathematics club. Students in attendance were invited to the club based on low mathematic scores according to the *Measures of Academic Progress* or lack of homework completed.

Design

The *Measures of Academic Progress* test in mathematics was given to the researcher's third grade students in the fall of 2007 as a pretest. In the winter of 2008, the MAP test was given to the researcher's third grade students as a posttest. A *t*-test was done to determine if the *Everyday Mathematics* curriculum improved student learning from fall to winter. A survey was given to parents and

students during parent-teacher conferences. The survey was developed to determine the opinions of parents regarding the *Everyday Mathematics* curriculum and homework.

Procedure

All twenty-two 3rd grader students in the researcher's classroom were given the *Measure of Academic Progress* test in mathematics. The test was administered in the computer lab by the computer lab teacher. The researcher stayed with the students while students completed the test. Students visited the computer lab once a week prior to taking the MAP test in Mathematics. The test was not timed. However, seven students stayed longer to complete the test as compared to the rest of the class.

During the fall 2007 parent-teacher conferences, parents completed a survey pertaining to mathematics homework. The students completed a similar survey after parent-teacher conferences (see appendices, pg 38-41). During the fall conferences, parents were informed of the mathematics homework students would receive. Homework was sent home each Monday in the form of a packet. Each night, parents were to help the child complete the homework of the day. Homework was returned to the teacher the following Monday. Throughout the first semester, 65% of all homework was returned to the researcher. Throughout the second semester of the school, 43% of all homework was returned.

The school of the researcher implemented an after school mathematics club.

Students in attendance were invited to the club based on low mathematic scores according to the *Measures of Academic Progress* or lack of homework completed. Of the twenty-two students in the class, 5 students attended mathematics club.

Each unit that was taught from the *Everyday Mathematics* curriculum was begun with a pretest. Areas of concern were addressed by the researcher while teaching the unit. After each unit was taught, the same unit test was given to students. Once tests were corrected, the students were able to see areas of growth obtained from the test. During each unit games, journal activities, and manipulatives were used to increase learning of the *Everyday Mathematics* curriculum. Students also worked in partners or individually while completing activities in class.

Treatment of the Data

Twenty-two students were tested in mathematics, using the *Measures of Academic Progress* test in the fall and winter. The test was administered in the computer lab. The test was not timed and the teacher stayed with the students while students completed the test. A *t*-test was conducted to compare the fall and winter MAP scores. A survey was given to parents and students to observe their opinions about the *Everyday Mathematics* curriculum and homework.

Summary

The researcher taught the *Everyday Mathematics* curriculum for three consecutive years. No additional supplemental materials were used with the

curriculum. Journals, group work, and manipulatives were used on a continual basis throughout each unit. Homework was sent home every Monday as extra practice of skills taught in the classroom.

CHAPTER 4

Analysis of the Data

Introduction

A study was conducted on the researcher's third grade students that received instruction from the *Everyday Mathematics* curriculum. The study was developed to determine if the *Everyday Mathematics* curriculum improved student learning in all students and at-risk students, according to the *Measures of Academic Progress*. Twenty-two students were used in the study. Fall and winter MAP scores were compared to determine statistical significance.

Description of the Environment

In an elementary school, twenty-four students enrolled in one particular third grade classroom were considered for the study. The classroom consisted of eleven boys and thirteen girls. Of the twenty-four students, eleven students spoke only Spanish in the home while thirteen students spoke only English in the home. During instruction time, all students spoke in English. Two boy students who left during the 2007-2008 school year longer than twenty consecutive school days were excluded from the study. According to a survey obtained at parent-teacher conferences, nine parents had less than an 8th grade education. Five parents had received a high school education. Three parents had received some college. Finally, five parents had a college degree or master's degree.

The community of the researcher was a small town in Eastern Washington. The rural community consisted of 5,847 people. Within the community, the median income for a family was $31,282. Within the community, 63.76% of the people were Hispanic, 33.6% were Caucasian, and 2.64% were of a different race (Wikipedia, 2007).

Hypothesis/Research Question

The researcher's third grade students that received *Everyday Mathematics* instruction would make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

The researcher's at-risk third grade students that received *Everyday Mathematics* instruction would make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

Null Hypothesis

The researcher's third grade students that received *Everyday Mathematics* instruction would not make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

The researcher's at-risk third grade students that received *Everyday Mathematics* instruction would not make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

Results of the Study

Table 1.

t-test of Pre and Post MAP Scores for the Researcher's Third Grade Classroom

Test	N	Mean	Standard Deviation
Pre	22	182.41	11.13
Post	22	189.91	10.87
df=21	t=5.19		p<.001

Table 1 compares the pre and post test scores of the researcher's third grade students using the MAP test. The null hypothesis was rejected. Table 1 indicates there was statistical significance between the fall and winter MAP scores. The table shows there was greater than expected growth in mathematical skills for the researcher's third grade classroom.

Table 2.

t-test of Pre and Post MAP Scores for At-risk students in the Researcher's Classroom

Test	N	Mean	Standard Deviation
Pre	12	175.42	6.45
Post	12	181.33	5.91
df=11		t=3.41	p<.01

Table 2 compares the pre and post test scores of at-risk third grade students, using the MAP test. The null hypothesis was rejected. Table 2 indicates that there was statistical significance between the fall and winter MAP scores. The table shows there was greater than expected growth in mathematical skills for the researcher's third grade at-risk students.

Findings

The results indicated that the researcher's third grade students and at-risk third grade students did make statistical progress. The comparison of fall and winter MAP scores showed that eighteen students out of twenty-two students made progress from fall to winter. The results of the winter MAP tests indicated that eight students were at benchmark. In addition, two students were approaching grade level. After comparing the fall and winter MAP test results, seven students improved fall scores by ten or more points. One student in particular made a twenty-four point gain on the winter MAP score. Although some students made as little as a three point gain, the gain was considered improvement. Of the twenty-two students, four students did not make progress. Of the four students, three scores decreased and one score stayed the same (appendices, pg 37).

As a result of the comparison of fall and winter MAP scores, the null hypothesis for all third grade students and at-risk third grade students was rejected. The researcher's third grade students and at-risk third grade students that received *Everyday Mathematics* instruction did make greater than expected growth in mathematics when measured by the *Measure of Academic Progress* in mathematics.

Discussion

The researcher's third grade students and at-risk third grade students made greater than expected growth on the MAP test. Eighteen students out of twenty-

two third grade students made progress. Four third grade students made no progress at all. In the fall, all students were tested using the MAP test. The fall MAP test was used as the pretest. Throughout the course of the year, each unit test was begun with a pretest. Areas of concern were addressed by the researcher while teaching the unit. After each unit was taught, the same unit test was given to students as a posttest. During each unit games, journal activities, and manipulatives were used to increase learning of the *Everyday Mathematics* curriculum. Students also worked in partners or individually while completing activities in class.

During the fall 2007 parent-teacher conferences, parents completed a survey pertaining to mathematics homework. The students completed a similar survey after parent-teacher conferences (see appendices, pg.38-41). After reviewing the parent surveys, the results were as follows: seventy-eight percent of parents understood the mathematics homework; eighty-three percent of parents felt homework was completed on a regular basis by the children; eighty-seven percent of parents were able to help children complete the homework; ninety-six percent of parents felt the homework and the teacher were helpful and valuable; fifty-seven percent of parents understood the mathematics vocabulary; and seventy-eight percent of parents felt the children were successful in mathematics. The results indicated that overall, the parents viewed the homework as helpful and

important. However, many of the parents did not understand the mathematics homework or the vocabulary used in the homework.

Summary

Students from the researcher's third grade classroom participated in a study to determine if the *Everyday Mathematics* curriculum improved student learning for all third grade students and at-risk third grade students. Fall and winter scores were compared to determine statistical significance. After comparing the fall and winter data, the researcher determined that third grade students and at-risk third grade students did make statistical growth. Therefore the null hypothesis were rejected. Nineteen students out of twenty-two students made progress from fall to winter.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

A study was developed by the researcher to determine if the *Everyday Mathematics* curriculum improved student learning for all third grade students and at-risk third grade students. The *Measures of Academic Progress* test in mathematics was used to determine the effectiveness of the *Everyday Mathematics* curriculum.

Summary

The researcher wanted to determine if the *Everyday Mathematics* curriculum improved student learning for all third grade students and at-risk third grade students. According to the research founded by the author of this study, the *Everyday Mathematics* curriculum was based on the belief that children could learn far more mathematics with deeper understanding than had been expected in more traditional programs (Fuson, Carroll, Druek, 2000). Since the program deemed beneficial to students, the researcher decided to monitor the progress of all third grade students and at-risk third grade students, using the *Measures of Academic Progress* test in mathematics. The *Measures of Academic Progress* was state-aligned computerized adaptive tests that accurately reflected the instructional level of each student and measured growth over time (NWEA,

2007). The researcher use the fall MAP scores as the pretest and the winter MAP scores as the posttest.

The researcher's twenty-two third grade students were considered for the study. The classroom consisted of eleven boys and thirteen girls. Two boy students who left during the 2007-2008 school year longer than twenty consecutive school days were excluded from the study. Throughout the year, each unit test was begun with a pretest. Areas of concern were addressed by the researcher while teaching the unit. During each unit games, journal activities, and manipulatives were used to increase learning of the *Everyday Mathematics* curriculum. After each unit was taught, the same unit test was given to students.

Conclusions

Students were given the *Measures of Academic Progress* test in the fall as a Pretest. In the winter, students were given the *Measures of Academic Progress* test as a posttest. Results from table 1 indicated that all third grade students made greater than expected growth in mathematics on the MAP test. Eighteen students out of twenty-two made progress. Four students made no improvement on MAP test. Therefore the null hypothesis for all third grade students was rejected. Results from table 2 indicated twelve at-risk third grade students made greater than expected growth in mathematics on the MAP test. Of the twelve students, nine at-risk third grade students made progress. Three at-risk students made no

improvement on the MAP test. Therefore the null hypothesis for at-risk third grade students was rejected.

Recommendations

The researcher recommended that further testing be conducted on third grade students and at-risk third grade students. An additional study should be conducted with a controlled classroom and a second classroom to determine the effectiveness of the *Everyday Mathematics* curriculum on all third grade students and at-risk third grade students within the grade level. A second recommendation was to conduct a study to determine if students that attended after school mathematics club improved mathematics scores according to the MAP test. In this study, students were not required to attend mathematics club. Only a few students attended at a time and the attendance of the students was inconsistent. There was no correlation whether the mathematics club improved student learning in mathematics. A final recommendation was to conduct a study to determine if homework returned and completed affected student learning according to the MAP test. In this study, homework was monitored on a weekly basis. However, there was no study done to determine if the amount of homework a student returned and completed, aided with the learning process of the student.

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Table 3. *t*- test Pre and Post Test MAP Scores for the Researcher's Third Grade Class

Student	Pre Test Fall MAP Scores	Post Test Winter MAP Scores
A	179	185
B	187	185
C	181	180
D	206	204
E	181	189
F	176	183
G	179	203
H	191	203
I	178	196
J	178	178
K	172	185
L	179	185
M	173	184
N	205	209
O	190	199
P	168	170
Q	178	190
R	196	201
S	192	198
T	193	199
U	166	169
V	165	183
Mean	182.41	189.91
Standard Deviation	11.13	10.87

df= 21 *t= 5.19* *p<.001*

Table 4. *t*-test Pre and Post Test MAP Scores for At-Risk Students in the Researcher's Classroom Grade Class

Student	Pre Test Fall MAP Scores	Post Test Winter MAP Scores
A	179	185
B	187	185
C	181	180
E	181	189
F	176	183
J	178	178
K	172	185
L	179	185
M	173	184
P	168	170
U	166	169
W	165	183
Mean	175.42	181.33
Standard Deviation	6.45	5.91

df=11 *t*=3.41 p<.001

Table 5. Table of Improvement and No Improvement with Points Values for the MAP Test

Student	Improvement	No Improvement	+ Increases or -Decreases of Points on MAP Test
A*	X		+6
B*		X	-2
C*		X	-1
D		X	-2
E*	X		+8
F*	X		+7
G	X		+24
H	X		+12
I	X		+18
J*		X	-0
K*	X		+13
L*	X		+6
M*	X		+11
N	X		+4
O	X		+9
P*	X		+2
Q	X		+12
R	X		+5
S	X		+6
T	X		+6
U*	X		+13
V*	X		+18

*Indicates At-Risk Student

Student Survey

Boy or Girl
Language spoken in the home: English Spanish Other_____

Yes	No	1. I understand the math we are doing.
Yes	No	2. I do my homework regularly.
Yes	No	3. I have help at home to do my homework.
Yes	No	4. My teacher helps me when I need it.
Yes	No	5. My parents understand the math homework.
Yes	No	6. I understand the vocabulary used by the teacher.
Yes	No	7. The math journal helps me understand the lesson.
Yes	No	8. The reference book is useful to me.
Yes	No	9. I enjoy doing hands-on activities during math.
Yes	No	10. I feel ready for each test.

Table 6.

Results of Student's Survey

11 Boys

13 Girls

Language spoken in the home: English 13, Spanish 11

Question	Yes	No	Percentage of Yes Answers
1	23	1	95%
2	19	5	79%
3	19	5	79%
4	22	3	91%
5	18	6	75%
6	22	2	91%
7	23	1	95%
8	22	2	91%
9	22	2	91%
10	18	6	75%

Parent Survey

Please circle one: Male Female

Language spoken in the home: English Spanish Other

Circle the age bracket that applies to you:

20-25 26-30 31-35 36-40 41-45 Other

Circle your highest level of education:

8th Grade High School Some College College Degree Master's Degree

Please complete the survey below. All responses will be viewed by the teacher only.

Yes	Sometimes	No	I understand my child's math homework.
Yes	Sometimes	No	My child does his/her homework regularly.
Yes	Sometimes	No	I can help my child do his/her homework.
Yes	Sometimes	No	I feel the homework is helpful to my child's learning.
Yes	Sometimes	No	I feel the teacher is helpful.
Yes	Sometimes	No	I value the homework sent home.
Yes	Sometimes	No	I understand the vocabulary used in the homework.
Yes	Sometimes	No	I feel my child is successful in math because of the math homework.

Table 7.

Results of Parent Survey

5 Male, 13 Female

Language spoken in the Home	English	Spanish	Both	Other		
	6	12	4	1		
Highest Level of Education	8th grade or lower	High School	Some college	College Degree	Master's Degree	
	10	5	3	2	3	
Age Bracket	20-25	26-30	31-35	36-40	41-45	Other
	1	5	8	4	4	1

Question	Yes	Sometimes	No	% of Yes Responses
1	18	5	0	78%
2	19	2	2	83%
3	20	2	0	87%
4	22	1	0	96%
5	22	1	0	96%
6	22	1	0	96%
7	13	9	1	57%
8	18	5	0	78%

*One survey was never returned.