

A Grant Proposal to Study the Benefits
Computer Based Programs have
on Student Achievement
in the Area of Math

by

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A Grant Proposal Project Report
Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
In
Education

Approved: 2 Semester Credits



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May, 2008

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Title: *A Grant Proposal to Study the Benefits Computer Based Programs Have on Student Achievement in the Area of Math.*

Graduate Degree/Major: MS. Education

Research Adviser: Ruth Nyland Ph.D.

Month/Year: May, 2008

Number of Pages: 38

Style Manual Used: American Psychological Association, 5th edition

ABSTRACT

This grant addressed the need for a computer-based program that will provide individualized instruction for elementary students in the area of math. One technology based math program that provides this type of individualized visual instruction is Accelerated Math. The goal is to establish a technology based math program at the elementary level that will provide students with instruction at their level and pace. It will allow all students, regardless of ability, gender, and race to succeed in math. The grant funding will be used to purchase assistive technology equipment, train teachers, and report data. Achievement data and teacher/students pre and post surveys will be collected and evaluated to determine the success of the program. Results of this program will be disseminated to the grant foundation, area education agencies, and at local and state levels.

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Acknowledgments

I want to thank all my friends and family who have supported me through the completion of this research proposal. I am grateful for my two wonderful children who have inspired me to follow my passion of learning and love of teaching. I want to also thank my parents who have instilled in me the gift of giving and helping others.

I was fortunate to have found wonderful professors and mentors at UW-Stout to share their expertise and help me throughout this master's program. Without Amy Gullixson, I would have had a difficult time being where I am today. She provided me with guidance, reassurance, and confidence in myself. I also feel blessed and privileged to work with and learn from Dr. Carolyn Heitz. She taught me the importance of reading and instilling the importance of reading in children. She has provided me with the tools to change the lives of students and to be successful at it.

Most importantly, I have to thank my wonderful husband who has been my support system that has carried me through this program. Without his guidance, reassurance and support, I would not have been able to complete this research proposal. He believed in me and pushed me when I felt like giving up. His constant encouragement has helped me fulfill my dreams of completing my master's degree at UW-Stout.

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Chapter I: Introduction

How technology, schools, teachers and students can interact to facilitate learning has been a long and perplexing task for professionals in the field of education. "The single best-supported finding in the research literature is that the use of computer assisted instruction as a supplement to traditional, teacher-directed instruction produces achievement effects far superior to those obtained with traditional instruction alone" (Cotton 1991). Educational technology coupled with a concerted effort by teachers in the area of math can provide students with the individualized pace of instruction they need. It can also "keep teachers aware of the performance and progress of every student in their class and enable them to make changes in instruction for students experiencing difficulty" (Ysseldyke, 2007).

The traditional layout of a math class at the elementary, middle, and high school level is one that involves students spending time working on time-consuming paperwork and copying and correcting mistakes. Even with all the time spent doing this there still is inadequate information available to know what math objectives students are meeting. With the lack of knowledge, teachers tend to focus instruction to the middle group. "The result is that at any one time, only about one third of the students are working on math objectives in their zone of proximal development, math objectives which are new and challenging, but not frustrating" (Pilot Schools Report, 2000) . This vicious cycle of teaching math is all too common in classrooms across America and with the diverse population of students in the school system today, it is becoming more and more impossible to teach the middle group and see achievement.

Math is a critical skill that students must master to academically succeed. Math encompasses a wide variety of opportunities in the job field and being competent in math will likely increase the chances of securing a job upon the completion of high school.

According to the Bureau of Labor Statistics, the top three fastest growing occupations from 1996-2006 are in the field of computer science. Computer science is the science of solving problems with the aid of a computer. Failure to obtain these skills increases students' risk for dropping out of school and making employment difficult as an adult. Educational technology will increase students' awareness of computers and take them through a supplemental math curriculum that is focused at their instructional level.

The technology discussed in this proposal has the potential to increase the proficiency of all students, improve success within the general curriculum, accurately assess abilities, provide students with independence in math, improve students' self concept and expand their post secondary opportunities. This educational technology is known as the Accelerated Math Program by Renaissance Learning. Accelerated Math or "AM is a direct corollary of the Accelerated Reader computerized reading management program. Accelerated Reader is the leading reading software produces in the U.S. schools and is currently used in over 53,000 schools nationwide" (Pilot Schools Report, 2000).

The objective of the Accelerated Math program is to provide teachers with a system of information to assure that students can master all math objectives at the local and state level. It also diminishes paperwork, improves motivation, and helps teachers free up time to work with students one on one while supporting all textbooks and instructional methods. This proposal addresses barriers to implementation of this program including high cost of assistive technology, teacher training, and dedication of students and staff to use this program faithfully. "A big push is to get away from instruction being textbook-driven, to needs-driven" (Trotter, 2007). This proposal strives to overcome such barriers to create a math program that is driven by the needs of each student and not the needs of the classroom as a whole.

Statement of the Problem

Title Math programs have been cut in half and providing individualized instruction is becoming more and more difficult. Title Math is given to students that have scored low on state testing and have been referred by a classroom teacher. These students receive extra support in the area of math in a small group setting where they can have immediate feedback and practice on the skills they are learning. With budget constraints affecting this program, individual needs of students in the area of math are not being met accurately. Students are being pushed through the general curriculum with less support. The lack of systematic usable data on individual student performance and progress on meeting the objectives in math are causing a “one size fits all” model in the traditional math setting. With the use of a curriculum-based instructional management system, teachers will be able to support differentiated instruction, monitor student progress and growth, and meet the wide range of learners’ needs in the increasingly diverse classrooms.

Purpose of the Project/Grant Proposal

The purpose of this proposal is to obtain the financial resources necessary to implement an effective math supplement that will increase students’ individual performance in the area of math. With budget cuts to the school district, the resources and money are not available to provide students with instruction at individual levels.

Definitions of Terms

The following terms are of importance for this grant proposal because they define what type of instruction and monitoring should be done so each student can succeed successfully. The terms also define what the state law mandates for all students in school. These terms will help the reader understand the importance and need for a curriculum-based instructional management system in the area of math.

Differentiated instruction:

To differentiate instruction is to recognize students varying background knowledge, readiness, language, preferences in learning, interests, and to react responsively. Differentiated instruction is a process to approach teaching and learning for students of differing abilities in the same class. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting each student where he or she is and assisting in the learning process (Hall, 2002).

Zone of Proximal Development: Vygotsky (1978) maintained the child follows the adult's example and gradually develops the ability to do certain tasks without help or assistance. He called the difference between what a child can do with help and what he or she can do without guidance the "zone of proximal development" (ZPD).

Educational technology: The Association for Educational Communications and Technology published in 1977 (Parts 1-3 of 16) defines educational technology as: *A theory about how problems in human learning are identified and solved. A field involved in applying a complex, integrated process to analyze and solve problems in human learning. A profession made up of an organized effort to implement the theory, intellectual technique, and practical application of educational technology.*

Assistive technology: Part A Sec 602(1) of 1997 IDEA act defines assistive technology as "any piece of equipment or product system... that is used to increase, maintain or improve functional capabilities of individuals."

Response to Intervention (RTI): Is a change in behavior or performance as a function of intervention. The RTI process includes: highly qualified instruction, evidence based

intervention, and universal screening and continuous progress monitoring. (Adapted from Mellard, 2004; NCRLD, 2004).

Progress Monitoring: A systematic process by which student performance data are frequently and repeatedly collected and analyzed. (James & Terrill, 2007).

IDEA: Individuals with Disabilities Education Act is a law that assures that all students will receive a free appropriate public education (FAPE) in the least restrictive environment (LRE) and the guarantee of due process procedures.

Methodology

Chapter two of this proposal will outline current research and literature in the area of math instruction, the need for differentiated instruction in today's diverse classrooms and why a curriculum-based instructional management system would aid in increasing students individual performance in the area of math. This chapter will also address the barriers that have prevented the use of technology in the classroom and how response to intervention and curriculum based measurement is being used to assess the needs of students. Chapter three will discuss the grant project's goal to provide students with a supplemental computer-based math program. Chapter four will discuss the implementation of the grant. This will include a timeline, budget and dissemination plan.

Chapter II: Literature Review

This chapter will discuss findings in the area of math instruction; specifically what the traditional math classroom entails. This chapter will also address the need for a more differentiated approach to teaching and why a curriculum-based instructional management system would aid in increasing students' individual performance in the area of math. This chapter will also outline the importance of properly training teachers in using the technology so gains can be made by students. Finally, this chapter will address the response to intervention process and the role that curriculum based measurement plays in assessing student's needs.

The Traditional Math Classroom

Mathematics is often thought of as an abstract topic that is populated by concepts and symbols. For many students, this lack of visual representation makes it difficult to make connections between math and real life. For most students, math is an endless task of attempting to memorize and then forgetting facts and procedures that make little or no sense. These facts make little sense because students are not being taught how to apply them in the real world setting. "Though the same topics are taught and retaught year after year, the students do not learn them. Numerous scientific studies have shown that traditional methods of teaching mathematics not only are ineffective, but also seriously stunt the growth of students' mathematical reasoning and problem-solving skills" (Battista, 1999).

A common traditional instructional method is that every day is the same. This means that the teacher shows the students example of the concept being taught, the student practices this concept on their own and then homework is assigned. Due to the lack of time spent explaining the usefulness of the process, students are not understanding the importance of math, but instead simply mimicking what they have seen and heard.

Traditional math instruction is similar. Students spend time learning computation skills that can be done with a calculator. “Furthermore, the focus on computation is so myopic that few students develop any understanding of why the computations work or when they should be applied” (Battista, 1999). These traditional methods ignore recommendations by professional organizations as well as research about how children learn. The fact is that the mathematics that is covered in the classrooms today is almost identical to what most adults were taught when they were in school.

The economic costs of the traditional math setting are stunning. “Recent studies of mathematics education, such as the Third International Mathematics and Science Study (TIMSS), show that the United States continues to lag behind other industrial nations” (Varley, 2005). According to the National Research Council, “60% of college mathematics enrollments are in courses ordinarily taught in high school” (Battista, 1999). Yet another study by the National Assessment of Educational Progress “indicate that only about 13% to 16% of 12th graders are proficient in mathematics” (Battista, 1999). Given these statistic, it is no wonder that the United States is lagging in behind other countries across the nation and struggle to stay competitive. What we are doing is not working for all students effectively.

The Diverse Classroom

“Today, students come from increasingly culturally and linguistically diverse backgrounds in which parental expectations and community norms may be at odds with traditional schooling” (Lapkoff, 2007). The diversity in schools today is not a new concept. Our world is full of different people who are all entitled to an education. Under the federal law called Individuals with Disabilities Act, all students regardless of race, gender, ability, or ethnicity are assured a free and appropriate education in the least restrictive environment.

It is very important for children to understand that all people are different and to learn how to work with all types of people, especially in school. Their experiences in school helps create an awareness and knowledge that all are different and all learn differently. These differences should be understood and appreciated. There are two main aspects of diversity that children will most likely encounter in the classroom. One is learners with special needs. Included in this category are children with learning disabilities and physical disabilities. Another part of diversity comes from the many cultures that are a part of the United States.

There is also diversity in the ability that students bring to the classroom. In an independent study conducted at the University of Minnesota (2004), it has been shown that in a “typical” sixth grade class in a large urban school that there is a range of math performance of 9.5 years. Teachers need a tool to help teach students to all learners at their level.

With all the diversity in the classroom how can a teacher effectively teach to all learners? “There are no universal solutions or specific rules for responding to ethnic, gender, and cultural diversity in the classroom” (Davis, 1999). With all the diversity found within an American classroom in this day in age, it is no surprise that teachers are seeking guidance as to how to effectively teach to all learners. “The vocation of education is awash with cries for reformed practices that fall short of the professionalism and ethical responses to serving all students” (Moll, 2002).

Differentiated Instruction

Differentiating instruction is not a new concept in the field of education. Differentiated instruction can be described as a process that ensures “what a student learns, how he/she learns it and how the student demonstrates what he/she learned is a match for that student’s readiness level, interests, and preferred mode of learning”

(Tomlinson, 2004). Given the diversity within a school it is literally impossible to teach a math concept the same way and expect all children to learn. Differentiated instruction ensures that all students whether talented and gifted or learning disabled will learn the same math concepts, but in different ways.

One researched method of teaching that is utilized to improve student's academic success is differentiated instruction. To fully engage in and progress through the general education curriculum, students need to be more than physically present. "They need small group, individualized instruction and modifications to which they are entitled" (Abell, Bauder & Simmons, 2005). Differentiating instruction in the area of math is crucial because math concepts are learned through one taking an abstract topic and constructing meaning into their own lives.

There has been sizable research conducted that demonstrates the positive effects differentiated instruction has on math achievement. In a qualitative study of teachers and students who took part in a 3-week enhanced curriculum unit in math, Tieso (2001) reported that "the students evidenced several positive affective outcomes: level of engagement, motivation, and excitement about learning." These findings are one of many that suggest when students are engaged, motivated and excited about learning they will succeed. That is the effect that differentiating instruction has in the area of math.

According to Lewis & Batts (2005), "when elementary teachers relied largely on undifferentiated instruction approaches to instruction, students had an overall 79% proficiency rate on state-mandated tests at the end of the year. After 5 years of differentiating instruction, 94.8% of their students scored in the proficient range."

According to the No Child Left Behind (NCLB) Act, signed by President Bush in 2002, "States will be held accountable for ensuring that all students can read and do math at grade level by 2014. They will disaggregate test scores, participate in the National

Assessment of Educational Progress (NAEP), and report state and NAEP results to parents on the same report card” (U.S. Department of Education, 2007).

This teaching style would be highly successful in a mathematics classroom because math is a form of reasoning that needs to be presented at a level that can be understood by all types of learners. The form of reasoning mathematical concepts cannot be absorbed from teachers and textbooks and then regurgitated on paper. Mathematical concepts must be personally constructed by the student as they try to make sense of situations and how to apply them in the world. “Indeed, to be able to use mathematics to make sense of the world, students must first make sense of mathematics” (Battista, 1999). To help develop this mathematical thinking in students, classroom instruction needs to focus on guidance and support of their personal constructions. This type of differentiated instruction encourages students to invent, explore, test and refine their own ideas rather than blindly follow mathematical procedures that have been handed to them by another person.

The data presented does support an increased performance students have with differentiating instruction, yet it is still not widely practiced. Although teachers believe in having all children succeed, the excessive workload, responsibilities, budget cuts to support programs, demands for substantial content coverage, and negative classroom behavior make the challenge seem impossible.

Zone of Proximal Development

Society over the past twenty years has changed dramatically. As a result, “schools face new challenges, such as avoiding exclusion by promoting inclusion” (Cesar & Santos, 2006). In order for teachers to find success within their classroom and include all types of learners, learning should be seen as a communicative process. “This idea builds upon the ideas of Vygotsky, who stressed the importance of social interactions in the

development in order to promote children's development" (Cesar & Santos, 2006).

Vygotsky 1978 said that the zone of proximal development "is the distance between the actual development level as determined by the independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers."

The starting point for instruction is the learner's current knowledge and skills or the ZCD, zone of current development. Within this zone it is assumed that the learner brings experience and existing knowledge to the learning situation that can be applied to solve problems. From the ZCD, students progress to the Zone of Proximal Development, ZPD. Within this zone, students need to be exposed to authentic real life activities in order for the maximum amount of learning to take place. These authentic activities guided by the teacher can be seen as scaffolding the learner. Scaffolding is "initial support for a student through the ZPD with the gradual dismantling of the support structure as students progress towards independence" (Harland, 2003). Whatever the strategy the teacher uses, the student will be able to create a relationship between what they already know, what they can do, and what is to be learned. The result of solving these new problems is the formation of new knowledge. In a diverse classroom this presents a problem because not all students are at the same starting point for instruction, therefore not all students can be in the zone of proximal development where ideal learning takes place.

Response to Intervention

Response to intervention or RTI is a process that is comprised of three main components. The first is that evidenced based instructional practices are being used to assess student learning. Secondly, a universal system of screening and progress monitoring is being used to assess student's ability in the content area. The third main

component is that there is a decision making system to determine who needs what interventions.

The RtI process allows general education and special education teachers to work together as problem solvers and to use data collected to make appropriate instructional decisions for students. “Assessment and intervention occur within increasingly intensive tiers designed to establish whether a student’s academic difficulties can be attributed to insufficient learning opportunities or to an underlying disability (Fuchs & Fuchs, 2006). These three tiers intensify services when a student fails to respond to an intervention. The first of the three tiers provides instruction for all students through the core curriculum. “80-90% of students in the general education curriculum are in this tier” (Fuchs & Fuchs, 2006). Tier two targets a smaller group of 5-10% of the school population. In this tier, students who have not met benchmarks are provided with supplemental instruction and support. Their progress is monitored on a more frequent basis and data is collect to develop an intervention plan. The third tier, “individually designed interventions are provided for students who have a high likelihood of developing a lasting pattern of academic failure or high levels or social or emotional distress” (Fuchs & Fuchs, 2006). The students receiving this intense individual instruction is between 1-5% of the population and data is collected more frequently to measure the student’s progress.

There are several goals that the RtI process aims to meet. First the process hopes to enhance the success of all students, especially those at risk for failure and referral for special education. It creates a climate of shared responsibility for all learners and promotes collaborative problem solving in schools. The process also sets out to identify, implement, and evaluate evidence based preventions and intervention programs at the student, classroom and system level.

Curriculum-Based Measurement (CBM)

Curriculum based measurement is a tool used for screening and monitoring a student's achievement in academic areas. CBMs are research based and are an ideal tool for screening and monitoring within the RTI framework. This type of measurement can sample a broad range of skills related to any given academic area. "Researchers have demonstrated criterion validity of CBM with widely used standardized assessments and state standard tests" (Deno, 1985). The measurements are designed to be administered repeatedly and progress is monitored multiple times throughout the school year. Teachers use student data to quantify short-term goals and long-term goals that will meet end of the year goals. The results from this data can also be used for instructional decision-making. "Research has also demonstrated that when teacher use CBM for instructional decision making: students learn more, teacher decision making improves, and students are more aware of their performance" (Fuchs & Fuchs, 2006).

In order to accomplish that goal, the teacher first identifies what curriculum material he or she expects a student to master over the school year. Second, the teacher uses the identified material, from the end of the year, and develops or selects CBM tests, often referred to as probes. Third, the teacher tests the student one to two times a week using the CBM probes. Fourth, the teacher records the student's score on a graph and uses this information to make instructional decisions. CBM's are used to create a database for each student.

Today, teachers face the challenge of managing a daunting number of instructional and non-instructional responsibilities with regard to academic assessment. Teachers must balance their time and schedule between collecting data on students and providing meaningful instruction on academic and behavior skills. CBM is one example of how collecting data on students can be used to improve student outcomes on academic

skills. However, in order for educators to consistently collect data, it must be efficient and simple to collect; but above all else, it should provide formative information that can be used to guide instruction and improve student performance. This is why tools like CBM that allow educators to monitor student progress and make curriculum adjustments accordingly are important. Moreover, with the increased focus on accountability and monitoring progress toward meeting goals and objectives, CBM appears to be a logical choice to accomplish these requirements.

Curriculum-Based Instructional Management System

Currently in schools across America, there is a “lack of systematic, usable data on individual student performance and progress at the classroom level” (Ysseldyke & Bolt, 2007). One way to work on obtaining this information is through the use of an instructional management system. One tool offered by an instructional management system is the ability to monitor student response to instruction or response to instructional intervention.

This type of system will allow teachers to be more aware of the performance of each student and enable them to make instructional changes for students having difficulties. An instructional management system “provides a possible solution for managing the complex set of tasks faced by educators today that are nearly impossible to do without the assistance of technology” (Ysseldyke & Bolt, 2007). Information obtained from such management systems will help drive instruction, individualize instruction and group students for instruction to differentiate learning styles and abilities.

Accelerated Math is an example of an instructional management system. It is a task-level learning information system that provides teachers with the information needed to assure that students are mastering the math objectives and state standards from third grade to calculus. Accelerated math provides teacher with the same data that would be

collected through administering CBM's, but eliminates teacher paperwork. This allows teachers more time to focus on the data and help students individually construct those mathematical skills that are emerging.

Evolving Software

“If there's one great thing about technology, it is the capacity for tailoring individual student learning in such a manner as to make precisely relevant” (Rivero, (2006). Math software that was first introduced tended to be electronic worksheets. Today's math software, while still focusing on basic developmental math facts also includes interactive tutorials for students. Help and reinforcement modes are also available when the child begins to experience failure. To take the evolution from drill and practice further, current software also features, “a cognitive approach to building math skills through modeling, providing an initial framework, and then fading as students succeed” (MacDonald & Caverly, 1999).

Student directed learning through math software will help develop a mathematical literacy that goes beyond computation. “Interactive, dynamic and multimedia-rich experiences offer a whole new perspective for students and teachers” (Rivero, 2006). With the use of evolving software teachers will be able to provide differentiated individualized instruction and students will be able to learn within their zone of proximal development. The Accelerated Math program has set out to meet the challenge of providing sufficient data to teacher, allow individual instruction for all students, eliminate unnecessary paperwork, and support benchmarks and standards that students need to master. As a result of almost five years of effort, Accelerated math produced a computerized math management program that met these goals.

The software was first piloted in September of 1997 in nine different locations including Washington, Wisconsin, Texas, Ohio and Virginia. The grade levels ranged

from elementary to twelfth grade. The schools were provided with one day of training and all the software, computers and support they needed. Some schools adapted the program as the primary source of management for math, while others used the program as a supplement to traditional teaching in the classroom. The results after one year were in the Virginia classroom was an average gain of 39 percentile for the 4-th graders, with 4th and 5th graders finishing at the +90th percentile. “These are some of the highest gains and highest ending percentile scores we have ever seen in either math or reading. Based on STAR Math grade-equivalent norms, the gains approximate to an average of two years growth in one year” (Pilot Schools Report, 2000).

Software is truly evolving and Accelerated math is at the front of the pack. Elements that this program entails are: algorithm problem generator for creating unlimited number of unique individual problems, computer rubric scoring, objective tracking, multiple libraries or problems to support all curriculums and all textbooks, and immediate student and class diagnostic reports

Proper Teacher Training

“Limited support, scant resources, and inadequate professional development further hinder efforts to serve the needs of their students” (Rock & Gregg & Ellis & Gable, 2008). There are numerous questions and concerns when it comes to using technology in the classroom to supplement curriculum. The answer to these questions lies within each educator that is teaching these concepts daily. Hanzek-Brill (1997), studied elementary teachers’ beliefs about teaching mathematics with technology and located three common beliefs. Teachers with exploratory beliefs believe technology should be used to introduce and explore math concepts and procedures. Teachers with post-mastery beliefs believe that technology should only be utilized after a math concept has been learned. The third belief came from the pre-mastery concept which found their thoughts

on technology somewhere between exploratory and post-mastery. All teachers have beliefs that for the most part cannot be change. These beliefs are what make each teacher and their teaching style so unique.

Despite varying beliefs on technology, teachers need to be properly trained to use technology to reap the positive effects it has on student learning in the area of math.

“Teachers need to become more involved in the changes by participating in programs, workshops, classes, online discussions that will strengthen their knowledge and resolve to instill in their students a passion for learning and a love for mathematics” (Varley, 2005).

Chapter III: Project Goals and Objectives

This chapter will discuss the grant project's goal to provide student's with a supplemental computer-based math program. Since Title Math programs have been cut in half; providing individualized instruction is becoming more and more difficult. Lack of systematic usable data on individual student performance and progress on meeting the objectives in math are causing a "one size fits all" model in the traditional math setting.

Goal 1: Develop a more individualized approach to learning math by incorporating technology based instruction with Accelerated Math.

Accelerated Math is motivating and effective for the average, gifted, and remedial student and individualizes assignments at each student's level. Math instruction will be taken to a whole new level. According to a study completed in three urban schools in Minnesota, "implementing an instructional management system, such as accelerated math does improve student math achievement and the classroom instructional environment" (Renaissance Learning 2007).

Teachers will be able to enhance daily instruction and use accelerated math to monitor the development of math skills students obtain. Students will be able to interact daily and use the skills they have been taught in a new and challenging setting. The program can be used to reinforce skills, challenge talented students, apply new skills taught, or remediate specific skills that students may have forgotten. In order to ensure that students are using the accelerated math correctly, teachers will be trained before the school year and throughout the school year. During these training opportunities, teachers will become fluent in using the program and how to assess student achievement in the core math curriculum and the AM program.

Goal 2: Evaluate students learning and success with the core math curriculum and the Accelerated Math program.

Evaluating student success with the Accelerated Math is very important in ensuring that the program is being utilized correctly and that students are benefiting from it. This project aims to collect data in several different ways. First, all students will be given an initial placement test the first day using the program. These initial individualized scores will be analyzed and compared with end of the year scores. Classroom evaluations will be completed by the project coordinator three times a year to ensure teachers are allowing students the allotted time needed and that students are making progress through the program. Teachers will also be given a survey twice a year to determine the effects Accelerated Math has on helping students improve math scores.

Goal 3: Data will be analyzed to determine the effectiveness of the Accelerated Math Program.

Teachers are rarely given the opportunity to sit down and analyze student assessments as a whole. One outcome of the grant proposal is that teachers will be given time to collaboratively analyze the data and the success of the program. This will take place three times throughout the school year to ensure the students taking part in this supplemental math program are seeing success in math. Student and teacher surveys will also be analyzed by the project coordinator to ensure that everyone is feeling and having success with the program.

Completion of these goals will improve the success of implementing a technology based supplemental math program for students at the elementary level. The following

chapter will address the methodology and implementation of this project including a timeline, budget, evaluation plan and dissemination plan.

Chapter IV: Project Methodology

With the use of a curriculum-based instructional management system such as Accelerated Math, teachers will be able to support differentiated instruction and meet the wide range of learners' needs in the increasingly diverse classrooms. This chapter will outline the implementation for this project upon receiving the grant. The timeline, budget, and dissemination plan will be discussed in detail.

Timeline

The evaluation of the goals and objectives will take place as noted in Table 1 below. This table lists month by month activities that will take place over the course of one academic school year. There are year round activities such as teacher documentation of the time students spend on the Accelerated Math program and students engaging in the Accelerated Math program weekly.

Table 1: Timeline

Month	Activity	Goal	People Involved	Expected Outcomes
August	Set-up AR equipment in the technology lab	#1	Technology Department, Project Coordinator, Renaissance Learning representative	Creation of an Accelerated Lab to use with students in second through fourth grade.
September	3 day workshop/training for teachers	#3	Elementary classroom teachers, school administrators, technology department, Renaissance Learning representative	Increased teacher knowledge of how to properly use the software and how to analyze results from the software.
October	Initial placement test for all students	#2	Elementary students grade second through fourth	Knowledge of each student's ability in math.
November	Teacher In-service	#3	Elementary classroom teachers, project coordinators, administration	Student test scores will be analyzed to obtain an understanding of where each child's current

				level of academic performance is.
December	Student and Teacher survey	#1	Elementary students in grades second through fourth, elementary teachers	Data collected on student and teacher feelings about using the accelerated math program.
January	Teacher In-service	#3	Elementary classroom teachers, project coordinators, administration	Increase teacher knowledge of using the program.
February	Classroom test scores analyzed	#3	Project coordinator, administration	Data collected from each classroom on the time used and student progress.
March	Teacher In-service	#3	Elementary classroom teachers, project coordinators, administration	Increase teacher knowledge of using the program and analyzing the past months data collected thus far.
April	Student and Teacher survey	#1	Elementary students in grades second through fourth, elementary teachers,	Data collected on student and teacher feelings about using the accelerated math program.
May	Evaluate test scores and other data collected	#2	Elementary teachers, administration, Renaissance Learning Representative, project coordinator	Analyze student achievement with the accelerated math program.
June	Teacher in-service for project evaluation	#3	Elementary teachers, administration, Renaissance Learning Representative	Increased student achievement in math. Satisfactory and positive attitudes among teachers and students with the program.

Evaluation Plan and Tools

Table 2 outlines the project's strategy for evaluating the success of the Accelerated Math program. Evaluation procedures will include student and teacher surveys, pre and post assessment of students' current academic performance in the area of math, and teacher in-service time to assess data collected from the program.

Table 2: Evaluation Plan

Goals	Assessment Tool	Timeline	People Involved
Creating individualized instruction with the AR Math Program	Student Survey Teacher Survey	December, April	Teachers Students Project Coordinator
Collection of Data	Initial placement tests, classroom AM reports, end of the year AM reports.	November, February, May	Project Coordinator, Technology Department, Administration
Analyzing Data	Teacher In-services	September, June	Teachers, Administration, Renaissance Learning Representative Project Coordinator

Instrumentation

The surveys used to evaluate a portion of the project will be developed by the project coordinator. Table 2 indicates when these surveys will be given. All teachers will be given the same survey to complete. Each grade will receive a slightly different survey to adjust to the reading level of second, third, and fourth grade students. The surveys used will contain questions in regard to their thoughts and attitudes about the use of technology, specifically in the area of math.

This project will also look at student achievement data collected by each classroom teacher. This data includes, but is not limited to report cards, standardized tests, unit tests, and accelerated math reports. This data will indicate student achievement

throughout the year. The project will also compare existing data from the prior year to data collected after the use of the accelerated math program for one full academic year.

Subject selection and description

All students in grades second through fourth would take part in the accelerated math program. This age group was selected because of the cut in funds for these students to receive Title I math time, where individualized instruction would help remediate skills already taught. Students of all academic levels will be taking part in the program. Parents will be informed of this program through letters from the project coordinator at the beginning of the school year.

Dissemination Plan

Table 3 outlines the project's plan for disseminating information to the school, district, grant foundation and other local educational agencies. These reports will discuss in detail the methodology and results of the AM program.

Table 3: Dissemination Plan

What	When	To Whom	Responsible Party
Initial Report	November, February, May	School District Newsletter	Project Coordinator Administration
In-Progress Report	January	School website Spencer Foundation	Project Coordinator
In-Progress Report	October, June	Local Newspaper	Project Coordinator
Final Report	June	Spencer Foundation, Area Education Meeting	Project Coordinator

Budget

Table 4 outlines the financial resources needed for this project to succeed. The majority of this budget will be used for the purchase of software needed for the Accelerated Math program. The following section will explain the budget in greater detail. Once implemented, the Accelerated Math program will help teachers target instruction to all learners and help them succeed. No additional funds will be needed to complete this project.

Table 4: Budget

Description	Budget Request
Accelerated Math Service subscription for 225 students	\$168.75
Accelerate Math one-time service fee	\$1,995.00
STAR Math service subscription one-time school fee	\$1,499.00
Annual all product hosting fee	\$399.00
Accelerated Math Wisconsin grade 2 library	\$1,229.00
Accelerated Math Wisconsin grade 3 library	\$1,229.00
Accelerated Math Wisconsin grade 4 library	\$1,229.00
Seven 1100 USB Accelerated Scanner Kits	\$2,793.00
Five Accelerated Math 2.02 Scan card pack of 1000	\$225.00
Customer Seminar Fees	\$2150.00
Six Math Professional Development days	\$894.00
Shipping and Processing	\$138.30
Quote Subtotal	\$1,4020.75
Shipping and Processing	\$138.30
<i>Grand Total</i>	<i>\$14,159.05</i>

Budget Narrative

For materials and supplies, an amount of \$3,687 is requested for the Accelerated Math Wisconsin grade library for second, third and fourth grade. This includes the lessons necessary for the Accelerated Math program to be successful at each grade level. \$3,018.00 will be used to purchase the 1100 USB accelerated scanner kits and scan card packs. These kits will be in each classroom and the library, where classroom teachers can scan student results for immediate feedback on their work.

For consultant and contract fees, an amount of \$168.75 is requested to subscribe all 225 students in the accelerated math program. This is important because without individual subscriptions not all students would be able to reap the full benefits of this program. An additional \$3,494.00 will provide the cost of the one time service fees and subscription fee necessary for the program to be installed correctly by professionals. \$399.00 is for the all product hosting fee. This fee provides support to the teaching staff for trouble-shooting and immediate help with the program.

For professional fees, an amount of \$3,288.30 is requested to supply the professional teaching staff with the best training needed to implement the computer-based program effectively and efficiently. Six in-service days with training by a representative are included.

The total amount for this project is \$14,159.05. Once implemented, the Accelerated Math program will help teachers target instruction to all learners and help them succeed. No additional funds will be needed to complete this project.

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Appendix A: Cover Letter

Spencer Foundation
625 N. Michigan Avenue
Suite 1600
Chicago, IL 60611

Dear Ms. Lauren Jones Young,

The issue of integrating technology into education is important because the standards of today challenge teachers across the nation to produce computer literate students. Findings have revealed that when appropriately used, computers may serve to improve student mathematics achievement as well as enhance the overall learning environment of the school. As a teacher I have observed that the integration of technology into math is limited.

With your support we will be able to provide students with an Accelerated Math program that has been scientifically proven to raise test scores and help teachers target instruction to all learners. The purchasing of the Accelerated Math program is quoted at \$14, 159.05 for students in our lower elementary. One anticipated outcome of this program is that students in the general math curriculum, special education, and English learners will be able to succeed with individualized instruction through the integration of technology in math.

We look forward to hearing from you. If you have any questions regarding the proposal of integrating technology resources into math, please do not hesitate to contact us.

Sincerely,

Alicia Helle

Appendix B: Sample Teacher Survey

Sample of Teacher Survey to determine the effectiveness of student's learning with the Accelerated Math Program.

1. What grade level do you teach?

1st

2nd

3rd

4th

multiple grades

2. Are students utilizing the AR Math program for the suggested time (20 minutes per day)?

yes

no

3. If not, how much time are students spending per day or per week on the program?

4. List any positive changes you have observed with students using the program?

5. List any concerns that you may have at this time with the AR Math program.

6. Overall do you feel that student's are improving in the area of math by utilizing this type of computer-based instruction?

yes

somewhat

not really

Appendix C: Sample Student Survey

Sample of Student Survey for 3rd grade to determine the effectiveness of their learning with the Accelerated Math Program.

- 1. What are two things that you have learned from using the Accelerated Math program?**
- 2. Why do you like to use the Accelerated Math?**
- 3. What don't you like about the Accelerated Math program?**
- 4. Do you think that this program is helping you get better at math? Why or why not?**