

Effective implementation of a supplemental educational services program

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The No Child Left Behind (NCLB) Act of 2002 requires that schools provide Supplemental Educational Services (SES) for Title I eligible students that did not achieve Adequate Yearly Progress (AYP). In order to qualify as an SES provider, Measurement Incorporated (MI) voluntarily provided tutorial services for 20 fourth and fifth grade students who were experiencing significant academic problems at Southwest Elementary in Durham, NC. The semester long program provided students with one hour of tutoring four times per week. Because of MI's success at Southwest Elementary School, six other Durham Public Schools used other discretionary state and local remediation funds to utilize MI's tutoring services for 135 students during the spring of 2007. This study shows the change in test results through pre/post- EOG test score analyses of the Durham Public Schools participants. More than 30% of the students who participated in the tutoring program experienced positive growth reflected in improved reading and/or mathematics achievement levels. Anecdotal evidence from parents, teachers, and school administrators regarding the effectiveness of the program was overwhelmingly positive. MI's experience has shown that the most effective implementation of an SES program requires student centered instruction based on the North Carolina Standard Course of Study. Rigor, relevance, and a positive student-tutor relationship should be the cornerstone of the program.

Introduction

With the passage of the No Child Left Behind (NCLB) Act of 2002, numerous requirements have been implemented to assist schools in achieving the goal of 100% proficiency in reading and mathematics for all students by 2014. One such requirement is that schools must provide Supplemental Educational Services (SES) for Title I eligible students that do not achieve Adequate Yearly Progress (AYP). These services consist of additional academic resources, such as tutoring, that are offered outside of the regular school hours.

In North Carolina, organizations that want to provide Title I SES must apply to the North Carolina Department of Public Instruction (NCDPI), Compensatory Education Section, and be approved before offering the services to parents of Title I students. Measurement Incorporated (MI), an educational assessment company, applied to offer "tutoring" services for Title I eligible students. In 2006, MI's application was not approved because the NCDPI decided that MI did not have adequate experience in providing tutorial services. In order to remedy this shortcoming, MI offered a self-funded tutorial program to the Durham Public Schools System.

Program Overview

In order to become a qualified SES provider, MI developed and refined a program known as the **Accelerated Achievement at Measurement Incorporated** (AA@MI) instructional program. Initially, MI committed more than \$60,000 to design, develop, and pilot test this

program at Southwest Elementary School in Durham, NC. The program was implemented in the fall of 2006 at Southwest Elementary School. The program was extended during the 2006-2007 school year to include six additional Durham Public Schools (Bethesda, Fayetteville Street, Glenn, R.N. Harris, Lakewood, and Little River). By the end of the 2006-2007 school year, the pilot program had delivered more than 45 one-hour sessions to over 150 fourth and fifth grade students, totaling more than 6,750 instructional hours of tutoring.

Thus far, under the current (2007-2008) contract with NCDPI, MI has successfully delivered Supplemental Educational Services (SES) in Reading/Language Arts and Mathematics to over 80 fourth and fifth graders in Durham Public Schools, and another 10 students in Franklin County Schools. MI has provided quality instruction and mentoring in small groups with a maximum 1:5 tutor/student ratio for grades 4 and 5 in both Reading/Language Arts and Mathematics. In total, MI has provided SES services to over 300 students.

SES Program

The NCDPI application process requires that potential SES providers outline a comprehensive plan that demonstrates qualities such as a record of effectiveness in increasing student academic achievement; high quality, research base instructional strategies linked to the North Carolina Standard Course of Study that are designed to increase student academic achievement; and evidence of services consistent with federal, state, and local health, safety and civil rights laws. MI has taken a multifaceted, data driven, scientific research based approach to meeting the criteria established by NCDPI. .

The research shows that effective tutoring programs that consistently result in positive student academic achievement share the following six characteristics (U.S. Department of Education, 2004):

1. Careful monitoring and reinforcement of progress.
2. Close coordination with the classroom or reading teacher.
3. Well-structured tutoring sessions with carefully scripted content and delivery.
4. Frequent and regular tutoring sessions with each session between 10 and 60 minutes.
5. Specially designed interventions for children with severe reading difficulties.
6. Intensive and ongoing training for tutors.

Monitoring and Reinforcement of Progress

The AA@MI program model embodies all six of these characteristics. Throughout the duration of the tutoring program, student growth is carefully monitored in relationship to the established timeline and goals. AA@MI is based on the belief that assessment and instruction should inform each other; that is, assessment results inform and guide instruction, and instruction demands further assessment. The following are a few instruments and strategies used to monitor and evaluate student progress:

North Carolina End-Of-Grade (EOG) testing data Anecdotes and testimonials

Student test scores
Student homework reports
Student report card

Tutor to parent/guardian letters
Attendance record
Discipline record

Studies have also shown that successful tutor-student relationships are characterized by strong reinforcement of progress; a high number of reading and writing experiences in which the student moves from being fully supported to working independently; and explicit demonstrations of appropriate reading and writing processes (Juel, 1996).

Tutors administer a pre- and post-assessment in reading and mathematics. During the intervening five-week intensive sessions, students work with the tutors and other students on oral and written activities designed to assess the student's understanding of the material and their comprehension of the vocabulary. In addition, the AA@MI program incorporates a daily Student Record Sheet on which tutors log student activities, curriculum used, work products generated, student progress, problems, and other observations. Progress reports, describing curriculum covered, successful completion of activities, ability to work cooperatively in small group settings, and other comments, are provided to each student's parents/guardians and teacher on the Bi-weekly Tutor/Parent/Guardian/Teacher Communication Form. Ongoing assessment is monitored and recorded.

Coordination with the Classroom or Reading Teacher

The tutors' central focus is on mediating the needs of each student in accordance with the state curriculum. With the pre-assessment in reading and mathematics, tutors are able to focus on the particular areas requiring remediation for each student, and attend to those needs individually on a session-by-session basis. The close coordination between tutor and the classroom and/or reading teacher employed in the AA@MI program is supported by the research of Venezky & Jain, 1996. They concluded that students perform better when tutoring is coordinated with good classroom reading practices than when tutoring is unrelated to classroom instruction.

The AA@MI program model emphasizes partnership building within a school community. Parents/guardians, teachers, support staff, and administrators are actively involved in the development of a learning plan aligned with the North Carolina Standard Course of Study (NCSCOS) and the classroom instruction. The AA@MI curriculum supports what the students are learning in the classroom, offering the benefits of extra time, more individualized attention, and a positive, engaging interaction with the material.

Structure of Tutoring Sessions

One of the hallmarks of the AA@MI program is the adherence to well-structured, carefully scripted lesson plans based on materials with proven effectiveness. The tutors are thoroughly trained and continuously supported, and lesson plans are designed for reliable and consistent implementation. In their meta-analysis, Cohen, Kulik, and Kulik (1982) found that structured, scripted tutorial programs demonstrated higher achievement gains than unstructured programs. Wasik and Slavin (1993) reached similar conclusions when they examined five successful tutoring programs.

The AA@MI Reading/Language Arts instruction uses reading materials designed to accelerate delayed readers to grade level proficiency and standards. Students begin with reading materials they are able to master quickly. All lessons are scripted with the direct and explicit instructional strategies of “demonstrate, coach, apply, and assess.” A typical reading session begins with 10 minutes devoted to fluency followed by 40 minutes with guided reading and 10 minutes of independent reading.

The AA@MI Mathematics instruction is rooted in *Principles and Standards for School Mathematics* (National Council of Teachers of Mathematics (NCTM), 2000). The curricula are based on the five strands of the NCSCOS that support these NCTM standards: number and operations, measurement, geometry, data analysis and probability, and algebra. AA@MI uses NCDPI’s mathematics curriculum resource, *Week-by-Week Essentials and Classroom Strategies*; Durham Public School’s (DPS) Pacing Guide; and other engaging resource materials to provide high quality lesson plans that support the NCTM standards.

Frequency of Tutoring Sessions

School-based tutoring, occurring two to three times per week for one to one and one-half hours per day is the current structure of the AA@MI program. Rigorous evaluations of tutoring programs reported positive results for programs whose tutoring sessions ran from 10 to 60 minutes in length, although longer sessions did not necessarily result in better outcomes (Brailsford, 1991; Warger, 1991; Robledo, 1990; Jenkins & Jenkins, 1987). Tutoring programs in which tutors met with students at least three times a week were more likely to generate positive achievement for students than programs in which tutors and students met twice a week (Reisner, Petry, & Armitage, 1990).

Interventions

Surveys of targeted groups of students who are tutored in reading have shown positive results for students’ self-confidence as readers, motivation to read, and views of their control over their reading abilities (Cohen et al., 1982; Lepper & Chabay, 1988). The most important strategies for improving early reading instruction and learning have been identified as creating an appreciation of the written work, developing an awareness of printed language and the writing system, teaching the alphabet, developing students’ phonological awareness, and helping children to develop fluent, reflective reading (Kameenui, Adams, and Lyon, 1996). Research shows that practice at an independent reading level increases confidence, motivation, and fluency and is a significant preparation for advancement to the next level (National Reading Panel, 2000). Trained volunteers under careful supervision from reading or resource teachers have proved to be effective instructors for learning disabled and other students with disabilities (Azcoitia, 1989).

The AA@MI reading curriculum supports the belief that all students are capable and is especially designed for children with severe reading difficulties. “The instruction is comprehensive, continuous, and inclusive of all the major components of reading: phonemic awareness, phonemic decoding skills, word- and passage-reading fluency, vocabulary, comprehension, spelling, composition, and related language skills” (Moats & Lyon, 1996). The

intervention program includes a Comprehension, a Word Work, and a Fluency Strand. The Word Work Strand, authored by Dr. Judith Cohen, is based on her 25 years of experience with learning-disabled students using the six highly reliable vowel syllable patterns she formatted into a neurological organization chart, coupled with a unique syllabication strategy. Students record their own progress in reading and award themselves with stickers to demonstrate personal satisfaction.

Tutor Recruitment and Training

The importance of tutor training is reinforced by several studies, which provide specific advice on the types of training that yield the best results. Students, whose tutors participated in ongoing, intensive, in-service training, outperformed students whose tutors did not complete the ongoing training sessions (Wasik & Slavin, 1993). Further, Jenkins and Jenkins (1987) and Warger (1991) point to the importance of training in interpersonal skills so tutors do not become impatient with students.

The AA@MI program design is based on a focused, continuous improvement model. The comprehensive training program for tutors includes a four-day, 20-hour initial training session followed by bi-weekly one hour staff development sessions where tutors reflect on the week's instruction, study the curriculum further, and share ideas. The bi-weekly sessions work to promote collaboration, reflective practice, and strong self-assessment. Both the initial intensive AA@MI training and the subsequent tutor support meetings include components that address effective tutor-parent/guardian-teacher communication and essentials for positive working relationships. Respecting and considering cultural differences, varying degrees of literacy among parent/guardians, individual learning styles, and personality types are all part of the MI philosophy.

For the past twenty-seven years, MI's primary business has been the development and hand scoring of educational assessments. MI maintains an extensive pool of college-educated readers/scorers in Durham and the surrounding areas. This candidate pool is used to identify and recruit the best possible tutorial staff from within the company. Recruiting efforts are directed toward and hiring priority is given to those applicants with teaching or mentoring experience.

Additionally, MI has established a database of active and retired teachers, "highly qualified" teacher assistants, community volunteers, affiliates of civic and faith-based groups, and members of parent/guardian teacher association. Local community members wishing to make a difference in the academic life of a child are recruited from this database. MI accepts only those applicants who either have at least a Bachelor's degree or are "highly qualified" teacher assistants (Associates degree or 48 semester hours of college credit) to work in our AA@MI program.

All applicants are required to show proof of education and to submit to required criminal background checks. Once hired, tutors receive a written job description and a tutoring handbook that outlines the program's approach, policies, procedures, and curriculum model. Instructors are carefully trained in an initial six hour training session specifically focused on instructional strategies and methodology, followed by three hourly support sessions. The initial training

session and curriculum materials emphasize the need to focus on the individual needs of the students, and to pace the sessions accordingly. The training includes practice sessions for the instructors on each part of the curriculum and provides detailed discussion on assessing that each student's abilities. Tutors also study guidelines outlining procedures, communication tools, and protocols. They practice games and activities, co-teach, and, in the process, form a well-functioning tutoring team.

Once tutoring begins, tutors receive ongoing training, technical assistance, and supervision. They participate in three one-hour support and staff development sessions where they have an opportunity to further study the curriculum, reflect on the week's instruction, and share ideas. These meetings are meant to maximize tutors' effectiveness and provide an opportunity for internal program evaluation. Additionally, these meetings offer an opportunity for receiving feedback from the school and program administrators regarding program effectiveness and its impact on student learning and classroom participation. Providing time to reflect and plan together is an essential element of the MI approach to effective tutoring. The support and resources needed to keep tutors and students on task are provided on a daily basis by MI.

Data Analysis

Scale score, achievement level, and percentile rank data in reading and mathematics from the 2006 and 2007 End of Grade (EOG) examinations were collected for the 155 students who participated in the MI sponsored tutoring program during the 2006-07 school year. Twenty of those participants were from the initial pilot school (Southwest Elementary). The remaining 135 participants were from the six other schools that engaged MI's services after the initial implementation at Southwest. The analyses include pre- and post-test descriptive statistics comparing EOG performance in reading and mathematics for the entire group of participants and for each participating school separately. In addition, paired t-tests were computed in order to determine whether there was a statistically significant difference in the examinee's academic performance before and after the tutoring intervention. A post hoc analysis was conducted to ensure that any observed statistical difference were not chance occurrences given the number of comparisons performed. Finally, the effect size was calculated to assess the practical significance of any statistical differences found.

Results

Table 1.1 shows the achievement levels for participants based on their reading and mathematics performance on the EOGs in the spring of 2006 and 2007. The points of greatest interest in Tables 1 and 2 are achievement levels 2 and 3. Achievement level 2 indicates that the student demonstrates inconsistent mastery of the subject area (not proficient) and level 3 indicates consistent mastery (proficient).

In reading, Table 1 shows that 58.2% (89) of the participants were at level 3 or higher in 2006. After the implementation of the tutoring program, the number of student at or above the proficient level increased by 14.2% to 72.4% or 110. In mathematics, none of these examinees reached achievement level 4 on the EOG administered in 2006 and only 20.5% (32) reached

level 3. After the 2007 EOG administration, 35.9% (56) attained the proficient designation in mathematics.

Table 1: Frequency Distributions for Reading and Mathematics

Level	Reading 06		Reading 07		Math 06		Math 07	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
4	20	13.25	19	12.58	0	0.00	2	1.29
3	69	45.70	91	60.26	32	20.65	54	34.84
2	50	33.10	34	22.52	84	54.19	67	43.23
1	12	7.95	7	4.64	39	25.16	32	20.65

Table 2 shows the changes in achievement levels from the spring 2006 to the spring 2007. Slightly more than half of the achievement levels in reading and mathematics were unchanged. However, more than 30% of the examinees experienced an increase of one or more achievement levels in reading and/or mathematics during this period. Greater emphasis was placed on changes in achievement levels than on changes in scale score. With maturation, one would expect there to be scale score increases; however, a move from level 2 to level 3, for example, represents growth up and above that which would generally be attributed to maturation.

Table 2: Change by Level for 2006 to 2007

Change	Reading		Math	
	Frequency	Percent	Frequency	Percent
+ 2 Levels	7	4.64	2	1.29
+ 1 Level	40	26.49	51	32.90
No Change	77	50.99	81	52.26
- 1 Level	25	16.56	20	12.90
- 2 Levels	2	1.32	1	0.65

Table 3 displays the mean difference in descriptive statistics for reading and mathematics scale scores, achievement levels, and percentile ranks between the 2006 and 2007 EOG examinations. The positive differences indicate that the reading and mathematics means were higher in 2007 than in 2006.

Table 4 displays the results for comparisons of the scale scores, achievement levels, and percentile ranks from the 2006 and 2007 EOG examinations. A paired t-test was conducted for each comparison in order to determine whether any of the comparisons revealed a statistically significant difference at the $\alpha = .05$ level. When making multiple comparisons, it is important to apply a post hoc multiple comparisons test (e.g., Bonferroni test) to ensure that statistically significant differences do not result from capitalizing on chance. A statistically significant difference indicates that the observed difference between two scores, levels, or ranks is greater than the expected difference due to chance. In other words, a significant difference suggests that there may be a real difference between the two groups being compared. However, statistical significance does not always translate into practical significance. Thus, a more useful approach to evaluating a statistically significant difference is to consider the effect size.

Table 3: Mean Difference

	Reading Scale Score	Reading Level	Reading Percentile	Math Scale Score	Math Level	Math Percentile
N	151.00	151.00	151.00	155.00	155.00	155.00
Max	23.00	2.00	52.00	27.00	2.00	69.00
Min	-15.00	-2.00	-68	-7.00	-2.00	-30.00
Mean	5.70	0.17	3.07	7.69	0.22	7.17
SD	6.57	0.80	18.89	5.94	0.70	16.25
SEM	0.53	0.07	1.54	0.48	0.06	1.31

The effect size standardizes the difference between the two groups and allows for comparisons in standard units. This method provides a better gauge of a significant difference from a practical standpoint. For the purposes of this study, as a general guide, effect sizes of 0 to .3 indicate a small difference between the groups. Effect sizes of .4 to .6 typically suggest a moderate group difference, and effect sizes greater than .7 indicate larger meaningful group differences.

After applying the Bonferroni correction, statistically significant differences were observed for the reading and mathematics scale scores, mathematics achievement levels, and mathematics percentile ranks. The effect size, however, indicates that only the differences for reading and mathematics scale scores appear to be of practical importance.

Table 4: Paired T-Test

	Reading Scale Score	Reading Level	Reading Percentile	Math Scale Score	Math Level	Math Percentile
T-statistic	10.59	2.37	1.92	16.11	3.77	5.49
df	149	149	149	154	154	154
Significance	3.5E-20*	0.01	0.03	3.7E-35*	1.1E-4*	8.08E-08*
Effect Size	0.81	N/A	N/A	1.02	0.29	0.37

*Indicates statistical significance $\alpha = .05$ after Bonferroni correction $\alpha = .0009$

Conclusion

This study shows that more than 30% of the students who participated in the MI sponsored SES program experienced positive growth reflected in improved reading and mathematics achievement levels. Statistical significance was observed in reading and mathematics scale scores, mathematics achievement levels and mathematics percentile ranks when compared across all participants. Overall, the reading and mathematics scale scores were found to have both statistical and practical significance.

To verify that the AA@MI SES program does make a significant contribution to academic achievement, the program should be replicated on a larger scale and analyzed using a control group to better gauge actual gains. Supplemental instruction can be most effective when

implemented on a long-term basis of 20-25 weeks, which allows the child to regain lost instructional time that cannot be recovered during the normal day. In addition to collecting and analyzing test score data, attendance and other affective measures of the program's impact should be systematically collected and analyzed.

Based on MI's experience with the seven remediation programs in as many schools during the 2006/07 school year, the following conclusions have been drawn:

- Any supplemental instructional program must be implemented as a compliment to the regular daily instructional program. Supplemental instruction must be focused and tightly aligned with the NC Standard Course of Study (SCOS), and targeted to specific goals and objectives.
- The SES instruction should be built upon the premise that the foundation of any instructional program includes the following three distinct and unique characteristics of *Rigor, Relevance and Relationships*. The instruction should be challenging yet understandable to the students with the goal of continuously extending their understanding by building on previous learning, and raising the bar of high expectations using previous success as a springboard for grasping new learning.
- The program must be built upon instructional material that is relevant to the student's experience, interest, and ambitions. Reading materials should be high interest, engaging, and visually attractive using pictures and artwork that peak the curiosity of the learner and a desire to want to read more and learn more. They must be able to make a logical connection with the instructional content of the reading and math material, while experiencing success in the assigned tasks.
- The teacher/tutor must employ not only a series of sound instructional strategies but they must also instruct in a caring, committed, understanding, and positive manner that takes into consideration the circumstances surrounding the life experiences of the students and past impediments to learning.
- There must be collaboration between the school district, the school, and the SES provider to compile data that provide an accurate history of the child's previous learning experiences. This is a critical component to building an effective instructional program for SES students.
- Finally, schools are encouraged to pursue more strategic usage of SES programs, and the additional supplemental resources provided by state and local officials to address the academic deficiencies of underachieving children. SES programs must be viewed as a compliment to the regular instructional program rather than a threat or indictment of the ineffectiveness of the hard work of the classroom teacher.

References

- Azcoitia, C. (1989). Structured peer tutoring in Chicago's vocational education program. Dissertations/Theses – Doctoral (ERIC Document Reproduction Service No. ED 320020).
- Brailsford, A. (1991). Paired Reading: Positive reading practice. Kelowna, British Columbia: Filmwest Associates 1991.
- Cohen, P.A., Kulik, J.A., & Kulik, C.L.C. (1982). Educational outcomes of tutoring: A meta-analysis of findings. *American Educational Research Journal*, 19, 237-248.

- Jenkins, J. R., & Jenkins, L. M. (1987, March). Making peer tutoring work. *Educational Leadership*, pp. 64-68.
- Juel, C. (1996). What makes literacy tutoring effective? *Reading Research Quarterly*, 31(3), 268-289.
- Kame'enui, Adams, and Lyon (1996). *Learning to Read/Reading to Learn* (1996). U. S. Department of Education, Washington, D.C.
- Lepper, M.R., & Chabay, R.W. (1988). *Socializing the intelligent tutor: Bringing empathy to computer tutors*. New York: Springer-Verlag.
- Moats, L. C.; & Lyon, G. R. (1996). Wanted: Teachers with knowledge of language. *Topics in Language Disorders*, v16 n2 p73-86 Feb 1996 (ERIC Document Reproduction Service No. EJ519814).
- National Council of Teachers of Mathematics (NCTM), (2000), *Principles and Standards for School Mathematics* <http://standards.nctm.org/document/>
- Reisner, E.R., Petry, C. A., & Armitage, M. (1990). A review of programs involving college students as tutors or mentors in grades K-12. Washington, D.C.: U.S. Department of Education.
- Robledo, M. del R. (1990). *Partners for valued youth: Dropout prevention strategies for at-risk language minority students*. Washington, DC: US Department of Education.
- U.S. Department of Education. (2004) *Options for families: supplemental educational services pilot programs*. Retrieved February 5, 2008, <http://www.ed.gov/nclb/choice/help/sespilot-2006.html>.
- Venezky, R. L., & Jain, R. (1996). *Tutoring for reading improvement: A background paper*.
- Warger, C. L. (1991). *Peer tutoring: When working together is better than working alone*. Reston, VA: Council for Exceptional Children.
- Wasik, B. A., & Slavin, R. E. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly*, pp. 179-200.