

The Reading Edge: Evaluation of a Cooperative Learning Reading Intervention For Urban High Schools

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Abstract

This article reports the findings of the first evaluation of The Reading Edge, a cooperative learning program for struggling secondary readers, in urban high schools. In addition to cooperative learning, the program emphasizes teaching of metacognitive skills, frequent assessment and regrouping, and a rapid pace. A quasi-experiment compared students in five Philadelphia-area high schools to similar schools in the same area. Controlling for eighth grade scores on state tests, students in The Reading Edge gained significantly more than controls on the overall Group Reading Assessment and Diagnostic Evaluation (GRADE) and on the Vocabulary subtest, but not on Sentence Comprehension or Passage Comprehension. The results, though modest in magnitude, suggest that reading performance can be improved in high-poverty urban high schools through an integrated program of instructional materials and professional development in cooperative learning strategies.

The high school years are a time of great promise as well as great peril. In high-poverty schools, however, there is more peril than promise. In particular, students who enter high school with poor literacy skills face long odds against graduating and going on to postsecondary education or satisfying careers. High school provides a last chance for many at-risk students, who must quickly improve their reading skills to be able to succeed in their demanding secondary courses (Biancarosa & Snow, 2004). The data are worrisome. Four-year high school completion rates range from 65.0 percent to 90.1 percent among states (Kaufman et al., 2004). Among African-American twelfth graders, 43% scored below basic on the 2009 National Assessment of Educational Progress (NCES, 2010), and among Hispanic students, 39% scored this poorly. By comparison, only 19% of white students scored below basic. These scores are for the students who made it to twelfth grade, excluding those who dropped out, so they underreport the problem. Further, neither the scores nor the achievement gaps have improved since 1992, and significantly, scores are only slightly higher in twelfth grade than in eighth, suggesting that high school has very little impact on students' reading performance. This situation is not new, but by any standard, the reading scores of disadvantaged and minority students in high school is unacceptable, as this poor performance translates directly into the high dropout rates and diminished futures characteristic of adolescents in high-poverty schools.

For the students who leave high school, the workplace does not offer a reprieve from literacy demands. The knowledge, skills, and reading ability needed for college are not very different from those needed for success in the workplace (American Diploma Project, 2004). Students who struggle with reading are often blocked from taking the academically challenging coursework that could lead to more wide reading, exposure to advanced vocabulary and content

ideas (Au, 2000). Only 51% of ACT-tested students were deemed to be ready for college-level reading demands. Minority students and students whose families earned less than \$30,000 per year were up to two and a half times less likely to be ready for college-level reading and success in basic college courses (ACT, 2006).

While almost half of disadvantaged and minority students score below the basic level, even those who do read at the basic level have difficulty understanding the increasingly complex narrative and expository texts they are faced with in high school and beyond. For example, one of the major hurdles in acquiring science literacy is the conceptual density of math and science materials (Barton et al., 2002). Performance on these more difficult texts, which include context-dependent vocabulary, concept development, and graphical information, is the clearest differentiator between students who are ready to succeed in college and work and those who are not (ACT, 2006). Clearly, there is a need for well-evaluated programs capable of enabling high school students with poor reading skills to develop the facility they need with complex text to succeed in their high school coursework and to graduate ready for college and work-related reading demands.

The poor reading skills of students in high-poverty high schools has long been recognized as a problem, yet there are very few replicable interventions available to improve the reading achievement of students in these grades, and fewer still that have even rudimentary evidence of effectiveness from experimental-control comparisons. Promising results have been reported for career academies (Kemple, 2004) and for restructuring large high schools into smaller ones (Bloom, Thompson, Unterman, 2010). Whole school reform models, especially the Talent Development High School (Kemple, Herlhy, & Smith, 2005) and First Things First (Quint, Bloom, Black, & Stephens, 2005) have also shown promise. In current policy, urban high

schools with persistently low achievement and high dropout rates, so-called “dropout factories” (Balfanz & Legters, 2004), are subject to draconian reforms, including closure, reopening as a charter school, takeover by states or other agencies, and so on, yet evaluations of solutions of this kind generally find that when the dust settles, student achievement remains very poor (see Alliance for Excellent Education, 2011; Cohen & Moffitt, 2009). While structural solutions may be necessary and effective in certain circumstances, there is also a need to have available classroom programs capable of improving student achievement within existing urban high schools with existing staffs. Even after restructuring, of course, effective programs are needed to take advantage of new leadership, resources, and structural opportunities.

The problem is that there are few proven, replicable classroom programs known to be capable of improving achievement outcomes in urban low-performing high schools. In a review of research on reading programs for middle and high school students, Slavin, Cheung, Groff, & Lake (2008) found little support for simply using reading texts designed for middle and high school or for computer-assisted instruction (CAI) approaches, at least in experimental studies that met a minimum set of methodological standards. There were positive effects of Read 180, a program that provides a 90-minute daily remedial program in which students cycle through computer-assisted instruction, independent reading, and small-group tutorials. Across eight qualifying studies, the sample size-weighted mean effect size was +0.23, but it is important to note that in most studies, students in Read 180 were compared to those not receiving any supplemental reading instruction.

Other than Read 180, all of the secondary reading programs found to be effective in the Slavin et al. (2008) review were various forms of cooperative learning methods, in which students work in small groups to help each other learn specific reading and study strategies.

These included Peer Assisted Learning Strategies (PALS; Fuchs, Fuchs, & Kazdan, 1999; Calhoun, 2005), which had a sample size-weighted effect size of +0.15 across three studies.

The other main cooperative learning approach was a set of strategies called The Reading Edge, a comprehensive reading approach that emphasizes cooperative learning, metacognitive strategies, and generative study skills. Combining a cohesive curriculum with research-based instructional processes, extensive professional development, and support for teachers and school leaders, The Reading Edge has been found to improve the reading achievement of students in middle schools in two major studies. One was a national study involving 14 schools in 6 states. In that study (Slavin, Daniels, & Madden, 2005), seven middle schools using The Reading Edge were compared to matched control schools in the same state (usually the same district) in terms of gains over a three-year period on their state tests. Schools using The Reading Edge gained more than their respective controls in six of seven comparisons. On average, Reading Edge schools gained 24.6 percentage points in percent passing state reading tests. Control schools gained 2.2 percentage points. The schools were all high-poverty Title I schools, but were otherwise quite diverse, including schools in inner-city Indianapolis, rural Missouri and Louisiana, and an Indian reservation in Washington State. An overall 2 x 2 x 2 chi square analysis (experimental-control x pre-post x pass-fail) found that these differences were statistically significant ($p < .01$). The mean effect size was +0.33.

The second study of The Reading Edge (Chamberlain, Daniels, Madden, & Slavin, 2007) involved middle schools in Florida and West Virginia. Students and teachers were randomly assigned to use The Reading Edge or to continue their usual reading programs for one school year. On Gates McGinitie posttests, controlling for pretests, students in The Reading Edge scored significantly higher than those in the control group ($ES = +0.15, p < .05$).

Earlier versions of the Johns Hopkins cooperative learning methods have also been found to increase achievement in middle schools. One of these, called Student Team Reading, was evaluated in high-poverty middle schools in Baltimore. Across two year-long matched comparisons, the mean effect size was +0.23 on California Achievement Test (CAT) comprehension and vocabulary measures (Stevens & Durkin, 1992). Effects were larger for students with special needs (ES = +0.44).

In the present study, a program adapted from The Reading Edge middle school approach was evaluated for the first time in inner-city high schools, with students who are struggling to learn to read. The Reading Edge for high schools makes extensive use of direct, explicit lessons, cooperative learning, teaching of metacognitive study strategies, frequent assessment, differentiated instruction, and a rapid pace of instruction. The main elements of The Reading Edge as adapted for high schools and the rationales for them are described in the following sections.

Cooperative Learning. Cooperative learning refers to methods in which students work in small groups to help one another learn. In The Reading Edge, teams have 4-5 members and are assigned by the teacher to be diverse in achievement levels, gender, and ethnicity. Extensive randomized and matched experimental research on cooperative learning methods has found that cooperative strategies increase student achievement if they incorporate two key conditions: the cooperative groups have some sort of group goal or objective, and the only way they can meet this goal is if all group members can individually demonstrate their mastery of the material (Slavin, 1995; Slavin, Hurley, & Chamberlain, 2003; Webb & Palincsar, 1996). That is, cooperative learning increases student achievement if the group members' roles are to teach each

other or to prepare each other for assessments. Studies have found positive effects of this type of cooperative learning in many subjects and grade levels (Slavin, 1995). Students in The Reading Edge receive recognition based on the sum of individual team members' assessments, and they have regular opportunities to prepare one another for these assessments.

In The Reading Edge, cooperative learning plays a central role in providing strategy instruction to students (see the following section). Cooperative learning methods have been successfully utilized with strategy instruction in a variety of peer-assisted techniques (see O'Donnell, 2000; Webb & Palincsar, 1996), and the Success for All Middle School (Slavin, Daniels, & Madden, 2005; Chamberlain et al., 2007).

The Reading Edge focuses on teaching and supporting application of metacognitive reading strategies that have been extensively evaluated with young adolescents. These powerful learning strategies have been found to help young adolescents comprehend difficult materials and to study and retain information (Pressley & Woloshyn, 1995; Collins et al., 2003; Pressley, 2003). A related body of research has identified means of teaching students strategies for self-regulation, such as monitoring their own comprehension and setting their own reading goals (Paris & Paris, 2001; Schunk & Zimmerman, 2003). Yet despite the wide acceptance of these findings among researchers, explicit metacognitive strategy instruction is rarely seen in day-to-day reading in high-poverty secondary schools. The Reading Edge translates the findings of metacognitive strategy instruction into practical, replicable techniques for middle school teachers and uses cooperative learning methods and other design elements to make strategy instruction effective as a routine part of reading comprehension instruction. Specific metacognitive strategies that have been particularly well researched include use of cooperative learning,

summarization, graphic organizers, story grammar, imagery, question generation, activation of prior knowledge, and self-regulation (see Pressley & Woloshyn, 1995; Schunk & Zimmerman, 2003). All of these are emphasized in the Reading Edge program.

Explicit support for the use of metacognitive strategies is provided in detailed daily lesson plans provided for teachers. For example, early in every Reading Edge six-day lesson cycle, students are presented with “The Big Question”, a provocative question that students ponder and discuss over the course of the day’s activities. With stems such as “Have you ever...” or “How would you handle this character’s challenge...” or “Based on what you know about...”, students must draw upon their own experiences and beliefs as well as details from the text they are reading in order to formulate their answer. This question often leads to student-generated questions of the same kind, and enriches team and partner discussions about the text. It also requires students to paraphrase or summarize what they have read, and encourages students to monitor their comprehension as they read.

Also in the early steps of every lesson, teachers use a “Building Background” segment in which they activate students’ prior knowledge and help students make connections to the text from their personal experience or other reading. Teachers make connections to student interests, and hold conversations in which they discuss vocabulary important to the understanding of the text. They preview the text and discuss text features that prompt students to make predictions about the main idea, topic, or theme, depending on the nature of the text.

During the “Active Instruction” portion of the lesson cycle, the teacher engages students in targeted instruction and guided practice on how to use a particular strategy or skill. For example, the teacher might read aloud a passage from the text and stop and “think aloud” about something significant, perhaps an example of foreshadowing, and how it influences her thinking

as she reads. As she does this, she is breaking down a larger strategy into smaller steps so students can understand the otherwise invisible tools that good readers use. After this strategy has been modeled and discussed, students practice using it as they read, set personal and team goals for effective strategy use, and later reflect upon whether or not the strategies improved their comprehension.

During Teamwork, students read some text silently and some aloud with a partner. They stop regularly to paraphrase what they just read, to share insights, and to clarify understanding. After reading, each team of 4 or 5 students uses cooperative learning routines to discuss what they have read, and “Discuss and Defend” their answers to prepared “Team Talk Questions”. Students have the opportunity to clarify their thinking, try out new ideas and strategies, use new vocabulary, and help teammates understand the text. Each student writes an extended response to one of the team talk questions. During Teamwork time, the teacher circulates around the room to check for understanding, prompt and reinforce positive behavior, and conduct quick, informal conferences with partners or teams called “One-to-One’s”. During these interactions, the teacher can informally assess the students’ grasp of the targeted strategy or skill.

Differentiated Instruction and Grouping. The Reading Edge uses an adaptation of the Joplin Plan, a flexible grouping strategy found in much research to increase student achievement (Gutiérrez & Slavin, 1992). Students are assessed using a standardized reading instrument and grouped according to instructional reading level and specific needs. Students are then re-assessed quarterly and moved to the highest instructional level at which they can succeed based on their progress during the quarter.

Engaging instruction. The instructional processes designed into each Reading Edge lesson build in both a rapid pace of instruction and a high demand for thinking and responding

by every student through structured cooperative learning. Research indicates that a rapid pace of instruction, consistent with high student comprehension, both maintains students' attention and increases students' achievement (e.g., Barr, 1987; Good, Grouws, & Ebmeier, 1983). Classroom management methods based on cooperative learning enable teachers to maintain a rapid pace of instruction and have both immediate and lasting impact on students' behavior and achievement. For example, Hawkins, Doueck, & Lishner (1988) used preventive classroom management methods emphasizing cooperative learning and interactive teaching with low-achieving seventh graders. In comparison with control group students, those involved in the program were suspended and expelled less often, had better attitudes toward school, and had higher achievement. These effects were substantially maintained in a long-term follow-up assessment into high school (Hawkins et al., 2001). Other longitudinal studies have also shown immediate and long-term positive effects of classroom management programs that emphasize cooperative learning and student engagement (O'Donnell et al., 1995; Freiberg, Connell, & Lorentz, 2001; Dolan et al., 1993).

Instruction in *The Reading Edge* focuses on the development of reading strategies needed for comprehension of more complex texts, including expository and high-inference texts. Students use trade books of both types as well as content-area texts similar to those they use in social studies and science classes. Instruction focuses on metacognitive comprehension skills such as clarification, summarization, self-questioning, questioning the author, graphic organizers, prediction, and self-monitoring. In addition, students practice reading with fluency using complex text in their teams and monitor growth toward grade-level performance. Vocabulary is emphasized for all students, using research-based vocabulary strategies, including writing sentences to show the meaning of vocabulary words, and identifying unknown words and

marking them with sticky notes in the clarification process (Beck, McKeown, & Kucan, 2002; Blachowicz et al., 2006; Graves, 2006). Students build a “word power journal” in which they keep records of new words and meanings. For students reading below the fourth grade level, instruction in phonics and word analysis skills is also provided.

Every Reading Edge lesson follows a regular pattern, but the instruction itself varies according to the nature of the text and the challenges it presents. Program developers carefully choose readings that lead the students to relevant discoveries and practice opportunities. Each lesson and each unit moves from teacher-mediated to student-mediated learning activities. Although lessons vary significantly in level and purpose, all follow this structure: Setting the Stage, Active Instruction, Teamwork, and Time for Reflection. The key components of cooperative learning, metacognitive strategy use, goal-setting and feedback, and classroom management techniques that engage students, are embedded in the everyday classroom routines that teachers use for instruction (Slavin, Daniels, & Madden, 2005).

During Active Instruction, teachers use techniques for keeping the lesson moving at a brisk pace by posing important questions to the entire class and randomly calling on students to answer. Teachers use cooperative learning strategies called “Think-Pair-Share” and “Numbered Heads” (Kagan, 2001) to allow students time to examine their thinking and then try it out in a brief team discussion. Every student knows that anyone could be called upon to answer for their team, so they must help each other prepare to answer every question. For quick checks of understanding, teachers use whole-class responses such as “Thumbs-Up/Thumbs Down” to keep every student involved (Emmer, Evertson, & Worsham, 2009).

Every Reading Edge lesson has both a reading goal and a strategy or skill goal. During Setting the Stage, the teacher and students discuss these goals and set a course of action to

accomplish them. During Time for Reflection, students have the opportunity to review how particular strategies helped them get meaning from text.

Student Goal-Setting and Feedback. Research demonstrates that students who perceive a classroom emphasis on meeting mastery goals rather than on ability and performance goals are more likely to take on challenging tasks, use effective strategies, and have a positive attitude in class. These students are also more likely to believe that effort brings success (Ames & Archer, 1988). There is evidence that focusing on mastery goals produces positive outcomes in motivation and higher grades among high school students (Gutman, 2006). A large body of research has shown the achievement benefits of specific strategies such as goal setting (Schunk & Schwartz, 1993) and self-monitoring by recording one's progress (Zimmerman, Bonner, & Kovach, 1996).

During each quarter, students record reading goals for each lesson and points they earn for classwork, homework, and tests that make up their grade for the cycle. A self-assessment tool helps the students identify strengths and weaknesses and set personal goals. It also helps students stay organized. Students keep track of their work as they complete it, and identify the work they still need to master. As the teacher visits each team during one-to-one conferences, she initials work that students have done well, and helps them identify next steps.

During each lesson, teammates prepare each other to represent the team in a series of questions the teacher asks the class. Teachers choose students at random, and the students' teams earn points if their answers are correct and supported with evidence. Team points are recorded on posters. At the end of each 8-week cycle, high-scoring teams are recognized in a class celebration.

As students complete the quarterly standardized reading assessments, the results are added to the growing set of data about how they are performing. Students know that as soon as they show sufficient improvement in reading, they will move up to the next instructional level, or even skip a level.

Regardless of the level where students enter The Reading Edge, they receive explicit instruction in reading comprehension strategies, writing in response to text, vocabulary, fluency, and word-level study. The emphasis and level of difficulty adjusts at each level according to the needs of the students. The Reading Edge lessons form a bridge from level to level by shifting emphasis from simple to increasingly more complex tasks applied to increasingly more sophisticated text.

Assessment. All Reading Edge students are assessed using standardized reading measures and the 4Sight state-specific reading benchmark assessment. 4Sight assessments provide regular predictive information on progress toward success on state assessments (in this study, the Pennsylvania PSSA). 4Sight assessments for high schools are given at the beginning of the school year and then twice thereafter. 4Sight assessments in the high school grades are highly correlated with state test scores and can predict student, class, and school scores as well as subscales with great accuracy. Cross-form reliability for the Pennsylvania PSSA was $+0.79$ (Cheung & Slavin, 2005). 4Sight assessments are used to monitor students' progress toward success on the state test.

At the beginning of the school year, standardized reading and 4Sight scores are used to assign students to intensive leveled reading classes to be taught during regular daily reading periods. Every quarter, all students in the reading classes are re-assessed based on assessments, classroom performance, and teacher judgment. Students who are performing above the level of

their current group are accelerated to a higher-performing group. Otherwise, students continue to progress with their current group. Most Reading Edge students are accelerated in this way once or twice a year, making gains of about two grade levels each year.

4Sight subscales identify students' strengths and weaknesses in the five areas identified on the Pennsylvania System of School Assessment (PSSA): Comprehension and Reading Skills, Interpreting and Analyzing Fiction/Nonfiction Text, Learning to Read Independently, Reading Critically in All Content Areas, and Analyzing and Interpreting Literature. This information is used to allow teachers to spend more time on the portions of their lesson plans that focus on areas in which students are weak.

Teachers administer curriculum-based measures of reading achievement weekly in Reading Edge. These include written assessments of comprehension of both previously discussed and independently read text as well as vocabulary mastery, observational measures of metacognitive strategy use, measures of fluency and, at the lowest levels, phonics mastery. These measures enable teachers to make immediate adjustments in instruction to respond to student needs. In addition, teachers summarize and review progress. At the end of each quarter, they use these assessments to make recommendations for student placement and instructional focus for the next quarter. Trends in student progress are reported to the entire staff and students quarterly, and are compared to the goals for progress set by the staff and to each student at the beginning of the year and quarter.

Professional Development for Teachers. Extensive professional development and coaching support for teachers is critical to program success. Teachers receive detailed daily lesson guides as well as professional development and follow-up coaching to help them succeed with the program strategies and increase student achievement.

The Reading Edge uses an integrated approach to professional development that depends on ongoing coaching and follow-up as much as initial training. A three day program introduction workshop provides a conceptual overview of the program and then engages teachers in simulations, in which they work in cooperative groups to learn the content and processes. Videos and study guides are used to show key components. Detailed manuals and student materials help teachers put the lessons into practice and solve problems.

After an initial the workshop, SFA coaches visit teachers for coaching about once each month. Classroom observations are conducted, and are followed by small group discussions with teachers. Data from observations and both formal and informal classroom assessments of student progress are used to refine implementation of Reading Edge. Quarterly progress reviews by coaches apply benchmarks to categorize both student progress and implementation quality as the basis for establishing new goals for progress.

Methods

Research Question

What is the effect of participation in the adaptation of The Reading Edge on the reading achievement of high school students reading two or more years below grade level?

Research Design

This mixed-methods study compared the reading outcomes of ninth grade students in The Reading Edge (the RE group) and ninth grade students in matched schools taught using the English/Reading curriculum the school was already using (control group).

Nine schools in 3 districts participated in this study. Seven schools, four experimental and three control, were located in the Philadelphia Public Schools, a large, urban district that is racially and ethnically diverse. This district's student population is majority African-American, with approximately 70% of students eligible for free/reduced-priced lunch. In Philadelphia, students may attend their neighborhood school or, through a voluntary transfer program, apply to attend a special admission, city-wide admission, or another neighborhood school within the district. Students may also attend charter schools, career and technical training schools, or special learning academies. The participating schools were not highly selective and therefore had fewer high-achieving students than the highly selective schools.

The remaining two schools that participated (one experimental, one control) were located just outside of Philadelphia. Each of these was a public, neighborhood school in its own district. The student population in both of these districts was majority African-American, with a high proportion of students in poverty.

Existing Reading/English Programs

A variety of reading and English programs were utilized by all schools in each district, but what is common among the districts was a 'double period' for low-achieving students, who attend a basic English course and also attend a supplementary reading or English class. The type of supplementary class depends on their reading levels. In Philadelphia, students with low reading levels are placed in 'Intensive English' for one semester, and receive reading instruction

in an additional class. If they fail the English course, they repeat it in the second semester. Students who are less needy are placed in 'Strategic English' and may or may not attend a separate reading class. Students in the treatment schools used The Reading Edge as their supplemental curriculum. In control schools, the supplementary curriculum was Corrective Reading, Read to Achieve, or Read 180.

Sample and Matching

The 5 schools that implemented RE did so following an awareness session intended to ensure buy-in at the district, school administration, and teacher levels. Schools were offered materials and training at no cost. After experimental schools were identified, potential control schools that met matching criteria of percent free lunch, ethnic composition, and urbanicity, were identified using public data sets. Once district approval had been granted, we approached regional superintendents for permission to contact the eligible control schools. Administrators from control schools were then invited to a meeting to explain the study requirements. Control schools were provided with a payment of \$10,000 as an incentive, for allowing assessment of their students.

Measures and Data Collection

To assess achievement gains, eighth grade PSSA scores (for use as covariates) were obtained from school records, and Group Reading Assessment and Diagnostic Evaluation (GRADE) tests were administered as posttests. Additionally, classroom observations and teacher focus groups were carried out by SFA staff. These additional measures allowed us to

document the presence or absence of factors related to student achievement, including instructional practices and teacher beliefs.

Achievement Test Scores. Student level outcomes on the GRADE Level H provided the primary measure for this evaluation. Students' end-of-eighth grade reading achievement scores from the PSSA were used as covariates to adjust for pre-existing performance. The GRADE is a norm-referenced, group-administered test that measures vocabulary knowledge, and sentence and passage comprehension. GRADE reliabilities are mostly in the mid 0.90s. Concurrent validity with the ITBS is 0.69. Standard scores for the GRADE have a mean of 100 and a standard deviation of 15.

Classroom Observations. Observations occurred in January and February of 2010 and again in April 2010. The observation measure was loosely based on the *Authentic Classroom Observation Form* (Borman et al., 2000). Each observation consisted of three consecutive 15-minute intervals, followed by a summary section. The checklist for each of the three sections, as well as the summary, was divided into four key areas: instructional orientation, lesson purpose/relevance, and classroom organization, and management. Observations were conducted in ninth grade English and reading classes in each of the study schools.

Teacher Focus Groups. A teacher focus group was conducted at each school, with one SFA researcher moderating while another took notes. The purpose of the focus groups was to learn the teachers' perspectives on their work in three key areas: 1) Teaching reading strategy use, 2) Using cooperative learning, 3) Goal-setting and feedback in the classroom.

Statistical Analyses and Reporting

Analysis of Covariance (ANCOVA) was used to determine whether there were significant differences between each group's mean scores. Students' pretest (PSSA) scores were used as the covariate, to increase precision. Other quantitative data from the teacher surveys and classroom observations were analyzed using t-tests.

Results

Pretest Equivalence

Tables 1-2 summarize the composition of the groups in each condition. While the RE and control groups were generally comparable, there were significant differences in the numbers of students with Individual Education Plans (IEPs). In the Reading Edge group, 22% of students had IEPs, while only 16% of control students had IEPs ($\chi^2(1) = 11.52, p < .001$). However, assessments from many of the students with IEPs were incomplete or not scorable. In order to make a more meaningful comparison, we did not include students with IEPs in the analysis sample. Tables 2-4 reflect the final analysis sample.

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The proportion of students eligible for free or reduced-priced lunch, as well as gender and English language learner (ELL) status, were found to be well matched between conditions (see Table 2).

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Table 2 also shows the ethnicity of the students in the study. There were fewer African American students in the Reading Edge group than in control (67% vs. 85%; $\chi^2 (1) = 37.8, p < .001$) and there were more White students in the Reading Edge group (17% vs. 2%; $\chi^2 (1) = 53.9, p < .001$).

Student Achievement Outcomes

There were no significant differences between Reading Edge and control groups on the 8th grade PSSA test ($t < 1, n.s.$). Table 3 displays pretest results. The PSSA pretest scores were extremely low, 1.3 standard deviations below the state average, and 0.64 standard deviations below the Philadelphia average.

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Table 3 displays student outcomes on each subscale of the GRADE, as well as the GRADE total (sum of 3 subscales). There were small significant differences favoring the Reading Edge group at posttest on the GRADE total ($ES = +0.10; F (1, 840) = 3.73, p < .05$), controlling for PSSA pretests. There were also significant differences on the Vocabulary subscale ($ES = +0.20; F (1, 840) = 11.72, p < .001$). There were no significant differences on the GRADE Sentence Comprehension subscale ($ES = -0.04; F (1, 840) < 1, n.s.$), or on the GRADE Passage Comprehension subscale ($ES = +0.07; F (1, 840) = 1.53, n.s.$).

Tests for interactions with various factors were also carried out. Looking at the total GRADE scores, there were significant race by treatment interactions, with Hispanic students in Reading Edge, gaining more than other groups ($F(6, 827) = 2.6, p < .02$). However, there were no significant interactions with gender or pretest proficiency levels.

Classroom Observations

Data from the classroom observations provided information on whether there were observable instructional differences between the Reading Edge and control classrooms. Five observers were trained to use the observation instrument, and achieved 80% inter-rater reliability during practice sessions held the year prior to the study. These observers conducted two rounds of classroom observations. The same teacher was often observed repeatedly, especially if he or she taught multiple classes of different levels or subjects. At least two observations were completed for each reading and/or English teacher. For analysis purposes, multiple observations of each teacher were averaged. More teachers taught RE classes than control classes, as RE was taught during only one period. Teachers providing supplementary reading or English in other schools usually taught multiple sections.

Table 4 shows differences in teaching behaviors between Reading Edge and control classes during reading and English periods. Reading Edge classrooms used less whole-class instruction (traditional lecture) ($ES = -0.55$) and more cooperative learning ($ES = +0.69$), as expected. The two groups were comparable on ratings of purpose/relevance and organization.

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Observations suggest that, in RE schools, classroom practices changed in Reading Edge classes. In RE schools, both RE and English classrooms were found to include more small-group work with the teacher playing a facilitating role, a greater feeling of collegiality between teachers and students, and more positive feedback on student behavior, compared to reading and English classes in control schools. However, implementation quality was generally poor early in the year, and remained at low levels for many RE teachers.

The Teachers' Perspectives on the Classroom

Teachers in focus groups in RE schools reported more regular use of cooperative learning in the classroom, confirming the observation data. Other than level-of-use, however, the information shared by teachers in RE focus groups did not differ markedly from that shared by teachers in control schools. That is, teachers in both RE and control schools shared similar perceptions and opinions about teaching reading strategy use, using cooperative learning, and goal-setting and feedback activities with students.

Teaching Reading Strategy Use. Sixty-four percent of teachers at RE schools and 67% of teachers at control schools said that they taught reading strategies. In both Reading Edge and control focus groups, a limited number of teachers seemed able to actually name specific strategies. Across RE schools, 43 teachers named 23 recognized reading strategies, the most popular of which were *chunking*, *using context clues*, and *re-reading* (each named 4-5 times). Among the control schools, 23 teachers named 17 recognized reading strategies that they taught. *Summarizing* was named most often (4 times). When asked what helped them teach reading strategies, teachers in both conditions cited access to professional development, lasting commitment to a strategy on the part of administration (as opposed to continually changing the program or focus), and structured peer support.

Cooperative Learning. While almost all teachers claimed to use cooperative learning, 83% of RE teachers said that they had used it in the last week, as opposed to 58% of control teachers. This difference is consistent with the format of the RE program, which is structured around cooperative learning activities. Teachers' opinions about using cooperative learning in the classroom varied from school-to-school, both in RE schools and in control schools. Most teachers expressed positive experiences with cooperative learning (in control as well as RE schools): *"Kids got their teammates into shape to increase their grade. Over time, I've seen the progress. They don't want the group to fail. It's pack rule."* (English teacher – RE school)
"It's easier classroom management. The groups versus the students are the unit of instruction." (English teacher, control school)

Optimal group size was said to be anywhere from 2-6, with variation from one teacher to the next. At every RE school and 4 of 5 control schools, almost every teacher said that he or she allowed students to group themselves. Many teachers said that they would tweak these groups, based on student behavior, which was the key consideration in forming student groups or teams. *"I know we're supposed to put groups together, mixed gender, mixed by race, but behavior decisions ultimately overrule heterogeneous grouping."* (RE teacher)

Most teachers in both RE and control groups said that when using cooperative learning, they graded both individual and group work products. Only 1-2 teachers in RE and in control sites said that they assigned a grade for team process or explained *how* students worked together.

Some teachers, however, did not support cooperative learning: *"I just shifted to rows. It's awesome! (The students) can't see each other!"* (English teacher, RE school)

Goal Setting and Feedback. Some difference between RE and control schools was noted in the area of goal-setting and feedback. RE teachers described academic goals for

individual students, and academic *or* behavioral goals for groups (class or team). Among control teachers, in contrast, individual goals could be academic or behavioral, but group goals were almost all academic. The use of more group-level behavior goals by teachers at RE schools supports the significantly higher level of positive behavioral feedback noted by observers.

Teachers at one RE school seemed more advanced in creating and monitoring thoughtful goals with regular feedback for students.

“Everyone with homework gets a pizza party –as well as the Top Ten, [and] good teamwork gets a reward, as well as bonus points for grades for everyone. 80% and up gets a reward.” (RE teacher)

“I do self-assessment (on cooperation) at the end of the week. They’d set a goal or I would, and I’d post it, and at the end of the week I’d ask them to review it and whether they’d done it. They’re pretty honest.” (English teacher – RE school)

Discussion

The findings of this first evaluation of The Reading Edge in inner-city high schools found uneven implementation and uneven outcomes. There were clear positive effects on the GRADE Reading Vocabulary scale (ES = +0.20, $p < .001$), but no significant differences on Sentence Comprehension (ES = -0.04, n.s.) or Passage Comprehension (ES = +0.07, n.s.). The overall effect size was +0.10 ($p < .05$), a modest but statistically significant difference. The size of this impact might be put in context by the finding from other research to the effect that high school students typically make very little gain from year to year in reading. Yet these students, scoring

far below grade level, have a long way to go to catch up to expected levels, and the modest impact reported here has a limited effect on this gap.

The overall effect size was similar to the effect size of +0.15 found in the one-year randomized evaluation of the middle school version of The Reading Edge by Chamberlain et al. (2007), but was less than the effect size of +0.33 reported from a matched, three-year evaluation of a middle school application of the program by Slavin, Daniels, & Madden (2005).

A key problem in the present study involved the quality of implementation. In these very difficult high-poverty urban schools, many teachers had serious problems with classroom management, student absenteeism, and lack of motivation, and implementation took a long time to establish at an adequate level. Also, most control schools were also using programs with strong evidence of effectiveness: Corrective Reading and Read 180 (Slavin et al., 2008). Focus group interviews and teacher surveys indicated that control teachers also reported use of cooperative learning and metacognitive reading strategies, though not at the same level as teachers implementing The Reading Edge. Also, it is important to note that all control students were in supplemental reading classes. Many studies of secondary reading strategies have compared students receiving reading interventions to those not receiving any supplementary reading instruction (Slavin et al., 2008).

For most Reading Edge teachers, the year of the experiment was their first year of implementing the program, and they developed skill with it gradually over the school year. Had the experiment gone on for a second year, with confident teachers implementing the program with a higher degree of fidelity from the beginning of the year, larger impacts might have been obtained.

The greater gains that were obtained by the Reading Edge students in comparison to controls were important in establishing that cooperative learning can be effectively used in high-poverty inner-city high schools. These schools, often castigated as “dropout factories,” are frequently targeted for takeover, closure, replacement by charter schools, and other draconian measures, yet research on outcomes of these extreme interventions generally finds that outcomes are no better (see Cohen & Moffitt, 2009). The cooperative learning intervention evaluated in this study was carried out by ordinary teachers in some of Philadelphia’s toughest high schools. The positive effects obtained may offer hope that such schools can be improved from the inside, by the teachers already in them. Later versions of The Reading Edge, revised to take into account the lessons learned in the first evaluation, may progressively improve outcomes for these at-risk adolescents. In particular, if these strategies are infused into all grades and other subjects, more students may ultimately graduate with higher levels of performance, making their success in further school and in the world of work more likely.

At a larger perspective, what is most disturbing about the experience of implementing The Reading Edge in Philadelphia non-selective high schools is how low students’ reading performance was at pretest. Perhaps the best intervention for urban high schools would be improving reading performance in elementary and middle schools. Once students have reached ninth grade with years of reading failure behind them, it is difficult to get many of them interested in reading. Effective and replicable interventions are needed for high school students, of course, but there is no reason they should be necessary for so many students, as there are many effective classroom approaches for high-poverty elementary and middle schools (see Slavin et al., 2008, 2009), and there are effective tutorial approaches for struggling readers

(Slavin et al., 2011). Had students experienced those effective programs in the earlier grades, they would presumably not have arrived in high school so deficient in this essential skill.

Further, development and research are needed to find more effective interventions for urban high school students with poor reading skills. At present, there are very few replicable approaches known to be effective. The results of the study reported here have shown promise for the Reading Edge approach, but a great deal more development and research are needed to create an approach capable of making substantial differences in high school reading.

References

- ACT, Inc. (2006). *Reading between the lines: What the ACT reveals about college readiness in reading*. Iowa City, IA: Author.
- Alliance for Excellent Education (2001). *Meeting the challenge: The role of school leaders in turning around the lowest-performing high schools*. Washington, DC: Author.
- American Diploma Project. (2004). *Ready or not: Creating a high school diploma that counts*. Washington, DC: Achieve, Inc.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80, 260-267.
- Au, K.H. (2000). A multicultural perspective on policies for improving literacy achievement: Equity and excellence. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. III) (pp. 835-851). Mahwah, NJ: Lawrence Erlbaum Associates.
- Balfanz, R., & Letgers, N. (2004). *Locating the dropout crisis: Which high schools produce the nation's dropouts? Where are they located? Who attends them?* Baltimore, MD: Center for Research on the Education of Students Placed At Risk (CRESPAR), Johns Hopkins University
- Barton, M.L. et al. (2002). Teaching reading in mathematics and science. *Educational Leadership*, 60 (3), 24-31.
- Barr, R. (1987). Content coverage. In M. J. Dunkin (Ed.), *International encyclopedia of teaching and teacher education*. New York: Pergamon.
- Beck, I., McKeown, M. & L. Kucan. (2002) *Bringing words to life*. New York: The Guilford Press.

- Biancarosa, G., & Snow, C. (2004). *Reading Next: A vision for action and research in middle and high school literacy*. New York: Carnegie Corporation of New York.
- Blachowicz, C., Fisher, P., Ogle, D., & Watts-Taffe, S. (2006). Vocabulary: Questions from the classroom. *Reading Research Quarterly*, 41 (4), 524-539.
- Bloom, H., Thompson, S. L., & Unterman, R. (2010). *Transforming the high school experience*. New York: MDRC.
- Calhoon, M. (2005). Effects of a peer-mediated phonological skill and reading comprehension program on reading skill acquisition for middle school students with reading disabilities. *Journal of Learning Disabilities*, 38(5), 424-433.
- Chamberlain, A., Daniels, C., Madden, N., & Slavin, R. (2007). A randomized evaluation of the Success for All Middle School reading program. *Middle Grades Research Journal*, 2 (1), 1-21.
- Cheung, A., & Slavin, R.E. (2005). *4Sight reading benchmark version 2005-06, second edition: Technical report for Pennsylvania*. Baltimore: Success for All Foundation.
- Cohen, D. K., & Moffitt, S. L. (2009). *The ordeal of equality: Did federal regulation fix the schools?* Cambridge, MA: Harvard University Press.
- Collins, V.L., Dickson, S.V., Simmons, D.C., & Kame'enui, E.J. (2003). *Metacognition and its relation to reading comprehension: A synthesis of the research*. Eugene, OR: University of Oregon, National Center to Improve the Tools of Educators.
- Dolan, L. J., Kellam, S. G., Brown, C. H., Werthamer-Larsson, L., Rebok, G. W., Mayer, L. S., Laudolff, J., Turkkan, J. S., Ford, C., & Wheeler, L. (1993). The short-term impact of two classroom-based preventive interventions on aggressive and shy behaviors and poor achievement. *Journal of Applied Developmental Psychology*, 4, 317-345.

- Emmer, E., Evertson, C., & Worsham, M. (2009). *Classroom management for secondary teachers (8th ed.)*. Boston, MA: Allyn & Bacon.
- Freiberg, H. J., Connell, M. L., & Lorentz, J. (2001). Effects of Consistency Management on student mathematics achievement on seven Chapter I elementary schools. *Journal of Education for Students Placed at Risk*, 6 (3), 249–270.
- Fuchs, L.S., Fuchs, D., & Kazdan, S. (1999). Effects of peer-assisted learning strategies on high-school students with serious reading problems. *Remedial and Special Education*, 20, 309-318.
- Good, T., Grouws, D., & Ebmeier, H. (1983). *Active mathematics teaching*. New York: Longman.
- Graves, M. (2006). *The vocabulary book*. New York: Teachers College Press.
- Gutiérrez, R., & Slavin, R.E. (1992). Achievement effects of the nongraded elementary school. A best-evidence synthesis. *Review of Educational Research*, 62, 333-376.
- Gutman, L. M. (2006). How student and parent goal orientations and classroom goal structures influence the math achievement of African Americans during the high school transition. *Contemporary Educational Psychology*, 31 (1), 43-63.
- Hawkins, J.D., Doueck, H.J., & Lishner, D.M. (1988). Changing teaching practices in mainstream classrooms to improve bonding and behavior of low achievers. *American Educational Research Journal*, 25, 31-50.
- Hawkins, J. D., Guo, J., Hill, K., Battin -Pearson, S., & Abbott, R. (2001). Long-term effects of the Seattle social development intervention on school bonding trajectories. *Applied Developmental Sciences*, 5, 225-236.
- Kagan, S. (2001). Teaching for character and community. *Educational Leadership*, 59 (2), 50-55.

- Kaufman, P., Alt, M., & Chapman, C. (2004). *Dropout rates in the United States: 2001* (NCES 2005-046). U.S. Department of Education. National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Kemple, J. (2004). *Career Academies: Impacts on labor market outcomes and educational attainment*. New York: MDRC.
- Kemple, J. J., Herlihy, C. M., & Smith, T.J. (2005). *Making progress toward graduation: Evidence from the Talent Development High School model*. New York: MDRC.
- National Center for Educational Statistics. (2010). *The nation's report card: Grade 12 reading and mathematics 2009 national and pilot state results* (NCES 2011-455). Washington, DC: US Department of Education, NCES.
- O'Donnell, A.M. (2000). The effects of explicit incentives on scripted and unscripted cooperation. *Journal of Educational Psychology*, 88 (1), 74-86.
- O'Donnell, J., Hawkins, J. D., Catalano, R. F., Abbott, R. D., & Day, L. E. (1995). Preventing school failure, drug use, and delinquency among low-income children: Long-term intervention in elementary schools. *American Journal of Orthopsychiatry*, 65 (1), 87–100.
- Paris, S.C., & Paris, A.H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36 (2), 89-101.
- Pressley, M. (2003). Psychology of literacy and literacy instruction. In W.M. Reynolds & G.E. Miller (Eds.), *Handbook of psychology*, Volume 7 (pp. 333-356). Hoboken, NJ: Wiley.
- Pressley, M., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Cambridge, MA: Brookline.

- Quint, J., Bloom, H., Black, A., & Stephens, L. (2005). *The Challenge of scaling up educational reform: Findings and lessons from First Things First. Final report.* New York: MDRC.
- Schunk, D.H., & Swartz, C.W. (1993). Goals and progress feedback: Effects of self-efficacy and writing instruction. *Contemporary Educational Psychology, 18*, 337-354.
- Schunk, D.H., & Zimmerman, B.J. (2003). Self-regulation and learning. In W.M. Reynolds & G.E. Miller (Eds.), *Handbook of psychology, Volume 7* (pp. 59-78). Hoboken, NJ: Wiley.
- Slavin, R.E. (1995). *Cooperative learning: Theory, research, and practice* (2nd Ed.). Boston: Allyn & Bacon.
- Slavin, R.E., Cheung, A., Groff, C., & Lake, C. (2008). Effective reading programs for middle and high schools: A best evidence synthesis. *Reading Research Quarterly, 43* (3), 290-322.
- Slavin, R.E., Daniels, C., & Madden, N.A. (2005). The Success for All Middle School: Adding content to middle grades reform. *Middle School Journal, 36* (5), 4-8.
- Slavin, R.E., Hurley, E.A., & Chamberlain, A.M. (2003). Cooperative learning and achievement: Theory and research. In W.M. Reynolds & G.E. Miller (Eds.), *Handbook of psychology, Volume 7* (pp. 177-198). Hoboken, NJ: Wiley.
- Slavin, R. E., Lake, C., Chambers, B., Cheung, A., & Davis, S. (2009). Effective reading programs for the elementary grades: A best-evidence synthesis. *Review of Educational Research, 79*(4), 1391-1465.
- Slavin, R. E., Lake, C., Davis, S., & Madden, N. (2011). Effective programs for struggling readers: A best-evidence synthesis. *Educational Research Review, 6*, 1-26.

- Stevens, R.J., & Durkin, S. (1992). *Using Student Team Reading and Student Team Writing in middle schools: Two evaluations*. Baltimore, MD: Johns Hopkins University, Center for Research on Effective Schooling for Disadvantaged Students.
- Webb, N.M., & Palincsar, A.S. (1996). Group processes in the classroom. In D.C. Berliner & R.C. Calfee (Eds.), *Handbook of educational psychology*. New York: Simon & Schuster Macmillan.
- Zimmerman, B.J., Bonner, S., & Kovach, R. (1996). *Developing self-regulated learners: Beyond achievement to self-efficacy*. Washington, DC: American Psychological Association.

Table 1
Distribution of Students with IEPs

Condition	IEP	No IEP	Totals
RE	100	349	449
Control	81	493	574
Totals	181	842	1023

Table 2
Free/Reduced-Price Lunch, Gender, English Language Learners Status, and Ethnicity
for RE and Control Groups

Condition	Total - Student	F/R Lunch	Female	Male	ELL	AA	Hispanic	White	Asian	Other
RE	349	67.0%	187 (54%)	162 (46%)	24 (7%)	234 (67%)	34 (10%)	58 (16%)	16 (5%)	7 (2%)
Control	493	65.3%	234 (48%)	259 (52%)	34 (7%)	419 (85%)	54 (11%)	12 (2%)	5 (1%)	2 (1%)
Totals	842		421	421	58	653	88	70	21	9
		t = -0.73	$\chi^2 = 2.77$		$\chi^2 = 0.65$	$\chi^2 = 58.25^{***}$				

***<.001

Table 3

**Analysis of Covariance
Student Performance on the GRADE**

Descriptive Statistics:	# of Students	Vocabulary			Sentence Comp			Passage Comp			Total		
		Means	Adjusted Means	Standard Deviation	Means	Adjusted Means	Standard Deviation	Means	Adjusted Mean	Standard Deviation	Means	Adjusted Means	Standard Deviation
RE	349	19.01	18.90	5.85	8.63	8.55	4.03	16.22	16.11	5.76	43.87	43.56	13.86
Control	493	17.70	17.78	5.74	8.66	8.72	4.16	15.65	15.73	5.57	42.01	42.23	13.58
Effect Size				+0.20***			-0.04			+0.07			+0.10*

*p<.05

***p<.001

Table 4
Independent *t*-Test of the Difference between Reading Edge and Control Classrooms on Observation Variables
Reading and English Classes

		Whole-Class Oriented		Cooperative Learning		Purpose/Relevance		Organization	
Descriptive Statistics:	# Classes	Means	Standard Deviation	Means	Standard Deviation	Means	Standard Deviation	Means	Standard Deviation
RE	44	4.41	2.49	3.04	3.25	4.24	2.81	5.17	2.77
Control	21	5.47	1.93	1.43	2.33	4.71	2.34	4.55	2.49
Effect Size			-0.55 ^a		0.69*		-0.20		0.25

^a p<.10

*p<.05