

The Effectiveness of Out-Of-School-Time Strategies in Assisting Low-Achieving Students in Reading and Mathematics: A Research Synthesis

Background

The No Child Left Behind (NCLB) Act of 2001 places new pressure on schools to provide effective out-of-school-time (OST) strategies (e.g., after-school, summer, and weekend programs) to improve student achievement. NCLB requires schools to not only ensure that all students demonstrate proficiency in mathematics and reading, but also provide supplementary education services, such as after-school programs, to students who fall short of these goals.

Research to date has painted a mixed picture of these programs' effectiveness. For example, the first year evaluation of the federal 21st Century Community Learning Centers program¹ found no statistically significant effects of these after-school programs on mathematics or reading. However, given the uneven quality of local programs, a closer examination is needed to determine which OST strategies work and which do not.

To provide this closer examination, McREL researchers analyzed all rigorous research conducted since 1984 on the impact of OST strategies in improving the reading and mathematics achievement of low-achieving or at-risk students.

Methodology

We began with an exhaustive literature search of all research and evaluation studies (pub-

¹ U.S. Department of Education. (2003). *When schools stay open late: The national evaluation of the 21st-century community learning centers program. First year findings.* (No. PR02-82). Washington, DC: U.S. Department of Education, Office of the Under Secretary.

Key findings

- OST strategies can have positive effects on the achievement of low-achieving or at-risk students in reading and mathematics.
- The timeframes for delivering OST programs (i.e., after or summer school) do not influence their effectiveness.
- Students in early elementary grades are more likely than older students to benefit from OST strategies for improving reading, while older students may benefit more from OST strategies to improve math.
- OST strategies need not focus solely on academic activities to have positive effects on student achievement.
- OST strategies that provide one-on-one tutoring for low-achieving or at-risk students have strong positive effects on student achievement in reading.

lished and unpublished) conducted after 1984 that examined the effectiveness of a program, practice, or strategy delivered outside the regular school day for low-achieving or at-risk K–12 students. Through this search, we identified a total of 371 studies. Until now, most reviews of research on OST programs have not systematically taken into account the methodological rigor of this research. To address this concern, we narrowed our analysis to only those studies — 56 in all — that used comparison/control groups to measure student achievement in reading and/or mathematics.

We quantitatively synthesized the results of these studies using a meta-analytic method to estimate the overall expected impact of OST strategies on student achievement. Results were further analyzed for the influence of “moderators” of effect, including time-

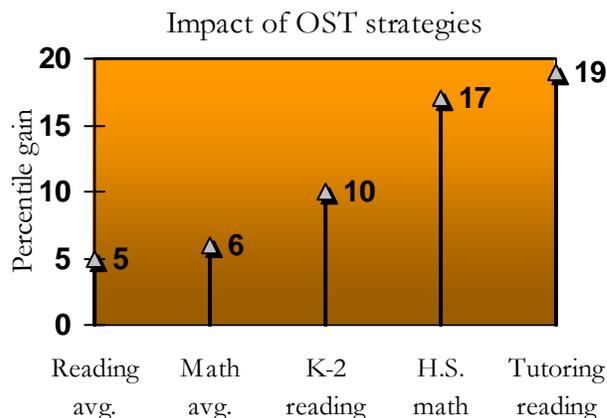
frame (after school or summer), grade level of students, focus of strategies (academic or academic and social), duration of the OST program, and grouping of students (large or small groups or one-on-one tutoring).

Findings

Overall findings. The synthesis resulted in statistically significant positive effects of OST on student achievement in both reading and math. Overall effect sizes ranged from .06–.13 standard deviations for reading and .09–.17 standard deviations for math, depending on the method used for weighting sample sizes. These effect sizes can be statistically converted into achievement gains of, respectively, up to 5 or 6 percentile points (see chart)².

Although these effect sizes may appear to be small, it is important to note that most of these programs are of relatively short duration compared to overall school day or calendar. In addition, these gains were achieved with students who struggle most to learn. It is also important to point out that some programs had much larger effect sizes, as discussed in the following section.

Moderators. We found that the timeframe for delivery of OST strategies did not have a statistically significant influence. Grade level was, however, a statistically significant moderator of effect sizes for both reading and mathematics outcomes. For reading, the largest average positive effect size (.26 based on 14 effect sizes, a gain of 10 percentile points) occurred for students in the lower elementary grades (K–2). For mathematics, the largest



average positive effect size (.44 based on five effect sizes, a gain of 17 percentile points) was for students in high school (9–12).

For reading outcomes, activity focus did not have a statistically significant impact on achievement. For math, strategies that were both academic and social had a slightly higher mean effect size than those that were mainly academic. For both reading and math, effect sizes were larger for OST programs that were more than 45 hours in duration. However, programs with the longest durations (210+ hours for reading and 100+ hours for mathematics) had the lowest effect sizes.

Overall, the largest average positive effect size (.50 based on five effect sizes, a gain of 19 percentile points) occurred for the reading strategies that used one-on-one tutoring. In summary, our findings suggest that certain program features can result in even higher positive effects of OST on student achievement.

Citation

Lauer, P.A., Akiba, M., Wilkerson, S.B., Apthorp, H.A., Snow, D., and Martin-Glenn, M. (2003). *The effectiveness of out-of-school-time strategies in assisting low-achieving students in reading and mathematics*. Aurora, CO: Mid-continent Research for Education and Learning.

The full report is available online at www.mcrel.org/PDF/SchoolImprovementReform/5032R_RSOSTeffectiveness.pdf.

² To interpret these percentile gains, imagine two groups of at-risk/low-achieving students that are identical except Group A receives a particular OST strategy and Group B does not. Our findings suggest that if both groups are given the same standardized achievement test, Group A's mean scores would be x percentile points higher than Group B's.