

Use of Accelerated Reader and Accelerated Math Shown to Increase Student Scores in Texas

Summarized from Nunnery, J. A., & Ross, S. M. (2007). The effects of the School Renaissance program on student achievement in reading and mathematics. *Research in the Schools*, 14(1), 40–59.

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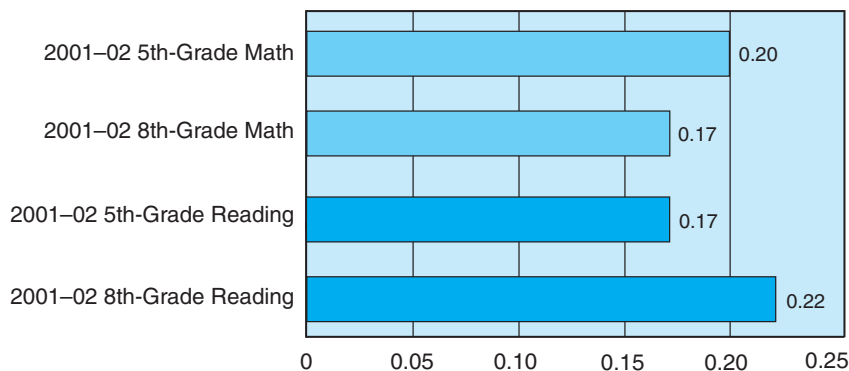
Introduction

This study was a quasi-experimental investigation of the effects of Accelerated Reader™ (AR™) and Accelerated Math™ on student achievement in grades 3 to 8 in a suburban Texas school district (McKinney Independent School District). The purpose of the study was to determine the effects of these tools, implemented as part of a school reform model, on students’ reading and mathematics achievement.

Research Questions

How do schools using Renaissance Learning’s progress-monitoring tools compare to matched schools not using these tools? Are there differences in reading and math achievement? Are there differences between elementary and middle school students? How does level of implementation affect student achievement?

Effect Size by Cohort
Statistically Significant Gains in TAAS Reading and Math Scores



Implementation Intensity Grades 3, 4, and 5

Assessment	High Implementation	Low Implementation	Significant Difference ¹
Number of Renaissance Certified Teachers per 100 Students	8.93	3.99	Yes
Reading Mean Index Score	74.00	50.20	Yes
Math Mean Index Score	36.25	12.60	Yes

Main Findings

- Renaissance Learning personalized practice and progress-monitoring tools, Accelerated Reader and Accelerated Math, contributed to increased achievement in reading and math as measured on state assessments.
- Students in schools with high levels of implementation experienced significantly higher achievement in both reading and mathematics.

Researcher Background

John A. Nunnery, Ph.D., is an assistant professor in the Department of Educational Leadership and Counseling at Old Dominion University where he teaches program evaluation, planning, and advanced statistics. He received a doctorate in educational psychology and research from the University of Memphis in 1995. Since then, he has published more than 20 research articles in peer-reviewed journals.

Steven M. Ross, Ph.D., is a Faudree Professor and executive director of the Center for Research in Educational Policy at the University of Memphis. He received his doctorate in educational psychology from Pennsylvania State University. Dr. Ross is the author of six textbooks and more than 120 journal articles in the areas of educational technology and instructional design, at-risk learners, educational reform, computer-based instruction, and individualized instruction.

Study Description

This retrospective, quasi-experimental, longitudinal study compared student achievement on the Texas Assessment of Academic Skills (TAAS) and Texas Learning Index between nine elementary and two middle schools in the McKinney Independent School District using Accelerated Reader and Accelerated Math, and matched control schools not using these personalized practice and progress-monitoring tools. Grades 3–8 were included in the study. The 11 schools implemented Accelerated Reader over a 5-year period. Accelerated Math was implemented for the last year of the study district wide but had been piloted in some schools the previous year. Comparison schools for each McKinney school were selected from the Texas Education Agency’s list of comparable schools, based on school performance and demographic characteristics (comparable socioeconomic and ethnic populations).

Repeated-measures analyses were performed to estimate program effects on reading and mathematics achievement while controlling for baseline performance, poverty levels, and the school group (treatment school or control school). The impact of implementation fidelity on student achievement was also examined.

Results

Study results show increases in reading and math achievement for students who used Accelerated Reader and Accelerated Math as compared to students in the control schools. McKinney elementary students made statistically significant progress in reading and math, and middle school students did so in math. Reading outcomes for the middle school students using AR were also positive, though not statistically significant.

Four out of six cohorts in the study were found to have statistically significant effects, reported as Cohen’s $d = +0.20$, or about one-fifth of a standard deviation higher than comparison students (see graph). This effect size is substantial compared to average effects for other school reform models (e.g., In a 2002 review, Borman²

reported the “most successful” school reform models as having an effect size range of +0.17 to +0.21.)

The two cohorts that did not experience statistically significant differences (2000–01 and 2001–02 eighth-grade reading) did, however, produce directionally positive effects using AR. In all, the results show a median effect size of +0.17 for the entire study.

The performance of two fifth-grade student subgroups—English Language Learners (ELLs) and free/reduced-price lunch eligibility—was also examined. When using Accelerated Reader and Accelerated Math, these students had gains that outpaced their counterparts in both subjects; however, the subgroups were too small to warrant tests of statistical significance.

The researchers also examined the impact of implementation intensity, or fidelity, on student outcomes compared to their matched controls. Implementation intensity is the degree to which Renaissance Learning software is implemented according to the company’s scientifically research-based best practices. In schools designated as having high levels of implementation, students experienced significantly higher achievement levels in both reading and mathematics than students in similar comparison schools, after controlling for students’ prior achievement and socioeconomic status (see table).

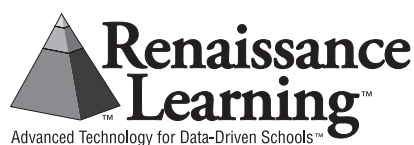
Lower intensity implementation resulted in directionally higher achievement, but the difference between control and other McKinney schools was not significant. Students attending schools with high implementation scored significantly higher than students attending comparison schools or low-intensity schools.

Conclusion

Students in schools using Accelerated Reader and Accelerated Math experienced achievement gains significantly greater than matched control schools. Increases were significantly higher for those following AR or AM Best Practices™ with full fidelity.

¹ Results show a statistically significant difference between low implementation and high implementation at $p < .01$.

² Borman, G. D., Hewes, G., Rachuba, L. T., & Brown, S. (2002). *Comprehensive school reform and student achievement: A meta-analysis*. Baltimore: Johns Hopkins University, Center for Research on Students Placed At Risk.



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