# **Quarterly** Research Note



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## Introduction

Welcome to the fourth issue of the Quarterly Research Note (QRN), a research brief that reflects Accelerate's approach to learning what educational interventions work, for which students, and under what conditions.

In this issue, we profile Accelerate's latest research report, "Conducting Cost Analysis of Tutoring Interventions: A Guide for Program Providers and Researchers," in which we describe the value of collecting and estimating program costs in the education field, summarize existing approaches to costing out educational interventions, and draw upon existing literature to present a standardized approach (and an applied tool) to conduct cost analysis of tutoring interventions.

In this issue's Research Roundup, we profile Deans for Impact, an Accelerate grantee that trains tutors to implement high-quality instructional materials (HQIM); and Guilford County Schools, an Accelerate grantee that is scaling a district-designed in-person tutoring program to reach students

with the greatest academic need. We then profile two randomized controlled trials (RCT) evaluating the impact of Accelerate grantees during the 2023-24 school year: ROOTS, an in-person math tutoring program for early elementary students; and Reading Futures, a virtual tutoring program delivering early elementary literacy instruction to students with dyslexia.

In Looking Ahead, we preview Accelerate's forthcoming report which will synthesize key research findings from our 2023-24 cohort of Call to Effective Action (CEA) grantees. We then preview Accelerate's forthcoming approach to identifying and studying the design, implementation, impact, and costeffectiveness of Al-enabled tools.

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## **Conducting Cost Analysis of Tutoring Interventions**

In a post-pandemic climate marked by sustained declines in student achievement and the end of federal fiscal aid, "Does it work?" is a necessary though no longer sufficient question to ask about educational investments. Instead, "Is it worth it?" must be the focus of policymakers and school leaders when considering which educational interventions to support with increasingly limited educational budgets.

In May 2024, Accelerate introduced an approach to measure and estimate the return on educational investments which requires both a valid estimate of program impact and data on the total cost of implementing an educational intervention. The return on educational investments, or a program's cost-effectiveness, is defined as the additional months of student learning gained by investing \$1,000 per pupil, and can be widely applied to all educational interventions. Yet, while the cost of implementing an educational program or intervention provides critical information to multiple stakeholders, program costs tend to be absent from program evaluations, limiting insight into the return on educational investments.

In February 2025, Accelerate released a report titled "Conducting Cost Analysis of Tutoring Interventions: A Guide for Program Providers and Researchers." In this report, we:

- 1. Describe the value of collecting and estimating program costs in the education field;
- 2. Summarize existing approaches to costing out educational interventions; and
- 3. Draw upon existing literature, in particular the Ingredients Method, to present a standardized approach to costing out educational interventions.

Accompanying this report is Accelerate's <u>cost analysis tool</u>, designed specifically for conducting cost analysis of tutoring programs. This report and accompanying cost analysis tool provides program providers and researchers with a standardized approach and an applied tool to conduct rigorous cost analysis of educational programs and interventions. In doing so, we aim to address the relative dearth of program cost estimates currently available in the education field. By increasing the frequency with which cost analysis is conducted, this work will provide guidance to inform program planning and implementation and the necessary information to conduct a variety of cost-related analyses. The greater prevalence of program cost data and associated cost-related metrics (e.g., cost-effectiveness) will serve to reduce existing information asymmetries in the tutoring market and will support ongoing decision-making among policymakers and educational leaders who are investing scarce resources to improve student learning.

We propose the following applications of the cost tool and policy recommendations associated with cost-related information:

- Accelerate and other sponsors of applied research should require programs and interventions to conduct program-specific cost analysis as part of their grant oversight process.
- **Researchers** should include estimates of program cost alongside estimates of program impact as part of a complete program evaluation.

- School and district leaders should require cost-effectiveness estimates based on high quality impact evaluations and transparent cost analyses in their procurement decisionmaking.
- State policymakers should require evidence on program costs from vendors applying to state-approved vendor lists.
- Program providers should engage in ongoing cost analysis of their programs and interventions to support continuous improvement.

Taken together, the application of this cost tool alongside the use of cost-related information generated by this tool should improve the identification of program models that efficiently and effectively improve student learning. Doing so is necessary to not just reduce existing information asymmetries in the tutoring market, but most critically, to support decisionmaking among policymakers and educational leaders who are allocating scarce educational resources to improve student learning.

**Part Two** 

# Research Roundup

In this Research Roundup, we describe new and emerging findings on the implementation (Deans for Impact and Guilford County Schools) and impact (ROOTS and Reading Futures) of tutoring from Accelerate's 2023-24 portfolio of grantees.<sup>1</sup>

## Training Tutors in High-Quality Instructional Materials (HQIM)

In QRN 1.1, we profiled research from Accelerate's portfolio of grantees that underscored the importance of tutor training and professional development as a key implementation feature in the delivery of high-dosage tutoring. A <u>study of eight Accelerate-funded grantees in the 2022-23 school year</u> highlighted the importance of supporting teacher and tutor training and professional development through: (i) the provision of high-quality (and often scripted) curriculum materials; and (ii) ongoing coaching and feedback. Prior research from Accelerate grantees in Baltimore City Public Schools (BCPS) and <u>Oakland</u> further showed that tutor support and feedback can help tutors feel better integrated into the school community, while also ensuring that the tutoring sessions occur in alignment with the school's teaching culture.<sup>2</sup>

Deans for Impact (DFI), an Accelerate grantee, has designed an approach to train and support tutors on the implementation of high-quality instructional materials (HQIM) during high-dosage tutoring sessions. The approach relies on four asynchronous training modules to prepare tutors on key components of instructional decision-making, enabling tutors to understand, analyze, and apply HQIM concepts to support their delivery of high-dosage tutoring. DFI designed this training approach to be scalable; for example, this training can be integrated into educator preparation programs as well as ongoing training provided by tutoring providers outside of teacher certification programs.

<sup>1</sup> Public versions of the Guilford County Schools (GCS) and ROOTS studies have not been shared but are available upon request.

<sup>2</sup> Public versions of the Baltimore City Public Schools (BCPS) study have not been shared but are available upon request.

In Spring 2023, DFI partnered with four sites to explore the implementation of HQIM modules for tutor professional development and the conditions associated with implementing tutor training across diverse tutoring programs. The four sites included: (i) a teacher preparation program in Ohio, where aspiring teachers serving as high-impact tutors completed the modules as part of a required math methods course for their teacher preparation program; (ii) an educator preparation program in Texas, where aspiring teachers completed the modules as part of their elementary math methods course while completing a semester-long work-based learning experience as part of their program; (iii) a statewide tutoring program on the East Coast, where aspiring teachers serving as tutors as well as other volunteer tutors completed the modules as part of their mandated tutor training; and (iv) a private non-profit university in the Midwest, where undergraduate students serving as tutors through a college-wide initiative completed the modules as part of the community-based component of their educational psychology course.

In a study of DFI's tutor training program, researchers from Texas A&M University and the University of Virginia examined two related constructs of the intervention: the modules and the tutors. First, the researchers examined the implementation of the practicebased tutor training across diverse tutoring programs, identifying important contextual features that might support module implementation; and second, the researchers examined the tutor experience, including whether there were changes in tutor beliefs, knowledge, and career plans. Relying on interviews, surveys, and formative assessments across the four study sites throughout the implementation period (spring 2023 semester), the researchers found that the training modules were easily integrated into existing course structure as well as assessments (e.g., exit tickets), and that the module content reinforced topics that were already being taught in the courses, supporting the seamless implementation of HOIM into course content and tutor

#### STUDY SNAPSHOT | Deans for Impact

**PUBLISHED:** February 2024

**RESEARCH TEAM:** Andrew Kwok, Brendan Bartanen & Michelle Kwok (Texas A&M University, University of Virginia)

STUDY PERIOD: Spring 2023

RESEARCH METHOD: Descriptive

**STUDENT GROUP(S) STUDIED:** Tutors from four educator preparation programs

## STUDY OUESTIONS:

- How were the tutor training modules implemented?
- To what extent did interacting with the training modules change the knowledge, beliefs and career plans of tutors?

#### **KEY FINDINGS:**

- Modules were easily integrated into existing educator preparation programs, however, there were usability challenges and some tutors found it challenging to balance coursework, tutoring and the modules.
- Notable gains (20 percentage points) in assessment response accuracy across all four sites.
- Tutors felt more prepared after accessing the modules but there was little change in their commitment to teaching. There were some increases in attitudes about teaching math.

#### **KEY TAKEAWAYS:**

- Modules of this nature could become a component of educator preparation programs because of the ease of integrating them into existing programs. However, usability concerns would need to be addressed.
- The modules successfully taught key content to participants that was on the assessment. Changes in attitude, beliefs and career plans were less clear.

training. Regarding tutor experience, the researchers found that the modules helped tutors gain self-confidence and preparedness by providing opportunities to practice authentic teaching skills in small settings and enhance professional areas such as building student relationships, being responsive within school sites, and content differentiation. The HQIM intervention was also associated with

nearly equivalent growth in tutoring knowledge across the four sites and growth in tutors' attitudes and dispositions for teaching math.

Thus, tutor training modules focused on supporting tutor training and the implementation of HQIM could support educator preparation programs because of the ease of integrating them into existing programs. At the same time, the researchers found that the modules required iterative improvements in their usability and suggest that DFI continue to refine the technical and content structure of the HOIM modules.

## **Scaling District-Designed Tutoring Initiatives**

The urgency to scale high-dosage tutoring has never been greater. Results from the 2024 administration of the National Assessment of Educational Progress (NAEP) indicate that just 1 out of 3 students nationally (in grades 4 and 8) are academically proficient in reading and math; the results are even more concerning for our nation's economically disadvantaged students.<sup>3</sup> And yet, only 10 percent of American public-school students nationally receive high-dosage tutoring (Center for American Progress, 2024). This disconnect - low student performance and limited access to academic support via tutoring - requires educational leaders at state and local levels to think strategically about how best to implement tutoring to reach as many students requiring additional academic support as possible.

In the 2021-22 school year, Guilford County (NC) Schools (GCS), an Accelerate grantee, first launched its district-designed in-person tutoring program. GCS continued its tutoring program into the 2022-23 and 2023-24 school years, with the goal of scaling tutoring to reach as many students as possible, with a particular focus on students with the greatest academic need. GCS's tutoring program relies on multiple tutor types (e.g., paraprofessionals, certified teachers, teacher candidates, college students, and peers) to provide tutoring to elementary, middle, and high school students in tutor-student ratios of no greater than 1:4 (and as low as 1:1). Students are expected to receive at least two sessions per week (for 30 minutes per session) for at least 10 weeks (or, a minimum of 10 hours of tutoring).

In a study conducted by the National Student Support Accelerator (NSSA) at Stanford University, the researchers describe the implementation of GCS's tutoring program during the 2023-24 school year, including the extent to which tutoring reached students most in need of academic supports and the amount (dosage) of tutoring students received. The study also examined the correlation between receipt of tutoring and student academic achievement and school attendance. Relying on student-level administrative data from GCS, the NSSA study finds that 24.5 percent (17,230 students) of all GCS K-12 students (70,326) attended at least one district-led tutoring session during the 2023-24 school year; in the prior school year (2022-23), 11,586 GCS students (or 16.5 percent) received tutoring. Among students who received tutoring in the 2023-24 school year, students participated in an average of 28 sessions corresponding to 14 hours of tutoring, representing a 7 percent increase in the number of sessions attended (approximately two additional sessions) compared to the prior school year.

<sup>3</sup> According to the 2024 NAEP results: 39 percent of grade 4 students are academically proficient in math; 30 percent of grade 4 students are academically proficient in reading; 27 percent of grade 8 students are academically proficient in math; and 29 percent of grade 8 students are academically proficient in reading. Among economically disadvantaged students, 25 percent of grade 4 students are academically proficient in math; 19 percent of grade 4 students are academically proficient in reading; 14 percent of grade 8 students are academically proficient in math; and 18 percent of grade 8 students are academically proficient in reading. (sources: <a href="https://www.nationsreportcard.gov/">https://www.nationsreportcard.gov/</a>; <a href="https://www.nationsrep

The district-led tutoring program in GCS also targeted its tutoring services to the highest-need students; specifically, English language learners (ELLs) and lower-achieving students were more likely to receive tutoring; yet, special education students were less likely to receive tutoring, highlighting the need for GCS to continue to refine the delivery of its district-led tutoring effort to meet the educational needs of all district students. And while the NSSA study is unable to draw a causal link between tutoring and student achievement in GCS (students were not randomly assigned to tutoring), recent evidence from NAEP suggests that the incorporation of high-dosage tutoring as a core district strategy may support improvements in student achievement. Indeed, between the 2022 and 2024 administrations of the district-level NAEP assessment (known as the Trial Urban District Assessment, or TUDA), GCS ranked among the top three urban districts nationally (along with the District of Columbia Public Schools (DCPS), also an Accelerate grantee) in the growth in the percent of grade 4 and 8 students who are academically proficient in math. Though more research is needed to uncover the causal impact of tutoring on student learning outcomes in GCS, this represents a promising district-led effort to implement and scale high-dosage tutoring to support the learning growth of the district's most struggling students.

#### **STUDY SNAPSHOT | Guilford County (NC) Schools**

**PUBLISHED:** Fall 2024

**RESEARCH TEAM:** National Student Support Accelerator (NSSA)

STUDY PERIOD: 2023-24 school year

**RESEARCH METHOD**: Descriptive; correlational

**STUDENT GROUP(S) STUDIED:** During the 2021-2022 school year, Guilford County Schools (GCS) launched an in-person tutoring program for students across elementary, middle, and high school campuses. GCS continued the tutoring program in the 2022-23 and 2023-24 school years, aiming to expand the program to focus on students in grades K through 12. GCS focused on serving the highest-need students. Relying on beginning-of-year NWEA MAP Assessment scores, GCS prioritized students below the 20th percentile of NWEA MAP as those with the highest need to receive tutoring.

#### **STUDY QUESTIONS:**

- How many students did the program reach and what are the characteristics of the students who were served?
- How much tutoring did students receive and did dosage vary by student characteristics?
- · What is the relationship between academic achievement and participation in tutoring?
- What is the relationship between school attendance and participation in tutoring?

#### **KEY FINDINGS:**

- Of the 70,326 students enrolled in GCS schools, 24.5% (17,230 students) attended at least one tutoring session. (In 2022-23, 11,586 students received tutoring).
- Participating students attended an average of 28 sessions corresponding to an average of 14 hours of tutoring.
- The average student:tutor ratio for tutoring sessions was 3:1; students met with 1-2 tutors, on average, over the course of the school year (mean=1.5).
- Elementary school students were more likely to participate in tutoring and attend more sessions than middle and high school students.
- English Learners were more likely to receive tutoring while students in Special Education programs were less likely to receive tutoring.
- Lower performing students were more likely to receive tutoring and receive more tutoring than their higher performing peers.

#### **KEY TAKEAWAYS:**

- Students who were already struggling academically at the start of the year were more likely to receive tutoring than their peers who started the school year with higher scores.
- The analysis is unable to distinguish the impact of receiving tutoring on student end-of-year outcomes (the research design is correlational and does not support causal analysis).

## Paraprofessional-led Tutoring and the Importance of Tutoring Dosage

In the 2023-24 school year, the District of Columbia Public Schools (DCPS) partnered with the ROOTS tutoring program ("ROOTS") to provide high-impact early numeracy tutoring to over 300 kindergarten students across 35 DCPS schools. ROOTS is an in-person tutoring program that leverages existing school staff (paraprofessionals) to provide small group instruction (tutor-student ratios typically no greater than 1:3) during the school day. The ROOTS program is aligned with DC State Standards and the DCPS mathematics curriculum, and is designed to provide students with three 20-minute tutoring sessions per week across approximately 17 weeks to complete ROOTS' 50-lesson curriculum.

In a study conducted by NSSA at Stanford University, the researchers randomly assigned eligible kindergarten students (within school and classroom) into a treatment group (n=384) and a comparison group (n=849). Students were identified as eligible for tutoring services if they scored below gradelevel math benchmarks. Students assigned to the treatment group were expected to receive 50 tutoring lessons from paraprofessionals during the 2023-24 school year; students assigned to the control group were to receive business-asusual instruction and support over the same time period and would not be eligible for ROOTS tutoring during the 2023-24 school year (no services that students would normally receive were withheld because of this study or participation in ROOTS). This study aims to provide evidence on the impact of early-grade math tutoring provided by paraprofessionals who represent a readily available supply of tutors at many public schools.

Findings indicate that there was no effect of ROOTS tutoring on kindergarten student math achievement (as measured by end-of-year i-Ready composite scores and numeracy subscores),

#### STUDY SNAPSHOT | DCPS ROOTS

**PUBLISHED:** January 2025 **RESEARCH TEAM:** NSSA

STUDY PERIOD: 2023-24 school year

**RESEARCH METHOD**: Randomized controlled trial (RCT)

**STUDENT GROUP(S) STUDIED:** Students were identified as eligible for tutoring services if they scored below appropriate grade-level benchmarks in their math skills. The NSSA team randomly assigned eligible students into a treatment group (n=384) and a comparison group (n=849).

#### **STUDY QUESTIONS:**

 What is the effect of ROOTS on end-of-year math achievement (i-Ready math composition score) for Kindergarten students?

#### **KEY FINDINGS:**

- Students initially assigned to treatment completed an average of 18 tutoring sessions, well below the 50 session curriculum.
- There is no effect of assignment to or receipt of ROOTS early numeracy tutoring on End-of-Year i-Ready composite scores and numeracy subscores for Kindergarten students. These findings vary little by student subgroup or campus.
- Among schools with higher tutoring dosage, there is a statistically significant positive effect on End-of-Year i-Ready composite scores and effects approaching statistical significance on numeracy subscores.
- Paraprofessionals generally reported positive baseline and final perceptions on outcomes like confidence in their abilities to build strong relationships with students and help students understand mathematical concepts.

#### **KEY TAKEAWAYS:**

 Further qualitative study is recommended to understand how to more effectively deploy paraprofessionals to support student learning and to maximize the tutoring dosage that students receive.

and that there was consistently no effect of ROOTS tutoring for students with different background characteristics (e.g., student race/ethnicity, gender, special education, and English Learner status). Notably, the typical treatment student completed an average of just 18 tutoring sessions, well below

the 50-session ROOTS curriculum. This means that the typical student received significantly less tutoring dosage than intended. Yet, the study further finds that for students who received more tutoring dosage - at least 60 percent of the intended dosage (or 30 sessions) - their achievement improved, and improved more with additional tutoring sessions.

In QRN 1.1 we wrote about how successful tutoring implementation requires that students attend and participate in the intended number of tutoring sessions for a given program model. In QRN 1.2, we highlighted evidence from an RCT of another Accelerate grantee (Once, which leverages paraprofessionals to provide in-school literacy tutoring to kindergarten students) showing that tutoring had no impact on student learning, potentially reflecting the fact that students received significantly less tutoring dosage than intended by the program. The ROOTS and Once studies together point to the need to address challenges with program implementation in paraprofessional-led tutoring and to maximize the tutoring dosage that students receive. Ensuring that students receive adequate dosage is key to improving student learning outcomes.

## **Supporting Academic Acceleration for Dyslexic Students**

Reading Futures, an Accelerate-funded grantee, partnered with Muncie (IN) Community Schools during the 2023-24 school year to provide early literacy tutoring to struggling readers, including students with characteristics of dyslexia, in grades 2-3. Reading Futures is a virtual tutoring intervention that relies on certified, well-trained, and closely-mentored teachers to deliver literacy instruction to students in small-group settings (tutor-student ratios are typically no greater than 1:4).

Reading Futures aims to provide students with four 55-minute tutoring sessions per week across approximately 21 weeks (for a total of 75 tutoring hours).

In the first year of a two-year study conducted by researchers at Ball State University, eligible students in grades 2 and 3 were randomly assigned (within school and grade) into a treatment group (n=51) and a comparison group (n=73). Eligible students included students scoring below the 20th percentile on the iReady assessment. This study aims to assess the impact of Reading Futures tutoring on students' literacy and reading outcomes. Data collection for the second year (2024-25) of the study is currently underway.

Findings from the first year of this small-scale RCT indicate that students receiving Reading Futures tutoring realized greater growth

#### **STUDY SNAPSHOT | Reading Futures**

**PUBLISHED:** September 2024

**RESEARCH TEAM:** Ball State University **STUDY PERIOD:** 2023-24 school year

**RESEARCH METHOD**: Randomized controlled trial (RCT)

**STUDENT GROUP(S) STUDIED:** Grade 2-3 students with dyslexia in three schools in Muncie (IN) Community Schools who were performing well below grade level.

#### **STUDY QUESTIONS:**

• What is the impact of Reading Futures tutoring on literacy and reading outcomes?

#### **KEY FINDINGS:**

- Treatment students realized greater growth on the DIBELS and iReady assessments than control students
- However, the difference in growth between treatment and control students is not statistically different from zero (given that this RCT is underpowered to detect differential effects across treatment and control groups).

#### **KEY TAKEAWAYS:**

 This RCT provides initial suggestive evidence that Reading Futures tutoring program may lead to improvements in early reading and literacy outcomes for students with dyslexia. However, the sample size was not sufficient to provide definitive evidence on the impact of Reading Futures.

on the DIBELS and iReady assessments than control students. However, the difference in growth between treatment and control students is not statistically different from zero, reflecting the fact that this small-scale RCT was designed to take place over two years to generate adequate power to detect differential effects across treatment and control groups. At the same time, the results from the first year of this study provide initial and suggestive evidence that Reading Futures' tutoring program may lead to improvements in early reading and literacy outcomes for students with severe reading difficulties, including characteristics of dyslexia.

This study addresses a key research priority outlined in <u>Accelerate's Research Agenda</u> - namely, a focus on understudied student groups who may need tutoring services the most. Reading Futures is dedicated to providing tutoring to students who are among the most underserved (in this case, students with severe reading difficulties, including characteristics of dyslexia). Data being collected during the 2024-25 school year will help to increase the study sample size in an effort to determine whether the observed growth in student learning can definitively be attributed to the tutoring intervention. This study reflects a dedication to understanding what works in the tutoring field for students with among the greatest educational needs.

**Part Three** 

# **Looking Ahead**

In partnership with Mathematica, a member of Accelerate's Research Learning Community, Accelerate will publish a synthesis of key learnings from research and evaluation studies on a subset of our 2023-24 cohort of Call to Effective Action (CEA) grantees. Grantees in the cohort include high-dosage tutoring providers, school districts, and community-based organizations that have implemented a range of tutoring models—virtual, in-person, and hybrid/blended approaches serving students from Pre-K through 12th grade in Math and English Language Arts. The subset of grantees that the report will focus on was selected based on having strong research designs, adherence to their program design, and a tutoring model with potential to scale. In this report, we will explore the effectiveness of high-dosage tutoring interventions across eight selected grantees, examining findings on both student outcomes and implementation experiences to identify factors that contribute to student learning. Building on our previous research synthesis with Mathematica, which highlighted eight grantees from the 2022-23 CEA cohort, this new report will delve deeper into measurable student outcomes and the conditions that support them. The report will feature findings on the implementation of tutoring programs and research activities, identifying common challenges and successful strategies. The report will also offer detailed summaries of the profiled grantees' specific tutoring interventions and research results. The report will share recommendations for program implementation and promising directions for additional research that aligns with Accelerate's research agenda and strategic grantmaking. By contextualizing student outcomes and drawing connections between student outcomes and program implementation, this synthesis will offer valuable guidance for practitioners, researchers, and funders working to scale effective tutoring models. Look for the full report in May 2025.

At Accelerate, our aim is to identify cost effective interventions that improve student achievement through rigorous research. In an effort to identify program models and program design features that improve student learning goals at the lowest cost (and, correspondingly, the greatest cost-

effectiveness), we plan to expand our Research Catalog to also focus on identifying AI-enabled tools with the greatest cost-effectiveness. Our AI-focused research will address some of the most pressing research questions in the field, including (though not limited to):

- What is the impact of Al-enabled tools on tutor performance and student learning?
- Does Al-enabled tutoring support more personalized delivery of HQIM-aligned content than current tutoring providers and programs?
- Does Al address challenges with program implementation and student participation associated with human-provided tutoring?
- Does Al-enabled tutoring support more efficient and effective instructional feedback and coaching for tutors?
- Can we design high quality research of Al-enabled products that provides evidence on program implementation and impact on a faster timeline that accounts for and incorporates iterative design?
- How does the cost and cost-effectiveness of Al-enabled tutoring compare to human tutoring?

Accelerate looks forward to working with our growing network of program providers and research partners to provide actionable evidence on Al-enabled tools.

We welcome readers to share with Accelerate research studies that examine the design, implementation, and/or impact of tutoring programs and personalized learning initiatives. Please <u>contact Matthew Steinberg</u>, Accelerate's Managing Director of Research and Evaluation, with any research studies you wish to share for potential inclusion in a future issue of the Quarterly Research Note.

