Annenberg Institute
BROWN UNIVERSITY

Rhode Island Education Research Initiatives

Strengthening Math Readiness through Summer Learning

Insights from Rhode Island's 2024 Algebra 1 Camps

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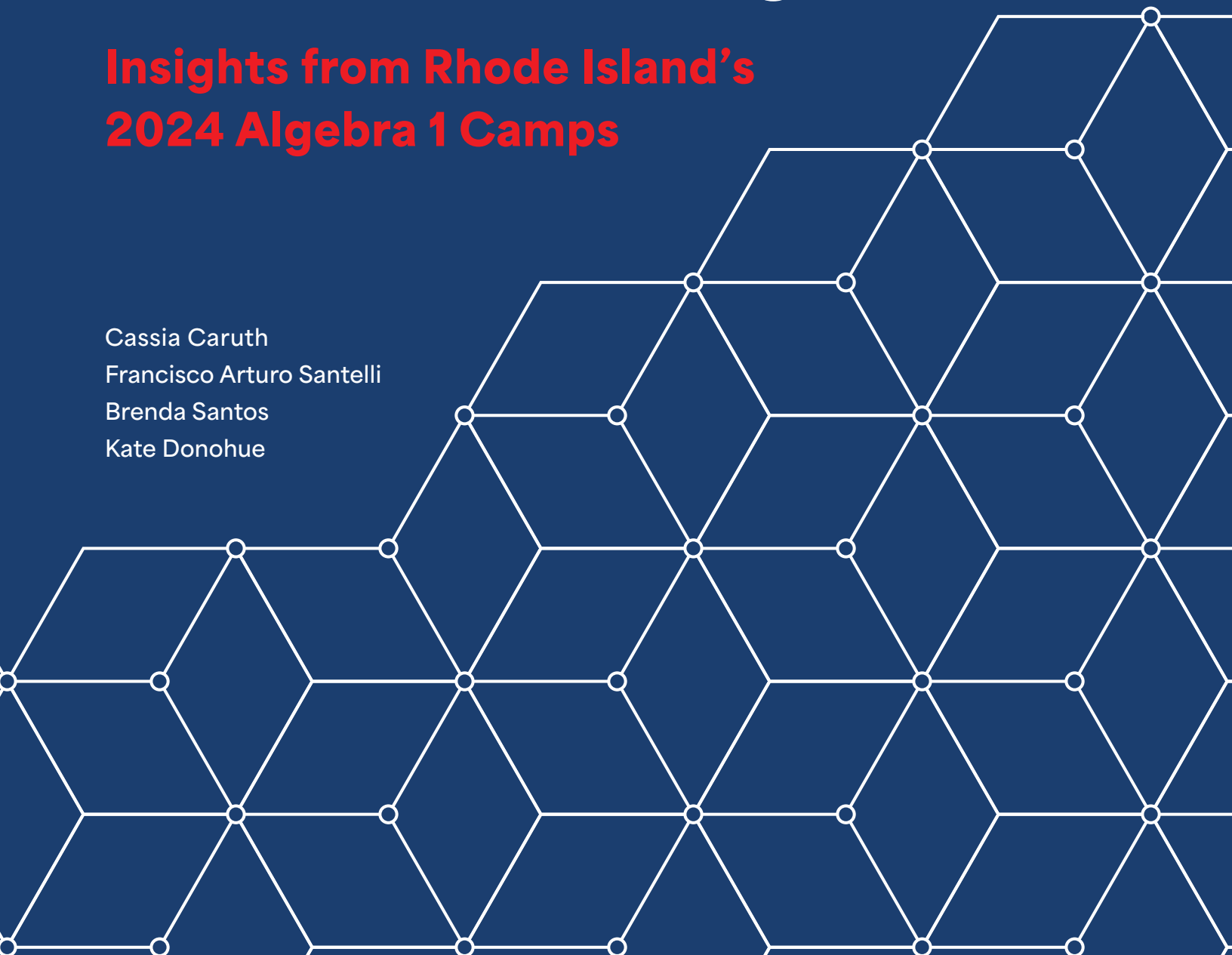


Insights from Rhode Island's 2024 Algebra 1 Camps

Rhode Island districts offer a wide range of summer programming to students that includes both enrichment and academic opportunities. A central goal of these programs is to better prepare students for the upcoming school year. To that end, 12 districts were awarded grants from the Rhode Island Department of Education and implemented Algebra 1 readiness camps during summer 2024 to better prepare rising 9th graders for new high school math requirements. We analyze the implementation and associated outcomes of these camps in five partner districts and find:

1. **Algebra 1 camps enrolled few students but participant attendance was high.**
2. **Program participants had fall math scores that were 4.5 percentile points higher than similar students who did not participate, with the largest gains among students who were struggling the most.**
3. **Student confidence and engagement increased for participants, with teachers attributing these outcomes to the project-based learning model.**

Background and Program Design

In 2023, Rhode Island revised its graduation requirements, introducing more rigorous math standards. Beginning with students entering 9th grade in the 2024-2025 academic year, all students must complete Algebra 1 in 9th grade to remain on track to fulfill successive advanced course requirements for graduation. These revisions reflect growing national recognition that advanced math coursework in high school is a strong predictor of postsecondary success and career outcomes (Adelman, 2006; Altonji, 1995; Attewell & Domina, 2008; Rose & Betts, 2004).

Notably, this policy change is set against the backdrop of declining performance of RI 8th graders on the biennial National Assessment of Educational Progress (NAEP). This long-term downward trend in foundational math skills raises concerns about RI students' readiness for high school math pathways. Data from the Rhode Island Comprehensive Assessment System (RICAS) shows a more nuanced picture. In recent years, RI 8th graders have experienced slow but steady gains on the RICAS Mathematics assessment. The average scaled score increased by one point annually over the past three years, from 483 in the 2021-22 school year to 485 in 2023-24 (Rhode Island Assessment Data Portal). However, the share of students not meeting expectations has remained relatively stable. Taken together, 8th grade performance on these assessments underscores the need for targeted interventions to accelerate progress, particularly for students who are struggling academically in math.

In response to these trends and to support districts' adjustment to the new requirements, the Rhode Island Department of Education (RIDE) invested $700,000 from ESSER III funds and ReThinkRI grants in Algebra 1 Readiness Camps across 12 local education agencies (LEAs). Algebra 1 is widely regarded as a gateway course linked to advanced coursework and stronger postsecondary outcomes (Adelman, 2006; Huffaker, 2025; Spielhagen, 2006). Since early algebra mastery can set students on a path to long-term success, the 10-day summer camps were designed to strengthen students' algebra readiness and confidence, using real-world tasks to make math engaging and accessible. As a condition of receiving RIDE grant funds, LEAs were required to design Algebra 1 Summer Camps that met specific state guidelines:

- ☑ **Camps had to provide 10 days of Algebra 1 instruction**
- ☑ **Students had to engage in project-based learning (PBL) to solve real-world problems**
- ☑ **LEAs had to incorporate adaptive learning platforms to support differentiation**
- ☑ **LEAs had to enroll at least 65% of their target number of students**

Research suggests that short-term math interventions like these can lead to meaningful academic gains (Lynch et al., 2022; Snipes et al., 2015). However, successful implementation is not guaranteed as districts often face logistical and instructional challenges that can limit program effectiveness (Kraft, Edwards, & Cannata, 2024; Kraft, Schueler, & Falken, 2024).

About the Partnership

Since 2022, the Annenberg Institute at Brown University (AIB) has facilitated a Summer Learning Network that partners with RI LEAs to support evidence-based program design and assess implementation and outcomes. This effort is part of a broader partnership with the Rhode Island School Superintendents Association (RISSA). One of the first AIB-RISSA District Networks, the Summer Learning Network was part of a joint effort to accelerate student learning by deploying research evidence and infrastructure at Brown University for impact (McCombs & Augustine, 2021; Morton & Hashim, 2023). Through this and other District Networks, AIB supports school improvement in RI through collaboration and evidence-based analysis. By bringing district teams together around a shared problem of practice, the network creates a space to work through the challenges of effective implementation across different contexts and facilitate shared learning that centers research-based strategies and data use. By doing so, the District Networks provide capacity-building opportunities across members and produce usable and accessible lessons for a wider audience.

Annenberg partnered with Burrillville School Department, Newport Public Schools, Paul Cuffee School, Smithfield Public Schools, and Woonsocket Education Department to understand the implementation and successes of these Algebra 1 camps. All except Burrillville received funding from RIDE for their Algebra 1 camps. Burrillville's camp was structured very similarly to the others with one difference; Burrillville's Algebra 1 camp was 20 days rather than 10. Through the partnership with these five districts, Annenberg engaged with participating LEAs at several points including: (1) pre-program planning meetings to discuss recruitment strategies, instructional goals, staffing, and data collection, (2) ongoing engagement to support survey development and completion for teachers and students and (3) post-program meetings, including district-specific report sharing and an all-network convening to summarize key outcomes and discuss future implementation.

We analyzed administrative data including student demographics, attendance records, and progress monitoring assessments from the 2023-2024 school year and fall of the 2024-2025 school year for all eligible students. Additionally, partners provided data on summer program enrollment and attendance. We also reviewed several artifacts, including planning documents, field notes from meetings with program administrators, and teacher and student survey responses.

Key Findings

Algebra 1 camps enrolled few students but participant attendance was high.

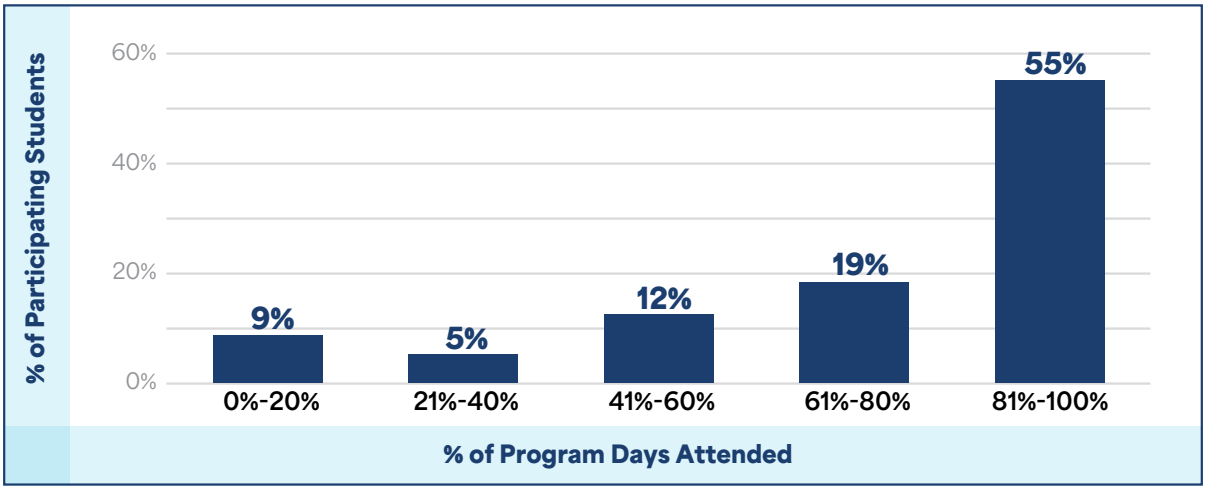
Algebra 1 camps enrolled a total of 103 students across the five partner districts. Districts originally aimed to enroll rising 9th grade students who were struggling in math but, due to lagging enrollment, they broadened eligibility to include rising 8th-10th graders, regardless of prior math proficiency. They implemented a range of outreach strategies to increase access and appeal. Some reframed the camps as opportunities for high school transition support, while others emphasized the value of math preparation. One district called all eligible families directly, while another rebranded its camp to signal a more engaging experience. Despite these efforts, enrollment remained below expectations with only 44% of the initial enrollment goal hit. Participants in partner districts represented roughly 30% of all statewide RIDE-funded summer Algebra 1 camp participants, suggesting that they were only slightly less successful in their recruitment efforts than other districts offering the program.[1]

These recruitment adjustments resulted in greater grade-level and academic heterogeneity than originally intended. While most participants (72%) were rising 9th graders, students spanned three grade levels and were academically diverse. Participating students were similar to non-participants academically with similar shares of students falling into each benchmark category. Approximately three fifths (58%) of participants were identified as either on watch or needing some level of intervention compared to 64% of non-participants. Similarly, 42% of participants were identified as at or above proficiency levels compared to 36% of non-participants. Demographically, participants were more likely to be economically disadvantaged and multilingual learners (MLLs) as compared to non-participants.

Encouragingly, program attendance was high across partner districts-over half of all participants attended 81-100% of program days, with an average attendance rate of 75%.[2] Attendance varied only slightly for different student subgroups. Notably, participants also had strong prior school-year attendance, suggesting that the programs attracted students who already attend school consistently during the academic year. Overall, the summer attendance patterns suggest that although recruitment was challenging, participating students were highly engaged.

FIGURE 1

Over half of the students attended more than 80% of summer program days.



Students in the program had fall math test scores that were 4.5 percentile points higher than similar students who did not participate, and students who were struggling the most with math appeared to benefit the most from the programs.

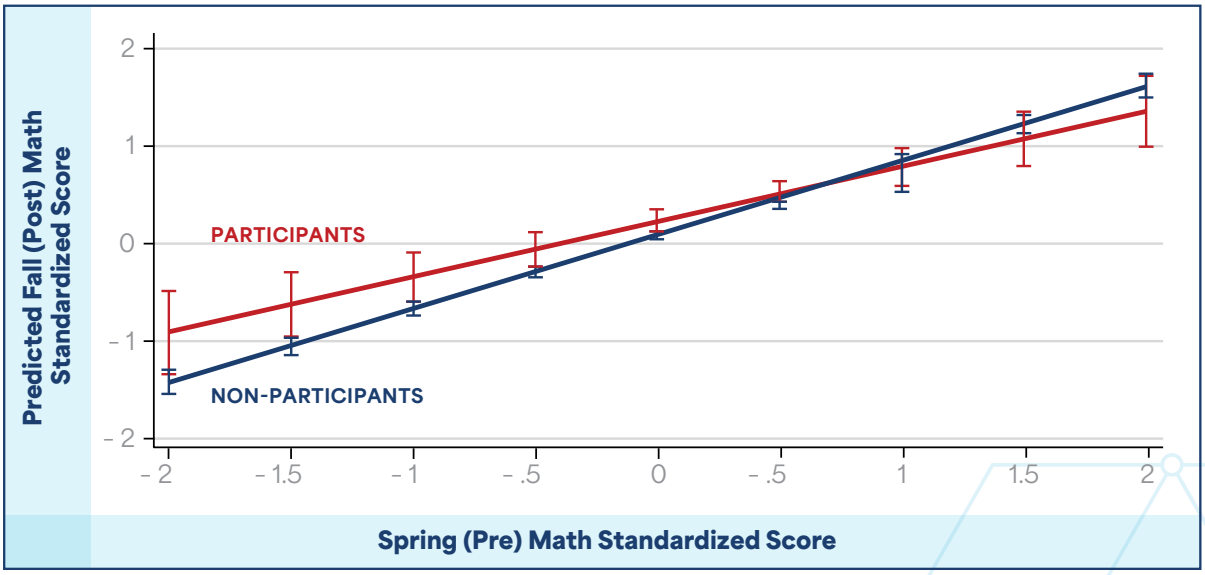
We analyzed spring to fall growth in interim math assessments to better understand the outcomes of students in the camps. First, we compared growth of students in the camp compared to non-participants and found that participants experienced larger gains than non-participants. Specifically, when we compared students with similar prior achievement, attendance, and demographic characteristics,[3] students who participated in the summer programs improved by about 4.5 percentile points more, on average, on their fall district-grade progress monitoring exams than non-participants.[4] While our estimate is positive, it is imprecise because of the relatively small sample and cannot be confidently attributed to the summer program.[5]

Notably, students entering the programs with lower scores on their spring progress monitoring assessments appeared to benefit more from the camps than their higher-achieving peers.[6] Figure 2 shows that among students with below-average spring math scores, participants had higher predicted fall scores than similarly scoring non-participants. Among students with above-average spring math scores, participants had lower predicted fall scores than similarly scoring non-participants.

This pattern suggests that students who were struggling the most with math upon entering the program saw the largest gains. Again, these estimates are imprecise due to the small sample but are encouraging nonetheless.

FIGURE 2

Participants with lower pre-program scores saw larger increases in post-program scores than students entering with higher pre-program scores.



Student confidence and engagement increased for participants, with teachers attributing these outcomes to the project-based learning model.

Teachers and students alike reported that the camps increased student confidence and curiosity. In surveys administered at the end of the program, all teachers agreed or strongly agreed that students' confidence grew, and 93% said students became more curious and open to exploring new interests and possibilities. Teachers frequently attributed these outcomes to the camps' PBL approach. Through hands-on tasks like "finding the Pythagorean theorem in nature" or "calculating the angle of a basketball shot," students connected algebra concepts to their everyday lives. "We saw increased student engagement when they were creating things from raw materials instead of using prefabricated kits," one teacher observed. Another noted, "Students were really engaged in the projects when we gave them creative freedoms to personalize them and try new things."

Students' reflections echoed these themes of confidence and ownership. One student wrote, "I liked being able to learn actual real-world math that I'll actually use in the future," while another shared, "I liked how I collaborated with my peers to solve problems and make a product by the end of the 2 weeks." These experiences also fostered meaningful student-teacher relationships, laying the groundwork for a smoother, more welcoming transition to high school. At the start of the school year, administrators recalled seeing students exchange "fist bumps" and warm greetings with educators they met during the summer, adding that the camps "helped students feel seen."

Future Considerations

While districts see immense value in the camps, long-term funding to support continued programming is uncertain. The 2024 offerings were supported by ESSER and state funds, but with those resources drying up, districts are exploring alternatives like state Out-of-School Time (OST) grants for municipalities and general fund allocations. Alongside funding, leaders are rethinking recruitment strategies to attract more students. This has proven to be challenging because the camps are noncompulsory. Districts had some success by highlighting the programs as a chance to ease into high school and experience real-world math through PBL, but additional efforts will likely be necessary to attract more students.

Leaders are also reflecting on ways to refine instructional approaches. Despite attributing PBL with boosting student engagement and confidence, some teachers found the curriculum lacked depth and needed to be supplemented to fill the camp schedule. Several teachers suggested providing more student choice for hands-on activities and incorporating direct instruction for key algebra concepts. Districts have begun to view the academic heterogeneity of students enrolled in their programs as a strength that might have contributed to the engagement and learning of all students. At the same time, students, teachers, and district leaders in most districts reported that the adaptive learning programs used to support differentiation did not work well for the programs. Going forward, districts are considering ways to ensure that students at various math levels receive the support they need to accelerate their learning during summer programs.

Ultimately, while uncertainties remain, districts are committed to finding ways to sustain and improve the summer Algebra I camps, recognizing their potential to support student success in high school and beyond.

"Students were really engaged in the projects when we gave them creative freedoms to personalize them and try new things."

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Endnotes

1 *This estimate is based on 93 participants enrolled across RIDE-funded partner districts (10 additional students were enrolled in Burrillville's program, which was not RIDE-funded) and a statewide total of approximately 300 students reported by the Rhode Island Department of Education (RIDE, 2024).*

2 *Woonsocket was excluded from attendance calculations due to insufficient data.*

3 *Demographic characteristics include gender, race/ethnicity, MLLs, economic disadvantage (FRPL), and special education status. Controlling for these factors allows for differences in outcomes to be more credibly attributed to participating in the Algebra I camps. However, we cannot control for characteristics we cannot observe, so we cannot be sure that the differences are due to the program and not other differences between the two groups.*

4 *Though all districts administered the same student assessment prior to the summer program, one participating district administered a different assessment to students in fall 2024, after the program. We standardized scores within each district and grade to allow for comparisons including that district. The standardized scores presented in figure 2 reflect student performance relative to the mean score of their grade within their district, and we translated the difference into an approximate percentile point change for easier interpretation.*

5 *The p-value on this estimate is 0.13, suggesting a 13% chance the difference between the two groups is due to random chance.*

6 *In the regression model we use to generate these predictions, we interact prior-year math scores with an indicator for participation in the program. The interaction term is statistically significant at the 0.10 level.*