Evaluation of Rocketship Students' Middle School Outcomes: Key Findings from First-Year Interim Report

Rocketship Education is a non-profit, national network of public elementary charter schools with the mission to close the racial and socioeconomic achievement gap through a "school model that combines personalized learning through technology, excellent teachers and leaders, and engaged parents."[1] Rocketship emphasizes four core values for staff and students: respect, responsibility, persistence, and empathy. These values are integrated into instruction and expectations for student behavior. The founding families of each school collaboratively choose a fifth core value, reinforcing Rocketship's emphasis on family engagement. These core values are designed to support students' social-emotional development and create students' ownership of their academic outcomes.

In 2014, Rocketship contracted with SRI Education to conduct a 2-year, rigorous independent evaluation of the middle school readiness and success of Rocketship alumni compared with their peers who did not attend Rocketship elementary schools. The evaluation focuses on alumni of Rocketship elementary schools in the San Jose area who transitioned to one of seven middle schools run by four charter management organizations (CMOs) in the 2012–13, 2013–14, and 2014–15 school years.[2]

This brief presents a summary of preliminary findings from the first year of the evaluation, drawing upon two data sources: a middle school student survey and extant student-level demographic and achievement data. To compare noncognitive outcomes, academic aspirations, and satisfaction levels for Rocketship alumni and their non-Rocketship peers, the team analyzed differences in the two groups' responses to the middle school survey. To compare middle school academic outcomes for Rocketship alumni and their non-Rocketship peers, SRI compared student test scores controlling for differences in students' demographic characteristics using propensity score weighting and multiple linear regression. The study samples varied by data source as follows:

- ***Middle school student survey.*** SRI surveyed all middle school students in the fifth through eighth grades attending one of seven charter middle schools in the San Jose area—both Rocketship alumni and peers who had not attended Rocketship elementary schools. The team surveyed 720 Rocketship alumni and 1,243 non-Rocketship peers and achieved an overall response rate of 95%.[3]
- ***Extant student-level data.*** SRI collected student-level demographic and achievement data for middle school students who attended four of the seven charter middle schools in the study during the 2012–13 and 2013–14 school years and who were 1 or 2 years removed from elementary school: a total of 197 Rocketship alumni and 632 non-Rocketship peers.[4]

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1 Rocketship Education. *Blasting to 20,000 Rocketeers*. (No year). Provided by Rocketship Education.

2 The following CMOs are participating in the study: ACE, Alpha, KIPP, and Downtown College Prep (DCP).

3 The survey sample included Rocketship alumni who attended five of nine current Rocketship elementary schools in the San Jose area. As a result, findings from the survey may not be generalizable to all Rocketship alumni.

4 Of the seven charter middle schools participating in the study, DCP data were not collected in time to be included in the first-year analysis; two other schools did not open until the 2014–15 school year and consequently had no data available for prior years.

Background on Rocketship Education and Its Student Population

To understand Rocketship elementary schools' student population, SRI compared student-level data collected from Rocketship and publicly available demographic data for students attending noncharter public elementary schools in the neighboring San Jose Unified, Alum Rock Union Elementary, and Franklin-McKinley Elementary districts for the 2012–13 academic year. The data indicate that Rocketship students were more socioeconomically disadvantaged than students who attended nearby noncharter public elementary schools. Rocketship schools also served larger proportions of English learners (ELs) and Latino students.

Exhibit 1
Comparative Demographic Data for Rocketship Students and Elementary Students in Neighboring Districts, 2012–13

District	Gender (%) (female)	Race (%) Asian	Latino	African American	White	Other	FRPM eligible (%)	EL status (%)
Rocketship	51	10	84	2	2	2	88	68
Franklin-McKinley	49	31	60	2	2	5	69	54
Alum Rock	48	12	79	1	2	5	85	51
San Jose Unified	48	12	53	3	25	7	46	33

Sources: (1) California Department of Education publicly available data for nearby noncharter public elementary schools and (2) Rocketship Education for student-level data.
Note: FRPM = free or reduced-priced meals.

Key Findings

Overall, Rocketship students outperformed their peers in their first year of middle school; experienced smooth transitions to middle school; reported high levels of self-efficacy, motivation, and grit (i.e., persistence); and had long-term academic goals.

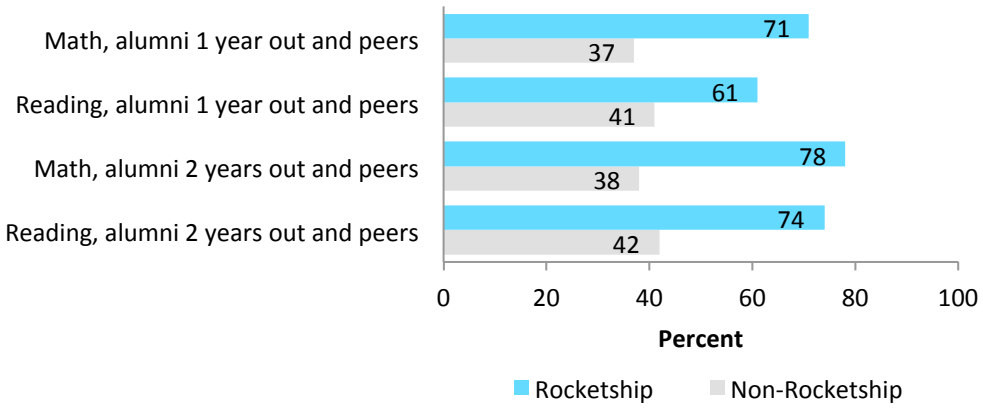
Middle School Academic Outcomes

To understand how well Rocketship alumni are performing in middle school relative to their non-Rocketship peers, the research team collected and analyzed middle school outcomes data for four cohorts of Rocketship alumni. Cohorts of Rocketship alumni were determined by the grade level and year in which alumni transitioned to middle school. The outcomes analysis first explored differences in middle school academic outcomes for Rocketship alumni and their peers at different time points—e.g., for Rocketship alumni who were in their first and second years of middle school—without taking into account differences in students' demographic characteristics or prior achievement. This analysis provided descriptive information about how well Rocketship alumni were performing relative to their peers over time; however, because the analysis does not take into account differences in students' demographic characteristics, prior achievement, or other unobservable characteristics (such as family motivation), these descriptive findings should be interpreted with caution.

Without taking into account differences in students' demographic characteristics or prior achievement, Rocketship alumni in their first year of middle school outperformed their non-Rocketship peers on spring assessments, particularly in math.

Rocketship alumni scored higher on the California Standards Tests (CSTs) and NWEA's Measures of Academic Progress (MAP) tests in middle school than their peers, particularly in math. Seventy-one percent of Rocketship alumni scored at or above the 50th percentile on the NWEA MAP math test at the end of their first year of middle school compared with only 37% of their peers (Exhibit 2). Rocketship alumni also outperformed their peers on English language arts and reading assessments, although the differences were not quite as substantial as those for math achievement.

Exhibit 2
Percentage of Rocketship Alumni and Non-Rocketship Peers Scoring At or Above the 50th Percentile on NWEA Map Tests



Source: Participating Charter Management Organizations

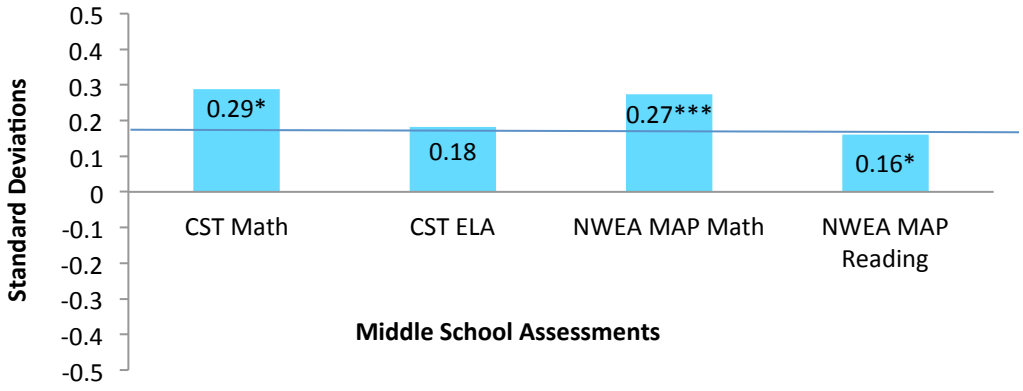
Next, the research team estimated the difference in middle school academic outcomes for Rocketship alumni and their peers, adjusting for students' demographic characteristics using multiple linear regression and propensity score weighting techniques. Although the research team controlled for differences in students' demographic characteristics, the research team still cannot attribute Rocketship alumni's success in middle school to the experience of attending a Rocketship elementary school. It could be that students who attended Rocketship systematically differed from students attending nearby schools in terms of prior achievement or unobservable characteristics such as motivation or parental involvement. While the research team attempted to explore some of these unobservable differences through the middle school survey, this analysis does not account for these differences or differences in prior achievement. Rather, the following findings indicate that attending Rocketship was associated with improved middle school academic outcomes.

Controlling for differences in student demographic characteristics, Rocketship alumni in their first year of middle school outperformed their non-Rocketship peers on spring assessments (i.e., CST and NWEA MAP), particularly in mathematics.

When expressed in standard deviations, the differences in middle school academic outcomes for Rocketship alumni and their peers is the effect size.[5] Researchers generally agree that a difference of 0.2 standard deviations is a sizable effect. Accounting for students' demographic differences, Rocketship alumni who were in their first year of middle school scored 0.29 standard deviations higher on the math CST than their peers and 0.27 standard deviations higher on the math NWEA MAP test (Exhibit 3). These effect sizes indicate that the difference in math achievement between Rocketship alumni and their peers was meaningful, and this was true for both the CST and NWEA MAP math tests. Rocketship alumni who were in their first year of middle school also outperformed their peers on the NWEA MAP reading test, controlling for student demographics, but there were no statistically significant differences on the English Language Arts (ELA) CST.

Exhibit 3

Average Differential Performance on Middle School Assessments for Rocketship Alumni After Their First Year of Middle School Relative to Demographically Similar Non-Rocketship Peers

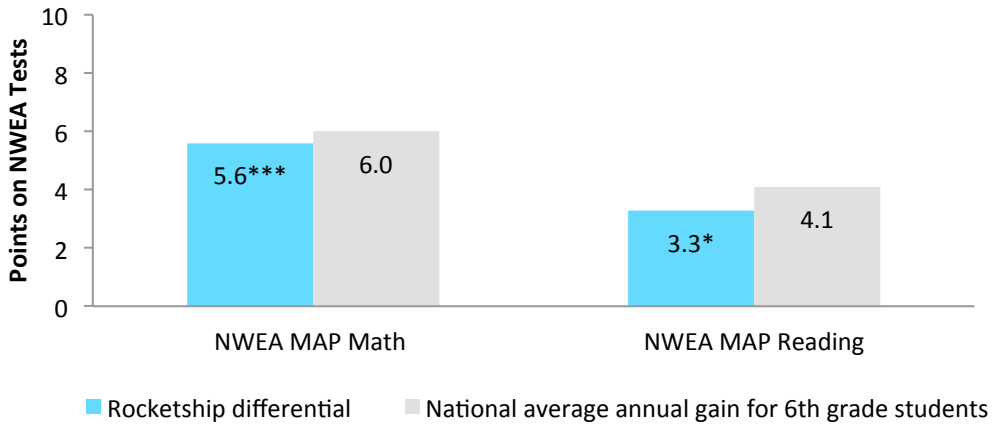


*p < .05; **p < .01; ***p < .001.
Source: Participating Charter Management Organizations
Note: Horizontal line at 0.2 standard deviations represents a sizable effect

[5] CST and NWEA MAP scores were first standardized by grade level because students in two grades were included in this analysis. Fifth- and sixth-grade students were included in the 1-year-out analysis, and sixth- and seventh-grade students were included in the 2-years out analysis. While NWEA MAP is vertically scaled and students in multiple grades may be included in the same regression analysis, the CST was not vertically scaled.

The research team also analyzed differences by grade level. For Rocketship alumni who were in their first year of middle school compared with non-Rocketship peers with similar demographic characteristics, sixth-grade Rocketship alumni outperformed their peers on the NWEA MAP tests in both math and reading, but there were no statistically significant differences on the test scores for fifth-grade Rocketship alumni and similar peers. On the NWEA MAP math test, sixth-grade Rocketship alumni outperformed similar peers by almost 6 points, on average (Exhibit 4); this effect size is almost equivalent to a year's growth for the average math student in the United States.[6] For the NWEA MAP reading test, Rocketship alumni outperformed their peers by 3 points, which is roughly equivalent to four-fifths of a year's growth for the average U.S. student.

Exhibit 4
Average Differential Performance on the NWEA MAP Tests for 6th Grade Rocketship Alumni Relative to Demographically Similar Non-Rocketship Peers, After Their First Year of Middle School



*p < .05; **p < .01; ***p < .001.
Note: The statistical significance stems from the difference in Rocketship alumni's scores relative to their peers, not the national average.
Source: Participating Charter Management Organizations and https://www.nwea.org/content/uploads/2014/07/MAP-Normative-Data-One-Sheet-Dec11.pdf

There were no statistically significant differences in any of the middle school outcomes for Rocketship alumni who were in their second year of middle school relative to their non-Rocketship peers.

In this first year of the evaluation, the sample size for Rocketship alumni who left the school 2 years ago was small. As a result, more data are needed to determine whether Rocketship alumni continue to outperform their peers 2 and 3 years into middle school. It is possible that with a larger sample size, differences would be statistically significant. Alternatively, Rocketship alumni's academic advantage may decrease over time as they experience the same instructional quality and classroom environments in middle school as their non-Rocketship peers. Further analyses will provide greater insight into the performance of Rocketship alumni over time.

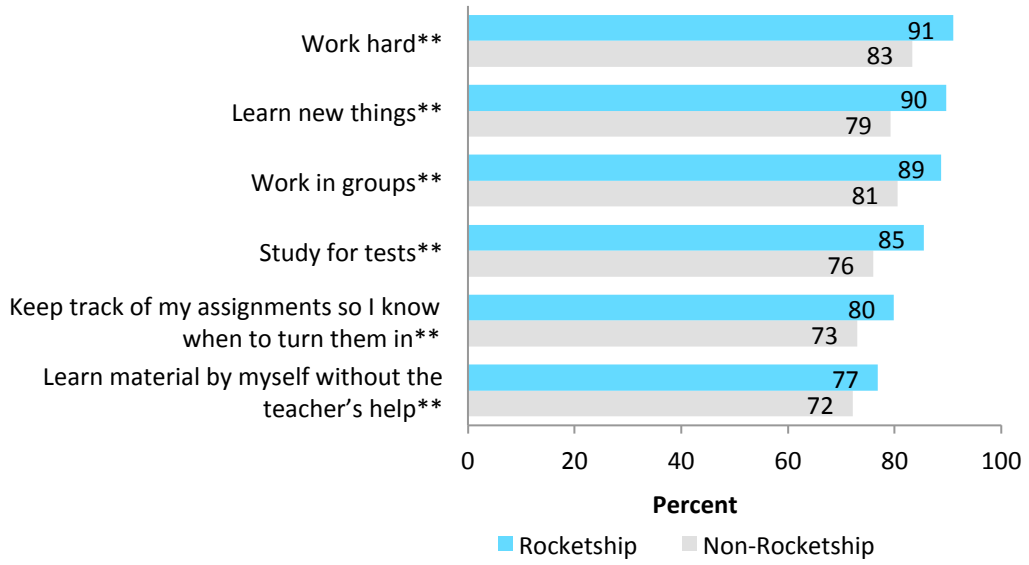
[6] National norms for the NWEA MAP tests were determined in the following 2011 study: https://www.nwea.org/content/uploads/2014/07/ MAP-Normative-Data-One-Sheet-Dec11.pdf. Note that the expected growth gains depend on initial achievement, with lower achieving students expected to have greater growth gains than higher achieving students.

Middle School Transition

Rocketship alumni were more likely than their non-Rocketship peers to attribute their preparedness for middle school to their elementary school experience.

The student survey included items intended to gauge how well students' elementary schools prepared them on a variety of skills that demonstrate a positive orientation toward learning, such as collaboration, hard work, time management, and independence. A large majority of all Rocketship alumni agreed or strongly agreed that their elementary school prepared them to work hard (91%), learn new things (90%), work in groups (89%), study for tests (85%), keep track of their assignments (80%), and learn independently (77%) (Exhibit 5).

Exhibit 5
Rocketship Alumni and Non-Rocketship Peers Who Agreed or Strongly Agreed That Elementary School Helped Them Develop Skills Needed for Middle School Success



Chi-Square Test, *p < .05; **p < .01; ***p < .001.
Source: SRI Middle School Student Survey

Rocketship alumni were more likely than their non-Rocketship peers to have been involved in choosing their middle school.

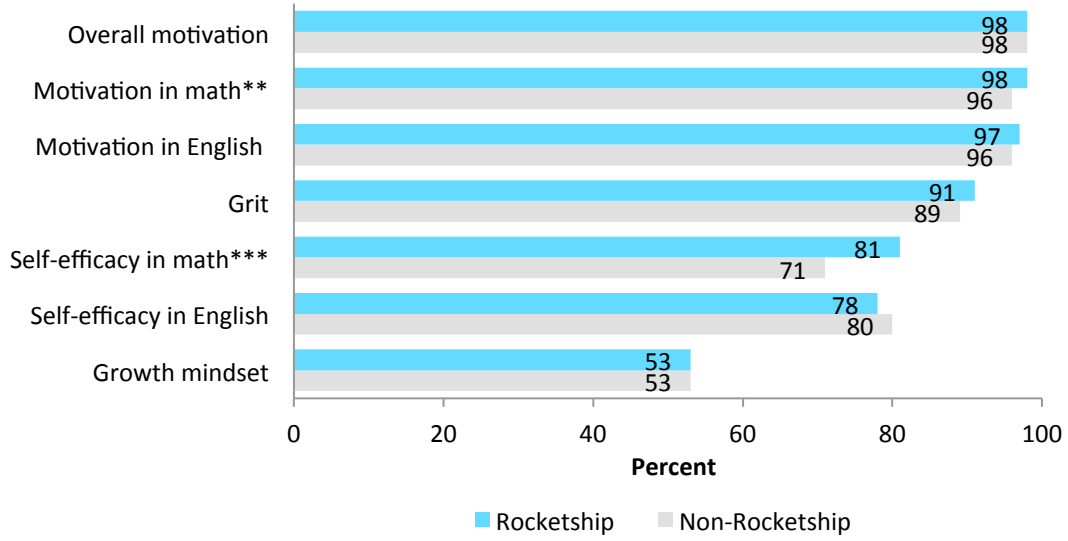
All students in the study sample were enrolled in local charter middle schools. Of those students, Rocketship alumni were more likely than their non-Rocketship peers to report that they chose their middle school. Seventy percent of Rocketship alumni agreed or strongly agreed with the statement, "I chose to go to this middle school," versus 50% of their non-Rocketship peers.

Noncognitive Attitudes and Mindsets

The majority of Rocketship alumni and their non-Rocketship peers indicated agreement on survey items measuring noncognitive factors. Agreement on items regarding motivation and grit (i.e., persistence) was especially high. Only about half, however, reported positive perceptions about their ability to learn and grow (i.e., growth mindset).

Most Rocketship alumni and their non-Rocketship peers agreed with items indicating high levels of self-efficacy and motivation in math, but Rocketship alumni were more likely to agree or strongly agree to these items than their non-Rocketship peers (Exhibit 6). Although there were not statistically significant differences between Rocketship alumni and their non-Rocketship peers on the remaining the noncognitive factors, the high proportion of all students who reported agreement on these items is promising. However, just over half of students in both groups agreed or strongly agreed to items measuring a "growth mindset." This included questions about students' abilities to affect their intelligence—in other words, having a fixed versus a growth mindset. Research has shown that having a growth mindset is positively correlated with student learning gains and that it can also help support the development of other positive dispositions, especially perseverance.[7] Our survey results indicated that, overall, more Rocketship alumni and their non-Rocketship peers agreed with statements about grit (e.g., "I finish whatever I begin," "I am a hard worker at school") than with statements about growth mindset.

Exhibit 6
Rocketship Alumni and Non-Rocketship Peers Who Agreed or Strongly Agreed on Survey Items Indicating Positive Attitudes and Mindsets



Chi-Square Test, *p < .05; **p < .01; ***p < .001.
Source: SRI Middle School Student Survey

[7] Blackwell, L.S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict academic achievement across an adolescent transition: A longitudinal study and intervention. *Child Development* 78, 246-263; Shechtman, N., DeBarger, A. H., Dornsife, C., Rosier, S., & Yarnall, L. (2013). *Promoting grit, tenacity, and perseverance: Critical factors for success in the 21st century*. Washington, DC: U.S. Department of Education.

The majority of Rocketship alumni and their non-Rocketship peers reported that graduating from high school and college is very important to them; however, Rocketship alumni were more likely than their non-Rocketship peers to report that someone at their elementary school talked with them about planning for high school and college.

Ninety-two percent of Rocketship alumni and 91% of their non-Rocketship peers reported that graduating from high school is very important to them, while 95% of Rocketship alumni and 91% of their non-Rocketship peers reported that graduating from college is very important to them. However, survey data indicated that Rocketship educators were more likely to begin conversations with students about their educational plans. Specifically, 40% of Rocketship alumni reported that a staff member at their elementary school talked with them about planning for high school, compared with 35% of their non-Rocketship peers. Similarly, 65% of Rocketship alumni reported that a staff member at their elementary school talked with them about planning for college, compared with 49% of their non-Rocketship peers. These early conversations about postsecondary expectations create norms for graduating from high school and attending college. Research shows that high expectations coupled with a supportive learning environment are correlated with higher rates of academic success and lower rates of problem behaviors, such as dropping out of school.[8]

Next Steps for the Evaluation

SRI's final report, expected in summer 2016, will describe further analyses of student achievement outcomes and the characteristics and behaviors associated with middle school success among Rocketship alumni.

[8] Benard, B. (1995). *Fostering resilience in children*. Council for Exceptional Children. (ERIC Digest No. ED386327).