

2017-18 Evaluation of Reasoning Mind

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At-a-Glance

In 2017-18, 11,311 Dallas Independent School District (ISD) students in grades two to five used the Reasoning Mind (RM) mathematics curriculum,¹ which was a large decrease from 2016-17 ($N=29,714$). The number of RM schools funded centrally decreased from 147 in 2016-17 to 57 schools in 2017-18 due to the budget cuts for the year. There were five schools that purchased RM with their own budget;² however, this evaluation is limited to 57 schools that were funded centrally. RM was supplemental to the district curriculum in grades two to four, which means teacher time was split between using district and RM curricula. RM served as the full curriculum for grade five. The 2017-18 budget was \$847,763, which was about half of the 2016-17 budget (\$1,763,660). The purpose of this report was to summarize 2017-18 RM implementation findings, campus staff survey findings, and mathematics assessment outcomes.

Methodology

The *Dallas ISD Reasoning Mind Evaluation Framework* developed by Bush and Kim (2015) was used to guide the evaluation. Context and process information were gathered from internal documents, the RM website, and interviews with RM and Dallas ISD program staff. The lead evaluator conducted interviews with the RM project director and the district mathematics director. Student data were extracted from the October 2017 Public Education Information Management System (PEIMS) file and RM files. Frequency and descriptive analyses were used to examine student demographic characteristics, student use of RM, and teacher training completion rates. Frequency and crosstab analyses were conducted for campus staff surveys, which were administered in January and February 2018.

Outcome analyses were carried out to determine how RM students performed on Spring 2018 mathematics assessments. These included *TerraNova* and *State of Texas Assessments of Academic Readiness (STAAR)*. There were four main limitations of the analyses. First, achievement results could not be attributed solely to RM due to the district's use of RM as supplemental to regular instruction in grades two to four. Second, implementation fidelity continued to be a confounding

factor as a sizeable proportion of students in all grades did not meet RM expectations for implementation. Third, there was possible selection bias between treatment and comparison groups for each grade. That is, the number of RM schools funded centrally decreased in 2017-18 because of budget cuts, and criteria to select schools were based on 2016-17 campus level RM implementation. It should be noted also that only one school was selected for fifth grade which may limit the generalizability of the findings. Fourth, per the spring 2018 RM teacher survey, between 10 and 29 percent of teacher respondents used additional mathematics programs such as Think Through Math (TTM) and Houghton Mifflin Harcourt (HMH) Personal Math Trainer.

Correlation coefficients were computed to note strength of relationships between test scores and RM indicators. Crosstab analyses were carried out to study the link between RM implementation and achievement. Multiple regression analyses were conducted for each grade level to determine which RM indicators best predicted students' achievement scores.

Propensity score matching (PSM) was used to create matched comparison groups of non-RM students.³ After that, multiple regression analyses were carried out for each grade to determine if there were statistically and practically significant differences in mathematics achievement scores between RM and non-RM comparison group students. For further analyses, frequencies and crosstab analyses were computed to examine differences between the two groups in percentages of students at or above grade level on *TerraNova* and that achieved Approaches Grade Level or Above (Approaches +), Meets Grade Level or Above (Meets +), and Masters Grade Level on *STAAR*. *STAAR* progress measures were also analyzed to examine how much fourth- and fifth-grade students improved this year.⁴

What were the demographic characteristics of RM students?

A total of 11,311 students participated in RM during 2017-18. This included 4,346 (37%) of the district's

¹ Imagine Learning acquired RM on July 30, 2018.

² Those schools included Carpenter, King, Peeler, Polk (grade five only), and Williams.

³ The matched comparison group for each grade was comprised of non-RM students in the district that had the same probability of being in RM as RM students.

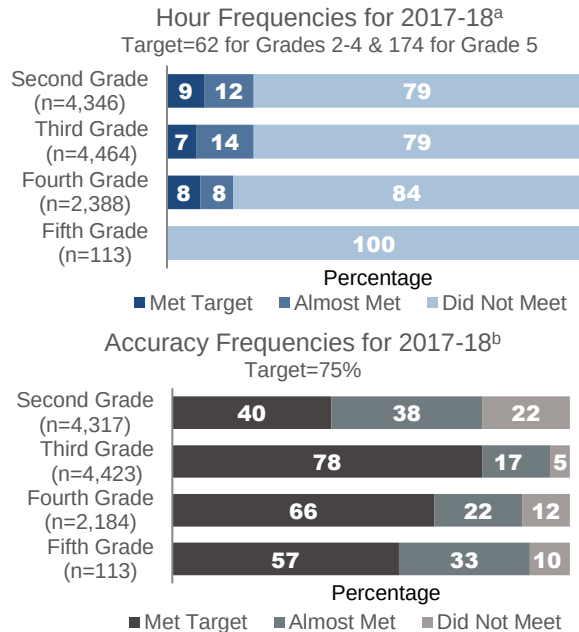
⁴ The progress measure is based on a comparison of a student's test score last year with his or her score this year. This measure informs how much the student has improved in a subject area.

second grade students, 4,464 (36%) of the district's third-grade students, 2,388 (19%) of the district's fourth-grade students, and 113 (1%) of the district's fifth-grade students. The percentage of district students enrolled in RM decreased from 2015-16 to 2016-17 to 2017-18 for all grades. The majority of RM students were economically disadvantaged (85%) and Hispanic (75%). Fifty-six percent were English learners (ELs).

Was the RM program used by students as planned?

Implementation fidelity continued to be a concern as the majority of campuses were classified as low implementing for second (87%), third (94%), fourth (88%), and fifth (100%) grades. The continued low level of implementation was surprising since most 2017-18 RM campuses had a medium or high level of implementation in 2016-17. Consistent with past years, Dallas ISD fell short of meeting implementation expectations (see Figure 1). Most RM students (91% to 100%) did not reach the district's 2017-18 target for hours online (target=62 hours for grades two to four and 174 hours for grade five), and a sizeable proportion (79% to 100%) logged less than 80 percent of expected hours. Whereas many third- (78%), fourth- (66%), and fifth-grade (57%) students met the district accuracy target, many second-grade students (60%) did not meet the accuracy target.

Figure 1: 2017-18 RM Student Hour and Accuracy Results



Source: PEIMS data (10/30/17); RM data (1/04/18 and 6/05/18).
 Note: The number of students with hour and accuracy data differ for each grade because some students did not have accuracy data.
^a Met=Logged 100% of expected hours. Almost Met=Logged 80 to 99% of expected hours. Did Not Meet=Logged less than 80% of expected hours.
^b Met=Attained Guided Study Level A accuracy rate of 75% or higher. Almost Met=Accuracy rate between 60 and 74%. Did Not Meet=Accuracy rate of less than 60%.

Did staff members participate in RM training as planned?

Until 2016-17, first-year RM teachers were required to take the RM Qualification Course (QC) prior to using RM with students. However, due to delayed processing of the purchase orders for RM in Fall 2017, first-year RM teachers in 2017-18 were not required but were strongly encouraged to take the QC before using RM with students. For this reason, only 36 percent of first-year RM teachers completed the QC by the end of the first six weeks, which was a notable decrease from last year (71% in Fall 2016). Half (50%) of first-year RM teachers did not complete the QC by the end of the fall semester.

RM offered additional training courses for all RM teachers. About eight percent (n=28) of the district's 344 RM teachers participated in optional RM PD during the fall semester. All 28 teachers used supplemental RM (grades two to four). There were two campus-based mathematics instructional coaches who attended RM's Best Practice Workshop courses.

What were teacher and administrator perceptions of RM?

Per interviews with RM and district staff, the RM project director and the district mathematics director viewed more communication and support by RM implementation coordinators (ICs) as a main success. In 2017-18, RM ICs held two group sessions based on individual campus need and held two individual meetings with each teacher. The RM project director also mentioned the single objective curriculum (SOC) as a success. SOC allows teachers to customize the RM curriculum to the district curriculum. Barriers to implementation included technology problems; delayed processing of purchase orders; the district's change in its data management tool to CLEVER; the reduced budget; and fewer ICs.

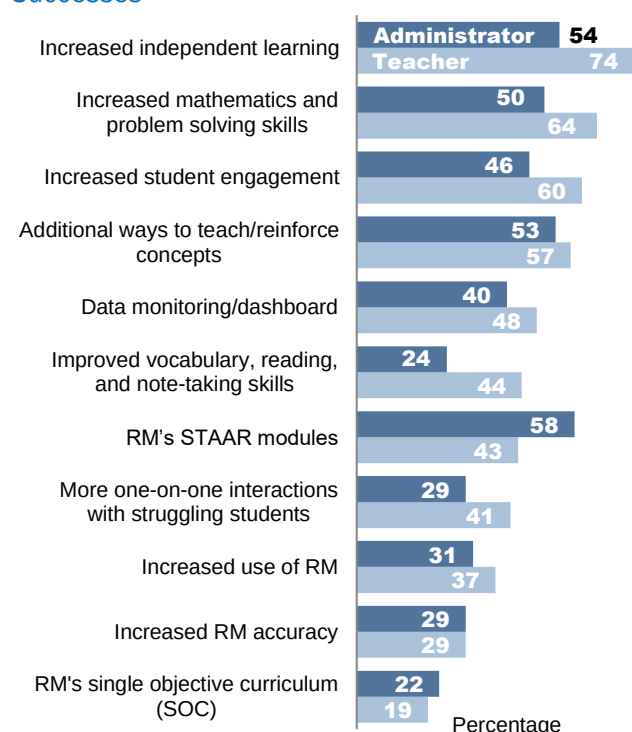
As in previous years, campus staff survey results revealed that teachers were more positive than campus administrators on the overall survey items with one exception (the benefit of RM on students: 91% for campus administrators and 88% for teachers). Whereas 69 percent to 91 percent of administrators gave positive responses to overall items, 77 percent to 88 percent of teachers did so. Most teachers (80% to 89%) believed students improved on key indicators (e.g., enjoyment of mathematics, confidence in mathematics ability, etc.). The majority of campus administrators and teachers were "satisfied" or "extremely satisfied" with support from the RM implementation coordinator (85% for both groups) or support from district staff members (77% to 88%).

Some campus administrators and teachers reported technology issues, especially with laptops/computers

on wheels (COW) carts (38% for campus administrators and 34% for teachers), network (22% for both), and wireless connectivity (21% and 28%, respectively). Between six percent and 30 percent of campus staff members reported other technology issues (6% to 30% for campus administrators and 8% to 18% for teachers). Of the teacher respondents, between 10 percent and 29 percent indicated that they used other mathematics intervention programs (e.g., Think Through Math, Houghton Mifflin Harcourt Personal Math Trainer, etc.) in addition to RM.

In terms of RM successes, teachers (19% to 74%) were more positive than campus administrators (22% to 58%) with two exceptions (see Figure 2). Campus administrators were more positive than teachers on RM's STAAR modules (58% and 43%, respectively) and RM's SOC (22% and 19%, respectively). Twenty-nine percent of campus administrators and teachers indicated the increased RM accuracy as a success.

Figure 2: Campus Staff Survey Responses for RM Successes

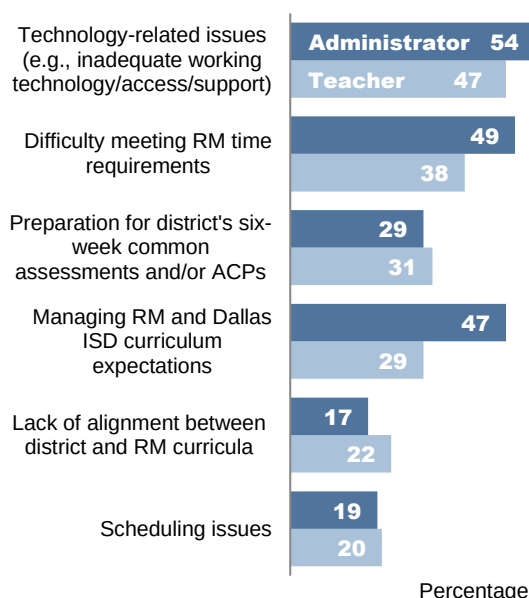


Source: RM campus staff (administrator and teacher) surveys administered in Spring 2018.

Note: Respondents could mark more than one category. This figure was limited to categories with 15 percent or more of respondents for each group ($n=194$ for teachers and $n=72$ for campus administrators).

The most cited challenges were technology-related issues (54% for campus administrators and 47% for teachers) and difficulty meeting RM time requirements (49% and 38%, respectively - see Figure 3).

Figure 3: Campus Staff Survey Responses for RM Challenges



Source: RM campus staff (administrator and teacher) surveys administered in Spring 2018.

Note: Respondents could mark more than one category. This figure was limited to categories with 15 percent or more of respondents for each group ($n=198$ for teachers and $n=79$ for campus administrators).

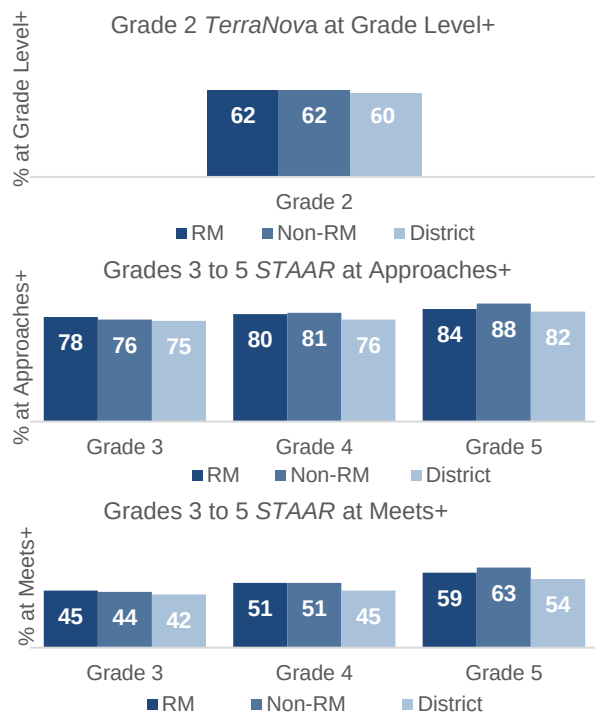
What were student mathematics achievement outcomes?

Outcome results were consistent with previous findings (Kim & Bush, 2017). RM students that met the accuracy target outperformed those who did not. Students that met the hour target showed similar patterns; however, the differences were not as pronounced as those for accuracy. Likewise, students' mathematics scores were more highly correlated with prior achievement ($r=0.71$ to 0.84) and accuracy ($r=0.56$ to 0.73) than with objectives completed ($r=0.13$ to 0.42) or hours online ($r=-0.03$ to 0.17). Multiple regression analyses showed that with the exception of fifth grade, prior achievement, RM accuracy, and RM objectives completed were major predictors of Spring 2018 assessment scores.

When student performance on *TerraNova* 2018 and STAAR 2018 was compared between RM and non-RM comparison students, results showed no clear pattern of differences in percentage of students that met the performance standards (see Figure 4).

When prior achievement and economically disadvantaged status were accounted for, differences in STAAR 2018 scale scores between the two groups were statistically significant (favoring RM students) for third and fourth grades but showed no practical significance. As for second and fifth grades, there were no statistically or practically significant differences between the two groups.

Figure 4: RM and Non-RM Student Comparisons on TerraNova 2018 and STAAR 2018



Source: PEIMS data (10/30/17). RM data (1/04/18 and 6/05/18). TerraNova (6/11/18). STAAR (6/20/18).

Note: STAAR=State of Texas Assessments of Academic Readiness. STAAR results included first administration data. STAAR Alternate 2 scores were excluded. Although all STAAR scores were included, some students' test scores might have been adversely affected by the online testing issues that occurred in 2018. Grade Level+ = At or Above Grade Level. Approaches+ = Approaches Grade Level or Above. Meets+ = Meets Grade Level or Above. $n=3,671$ for both RM and non-RM of second grade; 3,835 for third grade; 2,105 for fourth grade; and 104 for fifth grade. District information was provided as a reference ($n=10,974$ for second grade, 11,663 for third grade, 11,854 for fourth grade, and 11,785 for fifth grade).

In regard to RM and non-RM student comparisons on STAAR progress measures, 65 percent of RM students in grade four made 'Expected' or 'Accelerated' progress in 2017-18, which was two percentage points higher than non-RM comparison students. For fifth grade, 61 percent of RM students made 'Expected' or 'Accelerated' progress in 2017-18, which was 11 percentage points lower than non-RM comparison students.

Recommendations

- **Require higher levels of implementation for 2018-19 RM campuses.** Across grade levels, there were more campuses in the "low" implementing category than in the "medium" and "high" implementing categories. Strong implementation of RM is important to effectively impact student achievement and to ensure the district receives an adequate return on its investment of \$847,763.

- **Make sure teachers receive adequate guidance on how to meld two different curricula (district and RM) using SOC.** It is important to make certain that every teacher recognizes the availability of SOC and has sufficient guidance on how to customize the RM curriculum to the district curriculum as needed.
- **Make certain all campuses have adequate working technology and are reporting issues to Information Technology as problems occur.** Technology issues continued to be a challenge based on the surveys and interviews. It is important to continue to add and upgrade campus technology while ensuring ample campus support and timely submission of tickets to Information Technology.
- **Strategically plan for next year's RM QC training to make sure more teachers complete the QC prior to or at the onset of the 2018-19 school year.** Most teachers (64%) did not complete the QC by the end of the first six weeks. It was partly due to delayed processing of orders for RM in Fall 2017. As recommended in the past, the district needs to make sure more teachers complete the QC prior to or at the very beginning of the school year.

References

Bush, J. & Kim, M. (2015). Evaluation of Reasoning Mind: Final Report 2014-15. Dallas, TX: Dallas Independent School District.

Bush, J. & Kim, M. (2016). Evaluation of Reasoning Mind: Final Report 2015-16. Dallas, TX: Dallas Independent School District.

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An electronic version of this report as well as the full 2017-18 report can be found at www.dallasisd.org/Page/888. For more information, please contact Program Evaluation at evaluation@dallasisd.org.

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