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Evaluation of Transformative Reading Instruction: In Classroom Coaching

2016-2017

MPS MILWAUKEE
PUBLIC SCHOOLS

Milwaukee Succeeds
cradle to career

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Great Schools

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Milwaukee Succeeds

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Milwaukee Teacher Education Association

Milwaukee Teacher Education Center

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Next Door Foundation

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Wisconsin Literacy

Wisconsin Reading Coalition and Children's Dyslexia Center

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Executive Summary

Transformative Reading Instruction (TRI), a model for teaching foundational reading skills, was developed by the partners involved in Milwaukee Succeeds' third grade reading network. The goal of the model is to increase third grade reading proficiency. TRI coaching was implemented at two Milwaukee Public Schools (MPS) during the 2014-2015 school year. TRI expanded to five additional MPS schools, one charter school and one choice school during the 2015-2016 school year. This report provides an evaluation of TRI in the twelve schools that implemented TRI coaching throughout the 2016-2017 school year. This group included nine MPS schools, two Seton Catholic schools, and one charter school.

This report addresses the following elements and questions:

Element	Question
Fidelity of Implementation	Did teachers receive coaching as intended?
Fidelity of Implementation	Did students receive reading sessions as intended?
Fidelity of Implementation	Did the intended students receive TRI?
Outcome Analysis	Did students in MPS in TRI in 2016-2017 perform better on the STAR assessment than comparison students who were not in TRI?
Outcome Analysis	Did MPS students who were full participants perform better on STAR than students who were partial participants?
Outcome Analysis	To what extent did students in TRI 2016-2017 grow toward being on target?
Outcome Analysis	How did growth for TRI students compare to their expected growth?

Fidelity of Implementation The evaluation found that overall the main elements of TRI, including teachers receiving coaching, teachers providing TRI instruction, and students receiving intended TRI reading sessions, occurred within the expected levels of implementation.

Outcome Analysis   The analysis included the following four evaluation questions:

1. Did students in TRI in 2016-2017 perform better on the STAR assessment than comparison students who were not in TRI? Students who were in TRI during the 2016-2017 school year performed better on the spring STAR assessments than comparison students who did not receive

TRI, after controlling for fall performance and demographic variables. This was true for kindergarten, first and second grade students. There was a positive, statistically significant effect of participating in TRI. On average, students participating in TRI improved their spring STAR Early Literacy scores by 30.85 more points than comparison students, and their spring STAR Reading score by 27.25 more points than comparison students.

2. Did students who were full participants perform better on STAR than students who were partial participants? Students who received the full intended dosage of TRI showed significantly larger improvements on STAR than students who only received partial participation.

3. To what extent did students in TRI in 2016-2017 grow toward being on target? The intention of TRI is to move students' reading scores from below target to on target. On the STAR Early Literacy Assessment, taken by MPS Kindergarten and 1st grade students, 1.23% of TRI participants were on target or above in the fall and this increased to 46.92% by the spring. On the STAR Reading Assessment, taken by MPS 2nd grade student, 0.48% of students were on target in the fall and this increased to 19.71% in the spring. From fall to spring on the MAP assessment, taken by students at choice and charter schools, the percent of 1st grade students on target increased from 5.88% to 11.76% and 2nd grade from 5.45% to 21.82%.

4. How did growth for TRI students compare to their expected growth? All groups of TRI students who began the year below target and took a fall and spring reading assessment, except 2nd grade students starting below the 10th percentile, exceeded growth expectations.

Transformative Reading Instruction (TRI)

Transformative Reading Instruction, a model for teaching foundational reading skills, was developed by the Milwaukee Succeeds partners to improve students' reading achievement. It began in 2014. The table below displays the TRI schools that implemented the TRI coaching model throughout the 2016-2017 school year.

School Name	School Type	Year TRI Began
Gwen T. Jackson School	MPS	2014-2015
Clarke Street School	MPS	2014-2015
Rogers Street Academy	MPS	2015-2016
Forest Home Avenue School	MPS	2015-2016
George Washington Carver Academy	MPS	2015-2016
Ralph H. Metcalfe School	MPS	2016-2017
Hopkins Lloyd School	MPS	2016-2017
Parkview School	MPS	2016-2017
Mitchell Integrated Arts School	MPS	2016-2017
Milwaukee Academy of Science	Charter	2015-2016
Saint Catherine's Catholic Elementary School	Choice	2015-2016
Northwest Catholic School	Choice	2016-2017

> TRI creates readers by providing intensive evidence-based professional development and coaching to K-2 teachers on foundational reading.

The TRI components are in place to support the needs of students who are not yet on target to reach proficiency by third grade. TRI promotes school-wide, sustainable change that supports school leaders, teachers, student and parents. Figure 1 illustrates the model.

FIGURE 1. TRANSFORMATIVE READING INSTRUCTION MODEL

The overall model includes several elements that surround the core strategy of coaching on foundational reading. These elements are: committed leadership, evidence-based tutoring, parent engagement workshops, experiential opportunities and aligned data-driven progress monitoring. Committed leadership at the school level is essential to TRI success. TRI works best as a cohesive part of school leaders' visions, rather than a separate entity. Each school includes a designated internal coach who leads monthly TRI continuous improvement meetings. Evidence-based tutoring is a component in TRI schools. Tutoring helps students who need additional one-on-one support to master specific reading skills. Parent engagement workshops reinforce reading skills, attendance, and effective communication with the school. Experiential opportunities engage students and reinforce vocabulary and content. Finally, aligned data-driven progress monitoring occurs through bi-weekly consultation meetings between coaches and teachers, and monthly continuous improvement meetings and action step tables.

The core of the TRI model is the professional development and coaching that teachers receive on providing foundational reading instruction to students in differentiated teacher-led small groups. In TRI schools, kindergarten through 2nd grade teachers participate in professional development and in-classroom coaching sessions to improve foundational reading skill instruction. Coaching

sessions include the following content: rapid letter naming, rhyming, blending and segmenting (sound awareness), sounds and decoding, multi-syllable decoding, passage fluency, retelling, vocabulary, word fluency, and comprehension. Coaches use a gradual release design with each new topic. They begin by modeling practices for teachers in their classrooms, and then provide guided practice by coaching in real time. As teachers gain mastery, coaches continue to teach new skills, as well as observe, provide feedback, consult and review data collaboratively throughout the school year. Appendix A details the essential elements of TRI.

TRI teachers provide explicit, targeted instruction on foundational reading skills to students based on their needs as determined by data, including standardized test scores, curriculum-based measures, and ongoing program assessments. Small group instruction occurs three to five times per week and lasts approximately 20 minutes. Instruction directly matches students' needs. Students work to reach set fluency levels for each foundational skill. Students develop mastery of skills by reaching pre-determined levels of fluency in all skill areas such as blending, segmenting, and letter naming. Sessions maximize time for students' active engagement and deliberate practice and application. TRI follows the philosophy that foundational reading skills develop through deliberate, well-designed practice that develops expert performance. Well-designed practice includes established goals, meaningful feedback, responsive instruction, time limits, and systematic instructional designs.

TRI is based on evidenced-based best practices developed by the Milwaukee Succeeds third grade-reading network. The model is based on national evidence demonstrating the efficacy of these approaches to improve reading outcomes, as well as local data, including what has worked to improve reading scores in Milwaukee. The theory behind TRI is that working collectively can effectively improve student outcomes. TRI engages schools, school districts, and community partners, and follows the collective impact model Kania & Kramer[1] created that has been successful across the country. It includes five components: 1. A common agenda, 2. Mutually reinforcing activities, 3. A shared measurement system, 4. Continuous communication, and 5. Backbone support.

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[1] Kania, J., & Kramer, M. (2011). Collective impact. Stanford Social Innovation Review, 9, (1), 36-41.

Report Overview

This report provides analysis of the fidelity of implementation and outcomes of TRI during the 2016-2017 school year. The following table displays the questions answered in this report.

Element	Question
Fidelity of Implementation	Did teachers receive coaching as intended?
Fidelity of Implementation	Did students receive reading sessions as intended?
Fidelity of Implementation	Did the intended students receive TRI?
Outcome Analysis	Did students in MPS in TRI in 2016-2017 perform better on the STAR assessment than comparison students who were not in TRI?
Outcome Analysis	Did MPS students who were full participants perform better on STAR than students who were partial participants?
Outcome Analysis	To what extent did students in TRI in 2016-2017 grow toward being on target?
Outcome Analysis	How did growth for TRI students compare to their expected growth?

Fidelity of Implementation

Intended coaching consists of weekly sessions in teacher's classrooms (Figure 2a), bi-weekly consultation sessions between coaches and teachers (Figure 2b), and group professional development sessions (Figure 2c). TRI coaching occurs during teachers' TRI instruction. TRI consultation is a meeting with the coach and the teacher when students are not present. TRI professional development (PD) is a time when a TRI coach leads a session with a group of teachers when students are not present. See Appendix B for a sample coaching log.

Percent of TRI Teachers Meeting Coaching Fidelity

Figure 2a. Percent of TRI Teachers Meeting Coaching Fidelity. The percentage of teachers enrolled in TRI receiving at least one coaching session per academic week is graphed across active academic months. The different colored bars correspond to the different target grades. The total number of TRI teachers was updated monthly to account for new enrollments and teacher attrition. For the last active month, 61 teachers were enrolled in TRI.
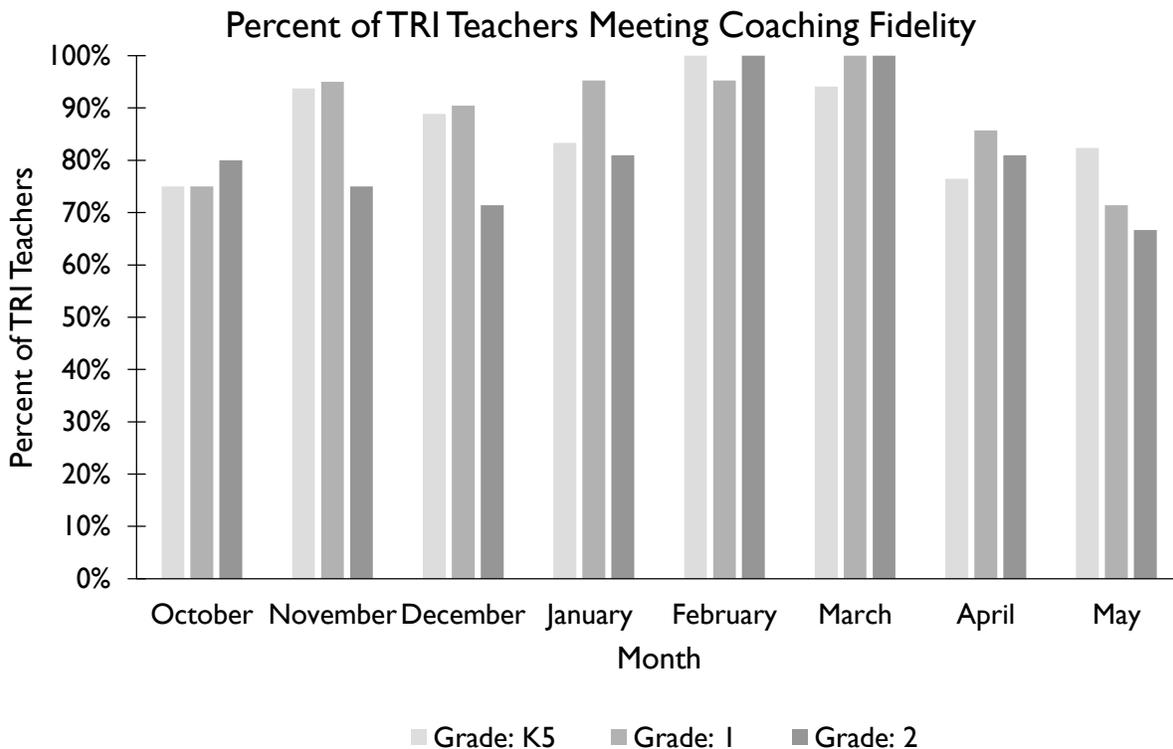
Percent of TRI Teachers Meeting Consulting Fidelity
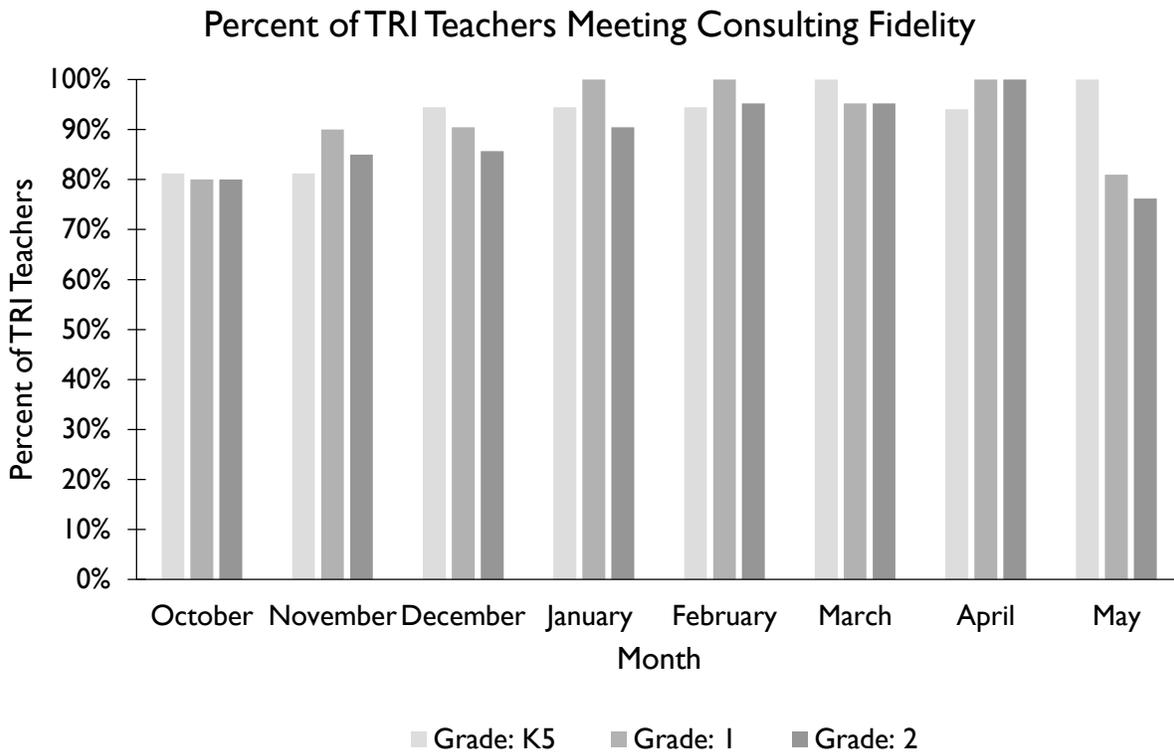
Figure 2b. Percent of TRI Teachers Meeting Consulting Fidelity. The percentage of teachers enrolled in TRI receiving at least one individual consulting session per every other academic week is graphed across active academic months. The different colored bars correspond to the different target grades. The total number of TRI teachers was updated monthly to account for new enrollments and teacher attrition. For the last active month, 61 teachers were enrolled in TRI.

Percent of TRI Teachers Meeting Professional Development Fidelity
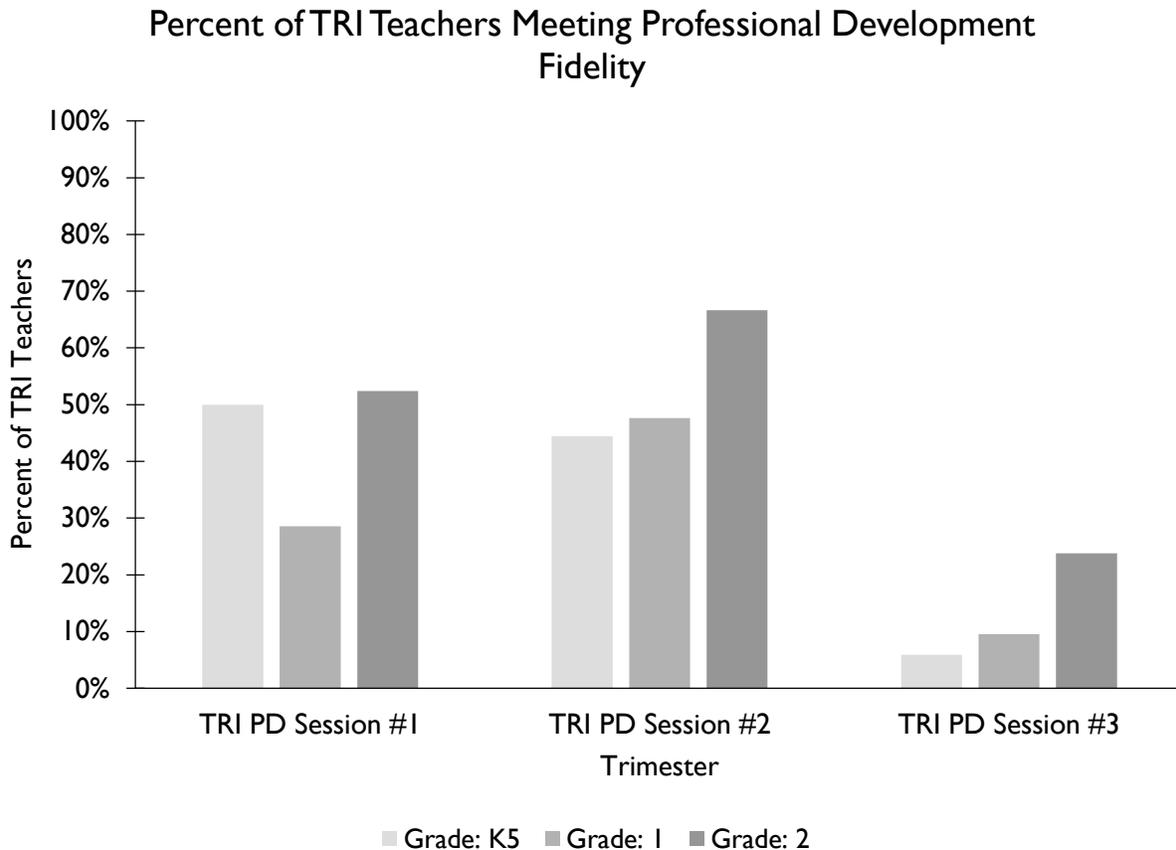
Figure 2c. Percent of TRI Teachers Meeting Professional Development Fidelity. The percentage of teachers enrolled in TRI who participated in at least one professional development meeting per academic trimester is graphed across active academic trimesters. The different colored bars correspond to the different target grades. The total number of TRI teachers was updated monthly to account for new enrollments and teacher attrition. For the last active month, 61 teachers were enrolled in TRI.

TRI intends for teachers to provide foundational reading instruction in differentiated small groups three to five times per week (60-100% of instructional days) for approximately 20 minutes. Figure 2d shows the average number of reading sessions and Figure 3 shows the percentage of students who received the intended amount of sessions.

Average Number of Student TRI Sessions
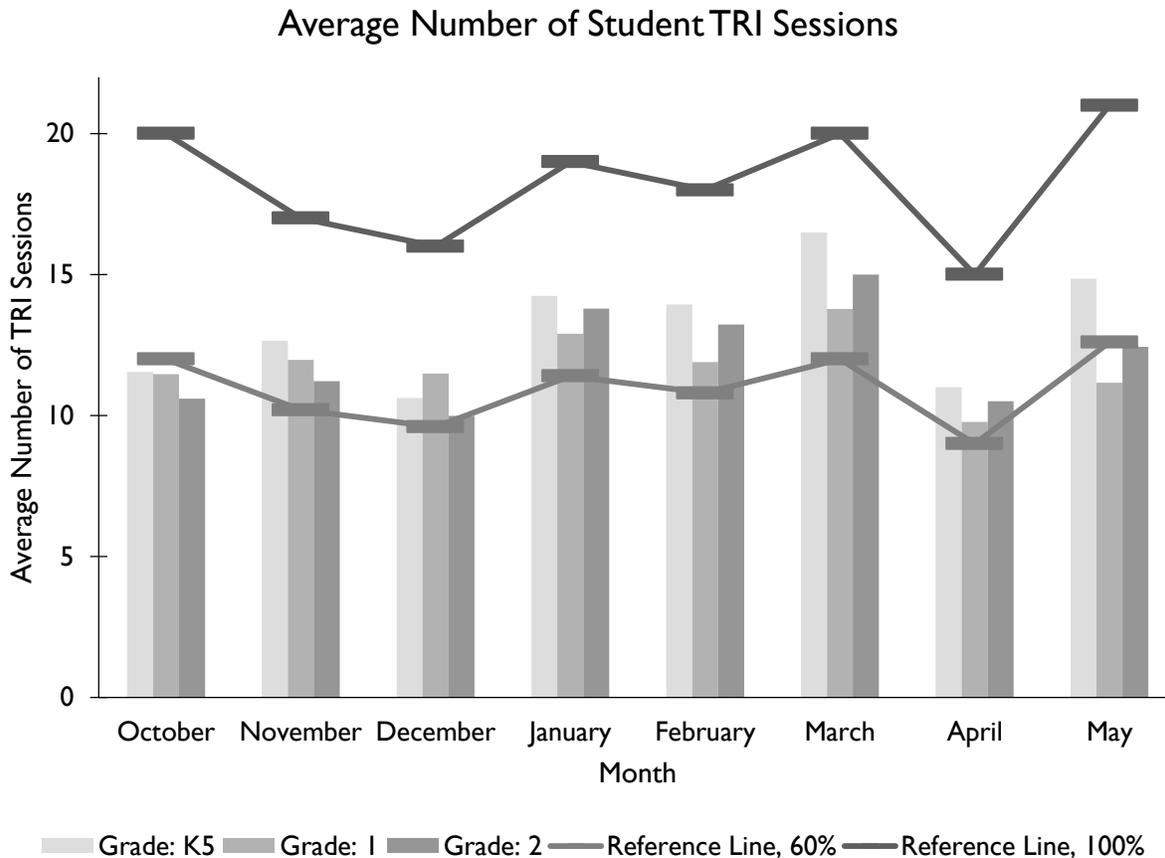
Figure 2d. Average Number of Student TRI Sessions. Average number of student TRI sessions are graphed for each grade per month. Data are compiled from 61 classrooms across 12 different schools. The reference lines indicate the average number of sessions expected for 60% implementation criteria (lower line) and 100% implementation criteria (upper line). The shift in reference lines reflect that the total number of enrolled students fluctuated each month. The data was continually updated to account for new students and student attrition. For the final academic month, 649 students were enrolled in the TRI program.

On average, classrooms provided at least the minimum intended TRI dosage in 6 out of 8 months.

Percent of Students Receiving Intended Dosage
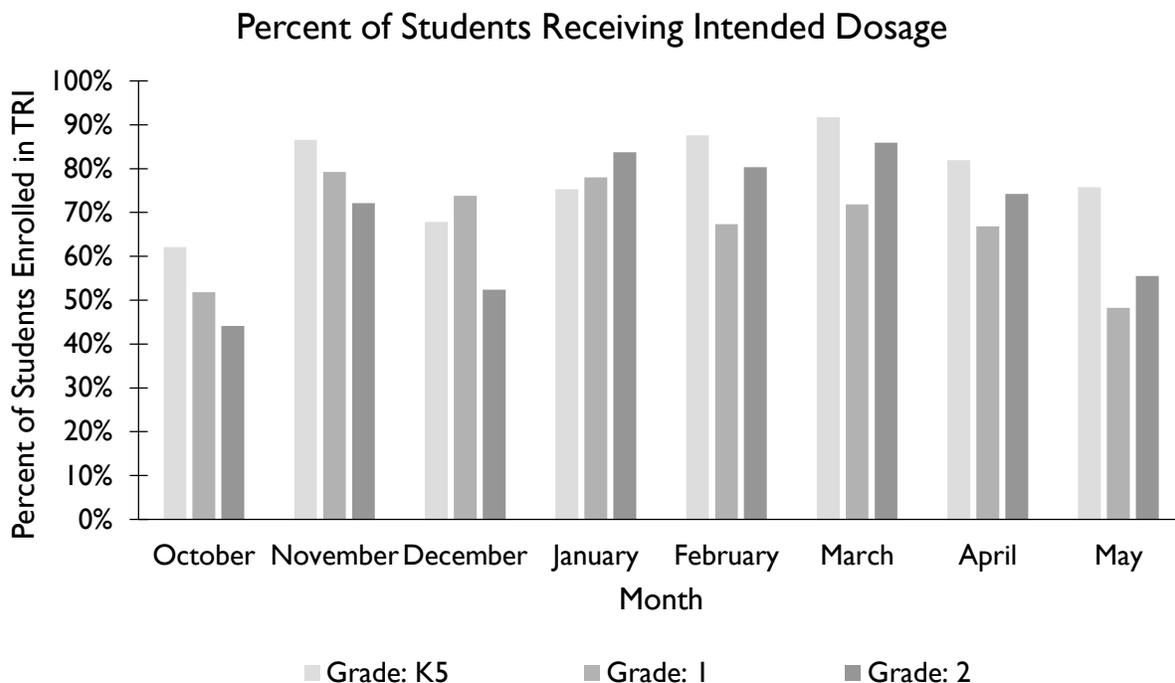
Figure 3. Percent of Students Enrolled in TRI Meeting Intended Dosage per Month. The percent of students enrolled in TRI receiving the intended dosage criteria were graphed for each grade per month. Data were compiled from 61 classrooms across 12 different schools. The total number of enrolled students fluctuated each month. The data was continually updated to account for new students and student attrition. For the final academic month, 649 students were enrolled in the TRI program.

In addition to investigating the extent to which teachers received coaching as intended, and the extent students received reading sessions as intended, we also measured whether the intended students received TRI. TRI is intended for students who are not yet reading on target. For the 2016-17 school year, this included students scoring below the 45th percentile on the STAR exam or below the 40th percentile on the MAP exam. Data analysis revealed that all intended students received at least one TRI session.

Outcome Analysis

Inferential Outcome Analysis

The purpose of the inferential analysis portion of this report is to investigate if the Transformative Reading Initiative (TRI) is associated with a statistically significant increase in reading skills for participating students. Inferential analyses were conducted using $p < 0.05$ significance level. Only MPS students were included in the inferential analyses. The MPS schools and choice or charter schools differ on criteria that may impact students' reading outcomes which could bias results if student scores were combined across sites. Comparison data from choice or charter schools was not available due to data collection and sample size. Therefore, choice and charter schools are included in the descriptive analysis only.

A pool of potential comparison students was created by identifying MPS schools with similar demographics and geographic zones to the schools that participated in TRI. The analysis compared the TRI students' spring standardized test scores to the comparison students' spring standardized tests scores, after controlling for the students' fall scores and relevant demographic factors. Participation in TRI was not determined by random assignment. Students from participating schools were identified by need. Typically, the students' fall 2016 STAR reading outcome determined this need. The target population was students who scored below the 45th percentile on either the STAR Early Literacy or STAR Reading assessment. Since participation in TRI was not by random assignment the results are correlational in nature and cannot be interpreted causally. However, the results can be interpreted as evidence supporting claims of association between TRI and increased student achievement on standardized reading tests.

Sample selection

Participation in TRI was defined as the student receiving at least one TRI reading session during the 2016-2017 school year. During the 2016-2017 school year nine MPS schools participated in TRI: Clarke, Jackson, Rogers, Carver, Forest Home, Metcalfe, Hopkins Lloyd, Parkview, and Mitchell. Data for this analysis was provided by two sources: MPS and TRI coaches. MPS provided student-level data including: STAR test scores, demographics, and attendance.

The analytic sample was created in two steps. MPS uses STAR Early Literacy and STAR Reading tests as interim formative assessments. Thus, the data were first separated into those students who took the STAR Early Literacy assessment (K5 and 1st grade) and those students who took the STAR Reading assessment (2nd grade). Initially, 515 MPS students were included in the TRI sample. Then, as with most large data sets, some data was missing or miscoded. Those students with missing or miscoded data were removed from the pool. Students were not excluded based on ELL status, economic status, or special education status. This resulted in a total valid TRI sample of $n = 451$.

The next step was to determine appropriate comparison schools from which to create the comparison sample. A list of appropriate comparisons based on geographic regions and overall student demographics was generated and reviewed by the MPS Director of Literacy. Students from the TRI participant school who were non-participants in TRI were also considered as possible comparison students. Once the pool of potential comparison students was established, students were selected through a case-control matching process. A SAS matching macro[1] was

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[1] Bergstralh and Kosanke (1995), macro code retrieved with open permission from 'http://www.mayo.edu/research/departments-divisions/department-health-sciences-research/division-biomedical-statistics-informatics/software/locally-written-sas-macros'

used to identify a set of comparison students that was as similar as possible to the TRI

participants. Comparison students were matched on: Fall 2016 STAR assessment score, gender,

race/ethnicity, English Language Learner (ELL) status, Free and Reduced Lunch (FRL) status,

and special education status. Side-by-side comparisons of the TRI students and the comparison

students can be seen in tables 1 and 2.

Table 1. STAR Early Literacy sample comparison

Variable	TRI (*n* = 243)	Comparison (*n* = 243)
Average Fall STAR Early Literacy Score	485.55	485.62
% ESL	9.88%	3.29%
% FRL	94.24%	97.12%
% Male	49.38%	55.14%
% African American	61.32%	74.49%
% Hispanic	22.22%	17.28%
% Special Education	16.46%	21.40%

Table 2. STAR Reading sample comparison

Variable	TRI (*n* = 208)	Comparison (*n* = 208)
Average Fall STAR Reading Score	104.00	102.65
% ESL	5.29%	6.73%
% FRL	91.83%	97.12%
% Male	49.04%	60.58%
% African American	61.06%	67.79%
% Hispanic	25.96%	23.08%
% Special Education	10.58%	30.29%

Outcome Measures

Milwaukee Public Schools used STAR Early Literacy and STAR Reading (Renaissance Learning, 2015) as a screening and formative evaluation measure during the 2016-2017 school year. These measures are computer adaptive assessments that assess a variety of literacy skills. In this sample, students in kindergarten and first grade completed the STAR Early Literacy assessment and students in second grade completed the STAR Reading assessment.

Student performance is presented in terms of scaled scores that range from zero to 1400. According to the STAR Reading technical manual (Renaissance Learning, 2016) the assessment has sufficient test-retest reliability ($r = .85$ for second grade) and internal consistency. Evidence of validity comes from correlations with other well-established standardized measures of literacy (e.g., Iowa Test of Basic Skills, Stanford Achievement Test) and the end-of-year state tests from several states. Evidence of predictive validity comes from correlations between STAR Reading and later performance on well-established standardized tests of literacy and state assessments.

In 2016, Renaissance Learning published a document linking scores on the STAR Reading assessment to the Wisconsin Forward Exam. Although these analyses did not include 2nd grade students, STAR Reading scores were positively correlated with Forward Exam ($r = .81$) in grades 3 through 8. Moreover, STAR scores adequately discriminated between students who scored in the proficient range and who scored below proficiency.

General Analysis Plan

Separate linear models were fit for each research question. The observed outcome measure for each student was dependent on their grade level. As stated above, K5 and 1st grade students were tested using the STAR Early Literacy assessment and 2nd grade students were tested using the STAR Reading assessment. Each student's Spring 2017 score was used as the outcome measure, and the Fall 2016 score was used as a control variable to account for their baseline literacy skills. Students were classified as TRI participants if they received at least 1 TRI reading session during the 2016-2017 school year. Students with zero sessions were included in the comparison pool. Although the comparison students were matched as accurately as possible, some difference between the groups required the inclusion of some additional control variables in the models. To determine which predictor variables would be used, each variable was introduced one at a time (see Appendix C for more information variable descriptions for inferential models). If there was a significant improvement in the predictive power of the model, which was determined by testing the *F*-ratio of the two versions of the model (i.e., with or without the variable in question) being compared, then the variable was included in the final model. Table 3 indicates which control variables were used to predict spring 2017 assessment scores in the linear models.

Table 3. Control variables used to predict Spring 2017 assessment scores in linear models.

Variable	Early Literacy	Reading
Grade Level	No	N/A
ESL	No	No
FRL	Yes	Yes
Gender	No	No
Race	No	No
Special Education	Yes	Yes
Fall 2016 STAR Score	Yes	Yes
Attendance Days 2016-2017	Yes	Yes

A Guide for Interpreting the Findings

Table 4 serves as a guide for reading the inferential analysis tables provided in this report.

Table 4. Guidance for inferential analysis.

Column	Interpretation
Variable	An attribute of a student that is being used to predict spring STAR scores. For example, we theorize that participation in TRI will have an effect on spring STAR scores, so we include 'Participate in TRI' as a predictor variable.
Parameter	An estimate of the amount that the variable affects the prediction of the spring STAR score. For example, the parameter for 'Participated in TRI' indicates how much higher, on average, a predicted spring STAR score would be for a TRI participant versus a non-participant
Standard Error	The accuracy of the parameter estimate. Since we are using a sample, parameter estimates are not exact. Standard error indicates how inaccurate, on average, a parameter estimate is based on the sample size.
***t*-value/*f*-ratio**	Test statistic based on the standard error and parameter estimate
***p*-value**	This value is compared to 0.05. If the p-value is less than 0.05, then the relationship is considered statistically significant.

The inferential analysis models and reported *p*-values indicate whether an independent variable (e.g., TRI participation) has a statistically significant effect on a dependent variable (e.g., spring STAR scores). Current standards require the reporting of an effect size along with tests of statistical significance (Wilkinson & The Task Force on Statistical Inference, 1999[2]). Effect sizes can be used to determine the magnitude of an effect, beyond whether the effect size is statistically significant.

Throughout the remainder of this report, we report the standardized mean difference between groups (i.e., Cohen's *d*). Using Cohen's *d* to represent the effects of TRI allows for comparisons to other reading intervention programs that used different outcome measures. Cohen's *d* is

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[2] Wilkinson, L., & The Task Force on Statistical Inference (1999). Statistical methods in psychology journals. American Psychologist, 54, 594-604.

calculated by calculating the difference between two group means, divided by the pooled standard deviation. A standardized mean difference of $d = 1.0$ indicates that the treatment group outperformed the control group by 1 standard deviation. Throughout this report, effect sizes were calculated using unstandardized mean and standard deviation values.

The most common framework for evaluating effect sizes is Cohen's (1988)[3] criteria. Cohen (1988) suggested that $d = 0.2$ represented a small effect, $d = 0.5$ represented a medium effect, and $d = 0.8$ represented a large effect. Best practice, however, requires interpreting effect sizes in context. For example, Hattie (2009)[24] analyzed over 800 meta-analyses (52,637 original studies) regarding malleable influences on student achievement. Across these 800 meta-analyses, the average effect size was $d = 0.4$.

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[3] Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd edition). New York, NY: Routledge.

[4] Hattie, J.A.C. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to student achievement. New York, NY: Routledge.

Tables 5 and 6 contain inferential regression analyses comparing TRI participants to the matched comparison students. The 'Participated in TRI' variable indicates whether or not a student received at least 1 TRI session during the 2016-2017 school year.

Table 5: Comparison between TRI students and Non-TRI MPS students on STAR Early Literacy

Variable	Parameter	Standard Error	t-value	p-value
Intercept	271.51	43.86	6.19	< 0.01
Participated in TRI	30.85	8.00	3.85	< 0.01
FRL	-52.06	19.59	-2.66	0.01
Special ED	-28.62	10.23	-2.80	0.01
Fall 2016 Early Literacy score	0.68	0.05	12.90	< 0.01
Attendance days 2016-2017	0.75	0.21	3.67	< 0.01

n = 486

Results indicate that there was a positive, statistically significant effect of participating in TRI ($t = 3.85$, $p < 0.01$) on predicted spring STAR Early Literacy scores. On average, students participating in TRI improved their spring STAR Early Literacy scores by 30.85 more points when compared to those who did not participate. TRI was associated with a small effect ($d = .349$) on spring STAR Early Literacy scores, after controlling for fall performance and the demographic variables in the model.

> There was a positive, statistically significant effect of participating in TRI. On average, students participating in TRI improved their spring STAR Early Literacy scores by 30.85 more points than comparison students, and their spring STAR Reading score by 27.25.

Table 6: Comparison between TRI students and Non-TRI MPS students on STAR Reading

Variable	Parameter	Standard Error	*t*-value	*p*-value
Intercept	-16.20	52.74	-0.31	0.76
Participated in TRI	27.25	10.26	2.66	0.01
FRL	-44.24	22.16	-2.00	0.05
Special ED	-31.05	12.91	-2.40	0.02
Fall 2016 Early Literacy score	1.39	0.12	11.14	< 0.01
Attendance days 2016-2017	0.75	0.28	2.68	0.01

N = 416

Results in table 6 indicate that there is a positive significant effect of participating in TRI (t = 2.66, p = 0.01) on predicted spring STAR Reading scores. On average, students participating in TRI improved their spring STAR Reading scores by 27.25 more points when compared to those who did not participate. The inferential evidence indicates that TRI is associated with increased performance on the spring STAR assessments after controlling for fall performance and the demographic variables, with an effect size of (d = .314).

Tables 7 and 8 contain simple ANOVA tests comparing two groups: students who participated fully in TRI and partial participants. Full participants were defined as those students who received at least 90 TRI sessions during the 2016-2017 school year. This number was determined by the number of weekly sessions students were intended to receive based on the goals set by TRI at the beginning of the 2016-2017 school year, with 3 sessions per week for 30 weeks. Partial participants were defined as those students receiving between 1 and 89 TRI sessions. The ANOVA tested whether there was a significant difference in the Fall to Spring improvement between the groups.

Table 7: Comparison of full participation and partial participation in TRI on the STAR Early Literacy assessment

	F-ratio	*p*-value
Full Participation	22.12	< 0.01
Group	N	M	SD
Partial Participation	139	183.00	92.08
Full Participation	104	242.96	106.16

Table 7 shows evidence that there was a significant difference ($F = 22.12$, $p < 0.01$) between the full participants in TRI and the partial participants on the improvement in STAR Early Literacy scores. Group averages indicate that, on average, full participants showed larger improvements from fall to spring. Receiving the full program, in comparison to the partial program, was associated with a medium effect on STAR Early Literacy scores ($d = .56$).

There was a significant difference between the full participants in TRI and the partial participants on the STAR Early Literacy and STAR Reading assessment. On average, full participants showed larger improvements from fall to spring.

Table 8: Comparison of full participation and partial participation in TRI on the STAR Reading assessment

	F-ratio	*p*-value
Full Participation	11.12	< 0.01
Group	*N*	*M*	*SD*
Partial Participation	133	103.34	94.72
Full Participation	75	161.17	155.47

Table 8 shows evidence that there was a significant difference ($F = 11.12$, $p < 0.01$) between the full participants in TRI and the partial participants on the STAR Reading assessment. Group averages indicate that, on average, full participants showed larger improvements from fall to spring.

Another method of evaluating the relationship between the amount of TRI participation and TRI scores was to examine the predictive relationship between the number of TRI sessions and STAR Early literacy scores. Tables 9 and 10 contain inferential regression analyses comparing TRI participants to the matched comparison students. The 'Number of TRI Sessions' variable indicates the total number of TRI sessions a student received during the 2016-2017 school year.

Table 9: The influence of more TRI sessions on STAR Early Literacy scores

Variable	Parameter	Standard Error	*t*-value	*p*-value
Intercept	280.12	43.40	6.45	< 0.01
Number of TRI Sessions	0.44	0.09	4.84	< 0.01
FRL	-48.98	19.45	-2.52	0.01
Special ED	-28.74	10.13	-2.84	< 0.01
Fall 2016 Early Literacy score	0.69	0.05	13.15	< 0.01
Attendance days 2016-2017	0.63	0.21	3.06	< 0.01

$n = 486$

Results from table 9 indicates evidence that there is a positive effect per TRI session ($t = 4.84$, $p < 0.01$) on predicted spring STAR Early Literacy scores. On average, each TRI session that a student participated in increased their predicted spring score by 0.44 points. Given the error inherent in any statistical model, the estimated growth per session for an individual student is likely to range from 0.26 to 0.62 points.

Table 10: The influence of more TRI sessions on STAR Reading scores

Variable	Parameter	Standard Error	t-value	p-value
Intercept	1.46	51.59	0.03	0.98
Number of TRI Sessions	0.47	0.12	3.87	< 0.01
FRL	-37.61	22.08	-1.70	0.09
Special ED	-28.60	12.71	-2.25	0.03
Fall 2016 Reading score	1.39	0.12	11.25	< 0.01
Attendance days 2016-2017	0.56	0.28	1.98	0.05

$n = 416$

Results from table 10 indicates evidence that there is a positive effect per TRI session ($t = 3.87$, $p < 0.01$) on predicted spring STAR Reading scores. On average, each additional TRI session that a student participated in was associated with an increase in their predicted spring score by 0.47 points. Considering the error in the model, the estimated growth per session for an individual student is likely to range from 0.23 to 0.70 points.

Descriptive Analysis

Descriptive analysis was performed on all TRI schools during the 2016-2017 school year. In addition to the nine MPS schools, three choice and charter schools also participated in TRI from fall 2016 through spring 2017: Milwaukee Academy of Sciences, Northwest Catholic School, and St. Catherine School. The outcome assessment for these schools is the Measures of Academic Progress (MAP) reading assessment. These descriptive results are not inferential and cannot be generalized to a larger population.

Tables 11 and 12 compare the percentage of TRI participants in each proficiency category between the fall and spring examination periods. The goal of TRI[5] is to advance as many students as possible into the 'On Target' and 'Significantly Above Target' categories.

Table 11: MPS TRI students' growth on STAR Early Literacy categories

Category	Fall	Spring
Significantly Below Target	34.16%	15.64%
Well Below Target	31.69%	17.7%
Below Target	32.92%	19.75%
On Target	1.23%	31.28%
Significantly Above Target	0%	15.64%

$n = 243$

Table 11 shows an increase of students on target or above between the fall and spring examination periods for the STAR Early Literacy assessment. In fall, 1.23% of TRI participants in K5 and 1st grade were on target or above. By the spring, 46.92% of those same students were on target or above.

> In the fall of 2016, 1.23% of TRI participants in MPS in K5 and 1st grade were considered on target or above target. By the spring of 2017, 46.92% of those same students scored on target or above.

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[5] 'On Target' for the STAR assessments during the 2016-2017 school year was set at the 45th percentile.

Table 12: MPS TRI student's growth on STAR Reading categories

Category	Fall	Spring
Significantly Below Target	54.81%	36.06%
Well Below Target	23.56%	23.08%
Below Target	21.15%	21.15%
On Target	0.48%	15.38%
Significantly Above Target	0%	4.33%

n = 208

Table 12 shows an increase of students on target or above between the fall and spring

examination periods for the STAR Reading assessment. In fall, only 0.48% of TRI participants

in 2nd grade were on target or above. By the spring, 19.71% of those same students scored in the

on target or above target range.

Table 13: Choice and Charter Schools' TRI student's growth on MAP – K5

Category	Winter	Spring
Significantly Below Target	0%	8.82%
Well Below Target	47.06%	20.59%
Below Target	32.35%	35.29%
On Target	20.59%	35.29%

n = 34

Table 13 shows an increase of students on target or above between the winter and spring

examination periods for the MAP assessment. The MAP assessment categories differ slightly

from the STAR categories. K5 students in our sample did not complete the MAP assessment in

fall, so Table 13 shows the improvement from winter to spring. While 47.06% of students were

in the well below target category in the winter, only 20.59% were in this category in the spring; the percent of students on target increased from 20.59% to 35.29%.

Table 14: Charter and Choice Schools' TRI student's growth on MAP – 1st Grade

Category	Fall	Spring
Significantly Below Target	35.29%	35.29%
Well Below Target	29.41%	29.41%
Below Target	29.41%	23.53%
On Target	5.88%	11.76%

n = 51

Table 14 shows a slight increase of students on target or above between the winter and spring examination periods for the MAP assessment. The percent of students on target increased from 5.88% to 11.76%.

Table 15: Choice and Charter schools' TRI student's growth on MAP – 2nd Grade

Category	Fall	Spring
Significantly Below Target	40.00%	34.55%
Well Below Target	36.36%	20.00%
Below Target	18.18%	23.64%
On Target	5.45%	21.82%

n = 55

Table 15 shows an increase of students on target or above between the winter and spring examination periods for the MAP assessment. The percent of students on target increased from 5.45% to 21.82%.

Tables 16-23 group each TRI participant by their starting (fall) percentile. These tables are using descriptive statistics, so while they indicate the real changes in score *within our sample*, they cannot be meaningfully extrapolated to any other population of students.

Table 16: Average TRI STAR Early Literacy scores grouped by Fall 2016 percentile

Fall Percentile Group	Average Fall 2016 STAR Early Literacy score – TRI students	Average Spring 2017 Early Literacy score – TRI students	Change	Expected Growth[6]
1st to 10th	416.84	640.42	223.58	173.6
11th to 25th	483.78	711.39	227.61	159.6
26th to 44th	552.83	731.84	179.01	151.2
45th +	643.33	738	94.67	145.6

n = 243

Table 16 indicates that all groups of students that began below the 45th percentile exceeded these growth expectations, with the largest gains below the 25th percentile.

> All groups of MPS TRI students that began below the 45th percentile, exceeded, on average, the growth expectations on the STAR Early Literacy assessment set by STAR.

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[6] From Renaissance Learning Default benchmarks published 2014. Expected growth was based on the Moderate Growth Rate established by Renaissance Learning * 28 weeks. Since K5 and 1st grade are grouped, the moderate growth rate between the two grades was averaged.

Table 17: Average TRI STAR Reading scores grouped by Fall 2016 percentile

Fall Percentile Group	Average Fall 2016 STAR Reading score – TRI students	Average Spring 2017 Reading score – TRI students	Change	Expected Growth
1st to 10th	76.57	183.15	106.58	142.8
11th to 25th	101.88	226.63	124.75	95.2
26th to 44th	175.09	336.59	161.50	84
45th +	N/A*	N/A	N/A	

$n = 208$

*Only 1 valid observation

Table 17 shows larger gains in STAR Reading scores for those who began the year in a higher percentile range. On average, those starting below the 10th percentile in the fall missed their expected growth. However, those students starting at the 11th percentile and higher exceeded their expected growth on average.

Table 18: Average TRI MAP Reading scores grouped by Winter 2016 percentile for Grade K5

Winter Percentile Group	Average Winter 2016 MAP Reading score - TRI students	Average Spring 2017 MAP reading score - TRI students	Change	Expected Growth[7]
1st to 10th	N/A	N/A	N/A	N/A
11th to 25th	140.75	152.19	11.44	7.53
26th to 44th	145.45	151.73	6.28	6.94
45th +	152.43	159.57	7.14	6.86

Table 18 shows the improvement from winter to spring. No K5 student in this sample received a fall MAP assessment. On average, those students who were between the 11th and 25th percentile and above the 45th percentile in the winter exceeded growth expectations while those students starting between the 26th and 44th percentile did not.

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[7] From Thum and Hauser (2015) NWEA MAP Norms Report

Table 19: MPS STAR K5 Early Literacy Scores by Percentile Group

Fall Percentile Group	Average Fall 2016 STAR Early Literacy Percentile – TRI students	Average Spring 2017 Early Literacy Percentile – TRI students	Average Change in Percentile
1st to 10th (n = 41)	5.85	41.39	35.54
11th to 25th (n = 38)	19.34	55.08	35.74
26th to 44th (n = 25)	34.56	52.60	18.04
45th + (n = 0)	N/A	N/A	N/A

n = 104

Table 19 shows the average fall 2016 and spring 2017 STAR Early Literacy percentiles of TRI students by groupings for K5. The average percentile for students scoring between the first and 10th percentile in the fall was 5.85%. For the same group of students their average spring percentiles was 41.39%.

Table 20: MPS STAR 1st Grade Early Literacy Scores by Percentile Group

Fall Percentile Group	Average Fall 2016 STAR Early Literacy Percentile – TRI students	Average Spring 2017 Early Literacy Percentile – TRI students	Average Change in Percentile
1st to 10th (n = 42)	5.85	21.62	15.77
11th to 25th (n = 39)	18.10	44.87	26.77
26th to 44th (n = 55)	33.07	50.09	17.02
45th + (n = 3)	52.00	40.00	-12.00

n = 139

Table 20 shows the average fall 2016 and spring 2017 STAR Early Literacy percentiles of TRI students by groupings for 1st grade. The average percentile for students scoring between the first and 10th percentile in the fall was 5.85%. For the same group of students their average spring percentiles was 21.62%.

Table 21: MPS STAR Reading Scores by Percentile Group

Fall Percentile Group	Average Fall 2016 STAR Early Literacy Percentile – TRI students	Average Spring 2017 Early Literacy Percentile – TRI students	Change in Percentile
1st to 10th (n = 113)	4.08	17.37	13.29
11th to 25th (n = 50)	17.38	26.50	9.12
26th to 44th (n = 44)	36.20	44.82	8.62
45th + (n = 1)	N/A	N/A	N/A

n = 208

Table 21 shows the average fall 2016 and spring 2017 STAR Reading percentiles of TRI students by groupings for 2nd grade. The average percentile for students scoring between the first and 10th percentile in the fall was 4.08%. For the same group of students their average spring percentiles was 17.37%.

Table 22: The average TRI MAP Reading scores grouped by Fall 2016 percentile for 1st Grade

Fall Percentile Group	Average Fall 2016 MAP Reading score - TRI students	Average Spring 2017 MAP reading score - TRI students	Change	Expected Growth[8]
1st to 10th (*n* = 18)	139.18	160.50	21.32	12
11th to 25th (*n* = 15)	147.53	159.27	11.74	11.45
26th to 44th (*n* = 15)	154.87	169.40	14.53	10.95
45th + (*n* = 3)	176.67	188.00	11.33	10.88

n = 51

On average, all groups of TRI 1st grade students who took the MAP in the fall and the spring exceeded their expected growth.

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[8] From Thum and Hauser (2015) NWEA MAP Norms Report

Table 23: The average TRI MAP Reading scores grouped by Fall 2016 percentile for 2nd Grade

Fall Percentile Group	Average Fall 2016 MAP Reading score - TRI students	Average Spring 2017 MAP reading score - TRI students	Change	Expected Growth
1st to 10th (*n* = 22)	148.84	165.50	16.66	11.65
11th to 25th (*n* = 20)	158.60	178.60	20.00	10.61
26th to 44th (*n* = 10)	168.20	182.10	13.90	9.67
45th + (*n* = 3)	175.00	187.67	12.67	9.45

n = 55

On average, all groups of TRI 2nd grade students who took the MAP in the fall and the spring exceeded their expected growth.

Conclusions and Recommendations

The TRI evaluation found that overall the core elements of the TRI model, including teachers receiving high-quality coaching, teachers providing high-quality TRI instruction, and students receiving intended TRI reading sessions, occurred at intended levels of fidelity. The analysis showed that students who were in TRI during the 2016-2017 school year performed better on the spring STAR assessments than comparison students who did not receive TRI, after controlling for fall performance and demographic variables. This was true for kindergarten, 1st, and 2nd grade students. The following recommendations are provided for continued program effectiveness and sustainability.

Sustain and Expand TRI

The findings presented in this report demonstrate the capacity TRI has to improve the reading outcomes for students in Milwaukee Public Schools and in the city of Milwaukee. However, sustaining and expanding TRI necessitates increased stakeholder involvement in terms of funding, implementing, and monitoring the program.

Continue the Feedback Loop

Monthly meetings with key stakeholders at each school provide an essential opportunity for school leaders and TRI coaches to review program implementation and effectiveness and plan action steps for improvement (See Appendix D for a sample monthly report). It is key for program success that these meetings occur every month and steps are taken to ensure program fidelity. These meetings establish a focus on TRI success and accountability for program implementation that is vital for continued and improved impact. Ideally, additional levels of program fidelity should be added to the content of these meetings– including students' mastery of foundational reading skills and program impact on curriculum based measures.

Beyond Foundational Skills

TRI focuses on improving students' foundational reading instruction in grades K-2. However, in order to reach the goal of increasing students' reading proficiency in 3rd grade, stakeholders also need to consider the needs of students beyond 2nd grade and in addition to foundational skills. Specifically, the needs for continued reading growth in 3rd grade must be considered and the continued development of comprehension skills must be addressed.

Appendix A: TRI Essential Elements

These elements lead to a cohesive, effective TRI group that allows students to make significant reading gain.

Pronounces letters and words accurately
Balances small group practice & individual level practice
Uses correct phonemic awareness procedures (blending, segmenting, auditory analysis)
Uses correct instant words procedures (acquisition procedures, fluency procedures)
Uses correct vowel game boards procedures (acquisition procedures, fluency procedures)
Uses correct vowel board work procedures
Uses correct passage fluency procedures (Title, Vocab, Prediction, Model, Choral, Independent Group Read, Independent Individual Read, Word Families, Comprehension, Teacher Check-outs)
Students consistently respond in unison
Uses timing protocols correctly
Uses formal correction procedure for errors and reinforces correct responses
Progress monitors students (ongoing and monthly)
Uses progress monitoring data to make instructional decisions
Uses effective class management system   - Acknowledges positive behaviors with positive to negative comments at a ratio of 10 to 1   - Proactive routines, expectations, and transitions are in place
Comprehension procedures (completed during reading block outside of TRI session) (Retell in order, answers questions) Predictions from pictures on cover or first page ("I think …, " or "maybe …) One to three vocabulary words picked out ahead for students to use in different sentences Retell using beginning, middle, and end Who, Where, What, When , What happened, Why

Appendix B: Coaching Log

School: Teacher: TRI Coach:

Please mark down the date and the **number of minutes** TRI Coaching, TRI Consultation, and/or TRI PD happens below.

Date	1. TRI Coaching	2. TRI Consultation	3. TRI PD

1. **TRI Coaching** is during teachers' TRI instruction. This might include: Modeling (when you show teachers how to implement a strategy and they observe), Guided Practice (when you and the teacher co-teach or co-implement a strategy together), or Observing (when you watch what the teacher is doing to provide feedback). The expectation is at least 20 minutes of TRI coaching occurs each week.

2. **TRI Consultation** is a 1 on 1 with teacher **when students are not present**. This might include Data Decision Making (when you and the teacher work together to look over student data and make decisions about whether teachers should keep doing what they're doing, advance, or go back), or Consulting/Coaching (when you and the teacher talk about their classroom practices). The expectation is at least 15 minutes/week with each teacher.

3. **TRI Professional Development (PD)** is when a TRI coach leads a session with a group of teachers **when students are not present**. Professional Development is a more formal session when you provide information in a sustained setting (possibly with a power point). It can happen before, during, or after school. The expectation is at least 45 minutes/month for each teacher.

Appendix C: Variable descriptions for inferential models

Variable Name	Description	Type	Range (Categories)
Intercept	N/A	Numerical	N/A
Participated in TRI	Indicates whether a student received at least 1 TRI session	Categorical	1 = Participated, 0 = Comparison
Number of TRI Sessions	Indicates the total number of TRI sessions a student received during the 2016-2017 school year	Numerical	[0, 137]
Additional Tutoring	Indicates whether a student participated in an additional tutoring program (SPARK or WRC)	Categorical	1 = Received TRI and either SPARK or WRC, 0 = Received only TRI
FRL	Indicates whether or not a student received free and reduced lunches (economically disadvantaged)	Categorical	1 = Economically Disadvantaged, 0 = Not economically Disadvantaged
Special ED	Indicates whether or not a student was assigned to special education	Categorical	1 = Assigned to special education, 0 = Not assigned to special education
Fall 2016 Early Literacy Score	Fall 2016 scaled score on the STAR Early Literacy assessment	Numerical	[300, 900]
Fall 2016 Reading score	Fall 2016 scaled score on the STAR Reading assessment	Numerical	[0, 1400]
Spring 2017 Early Literacy Score	Spring 2017 scaled score on the STAR Early Literacy assessment	Numerical	[300, 900]
Spring 2017 Reading score	Spring 2017 scaled score on the STAR Reading assessment	Numerical	[0, 1400]
Attendance days 2016-2017	Total number of days the student attended an MPS school during the 2016-2017. Calculated as total membership days – total absence days.	Numerical	[0, 185]
Full Participation	Indicates whether or not a TRI student received the intended number of sessions (90 or more) during the school year	Categorical	1 = Received 90 or more sessions (full participant, 0 = Received less than 90 sessions (partial participant)

Appendix D: TRI Monthly Report Sample

Figure 1: Average Student Sessions Per Month by Grade

Figure 2: Average Teacher Coaching Sessions