The Rock 'n' Read Project

REPORT

State Pilot
Years 2 & 3
2017-2019

February 15, 2019

To the MN Commissioner of Education and
Minnesota Legislature Education Finance and Policy Committee
Chairs and Ranking Minority Members

As required by:

2017 MN Sessions Laws
HF2, Subd. 14

The Rock ‘n’ Read Project

Interim Report

February 15, 2019

State Pilot Years 2 & 3
2017-2019

2017 MN Session Laws
HF2, Subd. 14

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The Rock ‘n’ Read Project
State Pilot—Year 2 & 3
2017-2019

2017 LEGISLATIVE CHARGE

HF2
Subd. 14. Singing-based pilot program to improve student reading.

(a) For a grant to pilot a research-supported, computer-based educational program that uses singing to improve the reading ability of students in grades 2 through 5:
$ 500,000 2018
$0 2019

(b) The commissioner of education shall award a grant to the Rock 'n' Read Project to implement a research-supported, computer-based educational program that uses singing to improve the reading ability of students in grades 2 through 5. The grantee shall be responsible for selecting participating school sites; providing any required hardware and software, including software licenses, for the duration of the grant period; providing technical support, training, and staff to install required project hardware and software; providing on-site professional development and instructional monitoring and support for school staff and students; administering pre-intervention and post-intervention reading assessments; evaluating the impact of the intervention; and other project management services as required. To the extent practicable, the grantee must select participating schools in urban, suburban, and greater Minnesota, and give priority to schools in which a high proportion of students do not read proficiently at grade level and are eligible for free or reduced-price lunch.

(c) By February 15, 2019, the grantee must submit a report detailing expenditures and outcomes of the grant to the commissioner of education and the chairs and ranking minority members of the legislative committees with primary jurisdiction over kindergarten through grade 12 education policy and finance.

(d) This is a onetime appropriation.

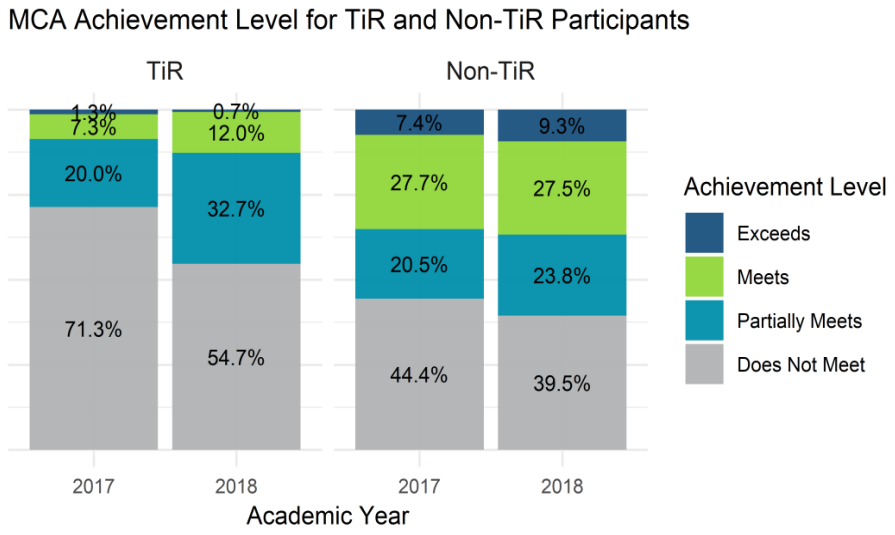
SUMMARY

Since 2016, approximately **1700 2nd-5th grade students at 15 schools** have participated in the state-funded Rock ‘n’ Read Project pilot using **TUNE into Reading (TiR),** a singing-to-read software program. Students sing songs, are rewarded for their singing accuracy, learn new vocabulary words, and receive points for answering vocabulary and comprehension quizzes.

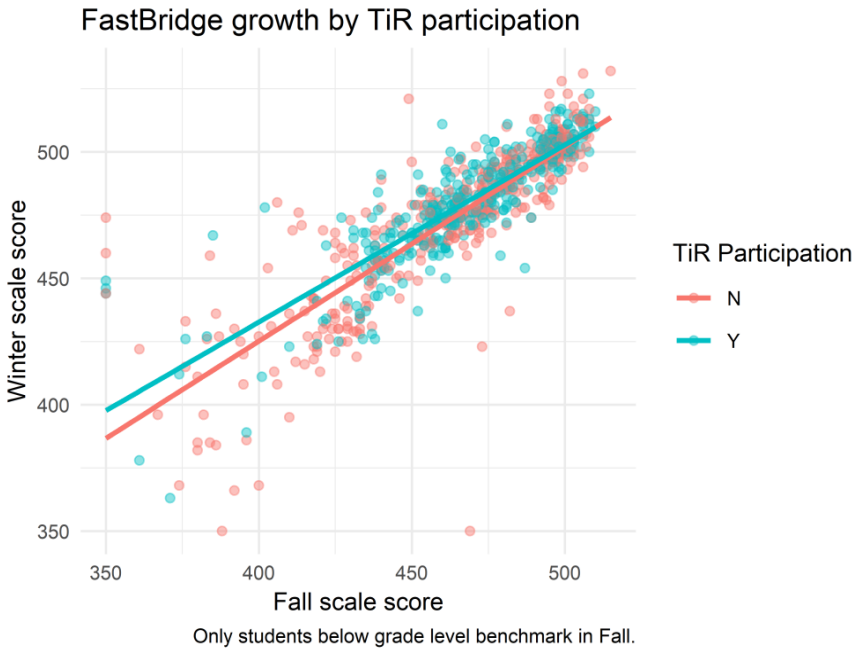
TiR students overall made statistically significant greater reading gains from 2017 to 2018 than students who did not use the program as analyzed on two different assessments**:** Minnesota Comprehensive Assessment (MCA) and FastBridge aReading assessment.

Lowest-achieving readers made the greatest gains overall. There was a statistically significant drop in numbers of participants reading at the lowest MCA level—Does Not Meet—indicating that they achieved greater growth than their peers who did not use the program.

SUMMARY



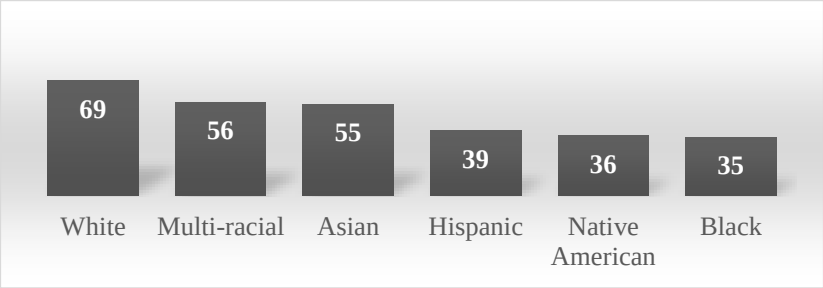
This analysis compared 634 3rd-5th grade students at 9 schools: 150 TiR participants and 484 non-TiR participants on 2017 to 2018 MCA-III reading scores. There was a statistically significant drop in Does Not Meet for TiR participants. This may indicate that TiR participants who are below grade level are achieving greater growth than their non-TiR peers.



Overall, the analysis compared 1283 2nd-5th grade students at 8 schools: 473 TiR participants and 810 non-TiR participants. In this sub-analysis of students below grade level in Fall, TiR participants scored on average 3.1 points higher in the Winter than non-TiR participants. This is evidence that TiR may be more effective for students below grade level than students above.

INTRODUCTION

Minnesota has one of the nation's largest academic achievement gaps. These are rounded percentages of students scoring proficient in reading on the 2018 Minnesota Comprehensive Assessments (MCAs).



To date, no program or strategy has proven successful at raising the overall achievement of struggling readers. After three years of a state-funded pilot, The Rock 'n' Read project has evidence that students using a singing-to-read software program made significantly more reading gains overall in one year than students who did not use the program.

Founded in 2014, The Rock 'n' Read Project (RnR) www.rocknreadproject.org is a Minnesota 501(c)(3) nonprofit with the mission:

Using singing to unlock children's potential for reading and learning

RnR launches initiatives that are based on brain research involving music, language and reading; research studies about the effects of singing and music-making on reading achievement; and evidence-based strategies that have been found to be effective (see Appendix C: Bibliography for specific research studies).

Neurological Research

- Music and language overlap in the brain, sometimes utilizing the same neural networks.
- Music-making enhances auditory processing (correlated with higher reading achievement).
- Ability to keep a steady beat is highly correlated with reading achievement.
- Dyslexia is a rhythmic entrainment problem in the brain.

Reading and Music-Making Research

- Music-making is correlated with increased reading abilities.
- Pitch awareness is correlated with phonemic awareness and reading achievement.
- Prosody (melody of language) is correlated with reading comprehension.
- Repeated reading improves comprehension.
- Eyes automatically track same-language subtitles in music videos, causing inescapable reading behavior.
- Singing songs with same-language-subtitled music videos (words light up as they are sung) dramatically increases literacy.

Evidence-Based Strategies

- TUNE into READING (TiR) software (a singing to read program)

- Affirming Parallel Concepts (singing and singing games used for conscious practice of reading and math skills)

- Musical training for students with dyslexia

- Same-Language-Subtitling
  (Words light up in time to the song lyrics)

In summary, singing and singing-to-read programs:

- develop the ability to maintain a steady beat.
- develop vocal prosody, which increases comprehension.
- increase automaticity and retention of words that improves comprehension.
- improve fluid eye movement to increase fluency.

TUNE into READING (TiR)

Founded in 2014, The Rock 'n' Read Project (RnR) chose as its first initiative to implement TUNE into Reading (TiR), a software program designed as a personalized intervention for struggling readers, with documented evidence of dramatic gains for struggling readers. TiR uses singing to repeatedly read words of songs that light up as they are sung, and gives feedback regarding pitch and rhythmic accuracy.

A number of university research studies found that struggling readers in 5th through 8th grades who used TiR for 30 minutes three times per week for nine weeks (13.5 hours) gained an average of one year in reading achievement. An analysis of 2005-'10 Florida Comprehensive Assessment Tests (FCAT) representing ten different schools and six different grade levels (4th, 5th, 8th, 9th, 10th and 11th), showed striking improvement for students using TiR. The researchers said they could not find documentation of any other intervention that had independent research supporting multi-year student gains on the FCAT. (For specific studies, see Appendix C: Bibliography, Evidence-Based Strategies).

To date, there has not been a research study about the effects of a singing-based reading intervention such as TiR on brain development. RnR has proposed such a study to neurologist Dr. Nina Kraus, at Northwestern University, that will be considered once she has completed the design of a new auditory processing tool.

Description of TiR Use

Each student is placed in the TiR program at his or her own reading grade level, and given about twenty songs to sing. The student chooses a song and listens to a soprano voice sing the song three times while the words light up exactly as they are sung. Before moving on, the student must click on all highlighted vocabulary words in order to see a picture of each word, hear it pronounced, and hear a definition. Next, the student will sing the song five times following gray lines for pitch and rhythm. After each time singing, the student receives a star (gold, silver or bronze) based on accuracy of pitch and rhythm (singing).

Lastly, the student is given a quiz based on the song content and highlighted vocabulary that includes comprehension, as well as direct and indirect inference questions. If the student answers 80% or more correctly, points are awarded, and the song disappears from the student's song folder. If the student scores below 80%, the song returns to the folder, and the entire process must be repeated until a score of 80% or above is achieved. When a student reaches his or her point goal for the level, the program moves up a reading level, and the student is given a new set of twenty songs. One level takes approximately seven hours to complete.

Students are not told what reading grade level they are in, so there is no stigma associated with using TiR at a lower reading grade level than a student's actual grade level (i.e., a 5th grader might be in the program at a first- grade reading level). All students are singing songs.

STATE PILOT YEAR 1
2016-'17

Process

In May 2016, the MN Legislature allocated a $100,000 grant to The Rock 'n' Read Project (RnR) to implement a state pilot in 2016-'17 using TiR software with 3rd-5th graders. RnR completed a grant application with the Minnesota Department of Education, and chose four schools:

- Bancroft Elementary (Minneapolis Public)
- College Prep Elementary (St. Paul charter)
- Jefferson Community School (Minneapolis Public)
- Tesfa International School (St. Paul charter)

Schools chose which students would participate, used TiR during the school day for three-four 30-minute sessions, and obtained between 13.5-40 hours during the year.

Overall, students who used TiR software made substantially more gain on the FastBridge aReading than those who did not and were not reading proficiently in the fall. English Language Learners comprised between 40-75% of the populations at the four schools. Additionally, 4th and 5th grade TiR users at Bancroft made significantly more reading gain (average) than students who had not used the program on 2016 and 2017 MCAs.

278 students used TiR in Pilot Year 1.

STATE PILOT YEAR 2
2017-'18

In May 2017, the Minnesota Legislature allocated a $500,000 grant to The Rock 'n' Read Project (RnR) to continue the pilot for two more school years 2017-2019. The only change in Year 2 was to expand the target group from 3rd-5th to 2nd-5th graders.

Process

During the spring and summer, RnR used data on the MDE Report Card to identify schools that had a high proportion of students not reading at grade level and receiving free/reduced-price lunch. Ten schools were selected: six urban, three suburban and one in greater Minnesota.

- Bancroft Elementary (Minneapolis Public) *
- Cityview Community School (Minneapolis Public)
- Garden City (Osseo Public)
- LoveWorks Academy for Visual and Performing Arts (charter in Minneapolis)
- Mastery School (Harvest Prep charter in Minneapolis)
- NE College Prep (charter in Minneapolis)
- Rothsay (Rothsay, MN Public)
- Stonebridge World School (charter in Minneapolis)
- Tesfa International (charter in Columbia Heights) *
- Valley View Elementary (Columbia Heights Public)

*2nd year in pilot

In September 2017, RnR purchased software licenses from Electronic Learning Products Inc. (ELP), purchased refurbished desktop and laptop computers and prepared them with operating software, set up stand-alone computer labs in six schools, and downloaded the software into existing computer labs at four schools.

RnR provided staff development for teachers and administered the FastBridge aReading assessment (if the school did not already use it). Each school chose which 2nd-5th grade students would use TiR. RnR, provided an Opening Day for students and one week of on-site staffing. During the year, RnR visited each school regularly to help students and staff.

Each school used different criteria for choosing students. The four schools with the greatest percentages of students not proficient on MCAs (79-88%) chose to have all students use TiR. All schools agreed to provide TiR students with three to four 30-minute sessions per week so that students logged a total of 90 minutes per week. Some opted not to use TiR with 5th graders.

Consistent with past research, the goal was to have each student use TiR at least 13.5 hours (minimal “dose”) before the Minnesota Comprehensive Assessment (MCA) was administered.

Populations

School	Not proficient—MCAs	Free/reduced lunch	EL
Bancroft	68%	82%	37%
*Cityview	87%	90%	14%
Garden City	69%	76%	40%
LoveWorks	88%	100%	1%
Mastery	69%	81%	2%
NECP	59%	90%	57%
Rothsay	50%	37%	0%
Stonebridge	79%	86%	24%
Tesfa	81%	96%	71%
Valley View	71%	76%	41%

	Hispanic or Latino	American Indian or Alaska Native	Asian	Black or African American	Native Hawaiian or Other Pacific Islander	White	2 or more Races
Rounded %							
Bancroft	23%	9%	4%	41%	0%	17%	5%
*Cityview	4%	2%	4%	72%	0%	9%	7%
Garden City	25%	1%	35%	30%	0%	5%	5%
LoveWorks	6%	0%	0%	86%	0%	0%	9%
Mastery	1%	0%	0%	95%	0%	1%	3%
NECP	14%	0%	2%	71%	0%	11%	3%
Rothsay	4%	1%	0%	1%	0%	95%	0%
Stonebridge	27%	2%	2%	60%	0%	4%	4%
Tesfa	0%	0%	0%	85%	0%	14%	1%
Valley View	45%	0%	2%	27%	0%	18%	7%

*At Cityview, RnR set up and wired a computer lab. All 200 2nd-5th graders started TiR in September. However, after a few weeks, the administration suspended the program because teachers said they needed more time to teach the district's new reading curriculum, and students were causing problems in the hallways (ironically) because they did not want to stop using TiR to go back to their classrooms.

Approximately 900 students used TiR in Pilot Year 2.

Grade	TiR	Non-TiR
2nd	266	167
3rd	224	198
4th	230	182
5th	187	144
Total	**907**	**691**

STATE PILOT YEAR 3
2018-'19

Process

None of the Year 2 schools continued in Year 3. They cited the following reasons:

- Bancroft — Chose other interventions
- Garden City — Closed the computer lab—needed the space for a classroom*
- LoveWorks — No reason provided
- Mastery — Chose other interventions
- NE College Prep — Chose other interventions
- Rothsay — Chose other interventions
- Stonebridge — Chose other interventions
- Tesfa International — Chose other interventions
- Valley View — Needed the room used for RnR computers for a classroom*

*TiR software does not work on tablets

During spring and summer 2018, highly qualified schools were contacted regarding the program. A number of schools were interested, but they were unable to implement due to lack

time, space, and/or staffing. Four schools chose to participate: one urban and three in greater Minnesota:

- Brown's Valley Elementary (Brown's Valley Public)
- Breckenridge Elementary (Breckenridge Public)
- Heron Lake-Okabena Elementary (Heron Lake-Okabena Public)
- Stride Academy (charter in St. Cloud)

Populations

School	Not proficient—MCAs	Free/reduced lunch	EL
Breckenridge	35%	46%	3%
Brown's Valley	60%	69%	0%
Heron Lake-Okabena	53%	49%	8%
Stride Academy	51%	72%	41%

School	Hispanic or Latino	American Indian or Alaska Native	Asian	Black or African American	Native Hawaiian or Other Pacific Islander	White	2 or more Races
Rounded %							
Breckenridge	7%	3%	0%	1%	05	83%	6%
Brown's Valley	1%	53%	0%	2%	0%	44%	0%
Heron Lake-Okabena	15%	2%	0%	0%	0%	83%	0%
Stride Academy	4%	0%	1%	53%	0%	38%	4%

RnR discontinued providing computer labs for schools that did not have them. Schools downloaded the program directly into their own computer labs. RnR provided staff development for teachers and administered the FastBridge aReading assessment (if the school did not already use it). Each school chose the 2nd-5th graders that would use TiR. RnR provided an Opening Day for students and two days of on-site facilitation of the program with students in the lab. During the fall, RnR visited each school at least once more, and stayed in communication.

Each school used different criteria for choosing students. All schools agreed to provide TiR students with three to four 30-minute sessions per week so that students log a total of 90 minutes per week with a goal of using TiR at least 13.5 hours (one minimal "dose,") before the MCAs are administered.

544 students are currently using TiR in Pilot Year 3.

READING ASSESSMENTS

Year 2 data from two sources has been analyzed: 1) the FastBridge aReading pre- and post-assessment was taken during the year by all 2nd-5th graders, and 2) 2017 and 2018 MCA scores were used to compare 4th and 5th grade TiR students to non-TiR users.
Year 3 data is currently being collected.

FastBridge aReading

The FastBridge aReading assessment was used as a pre- and post-measurement of reading progress to help schools evaluate which students were benefiting from TiR intervention.

FastBridge aReading is an online, 30-question assessment that provides a rapid assessment of student progress. Some schools used this information to add or remove students in the winter.

Minnesota Comprehensive Assessments (MCA)

RnR used 2017 and 2018 MCAs to compare yearly reading gains for 4th and 5th grade students, in terms of movement between levels of proficiency. TiR users who reached the minimum "dose" of 13.5 hours were compared to all non-TiR users.

IMPLEMENTATION OF PILOT PROGRAM IN MINNESOTA SCHOOLS

Implementation of TiR into Minnesota schools included a four-step process:

1. **Introduction of Program to Staff and Administrators***

   One hour of professional development including explanation of the RnR-TiR programs, current research, data, and evidence from neuroscience regarding the connection between active music making and learning achievement, an interactive demonstration of the software, and best practices and strategies to be used for success. This introduction provided teachers hands on experience with the TiR program, a general understanding of the how music specifically impacts reading achievement, and visual examples (via photos and handouts) of best practices and strategies for programmatic success.

2. **Assessment of Technological Needs; Lab Set-Up and Support**

   RnR meets with administrators and technology staff within schools to provide a needs assessment and assist in set-up of fully equipped computer labs, including–but not limited to–assisting in getting necessary software licenses, updating computers and downloading TiR software, providing and installing desktop and laptop computers (full lab set-up) in schools where needed, providing headsets for all computer stations to be used with the TiR program, set-up of FastBridge aReading tests where needed, and continued technological support in regard to hardware and software throughout the year of service.

3. **Proctoring FastBridge aReading, Opening Day*, Coaching and Support (3-7 days)**

   RnR provided staff to help proctor FastBridge aReading tests to all students, grades 2-5, and provided schools with the results of these tests. Once schools determined which students would be placed in the RnR-TiR program and a computer lab schedule was determined, RnR provided Opening Day services to introduce students to the TiR program, and provide coaching and support for students and staff actively using the program. These services included information and active coaching on lab management, how to coach struggling singers, troubleshooting with the hardware and software, how to best encourage and motivate students, and how teachers and administrators could access school-wide, classroom, and individualized reports on student achievement within the TiR software.

4. **Continued Support and Staff Development**

   RnR continued to provide regular visits and communication with schools throughout the time of service in terms of tech support, educational and lab-management support, extra

staff development on current research regarding how to use singing and active music-making to increase reading achievement, and the resolution of any other challenges.

A wrap-up meeting was provided at the end of the year, and surveys were given to staff and administrators involved with the TiR program to assess the general feeling regarding the program and to solicit ideas for future success.

Overall, staff and administration viewed the program very positively, finding that singing enlivened and motivated students. Schools were very pleased with the attentiveness of RnR consultants and the depth of information and support provided throughout the year. Schools saw value in using the program.

* Appendix B: Professional Development and Opening Day Procedures and Materials

IMPLEMENTATION SUCCESSES

Intervention Success with At-Risk Students

The RnR-TiR program was found to have a statistically significant impact on reading achievement across all demographic levels, including race, gender, ELL, and SES. This intervention also helps at-risk students who are often underserved because they do not qualify for special education. The most notable impact came in terms of movement and growth of students starting in the lowest levels of achievement (Does Not Meet category on MCAs) into higher levels. It is not typical to see significant movement in students from this level.

Unique Intervention Approach that Motivates Students

RnR provides a unique, singing-based, evidence-backed approach to reading intervention. Schools and teachers involved in the RnR program welcomed this unique approach and reported students eager and motivated to participate, especially hard-to-reach students. Many students were so enthusiastic about the program that they resisted leaving the computer lab. Students enjoyed this unique approach and were eager to learn.

Personalized and Active Learning

Students engaged with the TiR program immersed themselves in a personalized and active learning approach. Students were provided with song materials specifically chosen to meet their individual reading needs, based on current achievement levels, as measured through pretests. The program is able to automatically adjust based on student achievement during use to ensure appropriate levels of challenge and achieve maximum levels of success. Students are able to visually monitor their progress and make adjustments using colored stars, a visual voice tracking line, and points from quizzes based on word comprehension, direct and indirect inferences. The TiR program also generates a system of personalized diagnostic reports which are accessible to teachers.

Appropriate Challenge

Given the program's ability to monitor and make adjustments based on student achievement during use, students experienced appropriate levels of challenge to keep them motivated.

Celebration of Individual Success and Goal Completion

Students experienced success at multiple levels in the program. Students were eager to share progress with teachers, principals, and RnR consultants and showed pride in what they were able to accomplish. Entire classes were observed to cheer and clap for each other when a teacher would announce a student had achieved his or her point goal and essentially "leveled

up", causing students to feel a sense of personal achievement and a desire to take on more challenging song-reading materials. Some schools held all-school presentations where students were honored with certificates for achieving point goals.

Collaboration and Cooperation
Students were eager to share their successes with other class members. Students at similar levels on the program were often observed collaborating on songs, helping each other to understand, pronounce, and define specific words and phrases, and comparing results. These students worked together, sometimes simultaneously working on the same song to challenge themselves and each other in order to see who would achieve the best results.

English Language Learners
RnR, in Year 2, was able to successfully implement the pilot into five schools with one-third to two-thirds ELL populations.

IMPLEMENTATION CHALLENGES

Although the RnR-TiR program proved successful in motivating students and staff and significantly improved reading achievement overall in students at the highest levels of risk, there were many challenges in the implementation process. While all schools and staff initially showed enthusiasm for the implementing the RnR-TiR program, many encountered difficulties with faithfully implementing its use in their school days. These challenges, and RnR's proposed solutions are listed below.

Recruitment
Recruiting schools to implement the program proved to be far more difficult than initially expected. RnR recruited via direct emails and phone calls to qualifying schools and districts, presentations at state and regional teacher and administrator conferences (MEA and MSBA), social and regular media, and through individual teachers. Schools tended to be reluctant to implement the RnR program on the bases of individual curricular philosophies, time constraints, skepticism around the program concept, lack of interest, and various other reasons.

> Proposed solution
> RnR intends to work with a marketing consultant to assess the most effective ways to reach our intended market.

Scheduling
Many schools struggled with scheduling ample time to faithfully implement the RnR-TiR program. Time was not made up in the cases of special events, field trips, student absences, school breaks and in-service days, and other curricular activities; this increased the time in number of weeks needed to complete the required minimum of 13.5 hours on the program.

> Proposed solution
> RnR will work with ELP to provide beta testing sites for use of TiR on tablets. Using TiR on tablets will free students to access the program outside of a computer lab on school-provided tablets at convenient times during the school day, and at home. This migration to a tablet platform allows the program to have less impact on direct instruction time while still allowing students and teachers to monitor and assess their progress. RnR will also encourage after-school and summer school use.

Teacher and Educational Perspectives
Classroom teachers found the program to be time-consuming and became concerned about the benefits to the students versus the loss of direct instruction time. Some teachers were skeptical about the effectiveness of singing-based reading interventions, especially if they were unsure singers themselves.

Proposed Solution
Moving TiR to tablets will save time by not having to go to a computer lab, and provide flexibility about when to schedule TiR usage in their classrooms. Through professional development and an information campaign, RnR will continue to share current educational and neuroscience research about the effectiveness of singing-based reading interventions.

Lack of Experienced and Consistent Staffing
Many schools struggled to provide experienced and consistent staff to facilitate student time in the lab. Due to staffing issues, many schools changed facilitators multiple times throughout the year, resulting in a need for more coaching, training, and support from RnR. RnR testing achievement analyses indicated lower program achievement and growth in schools that struggled with consistent lab staffing.

Proposed Solution
Provide training for all school staff on the use of TiR with students on desktops and tablets. The use of tablets will require far less staffing than an individually-supervised computer lab.

Behavioral Expectations, Supervision, and Preparation
Students were not always familiar with how to use computers and with lab behavior expectations, leading to behavior problems, breakage of hardware, and low tolerance of common software issues (common problems that would otherwise be easily solved). RnR worked to provide staff with targeted materials and in-lab coaching to address issues with behavior management and to prepare students with expectations for working in a lab, but at times these challenges were too great and became a barrier to student success on the program.

Proposed Solution
RnR will devote a section of the introductory presentation to best practices for preparing students for first-time computer and lab use, including ideas for setting up lab behavior expectations and the proper care of equipment.

Waning Enthusiasm
Enthusiasm of students (especially 5th graders) and teachers for the program tended to wane after extended weeks of use, eventually hitting a point of diminishing returns.

Proposed solution
RnR has responded to this issue by requesting that ELP update song materials more frequently in order to keep the program interesting and motivating to students.

Keeping Up with Rapidly-Changing Technology
It is the current trend for schools to transition away from using computer labs, reclaim lab space, and move toward individual tablets hand-held devices. TiR software is not currently compatible with tablets, and schools no longer have space to devote to a specialized lab. Beta tests of TiR on tablets are in process, but full roll-out is not expected until Fall 2019.

Proposed solution
RnR will continue to monitor trends in technology use in Minnesota schools and work with ELP to create updates that keep technology current.

Lack of Retention of Participating Schools
Even when provided with data analysis from aReading assessments showing greater reading gain for TiR users, most schools chose not to continue using the RnR-TiR program beyond one year. We believe the choices to discontinue the intervention were directly related to the logistical challenges listed above.

Proposed solution
As RnR grows and learns throughout the course of this pilot, we continue to develop solutions to prevent these challenges from creating future barriers to implementation.

ASSESSMENT RESULTS

Summary

While results for individual students, classes, grades, and schools varied, ***TiR users overall made significantly more gains in reading*** during the 2017-2018 school year as measured by two assessments: the MCA 2017 and 2018 reading assessments and the FastBridge aReading assessment.

Especially important, the ***lowest-achieving students made the greatest gains overall*.** There was a statistically significant drop in the number of TiR users scoring at the lowest level—Does Not Meet—on the MCAs. TiR users at the lowest levels achieved greater growth than their non-TiR peers.

Minnesota Comprehensive Assessment (MCA)

An outside data analyst, Pete Talbert, was contracted to analyze reading gains. His comprehensive report (below) includes all nine schools' 4th and 5th graders 2017 to 2018 MCA reading gains. (Individual school reports are in Appendix A).

FastBridge a Reading Assessment

Mr. Talbert also analyzed overall reading gains for all 2nd-5th graders on the FastBridge aReading assessment at 8 of 9 nine pilot schools (one was missing full data). This includes students who used TiR for a minimum of 7.5 hours—half the minimum 13.5-hour research "dose". Each school administered the aReading assessment at different times, thus creating varying lengths of TiR usage. For schools where all students participated in TiR, hours of usage were compared (below). (Individual school reports are in Appendix A).

A Non-Pilot School

L.H. Tanglen Elementary (Hopkins Public) purchased TiR to use with selected students during an after-school program from December-March 2018. (Individual school report in Appendix A.)

Rock 'n' Read Project - Full MCA Analysis

Pete Talbert
1/19/2019

Introduction

This analysis compared students at schools who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 634 students included in the analysis: 150 participants and 484 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program. (Note: Some students received the intervention but had less than 13.5 hours; these are categorized as non-TiR for this analysis.)

Below is a table showing the total count of students by TiR participation and the grade levels and participating schools.

TiR Participation by Grade

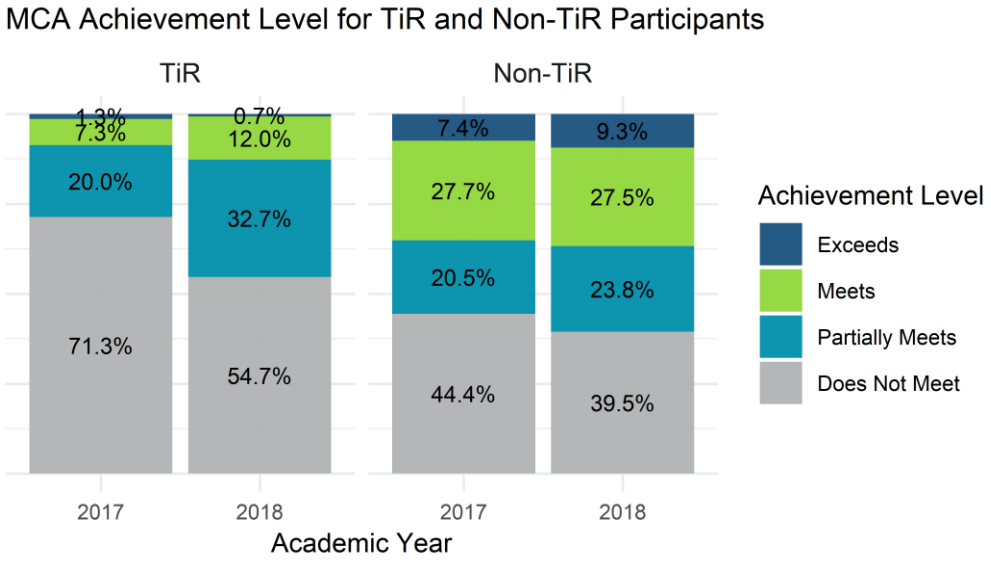
Grade Level	TiR Participant	n
3-4	TiR	99
3-4	Non-TiR	251
4-5	TiR	51
4-5	Non-TiR	233

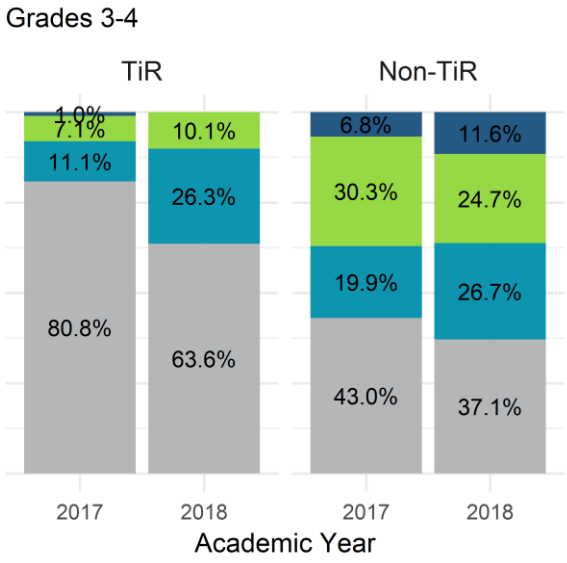
TiR Participation by School

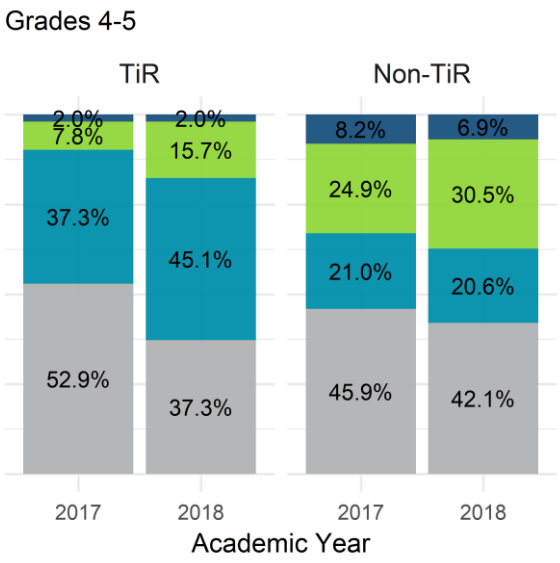
School Name	TiR Participant	n
Bancroft Elementary	TiR	23
Bancroft Elementary	Non-TiR	105
Garden City	TiR	30
Garden City	Non-TiR	63
LoveWorks Academy	TiR	11
LoveWorks Academy	Non-TiR	4
Mastery	TiR	8
Mastery	Non-TiR	48
Northeast College Prep	TiR	20
Northeast College Prep	Non-TiR	46
Rothsay	TiR	12
Rothsay	Non-TiR	45
Stonebridge World School	TiR	18
Stonebridge World School	Non-TiR	7
Tesfa	TiR	10
Tesfa	Non-TiR	22
Valley View Elementary	TiR	18
Valley View Elementary	Non-TiR	144

Change by Achievement Level

How did TiR and non-TiR participants perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.







T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Exceeds	2	1.3%
TiR	Meets	11	7.3%
TiR	Partially Meets	30	20.0%
TiR	Does Not Meet	107	71.3%
Non-TiR	Exceeds	36	7.4%
Non-TiR	Meets	134	27.7%
Non-TiR	Partially Meets	99	20.5%
Non-TiR	Does Not Meet	215	44.4%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Exceeds	1	0.7%
TiR	Meets	18	12.0%
TiR	Partially Meets	49	32.7%
TiR	Does Not Meet	82	54.7%
Non-TiR	Exceeds	45	9.3%
Non-TiR	Meets	133	27.5%
Non-TiR	Partially Meets	115	23.8%
Non-TiR	Does Not Meet	191	39.5%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.547	0.713	8.237	0.002
Non-TiR	0.395	0.444	2.244	0.067

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (54.7%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (71.3%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see statistically significant results for TiR participants and non-significant results for non-TiR participants; the drop in Does Not Meet is much larger for TiR participants compared to non-TiR: 16.7%-point drop versus 5.0%. Although the p-value for non-TiR participants is approaching significance (0.067), we cannot say for certain there was a change from 2017 to 2018. We *can* say that there was a statistically significant drop in Does Not Meet for TiR participants. This may indicate that TiR participants who are below grade level are achieving greater growth than their non-TiR peers.

Rock 'n' Read - FastBridge Analysis

Pete Talbert

2/9/2019

Introduction

This analysis compared students at schools who participated in the Tune into Reading (TiR) program at various dosage levels, with those who did not in grades 2-6 in 2017-2018. I compared their Fall FastBridge aReading scores to their Winter scores in a pre- and post-treatment design.

Overall, there were 1283 students in the analysis: 473 TiR participants and 810 non-TiR participants. Below shows the counts and totals by grade and treatment:

Counts by grade and TiR participation

Grade	TiR	Non-TiR	Total
2	138	169	307
3	126	206	332
4	106	239	345
5	87	180	267
6	16	16	32
Total	473	810	1283

Within the 473 TiR participations, there were students who received 7.5 to 13.5 hours, 13.5 to 27.5 hours, and greater than 27.5 hours. Below are the counts of these bins:

Counts by grade and TiR dosage

Grade	TiR (7.5-13.5)	TiR (13.5-27.5)	TiR (27.5+)	Non-TiR	Total
2	64	67	7	169	307
3	68	51	7	206	332
4	34	72	0	239	345
5	25	59	3	180	267
6	10	6	0	16	32
Total	201	255	17	810	1283

Analysis by overall TiR participation

I first look at whether there is a difference between TiR and non-TiR participants in terms of their growth from Fall to Winter on the FastBridge aReading assessment. Later on below, I will look at whether an increase in hours (as they are binned above) leads to higher performance.

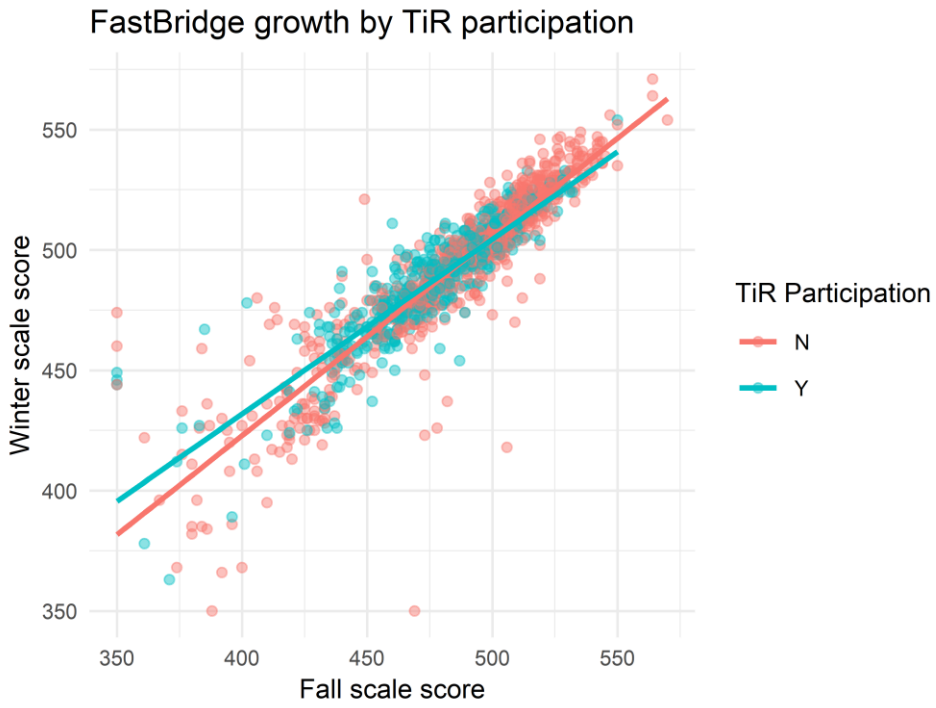
One question we can ask is whether there was an increase in Winter performance for TiR participants vs. non-participants *while accounting for their Fall performance.* We know that on average students performed better in the Winter than the Fall administration simply because they are growing in their reading skills. The real question is whether there is some type of positive increase in performance after accounting for students' Fall scores.

ANCOVA test

The statistical test used for this type of question is ANCOVA, which stands for *analysis of covariance.* ANCOVA is really just a linear regression where we try to explain one variable (the outcome variable) with one or more predictors. In ANCOVA, we have two predictors: one quantitative or continuous variable and one factor or categorical variable.

Here the outcome is students' Winter scores, and the predictors are their Fall scores and a "yes" or "no" factor for TiR participation. If the TiR factor is statistically significant, we can say that TiR participation increased performance above and beyond what is already explained by their Fall performance.

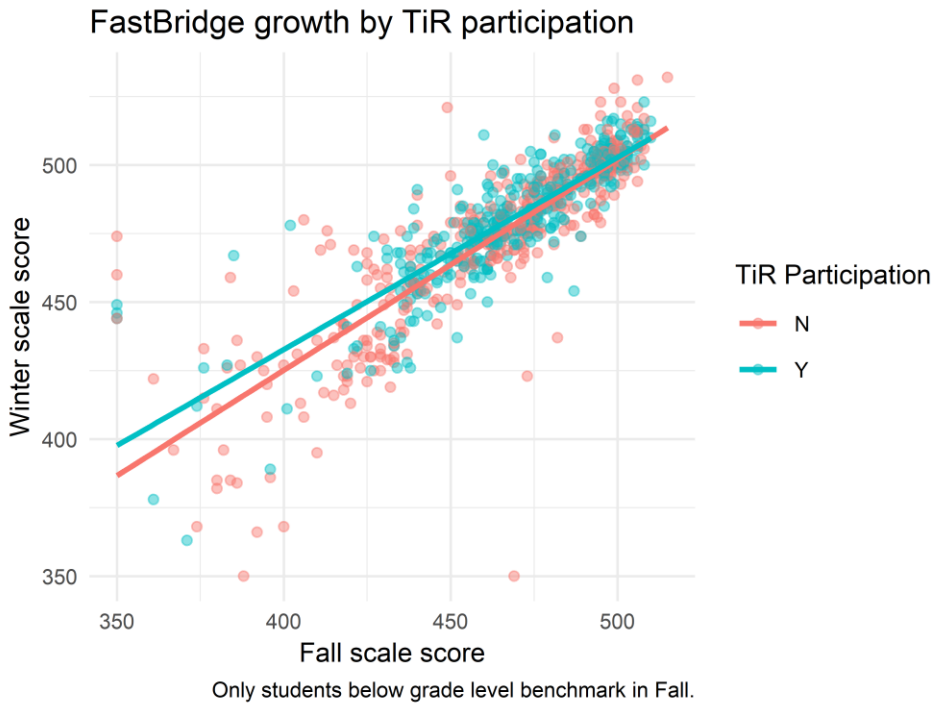
Below is a plot of Fall scores and Winter scores with points colored by TiR participation. There are two regression lines fit for each group. If the green line were parallel and above the red line, there would be evidence of a positive effect for TiR participants.



Unfortunately, we don't see that; in the lower left area of the graph, we see the green line starts above the red, but then as we move along the score scale, the green actually crosses the red.

Indeed, when I run a statistical test, there is a statistically significant interaction term, which is indicated by the lines not being parallel but actually crossing each other. Could this be because I am looking at students across all performance levels? What if I looked at only students who scored below grade level benchmarks in the Fall?

Below I plot the same graph, but only for students who were below the "Low Risk" level on FastBridge in the Fall. These students are considered below benchmark for their grade level.



Here there appears to be an increase in performance for TiR participants, as the green line stays consistently above the red along the score scale.

ANCOVA test for TiR participation - students below benchmark

term	estimate	std.error	statistic	p.value
(Intercept)	129.269	8.185	15.794	0.000
Fall score	0.744	0.018	42.048	0.000
TiR participation	3.095	1.132	2.735	0.006

The statistical test results confirm that the TiR factor *is* statistically significant (0.006). The estimate tells us that after controlling for fall scores, TiR participants score on average 3.1 points higher on the FastBridge aReading assessment in the Winter than non-TiR participants. This is evidence that TiR may be more effective for students below grade level than students above.

Analysis by TiR dosage

Lastly, I looked at whether there are increases in performance at different levels of the TiR treatment (7.5 to 13.5 hours, 13.5 to 27.5 hours, and greater than 27.5 hours). Since we already learned that overall participation was not statistically significant for students across all levels of performance but only for students *below grade level in the Fall*, I only run tests for this subset of students below.

ANCOVA test

Below I present the ANCOVA results where the TiR factor has four levels (instead of just two above) corresponding to non-participation, and the three levels of hours.

ANCOVA test for TiR dosage

term	estimate	std.error	statistic	p.value
(Intercept)	129.471	8.269	15.658	0.000
Fall score	0.743	0.018	41.594	0.000
TiR (7.5-13.5)	2.696	1.529	1.763	0.078
TiR (13.5-27.5)	3.192	1.354	2.357	0.019
TiR (27.5+)	5.260	3.858	1.364	0.173

Here we see that the 13.5-27.5 hours group is statistically significant but the others are not (but close). These tests are comparing the increase in Winter performance (after accounting for Fall performance) with the base group of non-TiR participants. We see the estimates increase corresponding to the increase in hours (2.7, 3.2, and 5.3 points for each increase in dosage). This should not surprise us: more hours of TiR intervention for students below grade level increases their performance.

It appears the 13.5 cutoff may be the appropriate dosage recommendation. The most likely reason that the 27.5+ group is not statistically significant is that there were only 17 students (as is evidenced by the larger standard error).

Conclusion

In conclusion, it is unclear how much of an impact TiR has for students across all reading levels; however, there is fairly strong evidence that for students *below grade level*, TiR participation leads to increased performance. It is also clear that 13.5 hours is an appropriate cutoff to see an increase that is statistically significant.

EXPENDITURES
Year 2

	The Rock 'n' Read Project MN State Grant	**$500,000**
	Expenditures July 1, 2018—June 30, 2019	
100	Administrative	18,400
100	Technical Project Administrator	19,000
100	Test Administrator	30,000
100	Professional Development and Lab Coordinator	55,200
100	Report Coordinator	4,500
300	Mileage to 1 school in greater MN	included in
300	Hotels and meals	prof. devel.
400	Internet site preparation ($500 per school)	5,000
400	Testing license fees	3,584
400	Software license fees	35,955
400	Rental space	2,500
400	Equipment rental	26,000
	TOTAL Year 2	**200,139**
	Year 3 Estimate	**$70,000**
	Years 2 + 3 Estimate	**$270,000**
	Unused remainder of MN Legislative grant	**$230,000**

Administrative—administrate the grant for each school. This includes drafting contracts and agreements involved in the program and allocating expenses based on each school.
Technical Project Administrator—review hardware, lab facility and internet access. Install necessary software links to access TiR. Set up RnR computer labs, facilitate software downloads, maintain and repair hardware and software. Coordinate software updates and resolve ongoing issues.
Test Administrator—coordinate and administer fall, winter, and optional spring FastBridge aReading assessments, using pre-test scores to establish reading levels for students in TiR.
Professional Development and Lab Coordinator—prepare teachers in how to facilitate students on TiR and how to access and utilize TiR report data.
Report Coordinator—oversee all assessment data, analyze results to evaluate effectiveness of the program, and create reports.
Mileage, Hotels and Meals
Reimbursement for mileage expense at current IRS rate for contractors implementing program.
Internet site preparation
Fee paid to Electronic Learning Products to set up each school for secured internet access.
Testing License Fees
Fee paid to FastBridge for use of FastBridge.org assessment licenses.
Software License Fees
Fee paid to Electronic Learning Products for TiR licenses.
Hardware Rental Fee
Rental fees for computers and hardware used to implement TiR.
Rental Space
Expense for rental of space for a computer lab.
Equipment Rental
Rental fees charged per school for RnR-owned computers that are set up as labs.

COST ANALYSIS

In Year 2, the Rock ‘n’ Read Project state pilot cost approximately $200,000 for 10 schools serving approximately 900 students—an average of $220 per student. A large portion of the cost was associated with set-up and maintenance of computer labs to enable six schools to participate that would not have been able to do so.

Year 3 is projected to cost less per school—approximately $60,000 for four schools serving 544 students—an average of $110 per student. This lower cost is due to schools using their own computer labs, and most of the schools purchasing and administering their own FastBridge assessments. Because all four schools are out of the metro area, there will be more mileage, hotel and meal costs.

In comparison, a study of the Minnesota Reading Corps (MRC) program found that the cost was $1.5 million per year to provide 1,261 Pre-K students with tutors across 25 schools—$1,210 per pupil on average (*Minnesota Reading Corps Pre-K Program Cost Analysis, 2018*).

While MRC has been proven effective in helping at-risk PreK-3rd graders learn early reading skills, many students in Minnesota are unable to read proficiently in 3rd-5th grades. In addition to early reading skills, the RnR-TiR program also develops vocabulary, comprehension, fluency, and oral reading. All of these skills are necessary for proficient reading in upper grades.

Given the greater reading gains overall for struggling readers, the Rock ‘n’ Read Project TiR program is a cost-effective intervention.

CONCLUSIONS

Proven Results
When implemented with fidelity, the RnR-TiR program has proven to be very successful in regard to student reading achievement. Analyses of Fast Bridge aReading and MCA scores have shown statistically significant movement in achievement levels, particularly in the students identified as being most at risk.

Best Intervention
In comparison to other reading interventions currently being used in RnR pilot schools, results of these analyses indicate RnR-TiR is one of the best, if not the best, interventions for 2nd-5th graders.

Cost-Effective
In comparison to other reading interventions currently in use in Minnesota, results indicate that RnR-TiR is one of the most cost-effective reading interventions available.

Unique Evidence-Supported Strategy
Singing-to-read is a unique strategy that is supported by evidence, and is not available in most other curriculums. According to neurologist Daniel Levitin, singing activates neurons in more regions of the brain than almost anything else. Singing also increases student motivation and joy in the learning process.

Effective for English Language Learners (ELL)
ELL students showed similar engagement and success as their English-speaking peers using the RnR-TiR program.

Positive Impact on At-Risk Students
The RnR-TiR program has statistically significant impact on reading achievement. This impact is most notable in terms of moving students out of the lowest levels of achievement toward proficiency.

RECOMMENDATIONS

RnR recommends that the Minnesota Department of Education inform schools about the current research and evidence regarding the effects of music-making on brain development and learning, and promote singing and active music-making as a basic curricular strategy at all levels of education.

RnR will continue to:

1. **Use TiR software**, with preference for computer tablets as soon as possible. Using the program on tablets will free up scheduling, enabling students to use the program at open times throughout the day and at home.

2. **Train teachers in how to use singing, singing games, and group choral reading** with all students in the classroom as a basic strategy for academic learning and social development (based on Olson's Affirming Parallel Concepts research in Appendix C: Bibliography).

3. **Advocate singing with same-language-subtitled music videos** to raise reading achievement for both children and adults.

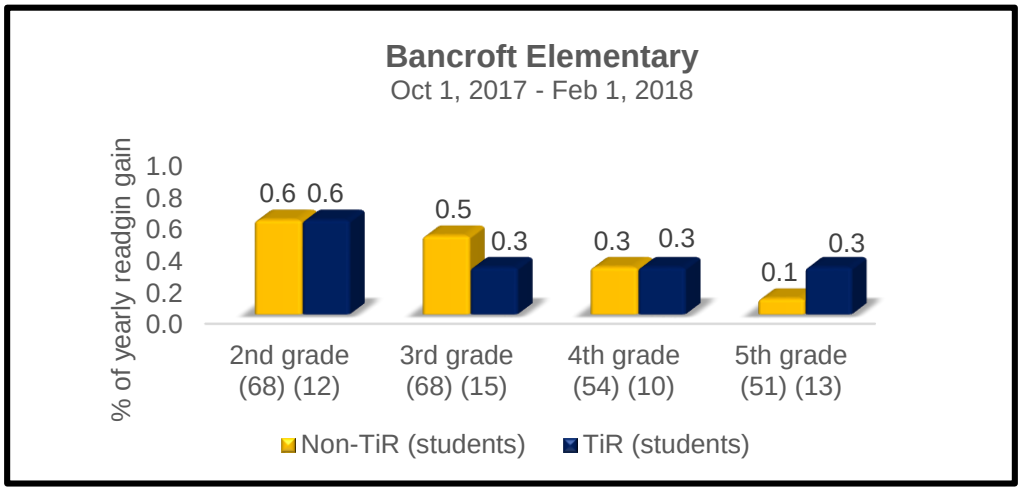
4. **Inform the public and schools about research and effective, evidence-based strategies** using singing to raise reading achievement.

APPENDIXES

APPENDIX A: ASSESSMENT DATA AND ANALYSIS

Bancroft Elementary (Minneapolis Public)

Bancroft chose 50 2nd-5th graders to use TiR. By the February FastBridge assessment, 25 students had completed 7.5-13 hours of usage, and 25 had completed 13.5+ hours.



Rock 'n' Read Project - Bancroft Elementary

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Bancroft Elementary who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 128 students included in the analysis: 23 participants and 105 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

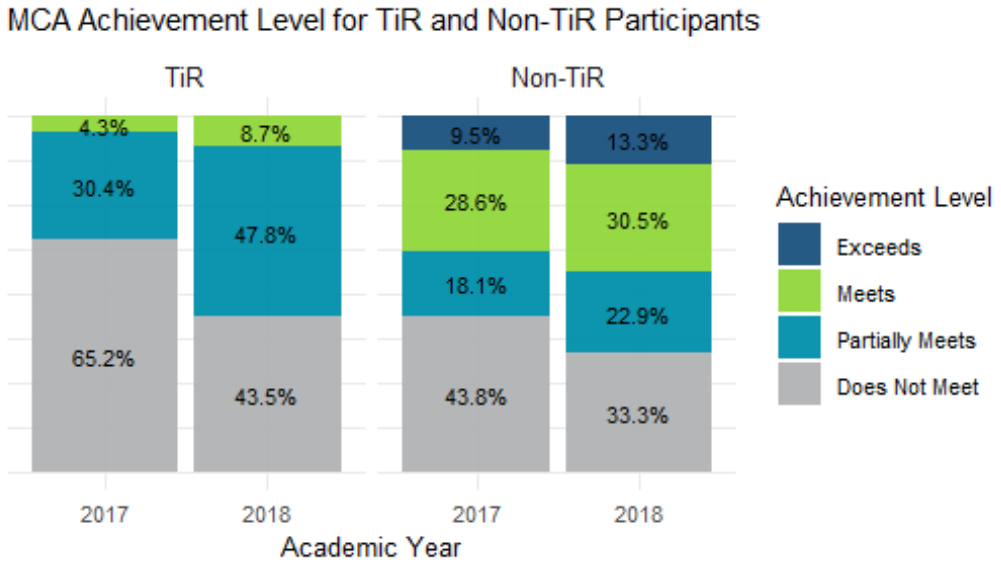
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	12
3-4	Non-TiR	52
4-5	TiR	11
4-5	Non-TiR	53

Change by Achievement Level

How did TiR and non-TiR participants at Bancroft Elementary perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	1	4.3%
TiR	Partially Meets	7	30.4%
TiR	Does Not Meet	15	65.2%
Non-TiR	Exceeds	10	9.5%
Non-TiR	Meets	30	28.6%
Non-TiR	Partially Meets	19	18.1%
Non-TiR	Does Not Meet	46	43.8%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	2	8.7%
TiR	Partially Meets	11	47.8%
TiR	Does Not Meet	10	43.5%
Non-TiR	Exceeds	14	13.3%
Non-TiR	Meets	32	30.5%
Non-TiR	Partially Meets	24	22.9%
Non-TiR	Does Not Meet	35	33.3%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

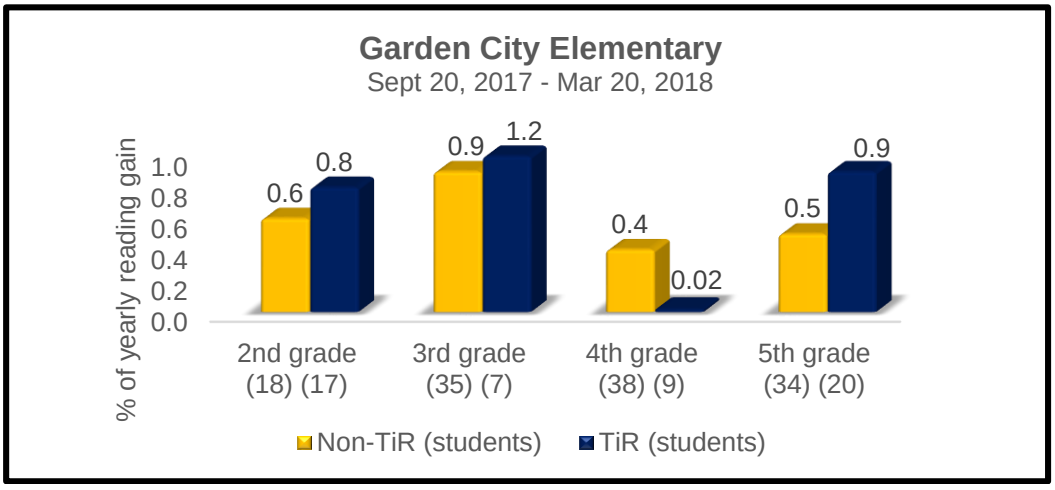
TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.435	0.652	1.402	0.118
Non-TiR	0.333	0.438	2.010	0.078

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (43.5%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (65.2%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR participants and non-significant results for non-TiR participants. This may be due to too low of a sample size.

Garden City (Osseo Public)

Garden City chose 53 students in 2nd-5th grades to use TiR in an existing computer lab, facilitated by one para professional. By the FastBridge post-assessment, 17 students had 7.5-13 hours of usage, and 37 had 13.5+ hours usage.



Rock 'n' Read Project – Garden City

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Garden City who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 93 students included in the analysis: 30 participants and 63 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

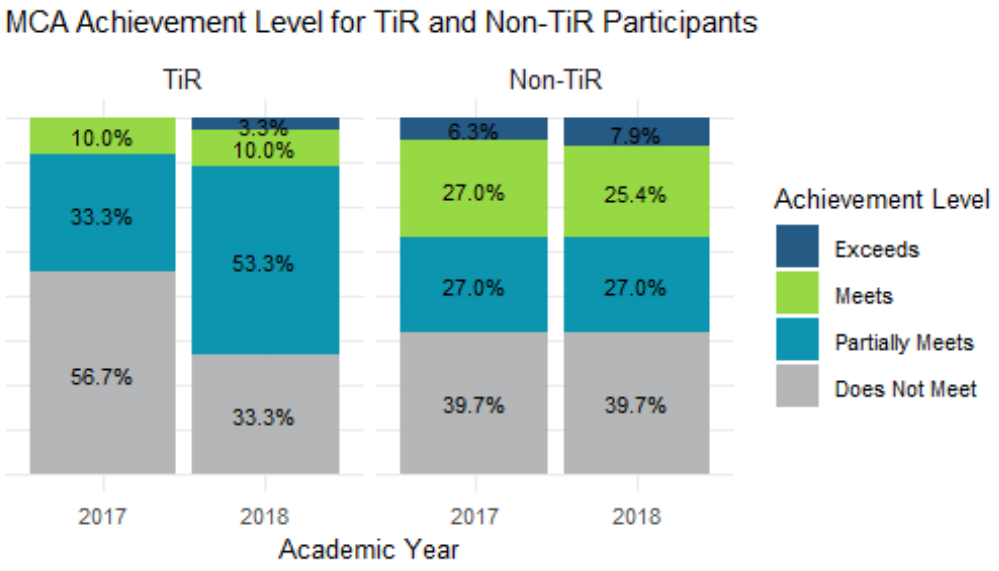
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	7
3-4	Non-TiR	39
4-5	TiR	23
4-5	Non-TiR	24

Change by Achievement Level

How did TiR and non-TiR participants at Garden City perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	3	10.0%
TiR	Partially Meets	10	33.3%
TiR	Does Not Meet	17	56.7%
Non-TiR	Exceeds	4	6.3%
Non-TiR	Meets	17	27.0%
Non-TiR	Partially Meets	17	27.0%
Non-TiR	Does Not Meet	25	39.7%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Exceeds	1	3.3%
TiR	Meets	3	10.0%
TiR	Partially Meets	16	53.3%
TiR	Does Not Meet	10	33.3%
Non-TiR	Exceeds	5	7.9%
Non-TiR	Meets	16	25.4%
Non-TiR	Partially Meets	17	27.0%
Non-TiR	Does Not Meet	25	39.7%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.333	0.567	2.424	0.06
Non-TiR	0.397	0.397	0.000	0.50

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (33.3%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (56.7%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR participants and non-significant results for non-TiR participants. This may be due to too low of a sample size.

LoveWorks Academy for Visual and Performing Arts (charter in Minneapolis)

RnR set up a stand-alone computer lab, and LoveWorks had all 2nd-5th grade students (78) use TiR, facilitated by classroom teachers and para-professionals. LoveWorks did not provide post-test FastBridge aReading scores.

Rock 'n' Read Project – LoveWorks

Pete Talbert
2/2/2019

Introduction

This analysis compared students at LoveWorks Academy who got the minimum dose (13.5 hours or more) in the Tune into Reading (TiR) program with those who did not. All students at LoveWorks Academy participated in the TiR program. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 15 students included in the analysis: 11 completed the TiR minimum dose (labeled TiR+), and 4 did not (labeled TiR-). A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores.

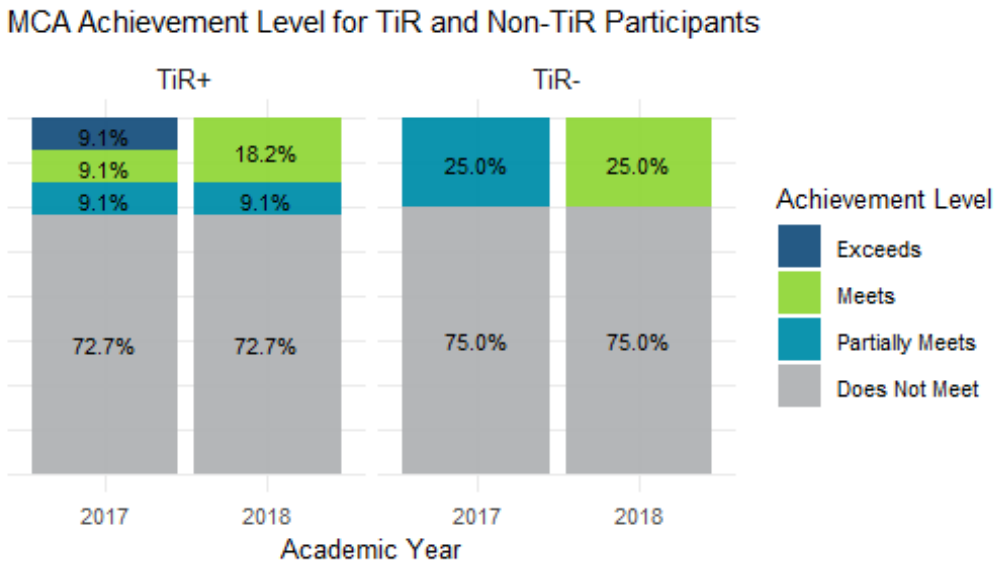
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR+	11
3-4	TiR-	4

Change by Achievement Level

How did TiR+ and TiR- participants at LoveWorks Academy perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



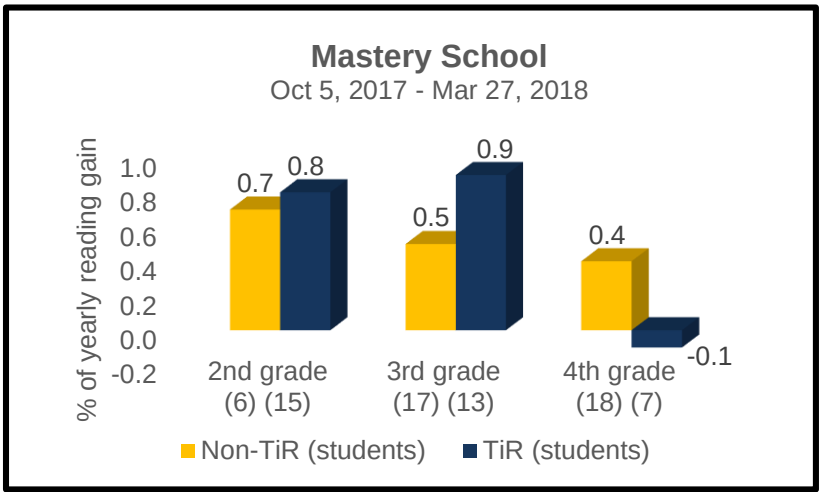
T-Test for difference in proportions of Does Not Meet

From the plot above we see that the same proportion of TiR+ students scored at Does Not Meets in 2018 as 2017. Therefore, we cannot do a statistical test to see if there was any drop in Does Not Meets performance.

Seeing as though there were only 11 TiR+ students for analysis, this is most likely due to too low of a sample size.

Mastery School (Harvest Schools charter in Minneapolis)

RnR set up a stand-alone computer lab, and Mastery selected 35 2nd-4th graders to use TiR. Of the 35 students, 4 logged 7.5-13 hours on TiR, and 31 logged 13.5+ hours by the time of the FastBridge post-test.



Rock 'n' Read Project –Mastery

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Mastery who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 56 students included in the analysis: 8 participants and 48 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

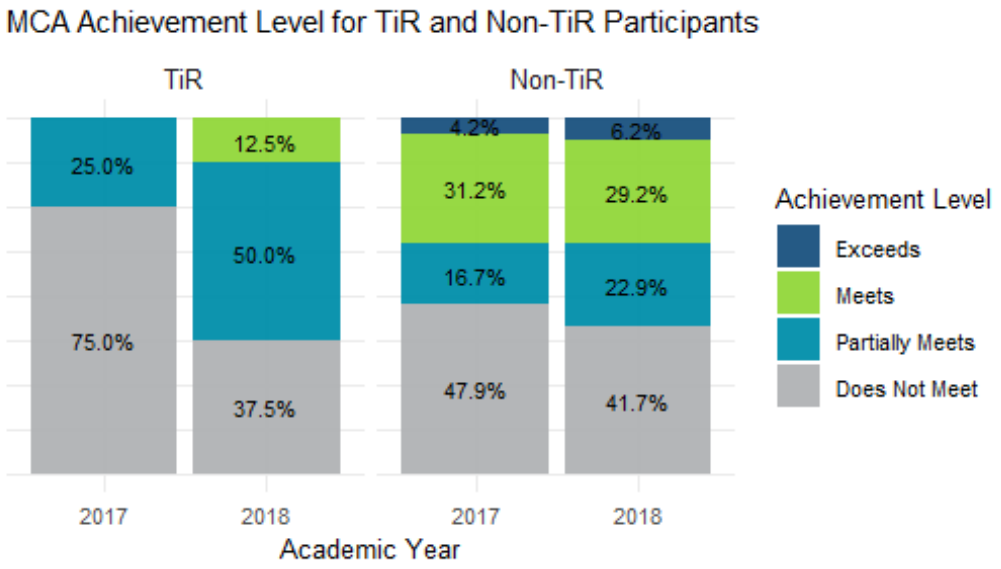
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	8
3-4	Non-TiR	26
4-5	Non-TiR	22

Change by Achievement Level

How did TiR and non-TiR participants at Mastery perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Partially Meets	2	25.0%
TiR	Does Not Meet	6	75.0%
Non-TiR	Exceeds	2	4.2%
Non-TiR	Meets	15	31.2%
Non-TiR	Partially Meets	8	16.7%
Non-TiR	Does Not Meet	23	47.9%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	1	12.5%
TiR	Partially Meets	4	50.0%
TiR	Does Not Meet	3	37.5%
Non-TiR	Exceeds	3	6.2%
Non-TiR	Meets	14	29.2%
Non-TiR	Partially Meets	11	22.9%
Non-TiR	Does Not Meet	20	41.7%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

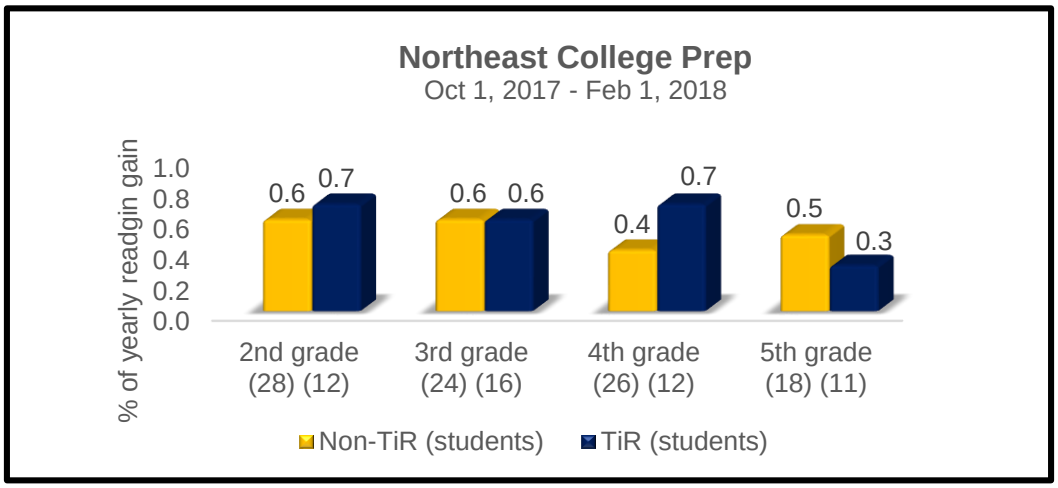
TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.375	0.750	1.016	0.157
Non-TiR	0.417	0.479	0.168	0.341

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (37.5%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (75.0%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR participants and non-significant results for non-TiR participants. This may be due to too low of a sample size.

Northeast College Prep (charter in Minneapolis)

RnR set up a stand-alone computer lab, and NE College Prep chose 53 TiR students. The majority (47) logged 13.5+ hours by the FastBridge post-assessment.



Rock 'n' Read Project – Northeast College Prep

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Northeast College Prep who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 66 students included in the analysis: 20 participants and 46 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

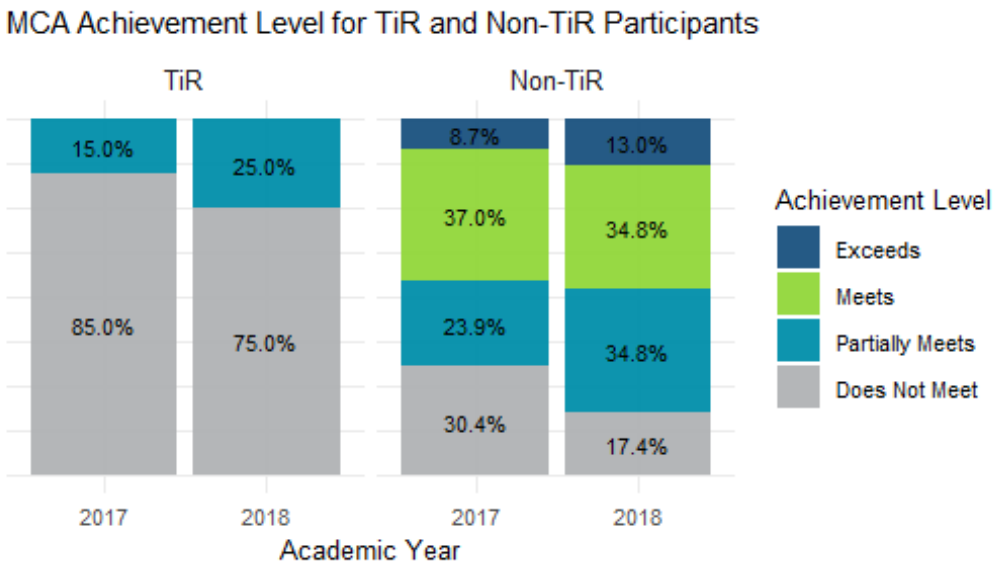
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	11
3-4	Non-TiR	25
4-5	TiR	9
4-5	Non-TiR	21

Change by Achievement Level

How did TiR and non-TiR participants at Northeast College Prep perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Partially Meets	3	15.0%
TiR	Does Not Meet	17	85.0%
Non-TiR	Exceeds	4	8.7%
Non-TiR	Meets	17	37.0%
Non-TiR	Partially Meets	11	23.9%
Non-TiR	Does Not Meet	14	30.4%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Partially Meets	5	25.0%
TiR	Does Not Meet	15	75.0%
Non-TiR	Exceeds	6	13.0%
Non-TiR	Meets	16	34.8%
Non-TiR	Partially Meets	16	34.8%
Non-TiR	Does Not Meet	8	17.4%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

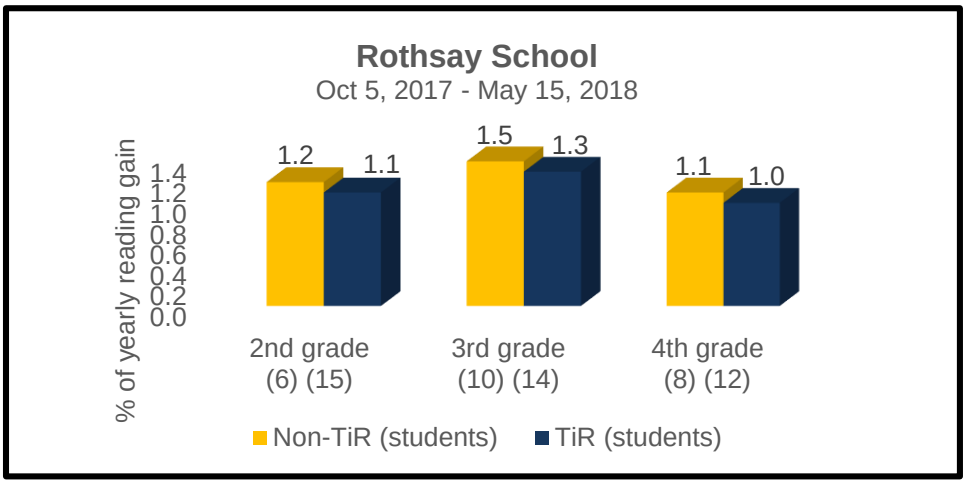
TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.750	0.850	0.156	0.346
Non-TiR	0.174	0.304	1.494	0.111

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (75.0%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (85.0%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR participants and non-significant results for non-TiR participants. This may be due to too low of a sample size.

Rothsay (Rothsay, MN Public)

Rothsay implemented TiR with 41 2nd-4th graders, and used it in an existing computer lab, facilitated by a para-professional and a teacher. Students logged 27-41+ hours on TiR over 7 months between pre- and post-FastBridge assessments.



Rock 'n' Read Project – Rothsay

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Rothsay who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 57 students included in the analysis: 12 participants and 45 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

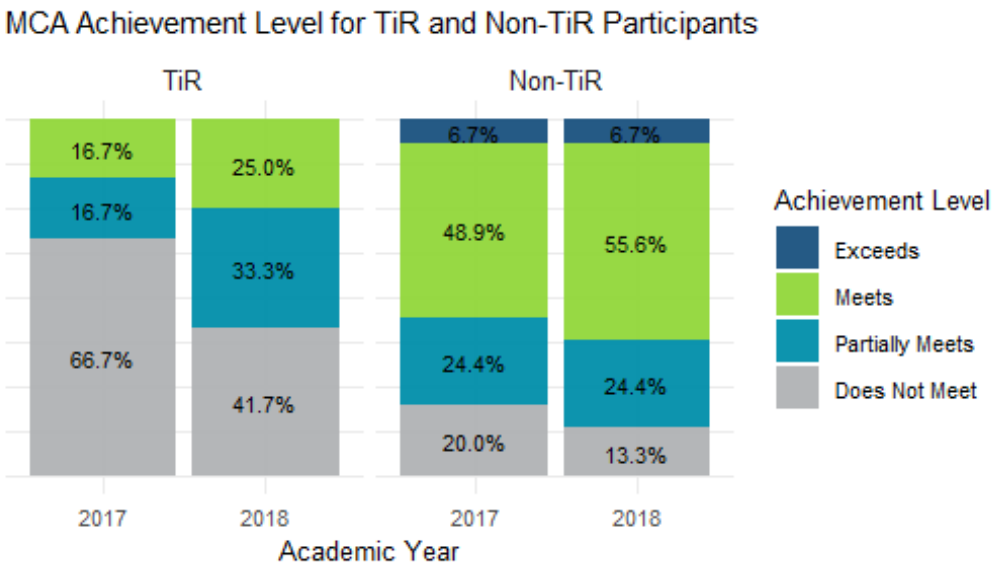
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	12
3-4	Non-TiR	12
4-5	Non-TiR	33

Change by Achievement Level

How did TiR and non-TiR participants at Rothsay perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	2	16.7%
TiR	Partially Meets	2	16.7%
TiR	Does Not Meet	8	66.7%
Non-TiR	Exceeds	3	6.7%
Non-TiR	Meets	22	48.9%
Non-TiR	Partially Meets	11	24.4%
Non-TiR	Does Not Meet	9	20.0%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	3	25.0%
TiR	Partially Meets	4	33.3%
TiR	Does Not Meet	5	41.7%
Non-TiR	Exceeds	3	6.7%
Non-TiR	Meets	25	55.6%
Non-TiR	Partially Meets	11	24.4%
Non-TiR	Does Not Meet	6	13.3%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

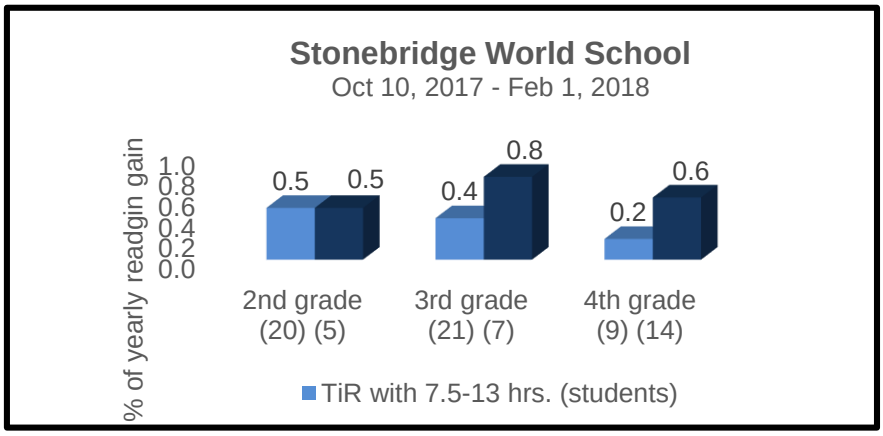
TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.417	0.667	0.671	0.206
Non-TiR	0.133	0.200	0.320	0.286

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (41.7%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (66.7%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR participants and non-significant results for non-TiR participants. This may be due to too low of a sample size.

Stonebridge World School (charter in Minneapolis)

Stonebridge chose to have *all* 2nd-4th graders (76) use TiR, facilitated by their teachers in an existing computer lab. The graph compares time logged on the program over four months: 50 students had 7.5-13 hours, and 26 had 13.5+ hours. With more hours of usage, 3rd and 4th grade students showed substantially more gain on the FastBridge assessments.



Rock 'n' Read Project – Stonebridge

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Stonebridge World School who got the minimum dose (13.5 hours or more) in the Tune into Reading (TiR) program with those who did not. All students at Stonebridge World School participated in the TiR program. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 25 students included in the analysis: 18 completed the TiR minimum dose (labeled TiR+), and 7 did not (labeled TiR-). A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores.

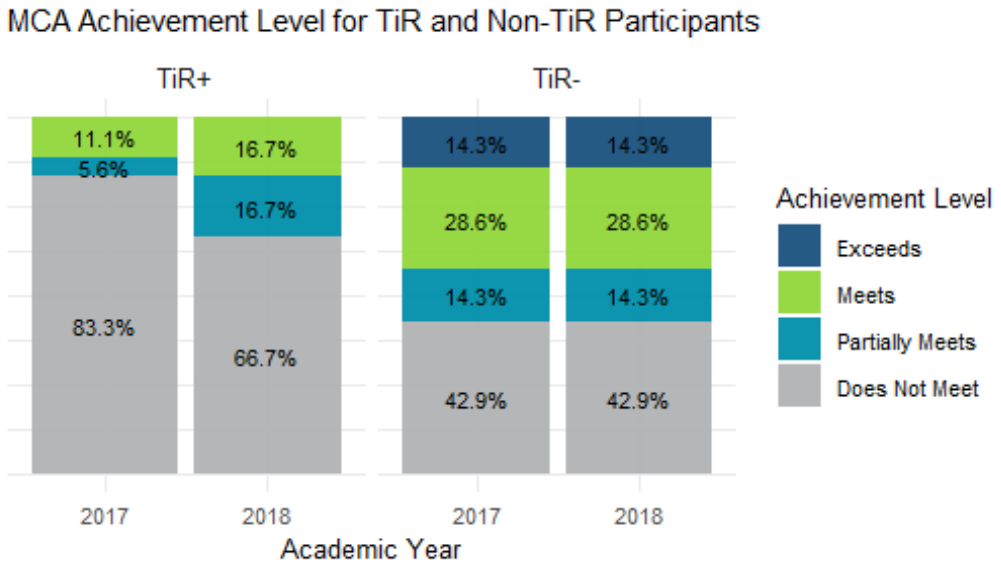
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR+	18
3-4	TiR-	7

Change by Achievement Level

How did TiR+ and TiR- participants at Stonebridge World School perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR+ who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR+	Meets	2	11.1%
TiR+	Partially Meets	1	5.6%
TiR+	Does Not Meet	15	83.3%
TiR-	Exceeds	1	14.3%
TiR-	Meets	2	28.6%
TiR-	Partially Meets	1	14.3%
TiR-	Does Not Meet	3	42.9%

2018 MCA results

TiR Participation	Achievement	n	%
TiR+	Meets	3	16.7%
TiR+	Partially Meets	3	16.7%
TiR+	Does Not Meet	12	66.7%
TiR-	Exceeds	1	14.3%
TiR-	Meets	2	28.6%
TiR-	Partially Meets	1	14.3%
TiR-	Does Not Meet	3	42.9%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

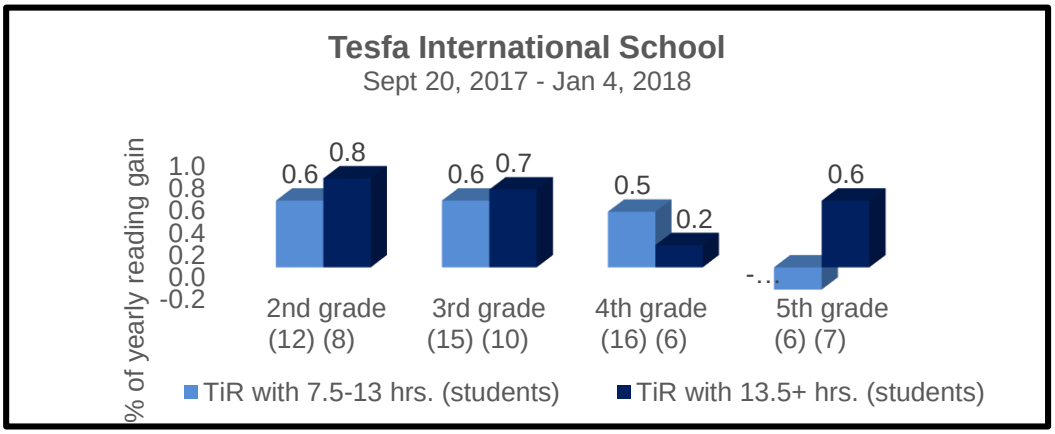
TiR Participation	estimate1	estimate2	statistic	p.value
TiR+	0.667	0.833	0.593	0.221
TiR-	0.429	0.429	0.000	0.500

In the table above, *estimate1* is the proportion of TiR+ students who were Does Not Meet in 2018 (66.7%); *estimate2* is the proportion of TiR+ students who were Does Not Meet in 2017 (83.3%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR+ students and non-significant results for TiR- students. This may be due to too low of a sample size.

Tesfa International (charter in Columbia Heights)

Although this was Tesfa's second year in the pilot, the school had moved from St. Paul to Minneapolis, so most students were new. They chose to have *all* 80 2nd-5th graders use TiR, facilitated by teachers in a lab set up by RnR. The graph compares those with the full dose (13.5+ hours) to those with less time on TiR on the FastBridge assessments.



Rock 'n' Read Project – Tesfa

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Tesfa who got the minimum dose (13.5 hours or more) in the Tune into Reading (TiR) program with those who did not. All students at Tesfa participated in the TiR program. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 32 students included in the analysis: 10 completed the TiR minimum dose (labeled TiR+), and 22 did not (labeled TiR-). A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores.

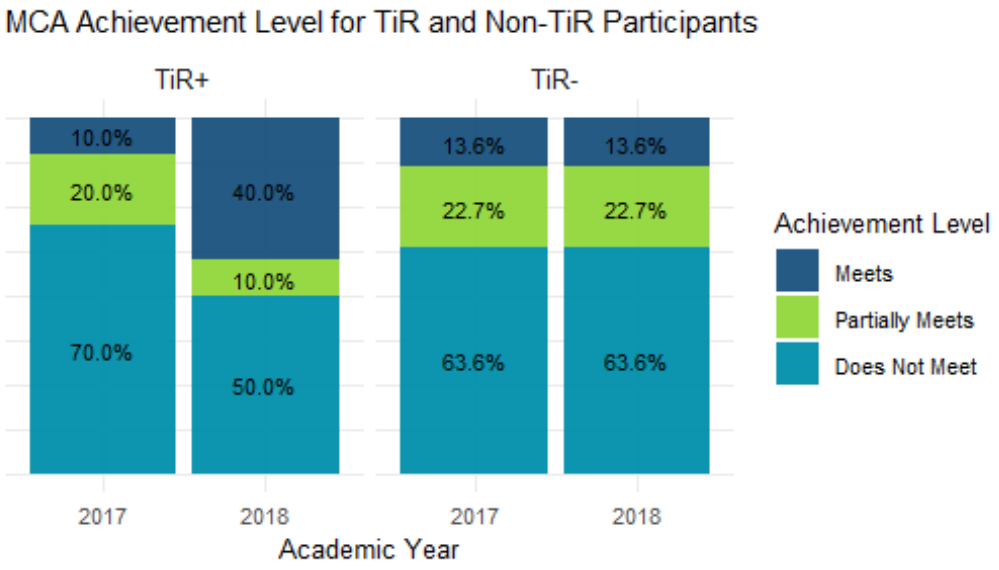
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR+	6
3-4	TiR-	12
4-5	TiR+	4
4-5	TiR-	10

Change by Achievement Level

How did TiR+ and TiR- participants at Tesfa perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR+ who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR+	Meets	1	10.0%
TiR+	Partially Meets	2	20.0%
TiR+	Does Not Meet	7	70.0%
TiR-	Meets	3	13.6%
TiR-	Partially Meets	5	22.7%
TiR-	Does Not Meet	14	63.6%

2018 MCA results

TiR Participation	Achievement	n	%
TiR+	Meets	4	40.0%
TiR+	Partially Meets	1	10.0%
TiR+	Does Not Meet	5	50.0%
TiR-	Meets	3	13.6%
TiR-	Partially Meets	5	22.7%
TiR-	Does Not Meet	14	63.6%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

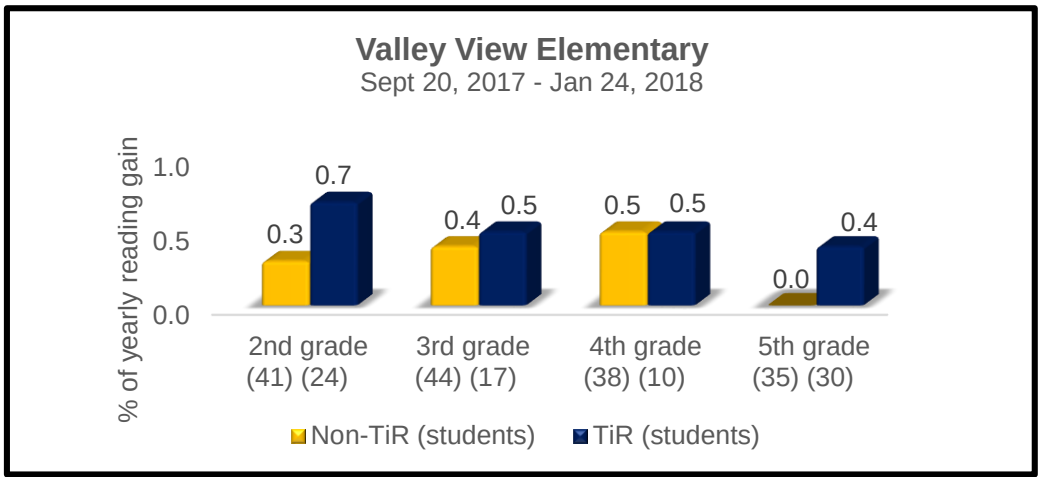
TiR Participation	estimate1	estimate2	statistic	p.value
TiR+	0.500	0.700	0.208	0.324
TiR-	0.636	0.636	0.000	0.500

In the table above, *estimate1* is the proportion of TiR+ students who were Does Not Meet in 2018 (50.0%); *estimate2* is the proportion of TiR+ students who were Does Not Meet in 2017 (70.0%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see non-significant results for TiR+ students and non-significant results for TiR- students. This may be due to too low of a sample size.

Valley View Elementary (Columbia Heights Public)

RnR set up a stand-alone computer lab, and Valley View chose 81 students to use TiR, facilitated by both teachers and para-professionals. This compares with 168 non-TiR users on the FastBridge assessments.



Rock 'n' Read Project – Valley View

Pete Talbert
2/2/2019

Introduction

This analysis compared students at Valley View Elementary who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 162 students included in the analysis: 18 participants and 144 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

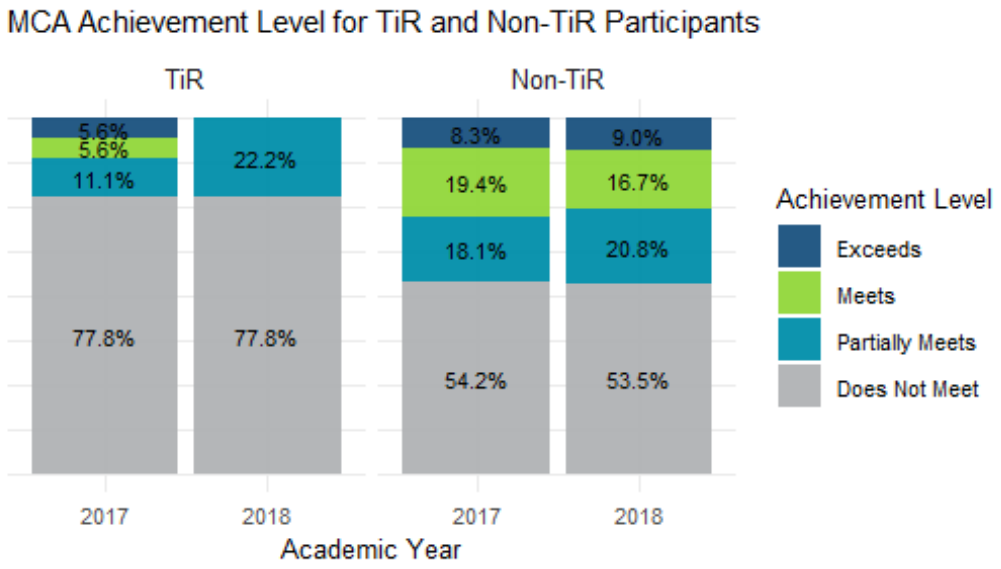
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	14
3-4	Non-TiR	74
4-5	TiR	4
4-5	Non-TiR	70

Change by Achievement Level

How did TiR and non-TiR participants at Valley View Elementary perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we see that the same proportion of TiR participants scored at Does Not Meets in 2018 as 2017. Therefore, we cannot do a statistical test to see if there was any drop in Does Not Meets performance.

Seeing as though there were only 18 TiR participants for analysis, this is most likely due to too low of a sample size.

Non-Pilot School: L.H. Tanglen Elementary (Hopkins Public)

Tanglen purchased TiR to use with selected students during an after-school program from December-March 2018.

Rock 'n' Read Project – L.H. Tanglen

Pete Talbert
2/2/2019

Introduction

This analysis compared students at L. H. Tanglen who participated in the Tune into Reading (TiR) program with those who did not in grades 3-5 in 2017-2018. The analysis compared students' 2017 MCA-III reading scores to their 2018 scores for those who participated in the program and those who did not.

Overall, there were 126 students included in the analysis: 21 participants and 105 non-participants. A number of students were excluded from the initial dataset for not having both 2017 and 2018 MCA-III reading scores. TiR participants were flagged if they had 13.5 or more hours with the TiR program.

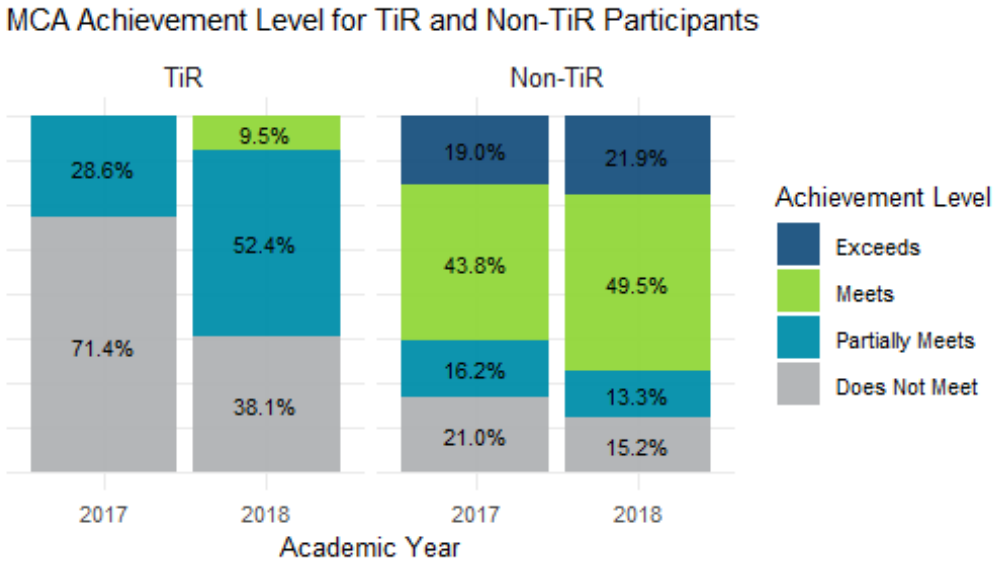
Below is a table showing the total count of students by TiR participation at the different grade levels.

TiR Participation by Grade

Grade Level	TiR Participant	n
3-4	TiR	8
3-4	Non-TiR	51
4-5	TiR	13
4-5	Non-TiR	54

Change by Achievement Level

How did TiR and non-TiR participants at L. H. Tanglen perform on the MCAs from 2017 to 2018? The MCA-III reading assessment has four achievement level descriptors: Does Not Meet Standards, Partially Meets Standards, Meets Standards, and Exceeds Standards.



T-Test for difference in proportions of Does Not Meet

From the plot above we did see a fairly significant decrease in the number of TiR participants who scored at Does Not Meets. Is this statistically significant? Below again are the total counts and proportions of students at the different achievement levels.

2017 MCA results

TiR Participation	Achievement	n	%
TiR	Partially Meets	6	28.6%
TiR	Does Not Meet	15	71.4%
Non-TiR	Exceeds	20	19.0%
Non-TiR	Meets	46	43.8%
Non-TiR	Partially Meets	17	16.2%
Non-TiR	Does Not Meet	22	21.0%

2018 MCA results

TiR Participation	Achievement	n	%
TiR	Meets	2	9.5%
TiR	Partially Meets	11	52.4%
TiR	Does Not Meet	8	38.1%
Non-TiR	Exceeds	23	21.9%
Non-TiR	Meets	52	49.5%
Non-TiR	Partially Meets	14	13.3%
Non-TiR	Does Not Meet	16	15.2%

I compute separate t-tests for the differences in proportions of students who achieved Does Not Meets. The null hypothesis here is that the 2018 Does Not Meet proportion is equal to the 2017 proportion, and the alternative is that the 2018 Does Not Meet proportion is *less than* 2017.

TiR Participation	estimate1	estimate2	statistic	p.value
TiR	0.381	0.714	3.460	0.031
Non-TiR	0.152	0.210	0.803	0.185

In the table above, *estimate1* is the proportion of TiR students who were Does Not Meet in 2018 (38.1%); *estimate2* is the proportion of TiR students who were Does Not Meet in 2017 (71.4%). All the statistical test is asking is whether *estimate1* is significantly less than *estimate2*. The same test is run for non-participants. The *p.value* tells us whether the test was significant: traditionally, if it is less than .05, then the test is significant.

Here, we see statistically significant results for TiR participants and non-significant results for non-TiR participants. This may indicate that TiR participants who are below grade level are achieving greater growth than their non-TiR peers.

APPENDIX B: TEACHER INSERVICE, OPENING DAY PROCEDURES & MATERIALS

Teacher Inservice Procedure

1. "Good Morning" song to get teachers singing (see below).

2. Video of TV news spot about first summer of the program on a bus. https://www.youtube.com/watch?v=XjMw3f0Titg&feature=youtu.be

3. PowerPoint slide presentation: history of the creation of the TiR software program, research about its effectiveness, Rock 'n' Read's vision and mission, funding for the state pilot from the MN Legislature, how schools qualify for participating in the state pilot (see below).

4. Demonstration (LCD) of using TiR.

5. Teachers log into TiR and experience using the program.

Students' Opening Day

1. "Good Morning" song to get students singing.

2. Video of TV news spot about first summer of the program on a bus. https://www.youtube.com/watch?v=XjMw3f0Titg&feature=youtu.be

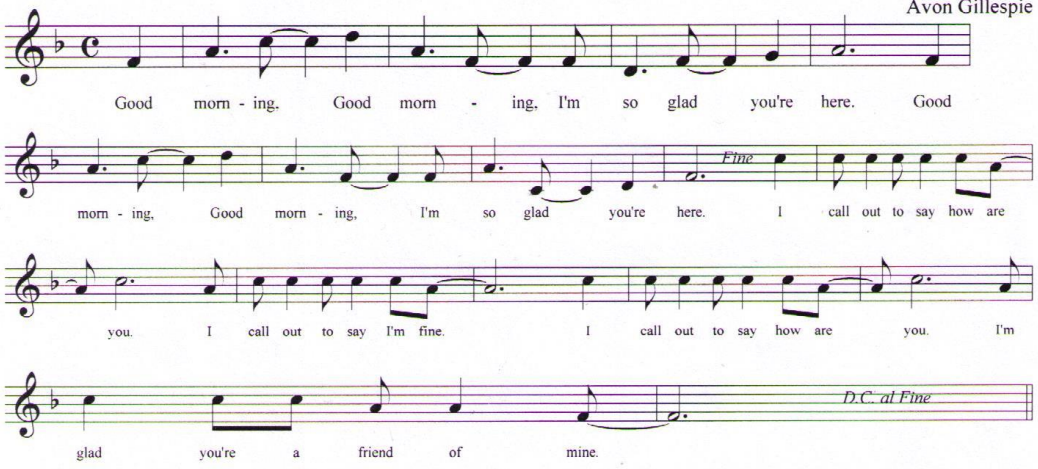
3. Demonstration (LCD) of using TiR.

4. Students log in to TiR and experience using the program.

5. Certificate--awarded to students when they reach their point goals (last page).

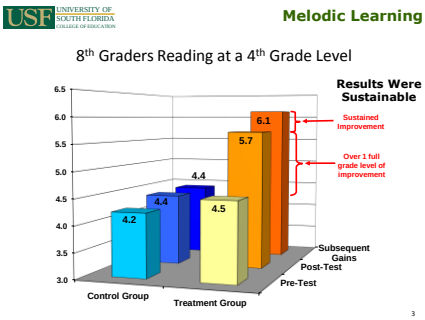
Good Morning

Avon Gillespie

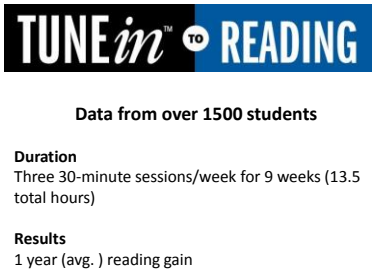


1. The Rock ‘n’ Read Project

2. Carlo Franzblau, owner of a singing-in-tune software accidently discovered that students using it were improving in reading.



3. A pilot study in 2005 found that struggling readers singing with the software for 30 min. 3x/wk for 9 weeks (13.5 hrs.) made 1.6 yr. gain.

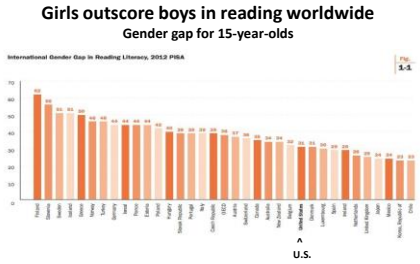


4. Franzblau created TUNE into Reading software, and five more studies confirmed the pilot study results.

5. Could singing and music-making actually change the brain to enable it for reading?

6. Children who cannot keep a steady beat almost always struggle with reading. (Neuroscientist Dr. Nina Kraus)

7. Humans are the only species (other than some birds) that can keep a steady beat. It's developed by jumping rope, hand-clapping, saying nursery rhymes, etc. Mostly girls do these activities.



8. Girls outscore boys worldwide in reading. Could it be that girls are training their brains with rhythmic games?

Why does singing songs raise reading?

1. Develops the ability to maintain a steady beat
2. Singing/reading songs repetitively = long-term memory, automaticity, retention
3. Singing/reading songs practices fluid eye movement = fluency
4. Develops vocal prosody, the "melody" of language = comprehension

9. Singing can help develop steady beat, improve memory of words, aid fluid eye movement and develop vocal prosody.

ROCK 'n' READ
www.rocknreadproject.org

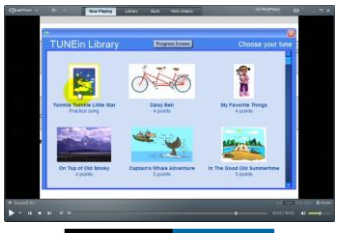
Vision
All children reading at grade level through singing

Mission
Using singing to unlock children's potential for reading and learning

10. The Rock 'n' Read Project, a 501(c) (3) non-profit, was formed in 2014.

Project #1

11. Bill Jones and Ann Kay co-founded the organization, and they built a mobile computer Lab as the first project.



12. RnR purchased TUNE into Reading to use on the bus. Students choose songs to sing and are rewarded for singing accuracy and for correctly answering vocab and comprehension questions.

Kids love it!

13. This is what happened the first summer in 2014 on the bus at a Minneapolis Public summer school and the YMCA on W. Broadway.

Project #2
In-school labs

14. The second project was to install the software in school computer labs or in classrooms.

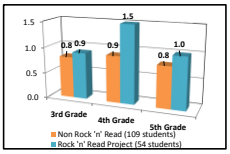
- 2016-'17 $100,000 from MN Legislature (4 schools)
- 2017-'19 $500,000 from MN Legislature (10-15 schools)

15. Rock 'n' Read was able to obtain public funding through the MN Legislature.

RESULTS
State Pilot First Year (2016-'17)

RnR students at all four schools made substantially **more reading gain** (avg.) than students who were also reading below grade level in the fall (FastBridge).

Minneapolis Public Bancroft RnR students made significantly **more gain** (avg.) than students who were also below grade level in the fall (FastBridge and MCAs):



16. First pilot year results at one school using FastBridge aReading assessment. TiR users made greater reading gains than non-TiR students who were also not proficient readers.

State Pilot

Eligible elementary schools have:

- Majority not proficient in reading & free/reduced lunch
- 2nd-5th graders
- Ability to schedule students for 4-5 30-mn sessions/week during school day

The Rock 'n' Read Project provides:
- Professional development
- Lab preparation
- Opening Day and support for students
- Monitoring, reporting and data analysis

17. Main qualifications for the free state pilot: majority of students not proficient in reading and qualify for free/reduced lunch.

How TUNEin to READING Software Works

- Active learning that accelerates growth
- Personalized
  Each student is at their reading level and tracked individually with data and analysis
- Visual feedback and reward
  For singing in tune and in rhythm
- Visual images and auditory explanations
  For new vocabulary words
- Point goal for each level
  Points awarded for quizzes
- Certificate awarded by teacher
  when each goal is completed

18. TiR=active learning, personalized, visual feedback, rewards, visual images and auditory explanations for vocab, point goals with certificate awarded when reached.

19. Happy 2nd graders and their teacher (with arms up in back) showing how they feel about TiR (with owner Carlo Franzblau in center).

20. We are actively seeking schools to partner with us.

APPENDIX C: BIBLIOGRAPHY

Neurological Research about Music

Bonacina, S., Krizman, J., White-Schwock, T., Kraus, K (2018). Clapping in time parallels literacy and calls upon overlapping neural mechanisms in early readers*. Annals of the New York Academy of Sciences Special Issue: The Neurosciences and Music VI,* 1–11. https://www.brainvolts.northwestern.edu/documents/Bonacina_nyas_NSM_b16_13704_1748026_final.pdf

Carr, K.W., Tierney, A., White-Schwock, T., Kraus. N. (2016). Intertrial auditory neural stability supports beat synchronization in preschoolers. Developmental Cognitive Neuroscience. Fe., 17, 76-82.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4763990/

Colling, L., Noble, H., Goswami, U. (2017). Neural entrainment and sensorimotor synchronization to the beat in children with developmental dyslexia: An eeg study. *Frontiers in Neuroscience*, July 12. https://www.frontiersin.org/articles/10.3389/fnins.2017.00360/full

Costa-Giomi, E. (1999). The effect of three years of piano instruction on children's cognitive development. *Journal of Research in Music Education*, 47 (3), 198-212. EJ 604 142.

Cumming, R., Wilson, A., Leong, V., Goswami, U. (2015). Awareness of rhythm patterns in speech and music in children with specific language impairments. Frontiers in Human Neuroscience. 9(672). https://www.researchgate.net/publication/287813239_Awareness_of_Rhythm_Patterns_in_Speech_and_Music_in_Children_with_Specific_Language_Impairments

Degé, F., Schwarzer, G. (2011). The effect of a music program on phonological awareness in preschoolers. *Frontiers in Psychology*, 2: 124. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3121007/

Fujioka, T., Ross, B., Kakigi, R., Pantev, C., & Trainor, L. (2006). One year of musical training affects development of auditory cortical-evoked fields in young children. *Brain,* 129 (10), 2593-2608.

Ho, Y., Cheung, M., & Chan, A.S. (2003). Music training improves verbal but not visual memory; Cross-sectional and longitudinal explorations in children. *Neuropsychology*, 17 (3), 439-450.

Hyde, K.L., Lerch, J., Norton, A., Forgeard, M., Winner, E., Evans, A.C., Schlaug, G. (2009). Musical training shapes structural brain development. *Journal of Neuroscience, 29(10), 3019-3025.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2996392/

Kraus, N., Chandrasekarn, B. (2010). Music training for the development of auditory skills. *Nature Reviews*, 11, 599-605. http://www.brainvolts.northwestern.edu/documents/KrausChandrasekeran_NRN10.pdf

Loui, P., Kroog, K., Zuk, J., Winner, E., Schlaug, G. (2011). Relating pitch awareness to phonemic awareness in children: implications for tone-deafness and dyslexia. *Frontiers in Psychology*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3108552/?tool=pubmed

Moreno, S., Marques, C., Santos, A., Santos, M., Castro, S., Besson, M. (2009). Musical training influences linguistic abilities in 8-year-old children: More evidence for brain plasticity. *Cerebral Cortex,* 19 (3), 712-723. https://academic.oup.com/cercor/article/19/3/712/436400

Patel, A. *Music, Language and the Brain*. Oxford: University Press, 2008.

Schellenberg, E. G. (2004). Music lessons enhance IQ. *American Psychological Society*, 15 (8), 511-514. https://msu.edu/course/psy/401/snapshot.afs/Readings/WK5.PresentB.Schellenberg%20(2004).pdf

Music-Making and Reading Research

Anvari, S.H., Trainor, L.J, Woodside, J, & Levy, B.A. (2002). Relations among musical skills, phonological processing, and early reading ability in preschool children. *Journal of Experimental Child Psychology*, 83 (20), 111-130.

Gordon, R., Fehd, H., McCandliss, B. (2015). Does music training enhance literacy skills? A meta-analysis. *Frontiers of Psychology*, 6, 1777. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4664655/

Gromko, J.E., (2005). The effect of music instruction on phonemic awareness in beginning readers. *Journal of Research in Music Education*, 53 (3), 199-209. https://eric.ed.gov/?id=EJ739989

Habib, M., Lardy, C., Desiles, T., Commeiras, C., Chobert, J., Besson, M., (2016). Music and dyslexia: A new musical training method to improve reading and related disorders. *Frontiers in Psychology. http://journal.frontiersin.org/article/10.3389/fpsyg.2016.00026/full*
Kraus, N. http://www.brainvolts.northwestern.edu/publications.php

Lamb S. J., Gregory A. H. (1993). The relationship between music and reading in beginning readers. *Educational Psychology*, 13, 19–2710.1080/0144341930130103 [CrossRef]

Loui, P., Kroog, K., Zuk, J., Winner, E., Schlaug, G. (2011). Relating pitch awareness to phonemic awareness in children: implications for tone-deafness and dyslexia. *Frontiers in Psychology*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3108552/?tool=pubmed

Ludke, K., Ferreira, F., Overy, K. (2014). Singing can facilitate foreign language learning. *Memory & Cognition,* Vol. 42, 1, 41–52. http://link.springer.com/article/10.3758%2Fs13421-013-0342-5

Lundetrae, K., Thomson., J. (2017). Rhythm production at school entry as a predictor of poor reading and spelling at the end of first grade. *Reading and Writing*, 31(1), 215-237. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5752745/

Tierney, A., Kraus, N. (2013). Music Training for the Development of Reading Skills. In Merzenich, M., Nahum, M., Vleet, T., ed: *Progress in Brain Research*, Vol. 207, pp. 209-241. http://www.brainvolts.northwestern.edu/documents/Tierney_Kraus_Chapter_2014.pdf

U.S. Department of Education What Works Clearinghouse (2014) reviewed 194 studies about repeated reading and found “potentially positive effects on reading comprehension and no discernible effects on alphabetics, reading fluency, and general reading achievement for students with learning disabilities.” https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_repeatedreading_051314.pdf

Evidence-Based Strategies

1. TUNE into READING (TiR) Software

Bennett, S.V., Calderone, C., Dedrick, R.F. Gunn, A.A. (2015). “Do I have to leave?” Beyond linear text: struggling readers’ motivation with an innovative musical program. *Reading Improvement. 52 (2), 51-10 (10).* https://www.ingentaconnect.com/contentone/prin/rimp/2015/00000052/00000002/art00002

Biggs, M.C., Watkins, N.A. (2008). Reading fluency through alternative text: Rereading with an interact sing-to-read program embedded within a middle school music classroom. Journal on School Educational Technology. 4(1), 24-35. https://eric.ed.gov/?id=EJ1098646

Biggs, M.C., Homan, S., Dedrick, R., Minick, V., Rasinksi, R. (2008), Using an interactive singing software program: A comparative study of struggling middle school readers. *Reading Psychology*, 29(3), 195-213. https://www.tandfonline.com/doi/abs/10.1080/02702710802073438

Biggs, M.C. (2007). Reading fluency through alternative text: Rereading with an interactive sing-to-read program embedded within middle school music classroom. Scholar Commons. Ph.D. Dissertation. https://scholarcommons.usf.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1633&context=etd&sei-redir=1#search=%E2%80%9DDr.+Marie+Biggs+USF

Biggs, M.C., Homan, S.P., Dedrick, R. (2005). Does singing improve reading skills? Using unique “learn-to-sing” software with struggling middle school readers. Pilot study internal to University of South Florida. www.tuneintoreading.com/pdf/ResearchAbstract_I.pdf

Homan, S., Calderone, C., Dedrick, R. (2009) Does Tune into Reading improve FCAT scores? Research Abstract IV, University of South Florida. www.tuneintoreading.com/pdf/HomanTIRResearchAbstractIV.pdf

2. Musical Training for Students with Dyslexia

Habib, M., Lardy, C., Desiles, T., Commeiras, C., Chobert, J., Besson, M., (2016). Music and dyslexia: A new musical training method to improve reading and related disorders. *Frontiers in Psychology.* http://journal.frontiersin.org/article/10.3389/fpsyg.2016.00026/full

3. Affirming Parallel Concepts

Olson, E. K. B. (2003). Affirming parallel concepts among reading, mathematics, and music through Kodály music instruction. Doctoral dissertation, University of Iowa. *Dissertation Abstracts International,* 64 (12) 4400A.

4. Same-Language-Subtitling

Kolthari, B. (2015). Same language subtitling on TV: putting children's reading literacy on a path to lifelong practice and improvement. *PlanetRead: Executive Summary.* AID-386-F-12-00003. https://www.planetread.org/images/pdf/research/Research-Article-2015-SLS-Impact-in-Maharashtra-Aug-4-2015.pdf

Kothari, B., Bandyopadhyay, T. (2014) Same language subtitling of bollywood film songs on TV: effects on literacy. *Information Technologies and International Development*. 10 (4) https://itidjournal.org/index.php/itid/article/view/1307/502

McCall, W.G. & Craig, C. (2009). Same-Language-Subtitling (SLS): Using Subtitled Music Video for Reading Growth. In G. Siemens & C. Fulford (Eds.), *Proceedings of ED-MEDIA 2009--World Conference on Educational Multimedia, Hypermedia & Telecommunications* (pp. 3983-3992). Honolulu, HI, USA: Association for the Advancement of Computing in Education (AACE). Retrieved January 26, 2019 from https://www.learntechlib.org/primary/p/32055/.
Note: The U.S. Department of Education What Works Clearing House found that these results were statistically significant. https://files.eric.ed.gov/fulltext/ED538460.pdf