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# Literacy Instruction with ThinkCERCA

## Findings from Chicago Public Schools

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## ThinkCERCA: Introduction

ThinkCERCA is a personalized literacy platform that helps teachers to grow students' critical thinking skills. Through close reading and argumentative writing lessons for English language arts, science, social studies, and math, ThinkCERCA's schoolwide approach to literacy instruction is designed to prepare students in grades 4-12 for post-secondary life by building up their analytical skills across subject matter. It provides educators with an online platform to differentiate literacy instruction easily while creating engaging learning experiences for their classrooms of diverse learners.

Research suggests that discipline-specific close reading and writing practice improves students' literacy skills while building up their critical thinking skills. As the authors of the Common Core State Standards point out, these skills are essential for 21st century success. ThinkCERCA's evidence-based argumentation framework helps students develop strong critical literacy skills across subjects by teaching them how to make **Claims**, support their claims with **Evidence** from texts, explain their **Reasoning**, identify **Counterarguments**, and address the appropriate **Audience** in a given academic, professional, or personal situation. ThinkCERCA's flexible CERCA Framework also empowers whole school teams by providing teachers, parents, administrators, and students with a common language to drive sustainable academic growth.

The ThinkCERCA program includes different types of lessons on varied themes for the development of rich argumentation skills. The main types of lessons that form the basis of the program include:

- a) QuickCERCAs – Short lessons containing high-interest, authentic informational texts with five multiple choice questions to get students engaged with independent reading;
- b) Minilessons – Expert introductions to CCSS-aligned key skills and concepts that include introductory ideas related to the CERCA Framework, such as how to make claims, find evidence, and explain one's reasoning, in addition to other basic literacy skills;
- c) Applied Lessons – Using the CERCA Framework, these lessons walk students through the process of developing formal written arguments about debatable topics that get students to think critically about relevant issues.

The ThinkCERCA lesson library features a curated array of direct instruction lessons, passages, and automated and constructed response assessments. Its lessons include authentic informational and literary texts from real-world sources and support 10 different levels of readiness to meet the needs of diverse learners. Close reading is activated in instructional settings through discipline-specific highlighting and summarizing practice, as well as in-text vocabulary and audio support. Writing practice is supported by ThinkCERCA's scaffolded, interactive Argument Builder, rigorous writing prompts, and standards-aligned sentence frames. In addition, ThinkCERCA lessons are designed to support student collaboration, including classroom discussion and debate, which allows academic literacy development through social and participatory learning.

## Evaluation: Context and Methodology

The Research and Assessment team at Atlantic Research Partners conducted an independent analysis<sup>1</sup> of ThinkCERCA's usage and student outcomes on standardized assessment in Chicago Public Schools (CPS). CPS, with more than 171,000 students in grades 3-8 and the third largest urban school district in the country, is one of the

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<sup>1</sup> The study was sponsored by ThinkCERCA.

largest users of ThinkCERCA program. ThinkCERCA was used in more than 150 schools across the district in the academic year 2014-15. This study intends to examine ThinkCERCA data and its impact on aggregate student outcomes, especially on nationally normed assessments, in elementary and middle grades. Student-level internal program data and publicly available grade-level NWEA assessment data from 2014-15 was used for analysis purposes.

The study aims to explore specific questions relating to student growth and attainment, such as:

1. In schools with high ThinkCERCA usage, what was the magnitude of NWEA student growth and attainment?
2. In schools with high NWEA student growth at grade level, what was ThinkCERCA usage and engagement in the program through lesson completion per student?
3. For grade levels that had very high attainment pre-test assessment scores, what was ThinkCERCA usage and lesson completion leading to sustained growth at high attainment levels?

The study focuses on elementary and middle schools in Chicago Public schools in grades 3-8. Data is further broken down into grades levels 3-5 and 6-8 to understand student outcomes at these different developmental and instructional levels. While examining these questions, the analysis accounted for demographic composition of schools and their pre-test scores from spring 2014 to analyze and contextualize student growth. Exhibit 1 provides basic demographic information for CPS and different groups of schools used for analysis.

**Exhibit 1: Demographic Composition for Grades 3-8, SY 2014-15**

| Demographic Categories    | CPS (Grade 3-8) | Schools with High Usage of ThinkCERCA | Schools with High NWEA Growth Using ThinkCERCA |
|---------------------------|-----------------|---------------------------------------|--|
| <b>Student Enrollment</b> | 171,000         | 3,254                                 | 1,464  |
| <b>% ELL</b>              | 14.3%           | 23%                                   | 11%  |
| <b>% SPED</b>             | 13.5%           | 10%                                   | 11%  |
| <b>% FRL</b>              | 86.8%           | 78%                                   | 58%  |
| <b>% African-American</b> | 38.6%           | 11%                                   | 39%  |
| <b>% Latino</b>           | 46.9%           | 57%                                   | 19%  |

The national normed assessment MAP data (Measures of Academic Progress) from NWEA (Northwest Evaluation Association) is used by Chicago Public Schools for its overall assessment of elementary and middle school student performance and school accountability. Publicly available grade-level data for the entire district for the school year 2013-14 and 2014-15 is used to assess the impact of ThinkCERCA in classrooms.

To formalize the model for 2014-15 year, exploratory analysis was conducted with initial product data from the 2013-14 school year to identify key metrics and indicators from the program and NWEA data respectively. To fully understand the impact of product use on student attainment and growth, a full year of pre-post assessment scores

were used for 2014-15 (i.e. spring 2014 to spring 2015 assessment scores for all schools in the study). Spring-to-spring duration is chosen to reflect a full year of instructional student growth accounting for summer loss.

Three distinct groups of schools are used to answer the three questions (as mentioned above) and codify student growth:

- a) CPS schools with highest usage of ThinkCERCA
- b) CPS schools with ThinkCERCA usage that have demonstrated highest NWEA growth in the school year 2014-15
- c) Specific CPS networks<sup>2</sup> that have high starting attainment levels but also have varied instructional needs based on demographic composition

### **Key Metrics and Indicators:**

For purpose of analysis, a few metrics were identified after deliberate exploration of internal product data for 2013-14 and 2014-15. These metrics include:

1. Average time on task defined as average minutes spent per week by each student actively engaged in the program (not considering idle time during program interaction)
2. Average lessons completed per student is defined as all lessons that were:
  - a) Completed by students and graded by the teacher
  - b) Submitted but not graded by the teacher
  - c) In progress: lessons in the process of being graded by the teacher

NWEA has a large sample of students nationally who test on the MAP assessment three to four times a year. NWEA uses a representative sample for many normative indicators and benchmarks to contextualize student growth and attainment nationally. Each student obtains a NWEA assessment score called RIT<sup>3</sup>, which provides information regarding the instructional level of the student and the relative position of a student compared to peers nationally. This data is aggregated to provide typical RIT scores of a grade level at the beginning, middle, and end of that school year by grade level. In other words, these grade-level equivalent RIT scores<sup>4</sup> demonstrate how a typical student at the 50th percentile performs instructionally at different times of the year. This definition is the core anchor for various performance analyses shown in the report.

Two quantitative approaches were used to assess the impact on student growth:

1. NWEA provides average RIT scores for each grade level for beginning, middle, and end of the year for a typical student at the 50th percentile nationally. Normative “expected growth” for each grade level is calculated by the difference between normative pre-test and post-test scores from the NWEA comparative tables as seen in Appendix I. For analysis, grade-level aggregate NWEA RIT scores for each school are compiled for spring 2014 and

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<sup>2</sup> Networks: CPS is divided into several “mini” districts called “Networks” that include 30-40 elementary and high schools.

<sup>3</sup> RIT: Assessments developed by NWEA use a scale called RIT to measure student achievement and growth. RIT stands for Rasch unit, a measurement scale developed to simplify the interpretation of test scores. The RIT score relates directly to the curriculum scale in each subject area. RIT scores range from about 100 to 300, depending upon the scale and test season.

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spring 2015. The average RIT growth for each grade for the year is compared to the NWEA normative “expected RIT growth” to understand the relative performance of ThinkCERCA users nationally.

2. An alternative method of looking at the same data is to determine the grade-level equivalence of the pre-test and post-test RIT score. For example, a starting pre-test average RIT of 202 corresponds to the middle of the year RIT score for a typical 4th grade student. A post-test average RIT of 211 corresponds to the beginning of the year RIT score for a typical 6th grade student. Aggregating and extrapolating the same method at the grade level will demonstrate student growth in grade-level years. In this example, students had 1.5 years of average grade-level growth.

Different methodologies are used to validate the amount of reading growth seen and to help educators make informed decisions regarding use of education technology in schools. This descriptive method is purposefully used to determine the student growth as defined in grade-level years. Many established charters, districts, and evaluation organizations have used this practitioner approach to determine student outcomes and accountability structures nationally.

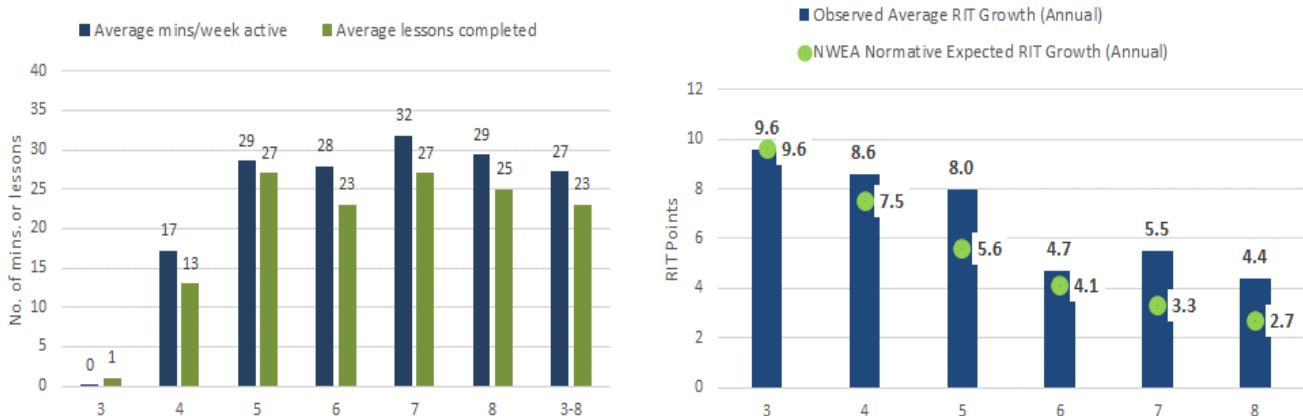
## Results

Overall, students in grade levels with significant use of ThinkCERCA outperformed their peers nationally on NWEA growth at different attainment levels in the academic year 2014-15. This was observed for all grade levels in elementary and middle schools; however, the greatest gains were observed among middle school grades. Even though it is challenging to draw causal inferences between ThinkCERCA use in classrooms and NWEA aggregate RIT growth, there appears to be a strong linkage between high program usage in classrooms and improvement in NWEA RIT growth. Strong linkages were seen for all groups of schools identified for analysis.

### High ThinkCERCA Usage Schools

Of the 150 ThinkCERCA schools in CPS, schools with high ThinkCERCA usage were identified to observe their NWEA growth for the 2014-15 academic year. High usage schools were defined as schools with two or more grade levels with average time on task per week of 25 minutes or more, a rigorous criteria in the light of technology access, curriculum needs, and schoolwide focus on writing. Average time on task on the product captures active engagement of students in reading or writing within the product. More than 3,000 total students in grades 3-8 across 11 schools were identified and used for the analysis. Exhibit 2 shows average active time spent on the program per week per student, average lessons completed per student, and NWEA RIT growth (observed and normative expected) for each grade for high program usage schools.

**Exhibit 2: NWEA RIT Growth for High ThinkCERCA Usage in Grades 3-8, SY 2014-15**

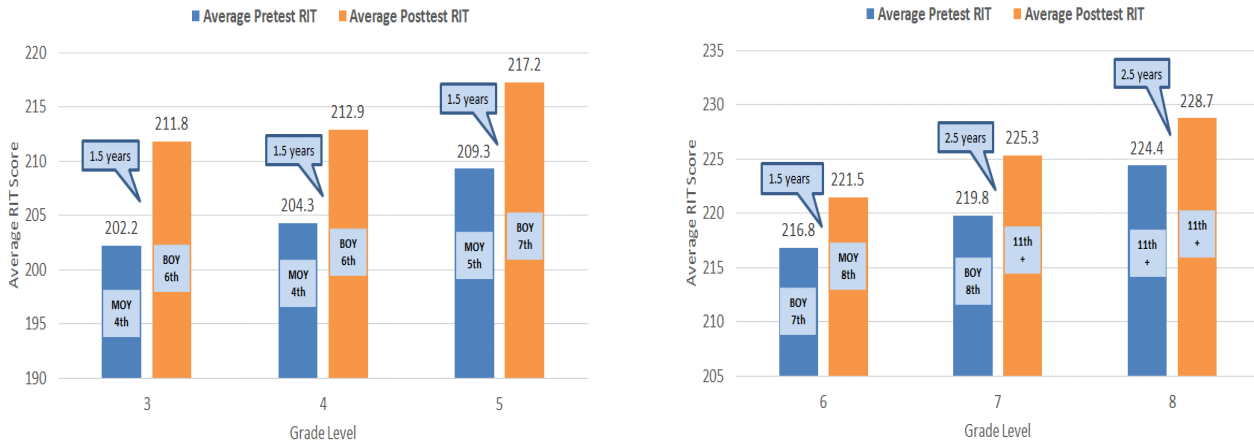


By spring 2015, students in high program usage grade levels spent on average 27 minutes per week actively engaged in reading and writing on ThinkCERCA and completed approximately 23 lessons per student, including Applied Lessons. The observed average RIT growth was consistently higher than the NWEA normative expected RIT growth for all grade levels by a factor of 1.2 years in grades 3-5 and 2 years in grades 6-8. Grades 7 and 8 spent the highest number of minutes on the program. This also corresponded with the highest amount of average RIT growth compared to normative expected RIT growth across grades 3-8. Despite limited use in grade 3 and 4, these grade levels maintained RIT gains comparable to their national peers.

Alternatively, students showed on average 1.5 to 2.5 years of grade-level growth in grades 3-8 when grade-level mean RIT growth was equated to NWEA grade-level norms to arrive at comparable grade-level growth. With respect

to attainment, these students started at a higher RIT score than comparable grade-level students nationally. Differentiation with different types of lessons and active engagement with reading and writing skills might be pivotal reasons for growth observed among students. Exhibit 3 shows average RIT scores for high ThinkCERCA usage schools and the equivalent grade-level year's improvement for each grade level.

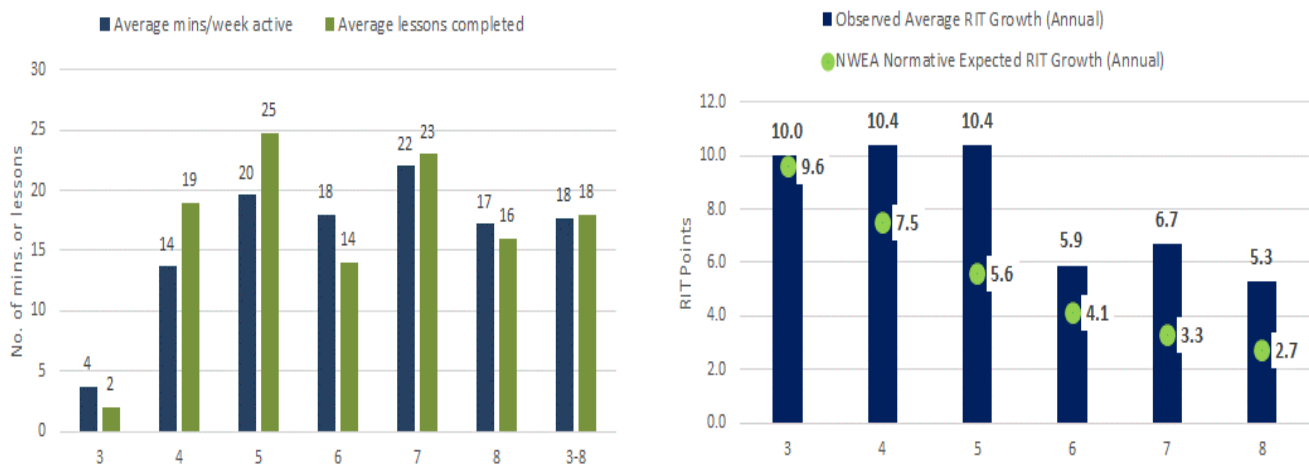
**Exhibit 3: Average RIT Scores for High ThinkCERCA Usage for Spring 2014 and Spring 2015**



*High NWEA RIT Growth Schools*

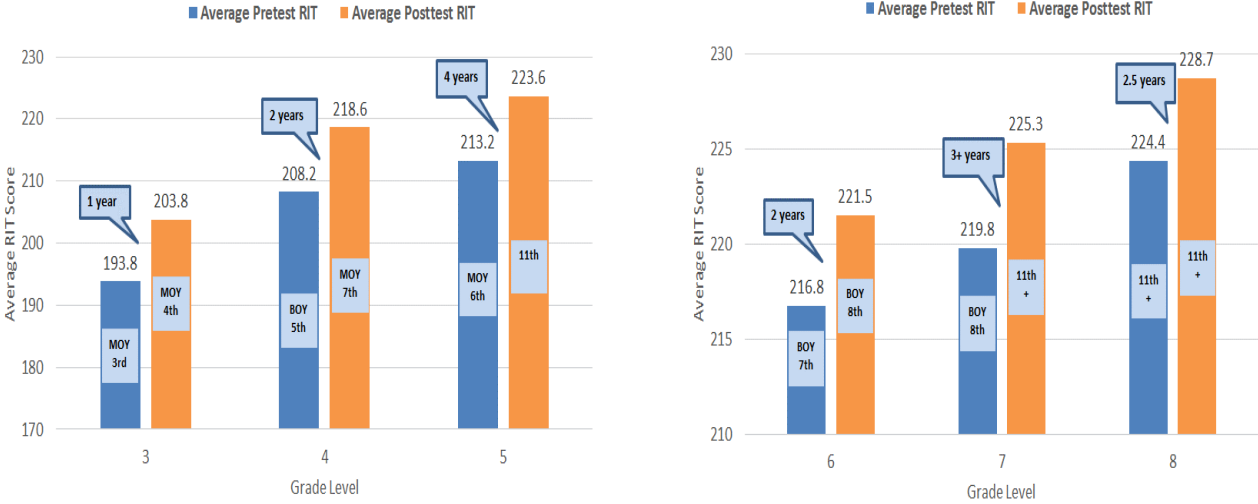
In order to identify the instructional practices and use of program in high performing schools, it was important to examine how actively students were engaged with ThinkCERCA among schools that have demonstrated some of the highest RIT growth in CPS for the academic year in 2014-15. High RIT growth is defined as schools with three or more grade levels at or above the 90th percentile nationally in spring 2014 to spring 2015 reading growth. For this purpose, 1,400 total students in grades 3-8 across eight schools were identified that also used ThinkCERCA in 2014-15. Exhibit 4 shows program usage and NWEA performance for each grade among high NWEA RIT growth schools in 2014-15.

**Exhibit 4: ThinkCERCA Usage in Schools with Highest NWEA RIT Growth for Grades 3-8, SY 2014-15**



On average, schools with the highest NWEA RIT growth used ThinkCERCA for approximately 18 minutes per week and completed 17-18 lessons per student in grades 3-8. Grades 5 and 7 used ThinkCERCA for approximately 20-22 minutes per week with an average lesson completion of 23-25 lessons per student and demonstrated double the amount of RIT growth in comparison to their peers nationally. The gains are even more pronounced when average RIT growth is equated to grade-level norms with more than 3 to 4 years of grade-level growth for grades 5 and 7 as shown in Exhibit 5. Sustained growth for middle schools at very high attainment levels with high ThinkCERCA usage validates the critical importance of engagement with authentic reading and writing skills to improve outcomes for all students.

**Exhibit 5: ThinkCERCA Usage in Schools with Highest NWEA RIT Growth for Spring 2014 and Spring 2015**



**High Attainment NWEA RIT Schools**

Example: Chicago Public Schools Network 1

Network 1 in Chicago Public Schools is a diverse “mini district” of 38 elementary / middle schools and eight high schools on Chicago’s northwest side. Twenty-three of the 38 elementary schools in Network 1, approximately 61 percent, opted to use ThinkCERCA. Several of these schools are now in their third year of ThinkCERCA usage. On average, each school uses the program in three to four grade levels across grades 3-8, accounting for more than 86 percent of all elementary school (grades 3-8) students. Exhibit 6 provides the main demographic compositions of schools in Network 1:

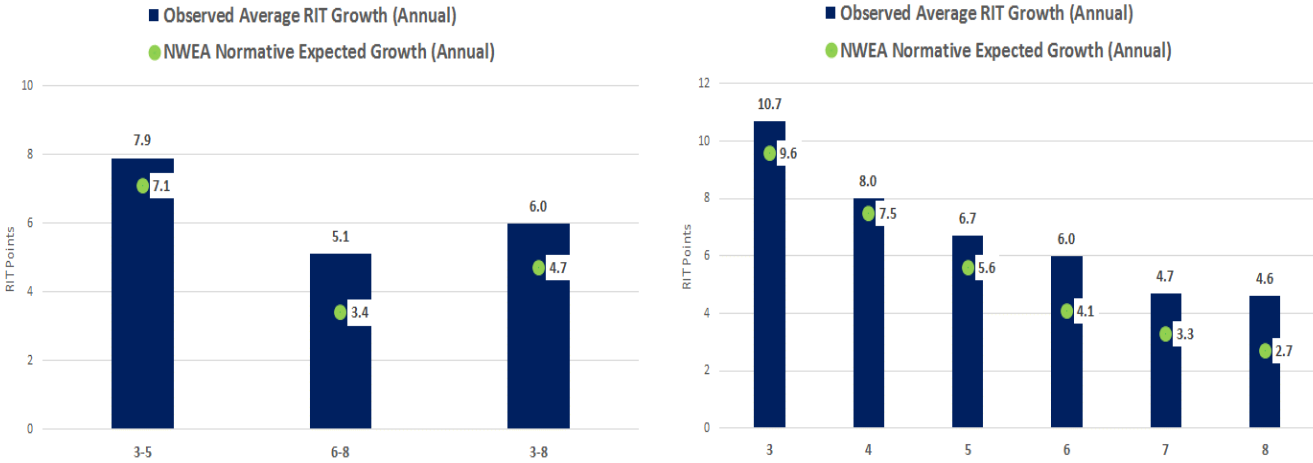
**Exhibit 6: Demographic Composition of CPS (Grades 3-8) and CPS Network 1**

| Demographic Categories | CPS (Grade 3-8) | CPS Network 1 Using ThinkCERCA | CPS Network 1 |
|------------------------|-----------------|--------------------------------|---------------|
| Student Enrollment     | 171,000         | 5,935                          | 40,425        |
| % ELL                  | 14.3%           | 27%                            | 22%           |
| % SPED                 | 13.5%           | 12%                            | 14%           |
| % FRL                  | 86.8%           | 69%                            | 72%           |
| % African-American     | 38.6%           | 3%                             | 4%            |
| % Latino               | 46.9%           | 52%                            | 53%           |



In the past three years, ThinkCERCA has been adopted on a school-by-school basis as principals saw the value of the program and received recommendations from colleagues and network administration. With moderately high percentages of English language learners, many principals feel the need for a reading and writing program that differentiates for students across all readiness levels. Most of the elementary and middle schools have high reading attainment levels. Exhibit 7 shows that students in middle school used the program for at least 20 minutes per week per student and completed approximately 15 lessons per week.

**Exhibit 7: ThinkCERCA Usage in Grades 3-8 in Network 1, SY 2014-15**



As can be seen from the chart above, grades 3-5 outperformed the NWEA normative expected RIT growth by a factor of 1.4 and middle school by 1.5 across grades 6-8. The results are even stronger when growth is reviewed from the perspective of grade-level years for spring 2014 and spring 2015. On average, these students started 1-3 grade levels above for the academic year and achieved 2 to 2.5 grade levels of reading growth for the academic year 2014-15. This sustained growth across all grade levels, especially in middle schools, indicates that the program can be a strong Tier 1 resource with Tier 2 capabilities of supporting students with more intensive instructional needs.

### Data Limitations and Conclusion

In preliminary analysis of a full year of program data and aggregate NWEA grade-level data, it is observed that high usage ThinkCERCA schools observed a significant magnitude of growth with an average usage of 20-25 minutes of active program use per week per student and by completing approximately 18-23 lessons per students. The analysis provides meaningful and effective ways of measuring student outcomes as impacted by use of ThinkCERCA program. However, most of the results are summative in nature and require more robust evaluation anchored in student-level data that will lead to strong correlating indicators within the program and potential identification of causal factors.

An attempt was made to investigate this further by performing correlation analysis with grade-level aggregate RIT score, average time on task, and average lessons completed. It is believed that the act of constant engagement with reading and writing authentic texts under the CERCA Framework supports students’ critical thinking and argumentation skills, leading to positive student outcomes with stronger impacts through teacher guidance, supervision, and authentic teacher-directed feedback.

Preliminary correlation analysis at the aggregate grade level shows RIT growth is positively, though weakly, correlated with average online time on task and average lessons completed at all grade levels, though this does not account for off-line instruction driven by ThinkCERCA. According to a ThinkCERCA-conducted survey of subscribing schools, 95 percent of teachers use ThinkCERCA at least once per month and 40 percent use ThinkCERCA's offline resources once per week in a variety of blended learning environments for classroom activities such as projecting lessons, peer-to-peer discussions, and conferencing. Given the strong aggregate performance of high-implementation ThinkCERCA-using schools, we believe that student level assessment data would reveal stronger positive correlations to time on task and ThinkCERCA lesson completion. All NWEA metrics (percent of students making typical growth, etc.) included in the study followed this positive trend.

In light of the strong, aggregate RIT growth of high-implementation schools, our exploratory analysis corroborates the need to access student-level data for a quasi-experimental design and analysis to authentically gauge the impact of the program. In addition to student-level data, other comparative characteristics will be needed to examine its impact on student outcomes. Given that most principals have willingly adopted ThinkCERCA due to strong pilots in the school or recommendations from colleagues, high overall school quality may be strongly collinear with ThinkCERCA adoption, which would mask the impact of adoption in the study – student-level assessment data would likely allow analysis to determine this conclusively. Multiple years of data, both for program use and NWEA data, will help establish if student growth becomes stronger with each year of ThinkCERCA exposure and will also allow for precise estimation of standard errors.

It is important to realize that in the era of blended learning where school models are constantly changing and evolving, research findings often contribute to refining hypothesis of interest, rather than claiming causality. We can conclude that high-implementation ThinkCERCA-using schools within the study performed well on valid, reliable formal assessment measures. This, coupled with the consistently positive, though slight, correlation with aggregate student usage strongly points to the need for longitudinal, student-level assessment data to fully explore the impact ThinkCERCA has on student outcomes.

## Appendix I

**Table 1: 2015 NWEA Measures of Academic Progress Normative Data**

| 2015 READING Student Status Norms |            |       |          |       |          |       |
|-----------------------------------|------------|-------|----------|-------|----------|-------|
|                                   | Begin-Year |       | Mid-Year |       | End-Year |       |
| Grade                             | Mean       | SD    | Mean     | SD    | Mean     | SD    |
| <b>K</b>                          | 137.5      | 16.78 | 149.9    | 13.20 | 157.6    | 13.27 |
| <b>1</b>                          | 160.7      | 13.08 | 171.5    | 13.54 | 177.5    | 14.54 |
| <b>2</b>                          | 174.7      | 15.52 | 184.2    | 14.98 | 188.7    | 15.21 |
| <b>3</b>                          | 188.3      | 15.85 | 195.6    | 15.14 | 198.6    | 15.10 |
| <b>4</b>                          | 198.2      | 15.53 | 203.6    | 14.96 | 205.9    | 14.92 |
| <b>5</b>                          | 205.7      | 15.13 | 209.8    | 14.65 | 211.8    | 14.72 |
| <b>6</b>                          | 211.0      | 14.94 | 214.2    | 14.53 | 215.8    | 14.66 |
| <b>7</b>                          | 214.4      | 15.31 | 216.9    | 14.98 | 218.2    | 15.14 |
| <b>8</b>                          | 217.2      | 15.72 | 219.1    | 15.37 | 220.1    | 15.73 |
| <b>9</b>                          | 220.2      | 15.68 | 221.3    | 15.54 | 221.9    | 16.21 |
| <b>10</b>                         | 220.4      | 16.85 | 221.0    | 16.70 | 221.2    | 17.48 |
| <b>11</b>                         | 222.6      | 16.75 | 222.7    | 16.53 | 222.3    | 17.68 |

**Table 2: Student Count for High Usage and Growth Schools**

| High Usage Schools  |         |         |         |         |         |         |         |            |
|---------------------|---------|---------|---------|---------|---------|---------|---------|------------|
|                     | N       | 3rd     | 4th     | 5th     | 6th     | 7th     | 8th     | Total      |
|                     | Schools | Grade N | Grade N | Grade N | Grade N | Grade N | Grade N | Enrollment |
| <b>Charter</b>      | 2       |         | 82      | 55      | 139     | 127     | 101     | 504        |
| <b>District</b>     | 9       | 59      | 359     | 377     | 651     | 693     | 611     | 2750       |
| <b>Overall</b>      | 11      | 59      | 441     | 432     | 790     | 820     | 712     | 3254       |
|                     |         |         |         |         |         |         |         |            |
| High Growth Schools |         |         |         |         |         |         |         |            |
|                     | N       | 3rd     | 4th     | 5th     | 6th     | 7th     | 8th     | Total      |
|                     | Schools | Grade N | Grade N | Grade N | Grade N | Grade N | Grade N | Enrollment |
| <b>Charter</b>      | 1       |         |         |         | 31      | 31      | 29      | 91         |
| <b>District</b>     | 7       | 91      | 222     | 239     | 302     | 266     | 253     | 1373       |
| <b>Overall</b>      | 8       | 91      | 222     | 239     | 333     | 297     | 282     | 1464       |