

RESEARCH RESULTS

READ 180: CHARLES ARMSTRONG SCHOOL

STUDY PROFILE

DISTRICT:

Charles Armstrong School, Belmont, CA

GRADES:

STUDY DESIGN:

Promising (ESSA)¹

EVALUATION PERIOD:

2019-2020 school year

STUDY CONDUCTED BY:

Forge Research Group

OUTCOME MEASURE:

- READ 180 Software Use
- Reading Inventory
- Word Identification Spelling Test (WIST)
- Read Naturally Reading Fluency Progress Monitor
- Track My Progress Reading Comprehension

IMPLEMENTATION:

45-Minute Single Period Model

THE CHALLENGE

Dyslexia is a language-based learning disability where individuals often have underlying difficulties in phonological processing and decoding (IDA, 2020). Compared to other students, students with language-based learning differences such as dyslexia are 2 ½ times more likely not to meet grade-level benchmark tests by 4th grade and 3 times more likely not to meet 8th grade standards (National Center for Education Statistics, 2013). Students who do not meet or exceed benchmark scores are less likely to be on track for future academic success without intensive intervention (CCRSC, 2013). Identification and evidence-based literacy interventions consisting of both foundational literacy skills and comprehension strategies are essential to meet the needs of students with dyslexia. The Charles Armstrong School identified the need for an intervention to accelerate students diagnosed with dyslexia in Grades 6 to 8 to gradelevel reading proficiency.

DISTRICT CHARACTERISTIC

The Charles Armstrong School in Belmont, California, is a private school designed to educate students with language-based learning differences such as dyslexia. The Charles Armstrong school serves approximately 240 second through eighth grade students. ² The Charles Armstrong School

serves students with a range of ethnic backgrounds: African American (2%), Asian (2%), Caucasian (78%), Hispanic (4%), Native American (2%), and students with Multiple ethnic backgrounds (12%). In the 2019–2020 school years, 25% of students received financial aid.

IMPLEMENTATION MODEL

Charles Armstrong School students in Grades 6 to 8 who were struggling with reading comprehension but had foundational reading skills completed the Reading Inventory and were placed in the READ 180 Universal intervention. READ 180 Universal students completed approximately 15 minutes in the personalized online student application between one and three days a week. Teachers met with HMH consultants for an overview of the READ 180 program and ongoing instructional coaching sessions while implementing READ 180.

PARTICIPANTS

Charles Armstrong school students comprise a unique population of students who all demonstrate language-based learning differences, such as dyslexia, and generally struggle with reading. As expressed during qualitative data collection, these students often experience anxiety with reading, find it emotionally difficult to read orally, and feel extreme stress when asked to complete a reading task with a time limit. As such, answering the question of whether the HMH reading intervention

¹ Promising Evidence under the ESSA guidelines pertains to studies that are well-designed and well-implemented correlational studies (with statistical controls for selection bias).

2 Charles Armstrong School Quick Facts found at www.CharlesArmstrong.org.

programs would be successful in increasing ELA skills in this specific population was of interest.

The READ 180 Universal student demographic information is listed below (see Table 1). All students who completed READ 180 Universal³ with a pretest and posttest using the Reading Inventory were included in the READ 180 analysis (N=56).

TABLE 1. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, Grades 6-8 (N=56) Demographics 2019-2020

Characteristics	READ 180 Students (N = 56)
Grade 6 7 8	16 (28%) 15 (27%) 25 (45%)
Gender Male Female	20 (36%) 36 (64%)
Ethnicity Asian African American White Hispanic Middle Eastern Multiracial Not Stated	2 (4%) 1 (2%) 31 (55%) 4 (7%) 1 (2%) 5 (9%) 12 (21%)

MEASURES

SOFTWARE USAGE DATA

Student software usage data was collected as students used the online student application during READ 180 Universal instruction. READ 180 Universal software usage data included number of days enrolled. number of segments completed, number of completed sessions, total software time, average time spent in each session, and number of sessions averaged per week.

READING INVENTORY

The HMH Reading Inventory measures reading comprehension proficiency for students in Grades K-12. The Reading Inventory uses adaptive technology to determine a student's reading comprehension level on the Lexile Framework for Reading; the higher the Lexile score, the more challenging reading material the student can comprehend. Test item difficulty ranges from items appropriate for developing readers to items requiring a reading proficiency indicating preparedness for college level texts, allowing measurement of skill growth regardless of the students' initial ability. Assessment results include a Lexile scale score that indicates reading ability at a level of text complexity and a performance level of below basic, basic, proficient, or advanced, indicating achieved reading comprehension compared to grade-level expectations. Charles Armstrong School students completed the Reading Inventory before beginning instruction in READ 180 Universal, and again at the end of the school vear.

READ NATURALLY READING FLUENCY PROGRESS MONITOR

The Read Naturally Reading Fluency Progress Monitor is an efficient, valid, and reliable assessment to measure a student's progress in reading aloud. The teacher listens to a student read a leveled passage at his/her instructional level (Grades 1-8) for one minute and determines the student's words-correct-per-minute score. Scores are graphed throughout the year to track student progress and make educational decisions. Charles Armstrong School students were assessed for Oral Reading Fluency using the Reading Fluency Progress Monitor multiple times during the 2018-2020 school years.

TRACK MY PROGRESS READING COMPREHENSION

Track My Progress is an online, computer-adaptive test designed to assess math and reading skills aligned to the Common Core State Standards in kindergarten through eighth grades. Track My Progress tests have been shown to be both reliable and valid measures of Common Core State Standard proficiency, normed to a nationally representative US sample. Student progress in meeting skills is tracked as students take four 20-minute tests each year, and teachers have access to reports on specific subject and domain proficiency. Charles Armstrong School student data included a spring 2019, fall 2019, and winter 2020 percentile score (range 0–99) for Reading Comprehension. A percentile score above 41 is considered to reflect grade-level ability.

TEACHER AND STUDENT FOCUS GROUPS

A focus group using a structured interview with small groups of students was conducted in February 2020. Grade 7–8 READ 180 Universal students who previously worked in the System 44 software (N=6), and READ 180 Universal teachers answered questions about experiences including what they liked, what they disliked, impressions of the program, progress after using the intervention, and suggestions for improvement.

RFSULTS

SOFTWARE USAGE FINDINGS

Charles Armstrong School teachers began implementation of READ 180 Universal during the 2019–2020 school years. However, the 2019–2020 school year data collection efforts largely ended after the winter quarter, January 2020, due to school closures due to the coronavirus pandemic (five READ 180 Universal students continued to use the software and completed a posttest in spring 2020). As such, length of student participation in the program varied.

Students who participated in READ 180 Universal during the 2019–2020 school year (see Table 2) completed an overall average of 2.2 READ 180 Universal segments (SD=1.65) over an average of 32.0 total sessions (SD=13.9), averaging 2.0 (SD=0.4) sessions per week and totaling an average of 422.6 minutes (SD=229.7) in the READ 180 Universal online student application. Each software session lasted an average of 13.0 (SD=2.8) minutes. Of note, READ 180 Universal students completed between 0 and 6 segments in the online student application before school closure, which is consistent with a "Partial" or "Low" implementation level compared to what is normally completed in a school year.

³ With a minimum of 150 minutes over at least 10 sessions

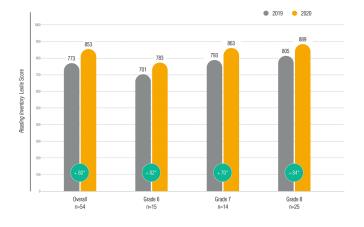
TABLE 2. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8 (N=56) AVERAGE USAGE OF READ 180 UNIVERSAL ONLINE STUDENT APPLICATIONS, 2019-2020

Usage Metrics	Mean	Standard Deviation
Days Enrolled	128.26	29.26
Segments Completed	2.23	1.65
Total Sessions	32.00	13.91
Sessions per Week	2.05	0.41
Total Software Time	422.6	229.67

READING INVENTORY FINDINGS

Charles Armstrong School READ 180 Universal students completed the Reading Inventory before beginning instruction (fall 2019 or winter 2020) and after completing instruction (winter 2020 or spring 2020). READ 180 Universal students averaged a statistically significant 80L overall gain in Reading Inventory Lexile scores during the 2019-2020 school year (see Figure 1). When disaggregated by grade level, 6th, 7th, and 8th grade students all demonstrated significant Lexile score gains, gaining 82L, 70L, and 84L, respectively.

FIGURE 1. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=56) CHANGE IN READING INVENTORY LEXILE SCORE OVERALL AND BY GRADE, 2019-2020

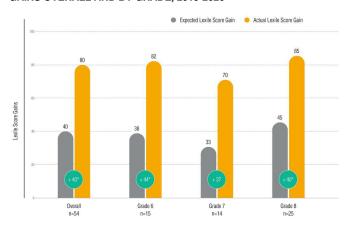


Note. *statistically significant change at p<.05. The increase in average Reading Inventory Lexile Score was statistically significant for READ 180 Universal students overall (t=7.27, p<0.001), and for sixth (t=3.92, p=0.002), seventh (t=2.83, p=0.01), and eighth grade students (t=5.49, p<0.001).

In addition to demonstrating statistically significant Lexile score gains, READ 180 Universal students demonstrated accelerated Lexile score gains compared to the average annual growth demonstrated by an initially same-scoring national sample⁴ (see Figure 2). Notably, on average, students gained approximately 2 times as many Lexile scores as would be expected (80L compared to 40L) from beginning to ending READ 180 Universal instruction in the 2019–2020 school year, demonstrating accelerated growth towards grade-level performance. With just one semester of use, the majority of READ 180 Universal students achieved a Lexile gain on the *Reading Inventory* (87%) and met growth expectations

(70%) based on Estimated Average Annual Growth adjusted for days of instruction between tests. Additionally, 43% of READ 180 Universal students more than doubled growth expectations.

FIGURE 2. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=54) EXPECTED AND ACHIEVED READING INVENTORY LEXILE SCORE **GAINS OVERALL AND BY GRADE, 2019-2020**



Note. * = statistically significant change. The average Reading Inventory Lexile Score gain was statistically significantly greater than the expected Lexile score gain Overall (t=4.01, p<0.001) and for sixth grade (t=2.61, p=0.02) and eighth grade students (t=2.85, p=.009).

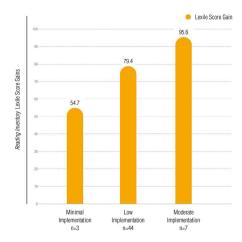
Notably, growth on the Reading Inventory from fall 2019 to winter 2020 was highest for the most struggling students. READ 180 Universal students who initially scored in the Below Basic performance level on the Reading Inventory gained an average of 112L during the 2019-2020 school year, demonstrating accelerated growth in approaching grade-level proficiency compared to students who initially scored in the Basic performance level, who gained an average of 66L, and students who initially scored in the Proficient performance level, who gained an average of 34L (medium effect size of Cohen's d=0.62). Of note, READ 180 Universal students completed between 0 and 6 segments in the online student application before school closure and achieved statistically significant gains in Reading Inventory Lexile scores.

Reading Inventory Lexile score growth was related⁵ to *READ 180* Universal online software use. On average, READ 180 Universal students who completed more segments in the online software also achieved higher gains in the Reading Inventory Lexile score, with both Low and Moderate implementation students achieving statistically significant Lexile score gains from pretest to posttest (see Figure 3).

HMH Reading Inventory: Estimated Average Annual Growth; analysis of 373,880 students' fall to spring Lexile score gains.

⁵ Implementation group sizes were insufficient to test statistical significance of difference in gains bet

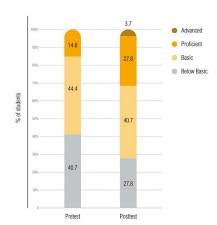
FIGURE 3. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=56) READING INVENTORY LEXILE SCORE GAIN BY IMPLEMENTATION, 2019-2020



Note. Minimal=0 completed segments; Low=1-3 segments; Moderate=4-6 segments completed. READ 180 Universal students achieved statistically significant pretest to posttest Lexile Score gains with Low (t=6.10, p<.001) and Moderate implementation (t=4.39, p=0.005).

In addition to Reading Inventory Lexile score gains, READ 180 Universal students also achieved statistically significant increases in pretest to posttest performance status on the Reading Inventory (see Figure 4). The percentage of students achieving an Advanced performance status on the Reading Inventory, indicating above grade-level proficiency, increased overall from 0% to 4% and Proficient students increased from 15 % to 28%, while the percentage of students scoring at a Below Basic performance status, indicating reading skills several years below grade level, decreased from 41% to 28% during the shortened 2019–2020 school year.

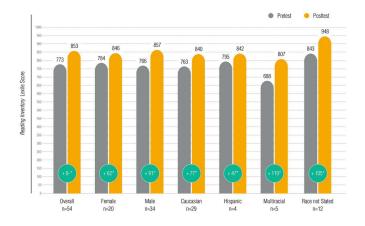
FIGURE 4. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=54) **CHANGE IN READING INVENTORY PERFORMANCE STATUS, 2019-**2020



Note. The average Reading Inventory performance status gain was statistically significant overall from 2019 to 2020 (t=4.76, p<0.001).

Notably, disaggregation of the data indicated that READ 180 Universal was associated with significant Reading Inventory Lexile Score gains for most categories of students during the 2019–2020 school year (see Figure 5). When results were disaggregated by gender, both males and females achieved statistically significant Reading Inventory gains from pre- to post-instruction. When results were disaggregated by ethnicity, Caucasian and multiracial students achieved statistically significant Reading Inventory gains. Although the sample was too small (n=4) to capture the true significance of gains statistically, Hispanic students gained an average of 47 points on the Reading Inventory, in line with other students' gains. Other categories of students (Asian, African American, Middle Eastern) had fewer than 4 members and so results were suppressed to protect student anonymity.

FIGURE 5. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=54) CHANGE IN READING INVENTORY LEXILE SCORE, OVERALL AND BY STUDENT CATEGORY, 2019-2020



Note. *statistically significant change at p<.05. The increase in average Reading Inventory Lexile Score was statistically significant overall, (t=7.27, p<.001), for female (t=4.40, p<0.001) and male students (t=5.93, p=<0.001), Caucasian students (t=5.35, p<0.001), multiracial (t=3.55, p=.02) and students who did not state a race (t=3.62, p=.004). Categories with fewer than 4 students were suppressed to protect student anonymity.

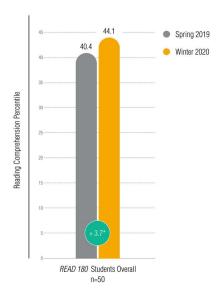
READ NATURALLY READING FLUENCY FINDINGS

In addition, READ 180 Universal students demonstrated growth on school administered ELA metrics and achieved statistically significant growth in the ORF on the Read Naturally Reading Fluency Progress Monitor. From the fall to winter of the 2019–2020 school year, READ 180 Universal students averaged a 4% increase (from 106 to 110) in wcpm on the ORF test (see Appendix Table 2 for details). When disaggregated by grade level, 6th grade students averaged a statistically significant 7% increase (from 124 to 133) in wcpm. Further, 6th and 7th grade students achieved the same rate of ORF wcpm gains as students without disabilities in \boldsymbol{a} national sample⁶ (see Appendix Table 3 for details).

TRACK MY PROGRESS FINDINGS

Notably, READ 180 Universal students showed accelerated growth in Track My Progress reading comprehension percentile compared to their initially same-scoring peers (see Figure 6). On average, students scored better than 40% of their peers in 2019 but better than 44% of their peers in winter of 2020. These gains represent progress towards achieving a percentile score above 41, which reflects grade-level ability. READ 180 Universal students demonstrated a 38% increase (from 23 of 51 to 34 of 55) in number of students scoring at least in the 41st percentile on the reading comprehension assessment from spring 2019 to winter 2020.

FIGURE 6. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS. GRADES 6-8, (n=50) TRACK MY PROGRESS READING COMPREHENSION PERCENTILE, **SPRING 2019-WINTER 2020**



FOCUS GROUP FINDINGS

Student experiences with the READ 180 Universal intervention, as expressed during qualitative data collection, align with the quantitative data. Students agreed that READ 180 helped them to become better readers and expressed that the level and content of READ 180 was more appropriate for older students as compared to other software used by the school-two sentiments that were echoed by the READ 180 teachers. Students found the following elements especially engaging and helpful: agency in selecting topics, videos that accompanied the passages, vocabulary words, spelling, and independent reading. READ 180 teachers additionally appreciated the inclusion of academic language, the structured fill-in-the-blank activities of the ReaLBook, multiple sources of text on the same concept, the repetition of readings to gain more practice, and that the *Reading Inventory* provided a measure of reading comprehension that motivated students to improve.

CONCLUSION

Multiple independent measures support the idea that students with dyslexia who received READ 180 Universal instruction made statistically significant improvements in English Language Arts and Literacy achievement. After one semester of instruction at a Moderate implementation level, students in the Charles Armstrong School demonstrated statistically significant increases in Reading Inventory Lexile scores and gained two times as many Lexile scores as an initially samescoring national sample. Students also increased in assessment performance status: the percentage of students achieving at least a grade-level Proficient performance status on the Reading Inventory increased overall from 15% to 32%. Disaggregation of the data by student category indicated that use of READ 180 was associated with significant gains in Reading Inventory Lexile scores for both male and female students and there were no significant differences in gains based on ethnicity. Students worked through varying amounts of the self-paced, online instruction components - increased completion of READ 180 segments was related to Lexile score gains during the shortened 2019-2020 school year.

In addition to gains measured by HMH metrics, READ 180 students also showed accelerated growth in reading comprehension, scoring better than 40% of their peers in spring 2019 but better than 44% of their peers in winter 2020 on the Track Mv Progress reading comprehension assessment. Qualitative data aligned with quantitative data as students and teachers agreed that READ 180 was effective at improving students' reading skills and boosted students' confidence in their reading ability. This study demonstrates that using READ 180 Universal to provide a reading intervention is an effective method of increasing literacy for students with dyslexia to achieve grade-level ELA proficiency.

REFERENCES

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APPENDIX

TABLE 1. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (n=54) RESULTS OF T-TEST AND DESCRIPTIVE STATISTICS FOR READING INVENTORY PERFORMANCE, 2019-2020

TABLE A1. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (N=54) RESULTS OF T-TEST AND DESCRIPTIVE STATISTICS FOR READING INVENTORY PERFORMANCE, 2019-2020

Outcome		Reading Inventory Lexile Score Pretest		Reading Inventory Lexile Score Posttest		95% Confidence Interval for Mean			
	M	SD	М	SD	n	Difference	t	df	р
Overall Reading Inventory	772.70	246.76	852.80	225.95	54	-102.21, -57.98	-7.27	53	<.001
Minimal Implementation	808.33	62.66	863.00	77.89	3	-163.98, 54.65	-2.15	2	0.16
Low Implementation	764.36	266.47	843.73	241.96	44	-105.61, -53.12	-6.10	43	<.001
Moderate Implementation	809.86	157.92	905.43	159.68	7	-148.83, -42.31	-4.39	6	0.005
Grade 6	700.60	238.33	782.73	193.87	15	-127.09, -37.18	-3.92	14	0.002
Grade 7	792.79	193.79	862.57	204.85	14	-123.12, -16.45	-2.83	13	0.01
Grade 8	804.72	276.48	889.36	252.13	25	-116.46, -52.82	-5.49	24	<.001
Female	784.05	257.79	846.35	233.91	20	-91.94, -32.66	-4.40	19	<.001
Male	766.03	243.74	856.59	224.62	34	-121.62, -59.50	-5.93	33	<.001
Caucasian	763.41	258.66	840.48	235.63	29	-106.56, -47.58	-5.35	28	<.001
Hispanic	795.00	157.49	841.75	110.60	4	-131.70, 38.20	-1.75	3	0.18
Multiracial	688.20	379.45	806.80	337.13	5	-211.40, -25.80	-3.55	4	0.02
Race not stated	843.42	171.94	947.67	136.87	12	-167.57, -40.93	-3.62	11	0.004

 $\textit{Note}. \ \ \mathsf{M=Mean}; \ \mathsf{SD=Standard\ Deviation}; \ \mathsf{n=sample\ size}; \ \mathsf{df=degrees\ of\ freedom}; \ \mathsf{p=significance}.$

TABLE A2. CHARLES ARMSTRONG SCHOOL READ 180 UNIVERSAL STUDENTS, GRADES 6-8, (N=54) RESULTS OF T-TEST AND DESCRIPTIVE STATISTICS FOR READ NATURALLY ORAL **READING FLUENCY, 2019–2020**

Outcome	Fall OR	F wcpm	Winter ORF wcpm			95% Confidence Interval for Mean			
	М	SD	M	SD	n	Difference	t	df	р
READ 180 Students Overall	106.21	31.33	110.48	32.30	48	-7.61, -0.93	-2.57	47	0.01
Grade 6	124.33	16.19	132.67	13.79	15	-13.77, -3.30	-3.29	14	0.005
Grade 7	98.23	31.98	100.07	32.25	13	-8.80, 5.13	-0.58	12	0.58
Grade 8	97.80	34.82	100.60	34.90	20	-8.60, 3.00	-1.01	19	0.33

Note. wcpm=words-correct-per-minute; ORF=oral reading fluency; M=Mean; SD=Standard Deviation; n=sample size; df=degrees of freedom; p=significance.

TABLE A3. CHARLES ARMSTRONG SCHOOL *READ 180* UNIVERSAL STUDENTS, GRADES 6–8, (N=54) RESULTS OF T-TEST AND DESCRIPTIVE STATISTICS FOR EXPECTED AND ACTUAL PERFORMANCE ON ELA METRICS, 2019–2020

Metric Outcome	Actual Gains		Expected Gains			95% Confidence Interval for Mean			
	М	SD	M	SD	n	Difference	t	df	р
Reading Inventory Lexile Score READ	Reading Inventory Lexile Score READ 180 students vs. NS								
Overall	80.09	81.01	40.09	30.19	54	20.01, 60.01	4.01	53	<.001
Grade 6	82.13	81.18	38.34	31.61	15	7.81, 79.78	2.61	14	0.02
Grade 7	69.79	92.38	33.20	15.09	14	-16.22, 89.40	1.50	13	0.16
Grade 8	84.64	77.08	44.99	35.38	25	10.92, 68.38	2.85	24	0.009
Oral Reading Fluency wcpm READ 18	Oral Reading Fluency wcpm <i>READ 180</i> students vs. NS								
Overall	4.27	11.51	10.46	2.50	48	-9.52, -2.85	-2.73	47	0.001
Grade 6	8.33	9.81	13.33	0.49	15	-10.54, 0.54	-1.94	14	0.07
Grade 7	1.84	11.53	8.54	1.20	13	-13.84, 0.44	-2.05	12	0.06
Grade 8	2.80	12.39	9.55	2.11	20	-12.72, -0.78	-2.37	19	0.03
Oral Reading Fluency wcpm <i>READ 180</i> students vs. SE									
Grade 6	8.33	9.81	4.08	0.15	15	-1.20, 9.72	1.67	14	0.12

Note. SE=Special Education students; NS=National sample of students; wcpm=words-correct-per-minute.

Check out more READ 180 research at hmhco.com/read180research.

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