The Impact of Classworks® Individualized Learning Language Arts Instruction as an Academic Intervention for K-3rd Grade

Curriculum Advantage, Inc.

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Research Overview

Since 2003, millions of students have used Classworks® to close learning gaps, keep pace, and grow! Classworks is an online, tiered intervention solution that combines assessment, instruction, progress monitoring, SEL, and powerful reporting in one platform. Classworks includes:

- NCII-validated reading and math academic screeners
- NCII-validated reading and math progress monitoring
- Individualized Learning for language arts, reading and mathematics, grades K-8
- Social-emotional and PBIS tools
- Rigorous tier-one reading and math lessons for grades K-8
- Data and reporting

After the closing of the 2022 spring testing window, an analysis was conducted to measure the impact of Classworks ® Individualized Learning on student growth for students performing below the 25th percentile in language arts. The study analyzed the impact of Classworks Individualized Learning language arts instruction, from fall to spring, across ten districts and 2,176 students in kindergarten-third grades during the 2021-2022 school year. It was hypothesized that students that participated in Classworks Individualized Learning language arts instruction would show more growth from the fall to spring on the Classworks Language Arts Universal Screener than their peers that did not participate in this instruction.

Results of the analysis concluded that Classworks Individualized Learning language arts instruction has a significant impact and positive effect on growth as an academic intervention for students performing below the 25th percentile in kindergarten through third grade. Moreover, there are statistically significant findings for students that use Individualized Learning (ILP Users), experiencing more growth than students that do not use Individualized Learning (Non-ILP Users) based on grade and race.

Introduction

Since 2003, millions of students have used Classworks® to close learning gaps, keep pace, and grow! Classworks is an online, tiered intervention solution that combines assessment, instruction, progress monitoring, SEL, and powerful reporting in one platform. Classworks includes:

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After the closing of the 2022 spring testing window, an analysis was conducted to measure the impact of Classworks ® Individualized Learning on student growth for students performing below the 25th percentile in language arts. The study analyzed the impact of Classworks Individualized Learning language arts instruction, from fall to spring, across ten districts and 2,176 students in kindergarten-third grades during the 2021-2022 school year. It was hypothesized that students that participated in Classworks Individualized Learning language arts instruction would show more growth from fall to spring on the Classworks Language Arts Universal Screener than their peers that did not participate in this instruction.

Individualized Learning

Classworks Individualized Learning is an integral component in Classworks tiered intervention support and is composed of online units of instruction in both language arts and math for K-8th grades. An Individualized Learning Path (ILP) is generated from student assessment data, such as the Classworks Universal Screener. ILPs consist of multiple units of Classworks instruction and are organized along an evidence-based learning progression.

A Classworks instructional unit includes direct instruction, activities to apply learning, and a short formative check focused on strengthening a specific skill. The direct instruction introduces the subject matter with two-to-three-minute segments that teachers can also use in classrooms. Extended learning and practice on the unit skills are introduced in the form of interactive games and activities that differentiate by instructional strategies. Next, a formative assessment confirms skill mastery with ten questions. This structure ensures that when students master a Classworks unit, they

master the concept. This translates into increased student achievement not only on state high-stakes tests but in cross-curricular experiences and real-life applications. Skill practice focuses on concepts in direct response to students' demonstrated needs.

Classworks lessons reflect different pedagogies, keeping students motivated and engaged because of the variety encountered throughout the lesson. Students are presented with different instructional approaches, types of interactivities, and varying degrees of games and concrete instruction as they learn each skill. Activities use diverse rich-media technology including voice, text, video, graphics, photographs, and animation.

To ensure the optimal impact of Classworks Individualized Learning, it is essential for teachers to actively monitor student progress and reassign assignments as needed to support student mastery (*Best Practices for Individualized Learning*, 2022). As a responsive system, Classworks Individualized Learning supports teachers' instructional planning by generating student assignments that are sometimes below or above grade level based on a student's readiness as indicated based on performance on assessments such as the Classworks Universal Screener. When monitoring student progress, teachers can make modifications to student learning progressions by turning a skill on or off as needed when that skill is introduced to a student's ILP. Classworks monitoring features allow teachers to prepare relevant and timely instructional support during individual or small group instruction. Using assessment data to inform instructional decision-making equips teachers to make expert decisions to guide and support students as they close learning gaps and encounter new levels of learning.

The instructional variety of Classworks Individualized Learning along with intentional classroom implementation practices ensure students encounter multiple ways to learn and practice every skill. It's important to note that the interventions the students receive in Tiers Two and Three are different in instruction and experience from what they receive in Tier One.

Classworks Tiered Instructional Model

Classworks RTI Instructional Model includes universal screening and K-8th grade supplemental instruction in reading, language arts, and math for Tier One and progress monitoring for Tiers Two and Three. The Individualized Learning Path (ILP) sets the progression of targeted instruction for each student.

Placement into an ILP is determined by a student's assessment results which may be the Classworks Universal Screener Assessments or from one of Classworks

nationally recognized partners such as Renaissance and NWEA. ILP placement provides students with individualized instruction based on the skills they are ready to learn.

The recommendation for all students is to spend a minimum of 30 minutes each week on individualized learning in each content area. Tier Two and Three students are recommended to complete 60 to 90 minutes per subject per week (*How Much Time Should My Students Be Using Classworks Each Day?*, 2022, Classworks, 2019).

In addition, Classworks' recommendation is that students will complete an average of six to eight individualized units mastered at 80% or higher each month, in each content area. On average, this is equivalent to 18 hours of individualized instruction over the school year, per student. When these recommendations of time and mastery are followed, studies show that students show significant increase in growth when compared with students not using Classworks (*Best Practices for Individualized Learning*, 2022, Classworks, 2019, Classworks, 2020).

It is important to note that these recommendations assume that all students experience stable school attendance. Regular classroom attendance wavered across the nation during the 2021-2022 school year, and evidence suggests that absenteeism rates differed across socio-economic groups with attendance rates for low-income students worsening as rates begin to level for high-income students (Dorn et al., 2021).

Classworks follows NCII guidelines with regards to tier placement recommendations and therefore recommends using the following percentiles for tier placement: Tier One students perform above the 25th percentile, Tier Two students perform between the 10th and 25th percentiles, and Tier Three students perform at and below the 10th percentile (Classworks, 2022).

At Tier One, for students performing above the 25th percentile, based on assessment results, Classworks ensures readiness, tracks learning gains, monitors rate of learning among peers, and identifies students requiring additional intervention. Tier One instruction includes rigorous and engaging activities built to Common Core and College and Career Ready Standards. Lessons are differentiated, presenting grade level standards at varying levels of difficulty. Teachers are equipped with resources to support lesson planning, real-time responsive instruction, and reporting for professional learning communities, student action plan meetings, and parent-teacher communication, with a focus on student identification of need for intervention.

At Tier Two, for students performing between the 10th and 25th percentile, extra instruction time is an important factor in achieving learning goals and providing real-time measures of student performance towards mastery of skills. In addition to the ILP placement by assessment, ongoing progress monitoring also further informs and adapts individualized instruction for each student. Formative assessments are embedded throughout the learning path assignments to monitor mastery of skills. The focus of Classworks data and reporting at Tier Two is on monitoring student performance and mastery through a battery of Curriculum-Based Measurement (CBM) Probes.

Skill-based CBM Probes continue to be essential at Tier Three, for students performing below the 10th percentile. Weekly progress monitoring to identify and respond to specific skills students are struggling with allows teachers to determine if students are making progress and make the necessary adjustments to an ILP. As previously mentioned, the intensity of intervention is increased at Tier Three, which may include lengthening instructional time, increasing the frequency of instructional sessions, adjusting the level of instruction, and/or targeting the skills the student is working on within the intervention. As with all Tiers, teachers are also able to make customized Classworks assignments to further address student deficits. The focus of Classworks data and reporting for Tier Three students is on skills and progress monitoring of student achievement and growth through intensified intervention (Classworks, 2022).

Students participating in the study were found to be academically-at-risk based on their identification as performing below the 25th percentile on their fall baseline Classworks Language Arts Universal Screener. In this analysis, we examined the fall to spring growth based on student score performance on Classworks Language Arts Universal Screener scores achieved by students that participated in Classworks Individualized Learning language arts instruction compared to their peers that did not participate in Classworks Individualized Learning language arts instruction.

Classworks Universal Screeners

Classworks Reading and Math Universal Screeners are included in the NCII Academic Screeners Tools Chart (*Academic Screening Tools Chart*, n.d.) and are valid and reliable assessments used to measure readiness for grade level instruction, help identify baseline learning levels, and measure growth (SEG Measurement, 2019; Classworks, 2022).

As mentioned, Classworks Universal Screeners were specifically designed for the purpose of screening students who may need additional intervention and can be

used as part of the MTSS (Multi-Tiered System of Supports) and Response to Intervention (RtI) process. In addition to reporting an overall scaled score based on the total test, Classworks Universal Screener results provide nationally normed percentile ranks and student strengths and weaknesses for key strands.

The Classworks Language Arts Universal Screeners measure student performance with key domains that are indicative of future reading performance: phonological awareness, letter-sound correspondence, decoding, and reading comprehension. Each of these strands has been identified as early predictors for further screening for learning disabilities, specifically dyslexia (Classworks, 2022). Classworks provides an online, interactive dashboard to explore the alignment of the Classworks Language Arts Universal Screener to state standards for kindergarten - tenth grade (*Classworks Universal Screener State Standards Alignment*, 2022).

Administration of the Classworks Universal Screeners are set at the district level and typically occur three times a year during the fall, winter, and spring (*What are the Universal Screener Testing Windows?*, 2022). In administering the Classworks Universal Screener, best practices recommended to teachers and proctors include consistently monitoring students to ensure students are actively working and making progress through the assessment, and that all questions are answered within 60 minutes, unless accommodations are in place. It is intended that these accommodations would be the same accommodations students would receive for end of year assessments. In the event that the assessment is administered remotely, teachers and proctors should monitor the amount of time students spend on the assessment to determine if students properly attended to the assessment. It is recommended that the administration of Classworks Universal Screeners is treated as a formal test administration, and that students are provided a day between subjects (*Best Practices for Classworks Universal Screener*, 2022). In addition to training support throughout the school year from Classworks Curriculum and Instruction Coaches, Classworks also provides school and district level training to prepare for the administration of Classworks Universal Screeners to further ensure fidelity of program implementation and administration of assessments.

Research Questions

Classworks provides online, tiered intervention solutions to school districts in 24 states across the nation. The current study explores the impact of Classworks Individualized Learning language arts instruction for kindergarten- third grade students performing below the 25th percentile during the 2021-2022 school year.

The following questions are addressed in this study:

- Do kindergarten-third grade students performing below the 25th percentile that participate in Classworks Individualized Learning language arts instruction experience more growth from fall to spring on the Classworks Universal Screener than their peers that do not participate in Classworks Individualized Learning language arts instruction?

- Does the impact of Classworks Individualized Learning language arts instruction vary by grade level? And if so, to what extent?

- Does the impact of Classworks Individualized Learning language arts instruction vary by student race? And if so, to what extent?

Methodology

Sample

Participants in this study were 2,176 kindergarten-third grade students, gathered from a convenience sample of traditional, public-school students from Classworks Individualized Learning language arts instruction and Classworks Language Arts Universal Screener usage files for the 2021-2022 school year.

Data from the Language Arts Universal Screener usage file were first filtered to identify students that completed both fall and spring Universal Screeners. As such, the impact analyses were conducted on students with non-missing data, and no data imputation was used. An additional filter identified students that performed below the 25th percentile on the baseline fall Language Arts Universal Screener. These filtered Student User IDs from the Universal Screener usage file was matched to the Student User IDs from the Individualized Learning language arts usage files which detail student Individualized Learning Path (ILP) usage metrics such as the sum of Individualized Learning (IL) time on task, IL unit score average, and count of IL units completed. This allowed for the assignment of students to treatment and comparison groups based on which students had taken both the fall and spring Language Arts Universal Screeners, as well as if students did/did not participate in Individualized Learning language arts instruction. In all, the 2,176 identified participants represented 40 schools across 11 districts with active implementation of Classworks to monitor and accelerate student achievement.

Assignment of participants to the treatment and comparison groups was at the individual-level of students, on the basis of participation in Classworks Individualized Learning language arts instruction during the 2021-2022 school year. To determine participation in Individualized Learning language arts instruction, students were assigned to either the treatment or comparison group based on whether they had measures indicating a sum IL time on task, IL unit score averages, and a count of IL units completed. Students with these measures indicating ILP usage were assigned to the treatment group, and those who did not have these measures were assigned to the comparison group.

Treatment group participants were kindergarten-third grade students performing below the 25th percentile that had completed both the fall and spring Universal Screeners and participated in Classworks Individualized Learning language arts instruction during the 2021-2022 school year. Treatment group participants are referred to in this study as Individualized Learning Path Users, or ILP Users.

Despite documented national trends of instability in school attendance (Dorn et al., 2021), most ILP Users spent between 10-30 minutes per week, or an average of 20 minutes per week on their Individualized Learning Path for language arts instruction over 30 instructional weeks. ILP Users spent an average of 6 hours on their ILP over the course of the school year, with an average of 1 unit completed per month. Of the ILP Users that had attained an average mastery of units in Individualized Learning language arts instruction of 80% or higher, the average master of units was 90%.

Comparison group participants were kindergarten-third grade students performing below the 25th percentile that had completed both the fall and spring Universal Screeners but did not participate in an Individualized Learning Path for language arts instruction during the 2021-2022 school year. Comparison group participants are referred to in this study as Non-ILP Users.

Treatment and comparison groups in the study were found to be similar by grade level at the baseline fall Language Arts Universal Screener (Table 1). Treatment and comparison groups by grade level were comparable to one another at pre-treatment, based on Hedge's *g* effect size calculations, as well as for most samples by grade and race. Kindergarten and first grade met baseline equivalence at less than 0.05 SD, whereas the second and third grade were at moderate baseline equivalence, between 0.05 to 0.25 SD (WWC, 2016). The majority of samples by grade and race were also equivalent at baseline, between 0.05 to 0.25 SD (WWC, 2016).

Table 1

Baseline Equivalence Statistics for ILP and Non-ILP Users on the Language Arts Universal Screener by Grade and Race

	Student Count	Fall Language Arts Universal Screener Mean	SD	Fall Mean Difference	Effect Size
Kindergarten					
ILP Users	466	200	-	-	<0.01
Non-ILP Users	153	200	-		
American Indian/Native Alaskan					
ILP Users	177	200	-	-	<0.01
Non-ILP Users	51	200	-		
Other					
ILP Users	101	200	-	-	<0.01
Non-ILP Users	45	200	-		
Black/African American					
ILP Users	109	200	-	-	<0.01
Non-ILP Users	34	200	-		
Hispanic/Latino					
ILP Users	79	200	-	-	<0.01
Non-ILP Users	23	200	-		
First Grade					
ILP Users	570	206.39	7.99	0.24	0.03
Non-ILP Users	122	206.15	7.76		
American Indian/Native Alaskan					
ILP Users	225	206.67	8.24	2.62	0.33
Non-ILP Users	37	204.05	6.44		
Other					
ILP Users	116	206.21	7.76	-1.39	0.17
Non-ILP Users	25	207.60	8.79		

Table 1 continued

	Student Count	Fall Language Arts Universal Screener Mean	SD	Fall Mean Difference	Effect Size
First Grade					
Black/African American					
ILP Users	144	205.69	7.63	-0.82	0.11
Non-ILP Users	43	206.51	7.83		
Hispanic/Latino					
ILP Users	85	207.06	8.28	-0.59	0.07
Non-ILP Users	17	207.65	8.31		
Second Grade					
ILP Users	430	225.05	17.70	1.94	0.11
Non-ILP Users	106	223.11	17.15		
American Indian/Native Alaskan					
ILP Users	184	223.32	17.66	-0.61	0.02
Non-ILP Users	41	223.93	16.01		
Other					
ILP Users	61	227.70	17.45	-1.12	0.07
Non-ILP Users	17	228.82	14.95		
Black/African American					
ILP Users	117	225.98	17.81	2.03	0.11
Non-ILP Users	38	223.95	18.24		
Hispanic/Latino					
ILP Users	68	225.74	17.73	14.74	0.83
Non-ILP Users	10	211.00	17.29		
Third Grade					
ILP Users	270	254.37	25.60	4.03	0.15
Non-ILP Users	59	250.34	27.16		

Table 1 continued

	Student Count	Fall Language Arts Universal Screener Mean	SD	Fall Mean Difference	Effect Size
American Indian/Native Alaskan					
ILP Users	122	255.82	26.90	11.38	0.42
Non-ILP Users	18	244.44	29.75		
Other					
ILP Users	56	252.32	25.73	-2.23	0.16
Non-ILP Users	11	254.55	24.23		
Black/African American					
ILP Users	58	259.66	23.54	5.66	0.23
Non-ILP Users	20	254.00	27.03		
Hispanic/Latino					
ILP Users	34	243.53	21.02	-5.47	0.24
Non-ILP Users	10	249.00	27.67		

Note: Other is composed of Asian, Native Hawaiian/Other Pacific Islander, Two or more races, and White students; SD= Standard deviation; Effect Size= Hedge's *g*

As shown in Table 1 above, both ILP and Non-ILP kindergarten students performing below the 25th percentile scored an average score of 200. A score of 200 is the lowest score that can be given on the Classworks Language Arts Universal Screener.

Also as shown in Table 1, participants in the first grade American Indian/Native Alaskan sub-demographic had a mean standardized difference beyond 0.25 SD (Hedge's *g*= 0.33). In addition, participants in the second grade Hispanic/Latino sub-demographic had a mean standardized difference beyond 0.25 SD (Hedge's *g*=0.83). Participants in the third grade American Indian/ Native Alaskan sub-demographic also had a mean standardized difference beyond 0.25 SD (Hedge's *g*=0.42).

The 2,176 kindergarten-third grade participants in the study represent 40 schools across 11 districts implementing Classworks to monitor and accelerate student achievement during the 2021-2022 academic school year. These districts range in size from some of the smallest to largest districts nationwide, with districts comprising as few

as 10 schools with less than 1,000 students to districts comprising over 125 schools and over 100,000 total students. Additionally, districts represented in this study have student populations with 70- to over 95% qualified for free and reduced lunch.

Instrument

The Classworks Universal Screeners have been found to be both psychometrically reliable and valid as instruments to measure grade level readiness, help identify baselines for instruction, identify students who may need additional intervention as part of the RTI/MTSS process, and measure student growth (SEG Measurement, 2019; Classworks, 2022).

Classworks Language Arts Universal Screener were found to be reliable for kindergarten through third grade for the 2021-2022 school year (Table 2).

Table 2

Measures of Reliability for Classworks Language Arts Universal Screener by Grade

Type of Reliability	Count	ICC Coefficient	95% CI (lower, upper)
Kindergarten			
Test-Retest (Fall to Winter)	1447	0.26	(0.13, 0.36)
Test-Retest (Winter to Spring)	1421	0.46	(0.33, 0.56)
First Grade			
Test-Retest (Fall to Winter)	1455	0.54	(0.22, 0.70)
Test-Retest (Winter to Spring)	1439	0.70	(0.49, 0.81)
Second Grade			
Test-Retest (Fall to Winter)	1475	0.75	(0.55, 0.85)
Test-Retest (Winter to Spring)	1408	0.71	(0.03, 0.87)
Third Grade			
Test-Retest (Fall to Winter)	1529	0.80	(0.69, 0.86)
Test-Retest (Winter to Spring)	1513	0.83	(0.81, 0.85)

Note: Test-Retest= Intraclass Correlation Coefficient (ICC)

Evidence of validity was demonstrated from both the concurrent and predictive relationships between the 2021-2022 Classworks Universal Screener assessment scores to the 2021-2022 NWEA MAP Growth test scores (Table 3). NWEA is known, both nationally and internationally, as a leader in educational assessment, and the

Measures of Academic Progress (MAP) Growth is accepted as a highly valid and reliable measure of academic performance for K-12 students (*Precisely Measure Student Growth and Performance with MAP Growth*, 2022).

Table 3

Measures of Validity for Classworks Language Arts Universal Screener by Grade

Type of Validity	Count	Pearson's r Correlation Coefficient	95% CI (lower, upper)
Kindergarten			
Concurrent (Fall/Fall)	180	0.39	(0.25, 0.50)
Predictive (Fall/Winter)	185	0.35	(0.21, 0.47)
First Grade			
Concurrent (Fall/Fall)	347	0.58	(0.51, 0.65)
Predictive (Fall/Winter)	349	0.62	(0.55, 0.68)
Second Grade			
Concurrent (Fall/Fall)	644	0.73	(0.69, 0.76)
Predictive (Fall/Winter)	647	0.74	(0.71, 0.78)
Third Grade			
Concurrent (Fall/Fall)	832	0.76	(0.73, 0.79)
Predictive (Fall/Winter)	846	0.74	(0.71, 0.77)

Note: Concurrent and Predictive Validity= Pearson's Correlation Coefficient (r)

In this study, the fall Language Arts Universal Screener was typically completed during the first three months of the 2021-2022 school year, between mid-August to the end of October. Most participants, including both ILP and Non-ILP Users, completed the fall screener from mid-August to mid-September.

The typical testing window for the winter Language Arts Universal Screener was between the end of November through the end of January, with the majority of students, including both ILP and Non-ILP Users, completing the winter screener during the months of December and January.

The typical spring Language Arts Universal Screener testing window was between March through the first week of May, with the majority of students, including both ILP and Non-ILP Users, completing the spring screener during the month of April.

Design

This study compared student growth measured by student score performance from fall to spring on the Classworks Language Arts Universal Screener between ILP and Non-ILP Users, all of whom performed below the 25th percentile on the fall baseline screener. Participants included in the study completed at least both the fall and spring screener during the 2021-2022 school year. In instances in which participants also participated in the winter screener, this data was also included in the analysis.

With repeated measures per participant over time, and data collected from participants at each grade level, we used a linear growth model to estimate the impact of ILP usage on student growth in language arts. Impacts were estimated separately by grade. In addition to the model-based mean estimates from the linear model provided in the results below, pairwise comparisons were generated to estimate the differences in growth between ILP and Non-ILP Users by grade and by grade and race. These pairwise comparisons are available upon request.

LMMs for the impact of ILP usage by grade and race were estimated in R (R Core Team, 2017) with the R-package lme4 (Bates et al., 2015). Analyses were conducted separately by grade. For each model, the dependent variable was the Universal Screener score, time was coded as 1= fall, 2=winter, 3=spring, and treatment was coded as 0=comparison, 1=treatment. Racial groups were treated as fixed effects and were coded as 1=American Indian/Native Alaskan, 2=Other (Asian, Native Hawaiian/Other Pacific Islander, two or more races, White), 3=Black/African American, and 4=Hispanic/Latino. The interaction between treatment and time was included to estimate the difference in growth between the treatment and comparison groups.

Growth Model by Grade Level

The model for determining the impact of IP usage on growth over time by grade level is as follows:

$$LAscaledscore_{ij} = \beta_0 + \beta_1 time_{ij} + \beta_2 cntrltreat_j + \beta_3 (time * cntrltreat)ij + \mu_j + e_{ij}$$

for i =moment of time (fall, winter, spring) and j =student. β_0 is the mean outcome for Non-ILP Users at the fall baseline. $\beta_1 time_{ij}$ represents the mean change over time (i.e.,

growth) from fall and winter and from winter to spring for Non-ILP Users. $\beta_2 cntrltreat_j$ represents the mean difference between ILP Users and Non-ILP Users for fall scores. The treatment by time interaction, $\beta_3(time * cntrltreat)ij$, represents the mean differences in growth between ILP and Non-ILP Users. μ_j represents the variance between students of their scores, and e_{ij} accounts for the error term for each student's three scores taken at fall, winter, and spring.

Growth Model by Grade Level and Race

The model for determining the impact of IP usage on growth over time by grade level and race is as follows:

$$LAscaledscore_{ij} = \beta_0 + \beta_1 time_{ij} + \beta_2 cntrltreat_j + \beta_3(time * cntrltreat)ij + \beta_4 race4cat_j + \beta_5(time_{ij} * race4cat_j) + \beta_6(race4cat_j * cntrltreat_j) + \beta_7(time_{ij} * cntrltreat_j * race4cat_j) + \mu_j + e_{ij}$$

for i =moment of time (fall, winter, spring) and j =student. β_0 represents the mean outcome for Non-ILP Users at the fall baseline. $\beta_1 time_{ij}$ represents the mean change over time (i.e., growth) from fall and winter and from winter to spring for Non-ILP Users who are in the reference category for race. $\beta_2 cntrltreat_j$ represents the mean difference between ILP Users and Non-ILP Users for fall scores who are in the reference category for race. $\beta_3(time * cntrltreat)ij$ represents the mean differences in growth between ILP Users and Non-ILP Users. $\beta_4 race4cat_j$ represents the mean difference of those in the reference category for race and each of the other categories of race for time = reference category and cntrltreat = reference category. $\beta_5(time_{ij} * race4cat_j)$ represents the mean differences in growth, between the reference category for race and each of the subsequent categories for race. $\beta_6(race4cat_j * cntrltreat_j)$ represents the mean differences between ILP Users and Non-ILP Users across race between the reference category for race and each of the subsequent categories for race. $\beta_7(time_{ij} * cntrltreat_j * race4cat_j)$ represents the mean differences in growth between ILP Users and Non-ILP Users between the reference category for race and each of the subsequent categories for race. μ_j represents the variance between students of their scores, and e_{ij} accounts for the error term for each student's three scores taken at fall, winter, and spring.

Results

Impacts by Grade Level

Kindergarten through third grade ILP Users experienced significantly more growth from fall to spring than Non-ILP Users (Table 4). Model-based mean differences in fall to spring growth between ILP and Non-ILP Users ranged from kindergarten 8.89 to third grade 36.54. Model-based means and mean differences in growth by grade level from fall to winter and from winter to spring are provided in Appendix A.

Table 4

Baseline Fall and Model-Based Spring Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade

	Fall Count	Baseline Fall Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Fall to Spring Growth (SE)	Effect Size
Kindergarten						
ILP Users	466	200	466	235.49 (32.55)	8.89** (2.96)	0.28
Non-ILP Users	153	200	153	226.60 (29.27)		
First Grade						
ILP Users	570	206.39 (7.99)	570	253.53 (44.42)	20.48*** (4.27)	0.48
Non-ILP Users	122	206.15 (7.76)	122	233.05 (34.40)		
Second Grade						
ILP Users	430	225.05 (17.70)	430	293.05 (44.33)	10.34** (4.79)	0.23
Non-ILP Users	106	223.11 (17.15)	106	282.71 (43.66)		
Third Grade						
ILP Users	270	254.37 (25.60)	270	300.44 (59.52)	36.54*** (8.24)	0.64
Non-ILP Users	59	250.34 (27.16)	59	263.90 (45.68)		

Note: SD=Standard deviation; SE=Standard error; Effect size= Hedge's g; ***p<0.01, ***p<0.001*

Impacts by Grade Level and Race

In addition to significant findings on the impact of ILP usage on student growth by grade, there is evidence of statistically significant impacts of ILP usage on student growth by grade and race.

Across race, kindergarten through third grade ILP Users experienced more growth from fall to spring than Non-ILP Users (Table 5). Significant model-based mean differences in fall to spring growth between ILP and Non-ILP Users ranged from 15.45 for kindergarten Black/African American students to 53.75 for third grade Black/African American students. Model-based means and mean differences in growth by grade and race from fall to winter and from winter to spring are provided in Appendix B.

Table 5

Baseline Fall and Model-Based Spring Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade and Race

	Fall Count	Baseline Fall Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Fall to Spring Growth (SE)	Effect Size
Kindergarten						
American Indian/ Native Alaskan						
ILP Users	177	200	177	235.48 (30.38)	5.87 (4.82)	0.19
Non-ILP Users	51	200	51	229.61 (30.26)		
Other						
ILP Users	101	200	101	234.06 (35.98)	3.39 (6.18)	0.10
Non-ILP Users	45	200	45	230.67 (30.78)		
Black/ African American						
ILP Users	109	200	109	234.86 (33.46)	15.45** (6.30)	0.48
Non-ILP Users	34	200	34	219.41 (26.96)		

Table 5 continued

	Fall Count	Baseline Fall Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Fall to Spring Growth (SE)	Effect Size
Hispanic/ Latino						
ILP Users	79	200	79	238.23 (31.90)	15.62* (7.30)	0.50
Non-ILP Users	23	200	23	222.61 (26.49)		
First Grade						
American Indian/ Native Alaskan						
ILP Users	225	206.67 (8.24)	225	255.11 (42.74)	22.14** (7.36)	0.53
Non-ILP Users	37	204.05 (6.44)	37	232.97 (32.82)		
Other						
ILP Users	116	206.21 (7.76)	116	258.37 (45.89)	31.97*** (9.40)	0.75
Non-ILP Users	25	207.60 (8.79)	25	226.40 (20.99)		
Black/ African American						
ILP Users	144	205.69 (7.63)	144	246.04 (43.20)	15.58* (7.25)	0.37
Non-ILP Users	43	206.51 (7.83)	43	230.46 (36.12)		
Hispanic/ Latino						
ILP Users	85	207.06 (8.28)	85	255.41 (47.92)	6.00 (12.63)	0.13
Non-ILP Users	17	207.65 (8.31)	17	249.41 (45.48)		

Table 5 continued

	Fall Count	Baseline Fall Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Fall to Spring Growth (SE)	Effect Size
Second Grade						
American Indian/ Native Alaskan						
ILP Users	184	223.32 (17.66)	184	289.62 (45.47)	3.49 (7.80)	0.08
Non-ILP Users	41	223.93 (16.01)	41	286.13 (43.87)		
Other						
ILP Users	61	227.70 (17.45)	61	303.70 (43.98)	8.98 (11.84)	0.21
Non-ILP Users	17	228.82 (14.95)	17	294.72 (40.02)		
Black/ African American						
ILP Users	117	225.98 (17.81)	117	295.78 (42.37)	19.73** (8.08)	0.45
Non-ILP Users	38	223.95 (18.24)	38	276.05 (46.06)		
Hispanic/ Latino						
ILP Users	68	225.74 (17.73)	68	288.34 (44.07)	14.34 (11.17)	0.33
Non-ILP Users	10	211.00 (17.29)	10	274.00 (38.93)		
Third Grade						
American Indian/ Native Alaskan						
ILP Users	122	255.82 (26.90)	122	294.34 (60.66)	34.90* (15.04)	0.58
Non-ILP Users	18	244.44 (29.75)	18	259.44 (51.04)		

Table 5 continued

	Fall Count	Baseline Fall Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Fall to Spring Growth (SE)	Effect Size
Other						
ILP Users	56	252.32 (25.73)	56	309.46 (58.73)	32.18 (19.51)	0.54
Non-ILP Users	11	254.55 (24.23)	11	277.28 (61.50)		
Black/ African American						
ILP Users	58	259.66 (23.54)	58	312.25 (60.47)	53.75*** (14.26)	0.97
Non- ILP Users	20	254.00 (27.03)	20	258.50 (33.60)		
Hispanic/ Latino						
ILP Users	34	243.53 (21.02)	34	287.35 (51.25)	19.35 (17.64)	0.39
Non-ILP Users	10	249.00 (27.67)	10	268.00 (39.94)		

Note: Other Racial group includes Asian, Native Hawaiian/Other Pacific Islander, two or more races, and White; SD=Standard deviation; SE=Standard error; Effect size= Hedge's g; *$p<0.05$, **$p<0.01$, ***$p<0.001$

Conclusion

The purpose of this study was to gather insight related to the impact of Classworks Individualized Learning language arts instruction on student growth on the Classworks Universal Screener Assessment from fall 2021 to spring 2022, for students performing below the 25th percentile in language arts.

The study included 2,176 students in kindergarten through third grade, gathered from a convenience sample of districts implementing Classworks as an MTSS solution for student achievement during the 2021-2022 academic school year. All participants were identified as academically-at-risk and in need of an academic intervention in language arts based on identification of performing below the 25th percentile at the fall baseline Classworks Language Arts Universal Screener.

The analysis showed that Classworks Individualized Learning language arts instruction does have a significant impact on growth as an academic intervention for students performing below the 25th percentile in kindergarten through third grade by grade level with evident effect sizes in kindergarten through third grade.

Findings include significant impacts of ILP usage on growth from fall to spring in kindergarten through third grade, as well as significant impacts for grades from fall to winter and winter to spring. In addition to significant findings on the impact of ILP usage on student growth by grade, there is evidence of significant impacts of ILP usage on student growth by race and grade.

Based on the results of this analysis, kindergarten-third grade students performing below the 25th percentile that participate in Classworks Individualized Learning language arts instruction do experience significant growth from fall to spring compared to their peers that do not participate in Classworks Individualized Learning language arts instruction.

With these significant findings for ILP Users by grade and race, further research is needed to determine the impact of ILP usage on growth by additional demographic groups such as gender, English language learners, and socio-economic status. Additionally, as students continue to return to school and experience consistent classroom instruction, further study may also reveal enhanced positive impacts of Classworks Individualized Learning language arts instruction when recommended usage time is routinely integrated into intervention instruction.

References

Academic Screening Tools Chart. (n.d.). Charts.intensiveintervention.org. Retrieved June 1, 2022, from https://charts.intensiveintervention.org/ascreening?_ga=2.185468329.1866389142.1654006126-845772245.1647890783

Bates, D., Maechler, M., Bolker, B. and Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. Journal of Statistical Software, 67(1), 1-48. doi:10.18637/jss.v067.i01.

Best Practices for Classworks Universal Screener. (2022). Help.classworks.com. Retrieved July 7, 2022, from http://help.classworks.com/en/articles/3296971-best-practices-for-classworks-universal-screener

Best Practices for Individualized Learning. (2022). Help.classworks.com. Retrieved June 3, 2022, from http://help.classworks.com/en/articles/3296916-best-practices-for-indiVidualized-learning

Classworks. (2019). *Classworks Achievement Study 2019: Integrated Assessments Report.* Classworks. https://www.curriculumadvantage.com/efficacy/classworks-achievement-study-2019-integrated-assessments-study

Classworks. (2020). *Classworks Shows Tremendous Impact in One Semester* [White paper]. Classworks. https://www.curriculumadvantage.com/efficacy/classworks-shows-tremendous-impact-in-one-semester

Classworks. (2022). *Research Basis for the Classworks Tiered Instructional Model* [White paper]. Classworks. https://www.curriculumadvantage.com/efficacy/research-basis-for-the-classworks-tiered-instructional-model

Classworks. (2022). *Validity and Reliability of Classworks Universal Screeners* [White paper]. Classworks.

https://www.curriculumadvantage.com/efficacy/validity-reliability-of-classworks-universal-screeners

Classworks Universal Screener State Standards Alignment. (n.d.). Us-Standards.classworks.com. Retrieved August 24, 2022, from http://us-standards.classworks.com/

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2021, December 14). COVID-19 and education: An emerging K-shaped recovery. *McKinsey & Company*. https://www.mckinsey.com/industries/education/our-insights/covid-19-and-education-an-emerging-k-shaped-recovery

How much time should my students be using Classworks each day? (2022). Help.classworks.com. Retrieved June 3, 2022, from http://help.classworks.com/en/articles/2393552-how-much-time-should-my-students-be-using-classworks-each-day

Precisely measure student growth and performance with MAP Growth. (2022). NWEA. Retrieved July 7, 2022, from https://www.nwea.org/map-growth/?gclid=CjwKCAjwiJqWBhBdEiwAtESPaOPHRUITC560sinI2qZ93J3f_Dpk-8leEGQ27S3X8lSINNzX9ci4PRoCOWYQAvD_BwE

R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/

SEG Measurement. (2019). *A Review of the Classworks Regional Efficacy Study* [White paper]. SEG Measurement. https://www.curriculumadvantage.com/efficacy/middle-nwea

What are the Universal Screener Testing Windows? (2022). Help.classworks.com. Retrieved July 7, 2022, from http://help.classworks.com/en/articles/5790369-what-are-the-universal-screener-testing-windows

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (2016). *What Works Clearinghouse:Module 3 Baseline Equivalence* [PowerPoint slides]. Retrieved July 13, 2022 from https://ies.ed.gov/ncee/wwc/Docs/OnlineTraining/wwc_training_m3.pdf

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (2020). *What Works Clearinghouse Standards Handbook, Version 4.1* Retrieved July 13, 2022 from https://ies.ed.gov/ncee/wwc/handbooks

Appendix A

Table A.1

Baseline Fall and Model-Based Winter Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade

	Fall Count	Baseline Fall Mean (SD)	Winter Count	Model-Based Winter Mean (SD)	Mean Difference In Fall to Winter Growth (SE)	Effect Size
Kindergarten						
ILP Users	466	200	464	221.67 (25.02)	4.24 (2.34)	0.17
Non-ILP Users	153	200	145	217.43 (23.02)		
First Grade						
ILP Users	570	206.39 (7.99)	569	235.31 (31.29)	11.25*** (3.12)	0.37
Non-ILP Users	122	206.15 (7.76)	117	224.06 (27.95)		
Second Grade						
ILP Users	430	225.05 (17.70)	422	250.75 (36.36)	3.34 (4.19)	0.09
Non-ILP Users	106	223.11 (17.15)	93	247.41 (37.30)		
Third Grade						
ILP Users	270	254.37 (25.60)	269	297.81 (54.94)	16.23* (7.93)	0.30
Non-ILP Users	59	250.34 (27.16)	58	281.58 (53.80)		

Note: SD=Standard deviation; SE=Standard error; Effect size= Hedge's g; *$p<0.05$, **$p<0.01$, ***$p<0.001$

Table A.2

Model-Based Winter and Model-Based Spring Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade

	Winter Count	Model-Based Winter Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Winter to Spring Growth (SE)	Effect Size
Kindergarten						
ILP Users	464	221.67 (25.02)	466	235.49 (32.55)	8.89** (2.96)	0.28
Non-ILP Users	145	217.43 (23.02)	153	226.60 (29.27)		
First Grade						
ILP Users	569	235.31 (31.29)	570	253.53 (44.42)	20.48*** (4.27)	0.48
Non-ILP Users	117	224.06 (27.95)	122	233.05 (34.40)		
Second Grade						
ILP Users	422	250.75 (36.36)	430	293.05 (44.33)	10.34** (4.79)	0.23
Non-ILP Users	93	247.41 (37.30)	106	282.71 (43.66)		
Third Grade						
ILP Users	269	297.81 (54.94)	270	300.44 (59.52)	36.54*** (8.24)	0.64
Non-ILP Users	58	281.58 (53.80)	59	263.90 (45.68)		

Note: SD=Standard deviation; SE=Standard error; Effect size= Hedge's g; *$p<0.05$, **$p<0.01$, ***$p<0.001$

Appendix B

Table B.1

Baseline Fall and Model-Based Winter Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade and Race

	Fall Count	Baseline Fall Mean (SD)	Winter Count	Model-Based Winter Mean (SD)	Mean Difference In Fall to Winter Growth (SE)	Effect Size
Kindergarten						
American Indian/ Native Alaskan						
ILP Users	177	200	176	220.95 (22.67)	0.17 (3.59)	0.01
Non-ILP Users	51	200	51	220.78 (22.08)		
Other						
ILP Users	101	200	101	225.35 (27.83)	0.66 (5.00)	0.02
Non-ILP Users	45	200	44	224.69 (27.41)		
Black/ African American						
ILP Users	109	200	109	223.03 (26.44)	10.07* (5.24)	0.40
Non-ILP Users	34	200	29	212.96 (18.92)		
Hispanic/ Latino						
ILP Users	79	200	78	216.66 (23.78)	16.21** (5.21)	0.76
Non-ILP Users	23	200	21	200.45 (2.18)		

Table B.1 continued

	Fall Count	Baseline Fall Mean (SD)	Winter Count	Model-Based Winter Mean (SD)	Mean Difference In Fall to Winter Growth (SE)	Effect Size
First Grade						
American Indian/ Native Alaskan						
ILP Users	225	206.67 (8.24)	224	235.63 (31.16)	17.17*** (5.45)	0.56
Non-ILP Users	37	204.05 (6.44)	36	218.46 (24.40)		
Other						
ILP Users	116	206.21 (7.76)	116	241.99 (31.79)	20.36* (6.89)	0.66
Non-ILP Users	25	207.60 (8.79)	24	221.63 (24.61)		
Black/ African American						
ILP Users	144	205.69 (7.63)	144	229.02 (30.23)	0.44 (5.49)	0.01
Non-ILP Users	43	206.51 (7.83)	40	228.58 (32.34)		
Hispanic/ Latino						
ILP Users	85	207.06 (8.28)	85	236.00 (31.18)	7.17 (8.17)	0.23
Non-ILP Users	17	207.65 (8.31)	17	228.83 (28.26)		
Second Grade						
American Indian/ Native Alaskan						
ILP Users	184	223.32 (17.66)	184	248.22 (35.21)	0.59 (6.11)	0.02
Non-ILP Users	41	223.93 (16.01)	40	247.63 (34.21)		

Table B.1 continued

	Fall Count	Baseline Fall Mean (SD)	Winter Count	Model-Based Winter Mean (SD)	Mean Difference In Fall to Winter Growth (SE)	Effect Size
Other						
ILP Users	61	227.70 (17.45)	60	262.10 (40.73)	-5.43 (12.01)	0.13
Non-ILP Users	17	228.82 (14.95)	15	267.53 (45.07)		
Black/ African American						
ILP Users	117	225.98 (17.81)	111	250.58 (35.59)	11.83 (7.3)	0.34
Non-ILP Users	38	223.95 (18.24)	29	238.75 (32.59)		
Hispanic/ Latino						
ILP Users	68	225.74 (17.73)	67	247.54 (35.78)	5.54 (13.04)	0.15
Non-ILP Users	10	211.00 (17.29)	9	242.00 (43.87)		
Third Grade						
American Indian/ Native Alaskan						
ILP Users	122	255.82 (26.90)	122	300.08 (56.18)	21.20 (14.15)	0.38
Non-ILP Users	18	244.44 (29.75)	18	278.88 (54.87)		
Other						
ILP Users	56	252.32 (25.73)	56	301.07 (51.93)	12.88 (17.26)	0.24
Non-ILP Users	11	254.55 (24.23)	11	288.19 (54.56)		

Table B.1 continued

	Fall Count	Baseline Fall Mean (SD)	Winter Count	Model-Based Winter Mean (SD)	Mean Difference In Fall to Winter Growth (SE)	Effect Size
Black/ African American						
ILP Users	58	259.66 (23.54)	57	299.40 (55.80)	8.23 (14.70)	0.15
Non-ILP Users	20	254.00 (27.03)	19	291.17 (54.56)		
Hispanic/ Latino						
ILP Users	34	243.53 (21.02)	34	281.47 (53.38)	20.47 (19.06)	0.38
Non-ILP Users	10	249.00 (27.67)	10	261.00 (51.52)		

Note: Other Racial group includes Asian, Native Hawaiian/Other Pacific Islander, two or more races, and White; SD=Standard deviation; ; SE=Standard error; Effect size= Hedge's g; *$p<0.05$, **$p<0.01$, ***$p<0.001$

Table B.2

Model-Based Winter and Model-Based Spring Means with an Impact on Growth on the Language Arts Universal Screener for ILP and Non-ILP Users by Grade and Race

	Winter Count	Model-Based Winter Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Winter to Spring Growth (SE)	Effect Size
Kindergarten						
American Indian/ Native Alaskan						
ILP Users	176	220.95 (22.67)	177	235.48 (30.38)	5.87 (4.82)	0.19
Non-ILP Users	51	220.78 (22.08)	51	229.61 (30.26)		
Other						
ILP Users	101	225.35 (27.83)	101	234.06 (35.98)	3.39 (6.18)	0.10
Non-ILP Users	44	224.69 (27.41)	45	230.67 (30.78)		
Black/ African American						
ILP Users	109	223.03 (26.44)	109	234.86 (33.46)	15.45** (6.30)	0.48
Non-ILP Users	29	212.96 (18.92)	34	219.41 (26.96)		
Hispanic/ Latino						
ILP Users	78	216.66 (23.78)	79	238.23 (31.90)	15.62* (7.30)	0.50
Non-ILP Users	21	200.45 (2.18)	23	222.61 (26.49)		
First Grade						
American Indian/ Native Alaskan						
ILP Users	224	235.63 (31.16)	225	255.11 (42.74)	22.14** (7.36)	0.53
Non-ILP Users	36	218.46 (24.40)	37	232.97 (32.82)		

Table B.2 continued

	Winter Count	Model-Based Winter Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Winter to Spring Growth (SE)	Effect Size
Other						
ILP Users	116	241.99 (31.79)	116	258.37 (45.89)	31.97*** (9.40)	0.75
Non-ILP Users	24	221.63 (24.61)	25	226.40 (20.99)		
Black/ African American						
ILP Users	144	229.02 (30.23)	144	246.04 (43.20)	15.58* (7.25)	0.37
Non-ILP Users	40	228.58 (32.34)	43	230.46 (36.12)		
Hispanic/ Latino						
ILP Users	85	236.00 (31.18)	85	255.41 (47.92)	6.00 (12.63)	0.13
Non-ILP Users	17	228.83 (28.26)	17	249.41 (45.48)		
Second Grade						
American Indian/ Native Alaskan						
ILP Users	184	248.22 (35.21)	184	289.62 (45.47)	3.49 (7.80)	0.08
Non-ILP Users	40	247.63 (34.21)	41	286.13 (43.87)		
Other						
ILP Users	60	262.10 (40.73)	61	303.70 (43.98)	8.98 (11.84)	0.21
Non-ILP Users	15	267.53 (45.07)	17	294.72 (40.02)		
Black/ African American						
ILP Users	111	250.58 (35.59)	117	295.78 (42.37)	19.73** (8.08)	0.45
Non-ILP Users	29	238.75 (32.59)	38	276.05 (46.06)		

Table B.2 continued

	Winter Count	Model-Based Winter Mean (SD)	Spring Count	Model-Based Spring Mean (SD)	Mean Difference In Winter to Spring Growth (SE)	Effect Size
Hispanic/ Latino						
ILP Users	67	247.54 (35.78)	68	288.34 (44.07)	14.34 (11.17)	0.33
Non-ILP Users	9	242.00 (43.87)	10	274.00 (38.93)		
Third Grade						
American Indian/ Native Alaskan						
ILP Users	122	300.08 (56.18)	122	294.34 (60.66)	34.90* (15.04)	0.58
Non-ILP Users	18	278.88 (54.87)	18	259.44 (51.04)		
Other						
ILP Users	56	301.07 (51.93)	56	309.46 (58.73)	32.18 (19.51)	0.54
Non-ILP Users	11	288.19 (54.56)	11	277.28 (61.50)		
Black/ African American						
ILP Users	57	299.40 (55.80)	58	312.25 (60.47)	53.75*** (14.26)	0.97
Non-ILP Users	19	291.17 (54.56)	20	258.50 (33.60)		
Hispanic/ Latino						
ILP Users	34	281.47 (53.38)	34	287.35 (51.25)	19.35 (17.64)	0.39
Non-ILP Users	10	261.00 (51.52)	10	268.00 (39.94)		

Note: Other Racial group includes Asian, Native Hawaiian/Other Pacific Islander, two or more races, and White; SD=Standard deviation; SE=Standard error; Effect size= Hedge's g; *$p<0.05$, **$p<0.01$, ***$p<0.001$