MEMORANDUM September 10, 2019

TO: Jessica Chevalier, Secondary Literacy Director

FROM: Carla Stevens
Assistant Superintendent, Research and Accountability

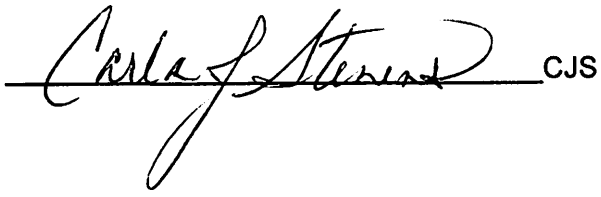
SUBJECT: **ACHIEVE3000®, 2018–2019**

The 2018–2019 academic year was the fifth year that the Houston Independent School District (HISD) offered the differentiated reading instruction program, Achieve3000®. Based on an analytic sample of about 4,900 6th through 12th grade students who completed both a pre-test Lexile assessment within the first 30 days of the start of the school year and a post-test Lexile assessment in the final 30 days of the school year, this year's evaluation of Achieve3000 assessed the relationship between fidelity of use of the tool—i.e., completion of one to two or more reading or writing lessons per week (40 to 80 or more activities for the year), with an average first try score of 75 percent or greater—and students' Achieve3000 Lexile growth and grade-specific college and career readiness.

Key findings include:

- Of the nearly 111,000 students who had access to Achieve3000 in the 2018-2019 academic year, only 402 students (about 8% of the analytic sample) achieved high fidelity of use of the program for the year.
- Lexile point growth was greatest for students who both worked toward the completion of 40 to 80 or more Achieve3000 activities and who had an average first-try score (AFTS) of 75 percent or greater on those activities.
- The average Lexile growth for a student completing 40 activities with an AFTS of less than 75 percent was about 35 points, while the average Lexile growth for a student completing 40 activities with an AFTS of 75 percent or greater was about 138 points.
- The odds of being college and career ready at the end of the year decrease by about one percent among students with an AFTS less than 75 percent.
- The odds of being college and career ready at the end of the year increase by about 4 percent among students with an AFTS of 75 percent or greater.

Further distribution of this report is at your discretion. Should you have any further questions, please contact me at 713-556-6700.



Attachment

cc: Grenita Lathan
Silvia Trinh
Montra Rogers

HOUSTON INDEPENDENT SCHOOL DISTRICT

RESEARCH

Educational Program Report

ACHIEVE3000 EVALUATION 2018–2019

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EVALUATION REPORT
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Assessing the Relationship between Fidelity of Use of Achieve3000 and Student Lexile Growth and College and Career Readiness

Prepared by D. Diego Torres, Ph.D.

Abstract

Despite its promise to help teachers meet the needs of diverse learners, district usage of Achieve3000® among most students with access to it remains far below the optimal level necessary for them to realize literacy growth and college and career readiness. Only a tiny minority of students (402 out of about 111,000) seem to be engaging Achieve3000 with fidelity, where fidelity is defined as the number of Achieve3000 activities completed over the course of the academic year (i.e., 40 to 80 or more), and an average first-try score (AFTS) earned on Achieve3000 assessments (75% or greater). This study examined how the minority using Achieve3000 with fidelity fared with regard to their Lexile® growth and college and career readiness relative to the majority using Achieve3000 without fidelity. Results show that fidelity of use of Achieve3000 is, net of student characteristics, associated with greater Lexile growth. For two students with an AFTS of less than 75 percent, the one completing 40 activities for the year would gain about 14 Lexile points more than the one who completed only one activity. Likewise, for two students with an AFTS of 75 percent or greater, the one completing 40 activities over the year would gain about 67 more Lexile points than the one who completed only one activity. Fidelity of use of Achieve3000 is also related to higher odds of college and career readiness at the end of the school year, controlling for readiness at the beginning of the year and other student characteristics. For students with an AFTS less than 75 percent, the odds of being college and career ready decrease by about one percent for each Achieve3000 activity completed. For students with an AFTS of 75 percent or greater, the odds increase by four percent.

Introduction

Rooted in Vygotsky's (1978) theory of Zone of Proximal Development (ZPD), defined as the difference between what a learner can do independently and what she or he can accomplish given guidance, differentiated instruction aims to tailor instruction to individual student needs. In contrast to traditional instruction, which targets middle, or average, achievers, differentiated instruction is a learner-centered model of instruction that recognizes the variance among classmates in their academic ability.

Because of class size, however, successful teacher-delivered differentiated instruction is difficult to implement in schools (Lightweis, 2013). The ideal size for a group receiving teacher-delivered differentiated instruction is three to five, numbers that constitute a fraction of the typical American classroom size.

Most schools do not have the resources to support an infrastructure conducive to effective teacher-delivered differentiated instruction. Even when support is available, teachers tasked with delivering differentiated instruction find the challenge of doing so greater than the potential returns to student achievement. In the short term, teacher-delivered differentiated instruction is labor-intensive, but its returns are cumulative and not immediately apparent, which, given all the responsibilities that the modern teacher has, often leads to a regression to familiar and often less effective teaching methods.

Essential to the task of addressing diverse students' educational needs is an acknowledgement of the limitations of the current education model, particularly its dependence on teachers as the sole responsibility-bearers for children's educational experiences (Senge et al., 2000). Successfully shifting from teacher-centered to learner-centered education requires that students be treated as co-

creators of the educational process. When learners actively participate in and are part of the decision-making process of their own education, teachers' responsibilities primarily as knowledge providers is subsumed under the more effective role as facilitators of autonomous learning (Watson & Reigeluth, 2008).

An indispensable tool for realizing the aim of learner-centered education and reducing disparities in educational opportunities, specifically as a consequence of differentiated instruction, is computer-, or web-based, technologies (Watson & Watson, 2011). As Jacob, Berger, Hart, and Loeb (2019) argue, growing Internet speed and accessibility to the world wide web can reduce many of the limitations that have historically disadvantaged poor students. Geographic limitations, or constraints, are removed because computer-based technologies scale easily so that they reach not just students in a single classroom or school, but across the district, the state, and the country. Correspondingly, in the same way that such technologies can benefit students, they can also assist in the professional development of less experienced teachers, allowing them access to more experienced teachers, from whom they can learn the knowledge and skills needed to be effective employing the varying kinds of instructional delivery, whether computer-based or face-to-face.

The Houston Independent School District (HISD), to help its secondary students achieve lifelong success through literacy acceleration, has invested considerable monetary resources in Achieve3000®. A cloud-based solution accessible via computer or as an application on a tablet or smartphone, Achieve3000 provides daily differentiated instruction for nonfiction reading and writing adapted to students' Lexile® reading level. When implemented with fidelity, whereby teachers encourage students to complete one to two or more reading or writing lessons per week (or 40 to 80 or more activities for the year) with an average first try score of 75 percent or greater, Achieve3000 has been shown to have a positive relationship with Lexile growth and college and career readiness (Achieve3000, 2019). Despite the district's expenditure on Achieve3000 as a supplemental differentiated instruction-delivery tool, and notwithstanding the district's evaluations of Achieve3000's efficacy at improving student literacy and college and career readiness (Reeves, 2014; Torres, 2015, 2016, 2018), usage, and specifically fidelity of use, among HISD students remains extremely low.

The present study examines differences in both Lexile growth and college and career readiness by fidelity of use among secondary students using Achieve3000 during the 2018–2019 academic year. Previous district reports on Achieve3000's impact have attempted to include as many students in an analytic sample as possible, often focusing on achievement indicators besides the Achieve3000 post-test Lexile or college and career readiness measure. This year's study is restricted to those who, at the conclusion of the academic year, met most of the specific criteria outlined in the *National Lexile Study, 2017–2018*, including having completed both a pre-test Lexile assessment within the first 30 days of the start of the school year and a post-test Lexile assessment in the final 30 days of the school year (Achieve3000, 2019).

Testing the relationship between fidelity of use and student Lexile growth and readiness for life after high school using only Achieve3000 data has been difficult because, historically, too few students have met both standards. The universe of students who now have access to Achieve3000, though, has expanded from only one secondary grade (grade 10) across 17 schools in 2013–2014 to all secondary grades (grades 6–12) across 100 schools in 2018–2019. Further, the number of students meeting both standards denoting fidelity of use, as well as meeting other criteria, has increased, making this analysis possible.

Research Questions

The aim, then, is to ascertain whether, net of student-level demographic factors, the combination of completed activities and average first-try score (AFTS) is:

1. related to greater Lexile growth between the beginning and end of the academic year?
2. related to greater odds of college and career readiness at the end of the academic year?

Given the established relationship between Achieve3000 usage and student achievement shown in previous years' research reports, it is hypothesized that there is a significant association between fidelity of use and both student Lexile growth and college and career readiness.

Data and Method

Sample

Achieve3000 was made available to more than 111,000 students enrolled in grades 6 through 12 during the 2018–2019 academic year. The sample

for this report, however, and consistent with the recent *National Lexile Study, 2017–2018* (Achieve3000, 2019), was limited to secondary students who (1) had a pre-test LevelSet Lexile measure within the first 30 days of the school year, (2) had an end-of-year post-test LevelSet Lexile measure within the final 30 days of school, and (3) completed at least one multiple choice activity. The first two restrictions ensure that students in the sample had at least 150 days between their pre-test and post-test measures, thus guaranteeing the maximum returns to those engaging the tool with fidelity.

Students finishing the test too slowly, too quickly, or whose responses are patterned can yield Lexile scores that are not accurately aligned with their abilities, thus resulting in invalid scores. Students whose pre- or post-test LevelSet assessment was graded as invalid were therefore excluded from this study. Also excluded were students who received negative Lexile scores on either the pre-test or post-test assessment, an indication of poor implementation of the program. Finally, only those schools with at least 25 students were included in this analysis. The ultimate analytic sample, then, consisted of 4,934 students in 43 schools. Most students, or 3,141, were represented across 23 high schools, another 1,645 students were represented across 18 middle schools, and 148 students were represented in two combined-level schools.

Measures

Dependent Variables. To answer the research questions above, this study focused on two primary outcomes: growth and college and career readiness. Growth is a change score and is calculated as the difference between students' post-test Lexile score earned at the end of the year and their pre-test Lexile score earned at the beginning of the year.

College and career readiness is an indicator used to denote whether students are meeting the grade-specific Lexile level and are "On Track" to read at or above the college and career ready Lexile level of 1300 by the time they graduate high school.

Independent Variables. The main predictors for this study are the number of Achieve3000 activities that students completed over the course of the academic school year and the average first-try score (AFTS) that students received on all Achieve3000 activities completed. The former predictor is a continuous variable ranging from one to 208 while the latter is a binary variable for which 0 denotes an AFTS less than 75 percent and 1 denotes an AFTS of 75 percent or greater.

A primary moderating variable denoting students' pre-test college and career readiness was included when assessing the effect of fidelity of use on post-test college and career. If a student had pre-test Lexile suggesting that he was college and career ready, he was coded 1 on the pre-test college and career readiness indicator; all others were coded 0.

Additional student-level controls were entered for race/ethnicity, gender, economic disadvantage, special education status, English Learner (EL) status, at-risk status, overage status, and gifted/talented (G/T) status. A dummy variable was created for each category of each of these additional controls.

Analytic Strategy

To test the relationship between fidelity of use of Achieve3000 on student Lexile growth, and to answer the first research question, this study regressed the difference between end-of-year and beginning-of-year Lexile measure on completed activities, whether students had an AFTS of 75 percent or greater, and all other covariates. Since growth, the continuous dependent variable in this study, is a change score denoting the difference between post- and pre-test Lexile scores, it was unnecessary to control for the pre-test Lexile scores when carrying out the linear regression analysis (Allison, 1990), as doing so tends to produce substantially inflated regression coefficients for other controls and can induce spurious statistical associations between those controls and the change in score (Glymour, Weuve, Berkman, Kawachi, & Robins, 2005).

To understand more fully how fidelity of use of Achieve3000 usage is related to whether students are ready either for postsecondary education or the world of work, and to answer the second research question, this evaluation regressed students' college and career readiness on completed activities, whether students had an AFTS of 75 percent or greater, and all other covariates. Because the outcome here was dichotomous, a logistic model was fit to ensure the output of a linear equation between 0 and 1. The result is a probability, or odds, of the occurrence of the event (college and career readiness = 1) based on the combination of known covariates. As the correlation between beginning-of-year and end-of-year college and career readiness was quite strong ($r = .81$, $p < .001$), each model adjusted, or controlled, for beginning-of-year college and career readiness to improve the efficiency of the analyses and to achieve robust, and more convincing, evidence of the relationship between the primary predictors and the outcome.

Results

Summary Statistics

As stated above, Achieve3000 stresses the relevance of fidelity of use when assessing the tool's impact on student growth and college and career readiness. Fidelity of use is defined as the minimum level of quantity and quality of use, or, as **Table 1** shows, the number of activities students completed over the course of the academic school year and the average first-try score (AFTS) students receive on those activities (Achieve3000, 2019). For this study, and consistent with the *National Lexile Study, 2017–2018* (Achieve3000, 2019), a binary indicator was created that codes the first two categories as 1 ("Used with Fidelity") and the bottom four categories as 0 ("Used without Fidelity").

Table 1. Fidelity of Use Descriptions

Implementation Category	Description
High Quality, Highest Quantity	AFTS greater than or equal to 75% and on track to complete 80 lessons in a year (2+ activities/week)
High Quality, High Quantity	AFTS greater than or equal to 75% and on track to complete 40–79 lessons in a year (1+ activities/week)
Lower Quality, Highest Quantity	AFTS less than 75% and on track to complete 80 lessons in a year (2+ activities/week)
Lower Quality, High Quantity	AFTS less than 75% and on track to complete 40–79 lessons in a year (1+ activities/week)
High Quality, Lowest Quantity	AFTS greater than or equal to 75% and on track to complete less than 40 lessons in a year (<1 activity/week)
Lower Quality, Lowest Quantity	AFTS less than 75% and on track to complete less than 40 lessons in a year (<1 activity/week)

Source: Adapted from chart printed in the *National Lexile Study, 2017–2018* (Achieve3000, 2019).

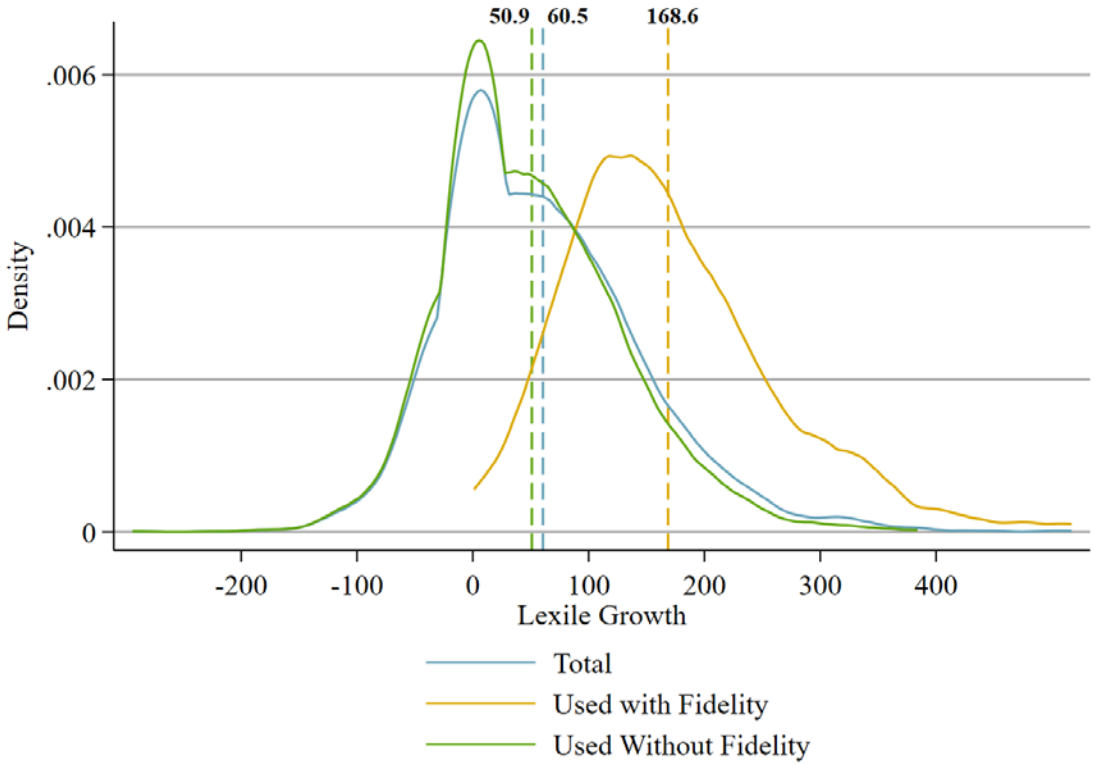
Table A1 (p. 11) presents summary statistics by fidelity of use status. Focusing on the bottom portion of the table beneath the horizontal line dividing the table, it should be noted that most of the group percentages for race and ethnicity are similar between those who used Achieve3000 without fidelity and those who used it with fidelity. A slightly smaller percentage of whites and a slightly higher percentage of Hispanics used the program with fidelity than used it without fidelity; that is, these students completed at least 40 activities over the course of the academic year and had an AFTS of 75 percent or greater. A slightly larger percentage of economically disadvantaged students also used Achieve3000 with fidelity than used it without fidelity. There were much larger percentage differences in fidelity of use among the other demographic characteristics. Much smaller percentages of special education, English learner, at-risk, and overage students used Achieve3000 with fidelity than used it without fidelity, and a much greater percentage of gifted and talented students used Achieve3000 with fidelity than used it without fidelity.

The top portion of Table A1 shows the means and standard deviations for number of activities completed, Lexile point growth, and percent college and career ready. Because the first of these is one of the two factors used to create the fidelity of use indicator, the wide difference in mean usage between the two categories for number of activities completed is expected. The important numbers to focus on are those for Lexile growth and college and career ready. Students who used Achieve3000 with fidelity had an average Lexile growth of about 169 points compared to an average growth of only about 51 points for those who used it without fidelity. About 68 percent of those using the program with fidelity had a gain of between 78 and 260 Lexile points. Sixty-eight percent of those using Achieve3000 without fidelity had a loss-gain of between -22 and 132 Lexile points. **Figure 1 (p. 5)** presents a visualization of the distribution of growth among the fidelity of use groups and for the total sample, with vertical lines drawn at the means.

Figure A1 (p. 12) shows the mean growth by fidelity of use status for middle and combined-level schools while **Figure A2 (p. 13)** shows the mean growth by fidelity of use status for high schools. In all but one school (Lamar High School) did students who used Achieve3000 with fidelity outperform their peers who used Achieve3000 without fidelity. Average school-level Lexile growth for students using the program with fidelity ranged from a low of 73 at Lamar High School to a high of 289 at Stevenson Middle School. Average school-level growth for students using the program without fidelity ranged from a low of 8 at the High School for Law and Justice to a high of 144 at Challenge Early College High School.

Among middle and combined school students (Figure A1, p. 12), the largest Lexile point growth gap was witnessed at Stevenson, where students who used Achieve3000 with fidelity had mean growth of 289 points and those who used it without fidelity had a mean growth of 58, a 231-point gap. Kashmere High School students who used the program with fidelity had mean growth of 216 Lexile points, while those who used the program

Figure 1. Kernel Density Plot of Achieve3000 Lexile Growth by Fidelity of Use



Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.

without fidelity had mean growth of 42, a 174-point gap (Figure A2, p. 13). That these two schools should also show large gains among students using Achieve3000 with fidelity is interesting. Relevant staff at both schools worked diligently to promote the use of Achieve3000 among its student body, Stevenson Middle School through a campus contest that ignited friendly competition, and Kashmere High School through the deployment of wraparound resources, with its holistic approach to providing support, to help that campus shed its Improvement Required Texas Education Agency (TEA) accountability rating.

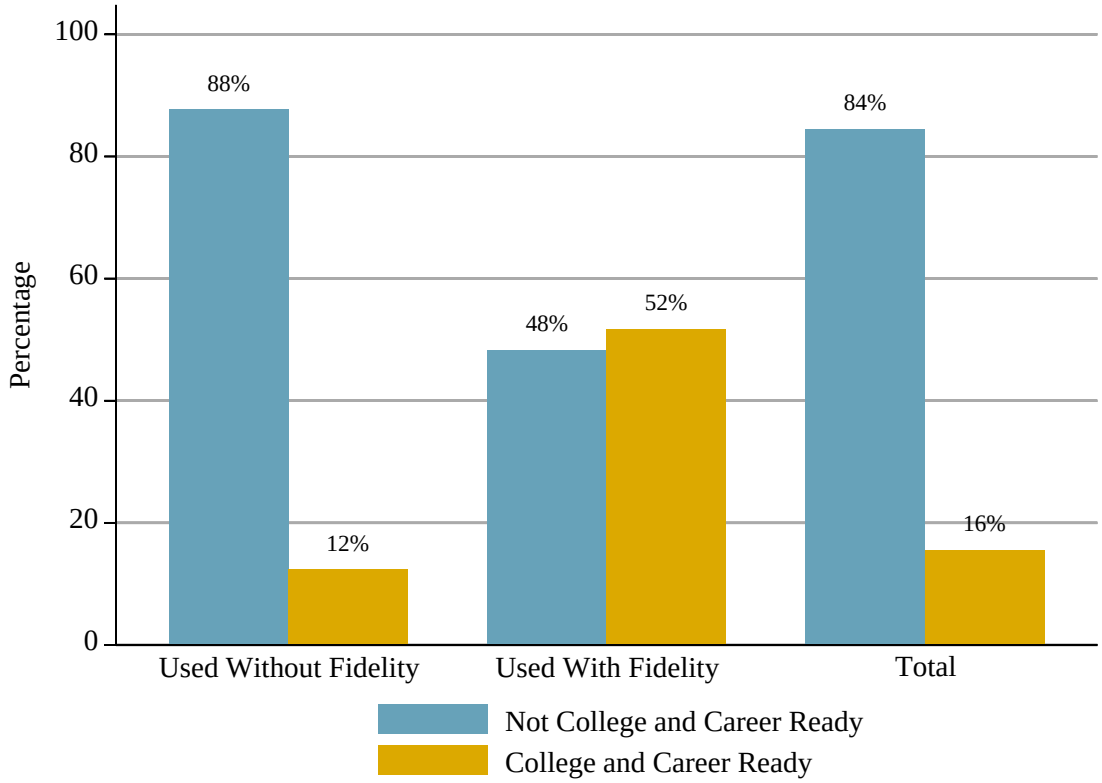
Returning to Table A1 (p. 11) and the comparison of means and standard deviations for college and career ready, only one in eight students who used Achieve3000 without fidelity met the grade-specific Lexile level standard denoting college and career ready; one in two students who used the program with fidelity did so. **Figure 2 (p. 6)** presents a bar graph to help visualize these differences. As is readily apparent, completing 40 activities or more in tandem with achieving an AFTS of 75 percent or greater is associated with being ready for college, the workforce, or the military at the conclusion of the academic year.

While these descriptive statistics and figures presented thus far are instructive, they do not control for moderating factors that may change the relationship between fidelity of use and either Lexile growth or college and career readiness. For that, multivariate regression models are used.

Fidelity of Use and Lexile Growth

Table A2 (p. 14) shows the results of the multivariate linear mixed regression parameters for two-level models examining the impact of Achieve3000 fidelity of use (i.e., number of activities completed, AFTS of 75% or greater, and the interaction between the two) on student Lexile growth for all secondary-grade students. Model 1 estimated the unconditional model to highlight the interclass correlation coefficient (ICC) for Lexile growth, or the ratio of the between-school variance to the total variance. Since the between-school variance is 738.045, and the within-school variance

Figure 2. Percentage of Students Who Were Either College and Career Ready or Not College and Career Ready by Fidelity of Use of Achieve3000



Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.

is 6619.259, the ICC for Lexile growth is 738.045/(738.045 + 6619.259), or 0.100. This means that exactly 10 percent of the variance in Lexile growth is due to school clusters and that the correlation among students in the same school for Lexile growth is 0.100.

Model 2 examined the relationship between the two primary predictors, activities completed and AFTS of 75 percent or greater, and Achieve3000 Lexile growth. The between-school variance decreased by 65 percent between Models 1 and 2, from 738.045 to 253.740, while the within-school variance decreased 23.6 percent, from 6619.259 to 5056.993. These decreases denote the amount of variance explained due to the inclusion of the primary fidelity of use predictors. The correlation among students in the same school for Lexile growth is 253.740/(253.740 + 5056.993), or 0.048, suggesting that about 5 percent of the variance in Lexile growth is due to school clusters.

Model 3 added an interaction between activities completed and AFTS of 75 percent or greater. This suggests that approximately 73.5 percent (i.e., the variance reduction from 738.045 to 195.679) of the between-school variance in Achieve3000 Lexile growth is explained by activities completed, AFTS, and the interaction between the two. About 27.4 percent (i.e., the variance reduction from 6619.259 to 4803.023) of within-school variance in Lexile growth is explained by the same.

Model 4 investigated the effect of Achieve3000 fidelity of use on Lexile growth after controlling for student characteristics. The reduction in the variance components from Model 1 to Model 4 shows that the included covariates accounted for 76.0 percent (i.e., variance reduction from 738.045 to 177.081) of the between-school variance and 28.4 percent (i.e., the variance reduction from 6619.259 to 4738.746) of the within-school variance. Mean Lexile growth was 21.03, net of the effects of any controls. All other things being equal, Lexile growth did not vary significantly by race/ethnicity, gender, economically disadvantaged status, special education status, at-risk status, overage status, or gifted and talented status. Interestingly, English learners experienced mean Lexile growth of 15.72 points more than their non-English learner peers. The combination of activities completed, AFTS, and

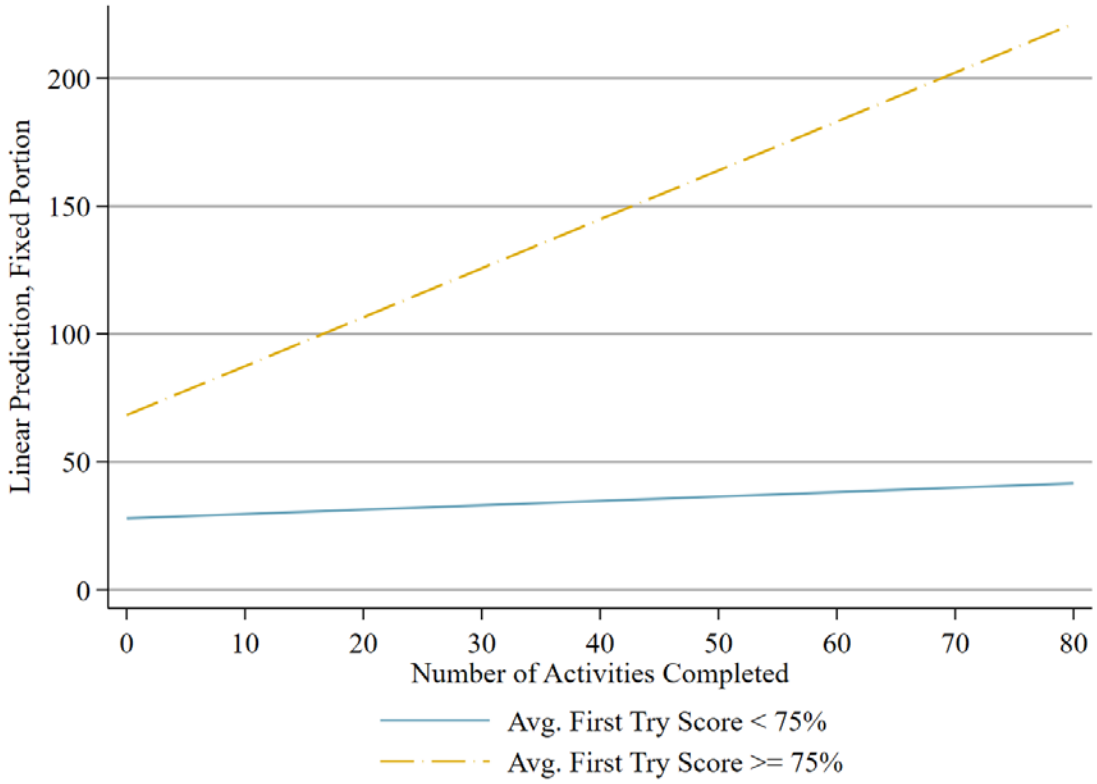
the interaction between the two revealed that, for two students with an AFTS of less than 75 percent, the one completing 40 activities for the year would gain about 14 Lexile points more than the one who completed no activities. Likewise, for two students with an AFTS of 75 percent or greater, the one completing 40 activities over the year would gain about 77 more Lexile points than the one who completed no activities. These values are in addition to the mean of 21.03 for students with an AFTS less than 75 percent and in addition to the mean of 21.03 + 40.398 for students with an AFTS of 75 percent or greater. **Figure 3** illustrates the interaction term shown in Model 4.

Fidelity of Use and College and Career Readiness

Table A3 (p. 15) fit four multilevel mixed effects regression models showing the relationship between fidelity of use and odds of college and career readiness for all secondary-grade students. Model 1 presents the unconditional, or null, model, which incorporates only school-specific random effects to model the between-school variation in college and career readiness at the conclusion of the academic year. Model 2 added the primary fidelity of use characteristics, activities completed and AFTS, as well as a control for college and career readiness at the beginning of the year. Model 3 added the interaction between activities completed and AFTS. The final model (Model 4) incorporated student-level characteristics. Because they are easier to interpret, odds ratios are presented instead of the default estimated regression coefficients, often shown as log odds.

The unconditional model revealed an intercept of 0.103 and an estimated variance on the random effects of 7.741. Turning to Model 2, the odds ratio for beginning-of-year college and career readiness suggests that, when comparing two students who have different values for readiness, but who are

Figure 3. Marginal Linear Prediction of the Interaction between Number of Activities Completed and AFTS on Achieve3000 Lexile Growth



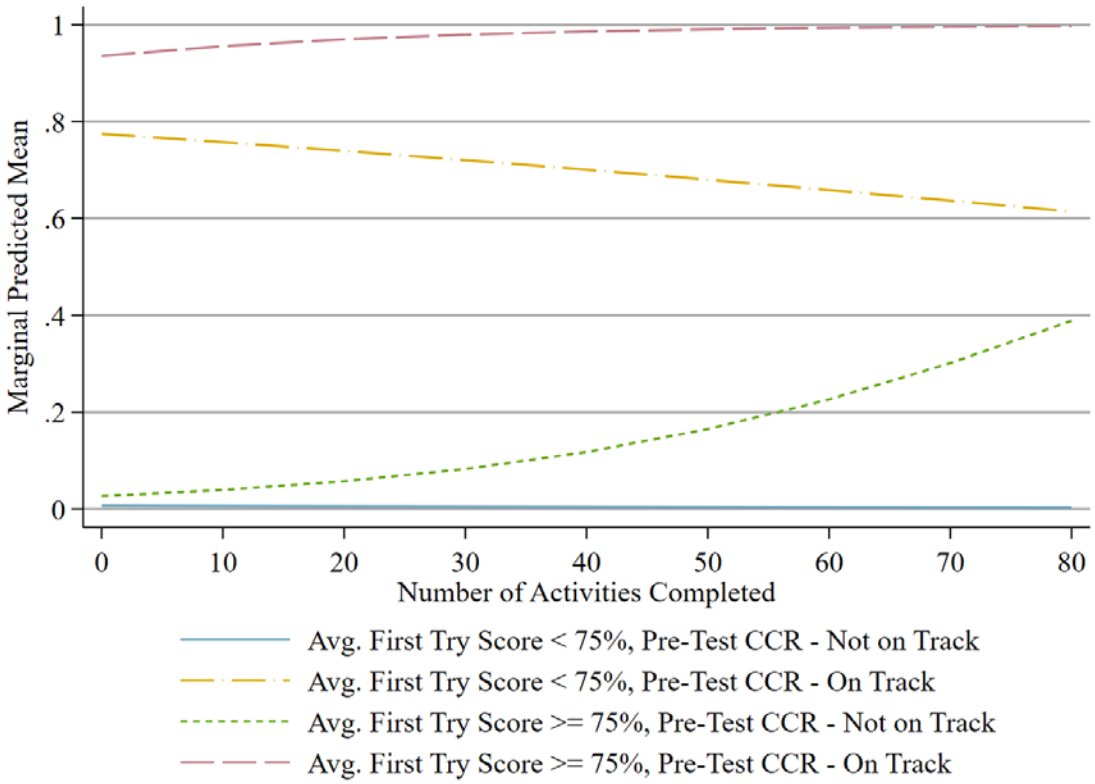
Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.

similar in every other respect, the odds of being college and career ready at the end of the year is 405 times higher for those who were college and career ready at the beginning of the year than for those who were not ready. The odds of being college and career ready at the end of the year is 27 times higher among students who had an AFTS of 75 percent or greater relative to those who had an AFTS of less than 75 percent. Also, for each Achieve3000 activity completed, the odds of college and career readiness increase by 2 percent, double the impact shown in the *National Lexile Study, 2017-2018* (Achieve3000, 2019).

Model 3, which added the interaction between activities completed and AFTS, showed that starting the year college and career ready was a strong predictor for ending the year college and career ready. Such students were 379 times more likely to be ready for college, the workplace, or the military than were their peers who were not college and career ready at the beginning of the year. Taking the coefficient for the interaction between activities completed and AFTS, the results revealed that for each Achieve3000 activity completed among students with an AFTS less than 75 percent remain flat. For students with an AFTS of 75 percent or greater, the impact of each activity completed increases the odds of being college and career ready by about 4 percent.

Controlling for student characteristics only slightly augments the findings from Model 3. Focusing on the interaction term under Model 4, for students with an AFTS less than 75 percent, the odds of being college and career ready decrease by about one percent for each Achieve3000 activity completed. For students with an AFTS of 75 percent or greater, the odds increase by four percent. Being college and career ready at the start of the school year is still highly predictive of being college and career ready at the end of the school year. **Figure 4** presents, by college and career readiness status at the beginning of the year, a graphical

Figure 4. Marginal Predicted Mean of the Interaction between Number of Activities and AFTS on End-of-Year College and Career Readiness by Beginning-of-Year College and Career Readiness



Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.

representation of the interaction term in Model 4. Note that students who were not college and career ready at the beginning of the year, but who used Achieve3000 with fidelity (i.e., completed at least 40 activities and had an AFTS of 75 percent or greater), improved their odds of being college and career ready by the end of the year (green dotted line). While being on track for college and career readiness at the beginning of the year meant higher odds of being ready at the end of the year, if it was accompanied by low quality usage of Achieve3000, the odds could decline (yellow dashed line).

Conclusion

This study set out to answer the questions of whether, among HISD secondary students, fidelity of use of a computer-based differentiated literacy instruction program was associated with greater Lexile growth and higher odds of college and career readiness. The results affirm that it does. When students work diligently toward completing at least 40 Achieve3000 activities throughout the academic year (defined as high quantity), and when they do so with an average first-try score (AFTS) of 75 percent or greater (defined as high quality), they achieve greater growth and are more likely to be college ready, net of moderating factors.

District curriculum professionals, school administrators, and teachers, of course, play an important role in making sure students know about and are using the technology-based tools at their disposal. When the tools assist teachers in delivering the type of instruction designed to meet the needs of diverse learners, as Achieve3000's computer-based differentiated instruction does, it should be a goal to promote its use by students, as doing so facilitates effective differentiated instruction themselves. Unfortunately, despite HISD's expenditure on Achieve3000, usage remains low among the approximately 111,000 secondary students to whom it is available. As such, Achieve3000's benefits are not widely experienced.

Recommendations

To improve usage of Achieve3000 among HISD's secondary students, two courses of action are recommended. First, curriculum professionals, in concert with senior school personnel and teachers, need to ensure that students are completing the pre-test within the first 30 days of the beginning of the school year and the post-test in the last 30 days of the school year. Second, students must be regularly encouraged to complete one to two, preferably more, Achieve3000 activities per week throughout the year. The first course of action requires planning at the classroom level, but teachers need to know that Achieve3000 is effective and why (i.e., non-fiction builds literacy and knowledge across content areas). Its use among students will augment their goal of fruitful instruction aimed at all students, including those reading below their grade level.

The second course of action builds on the first. Once teachers have buy-in, they will strive to remind students to complete Achieve3000 activities, fully cognizant that doing so will absolutely yield positive results for their students.

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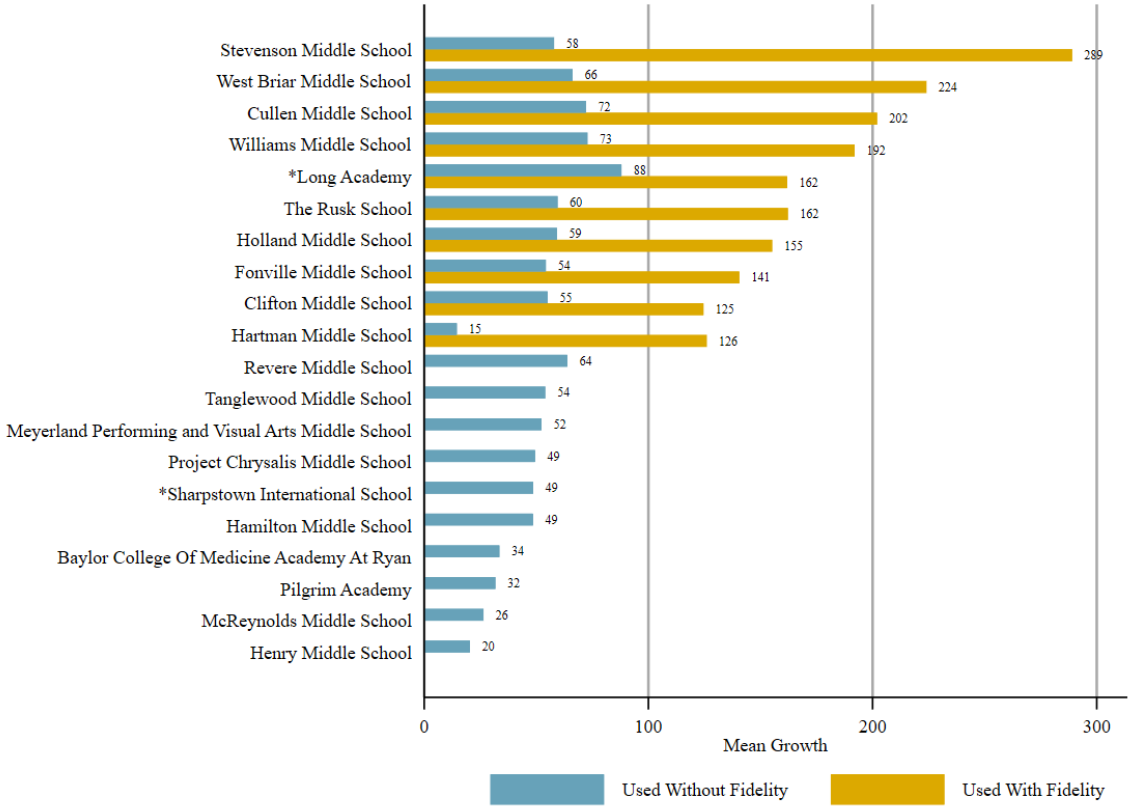
Appendix

Table A1. Summary Statistics by Fidelity of Use

	Used Without Fidelity (n = 4,532)		Used With Fidelity (n = 402)		Total (n = 4,934)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Number of Activities Completed	28.3	20.0	57.8	16.8	30.7	21.4
Lexile Growth (in points)	50.9	77.0	168.6	90.6	60.5	84.5
College and Career Ready (%)	12.3	32.9	51.7	50.0	15.5	36.2
Race/Ethnicity						
White (%)	2.9	16.9	2.0	14.0	2.9	16.7
Black (%)	21.4	41.0	19.9	40.0	21.3	40.9
Hispanic (%)	73.5	44.2	76.1	42.7	73.7	44.0
Asian/Pacific Islander (%)	1.6	12.5	1.7	13.1	1.6	12.6
Other Race (%)	0.6	7.6	0.2	5.0	0.5	7.4
Gender						
Female (%)	49.1	50.0	60.4	49.0	50.0	50.0
Male (%)	50.9	50.0	39.6	49.0	50.0	50.0
Economically Disadvantaged (%)	88.7	31.6	93.0	25.5	89.1	31.2
Special Education (%)	9.0	28.7	2.2	14.8	8.5	27.9
English Learner (%)	27.0	44.4	9.7	29.6	25.6	43.6
At-Risk (%)	48.9	50.0	23.4	42.4	46.8	49.9
Overage (%)	25.2	43.4	13.7	34.4	24.2	42.9
Gifted/Talented (%)	11.7	32.2	22.9	42.1	12.6	33.2

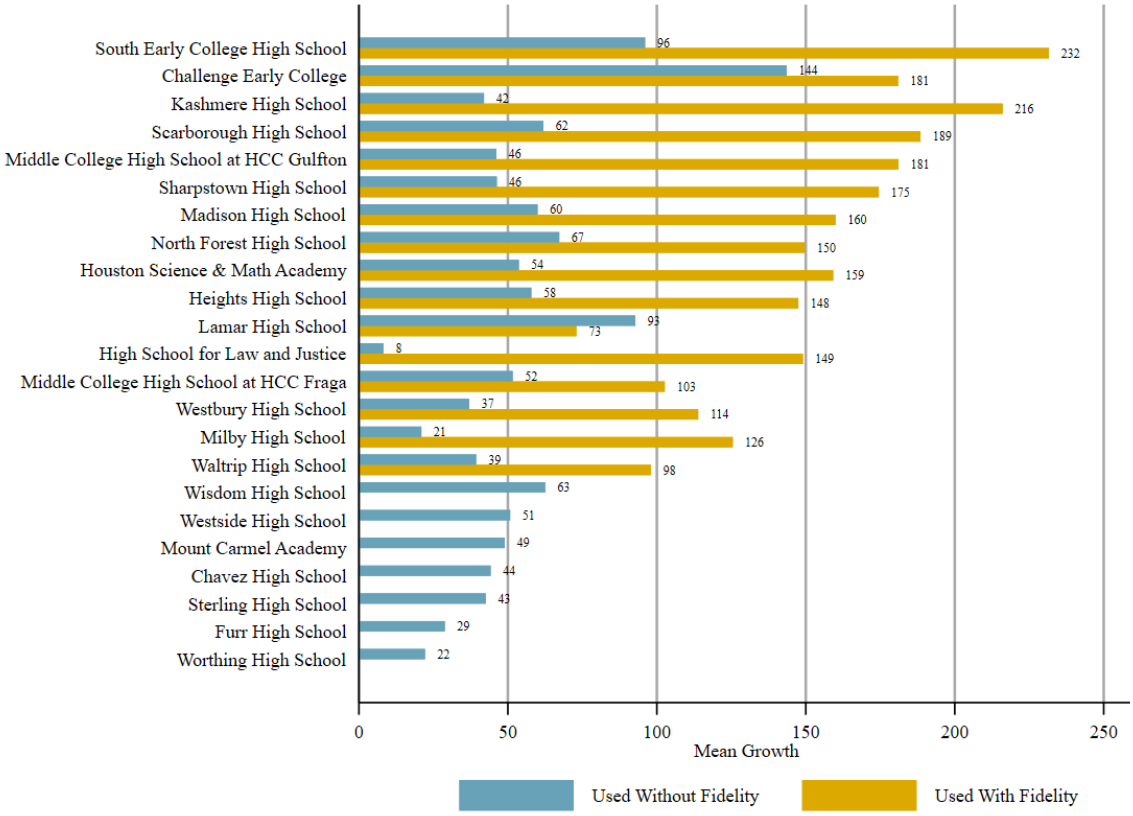
Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.
Note: Fidelity of Use refers to whether a student had both an average first try score of 75 or greater (high quality) AND 40 or more (high quantity) completed Achieve3000 activities (coded 1) during the academic year. All other students, who had either a combination of low quantity and high quality, or low quality and high quantity, were coded 0.

Figure A1. Mean Achieve3000 Lexile Growth by Fidelity of Use and Middle and Combined School



Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.
Note: An asterisk denotes a combined-level school that educates all secondary students (i.e., those in grades 6 through 12).

Figure A2. Mean Achieve3000 Lexile Growth by Fidelity of Use and High School



Source: Achieve3000 Student Data 2018–2019 and Student Demographic Data 2018–2019 from SIS Ad Hoc Package in IBM Cognos.

Table A2. Estimated Effects of Completed Achieve3000 Activities and Average First-Try Score on Lexile Growth for All Secondary Grades

	Model 1	Model 2	Model 3	Model 4
Lexile Growth	60.374***	13.872***	28.409***	21.030**
	(4.410)	(3.309)	(3.174)	(7.187)
Activities Completed		0.677***	0.203**	0.171**
		(0.057)	(0.063)	(0.063)
AFTS of 75% or Greater		89.047***	37.751***	40.398***
		(2.334)	(3.866)	(3.905)
Activities Completed × AFTS of 75% or Greater			1.709***	1.741***
			(0.104)	(0.104)
Race/Ethnicity (Ref. = White)				
Black				-2.115
				(6.402)
Hispanic				-4.452
				(6.067)
Asian/Pacific Islander				5.325
				(9.795)
Other Race				7.715
				(14.559)
Male (Ref. = Female)				-0.478
				(1.986)
Economically Disadvantaged				4.716
				(3.323)
Special Education				-6.376
				(3.708)
English Learner				15.720***
				(3.128)
At-Risk				4.052
				(2.782)
Overage				3.842
				(2.553)
Gifted/Talented				1.557
				(3.271)
Variance Components				
Between-School Variance	738.045***	253.740***	195.679***	177.081***
	(90.574)	(35.653)	(28.332)	(26.154)
Within-School Variance	6619.259***	5056.993***	4803.023***	4738.746***
	(66.929)	(51.138)	(48.563)	(47.913)
AIC	57517.4	56164.4	55905.4	55858.2
BIC	57536.9	56197.0	55944.4	55968.7
Observations	4934	4934	4934	4934

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3. Estimated Effects of Completed Achieve3000 Activities and Average First-Try Score on College and Career Readiness for All Secondary Grades (Presented as Odds Ratios)

	Model 1	Model 2	Model 3	Model 4
College and Career Readiness (End-of-Year)	0.103***	0.003***	0.007***	0.024***
	(0.024)	(0.001)	(0.002)	(0.013)
College and Career Readiness (Beginning-of-Year)		405.308***	378.705***	283.852***
		(94.382)	(84.355)	(63.546)
Activities Completed		1.023***	0.991	0.990
		(0.003)	(0.007)	(0.007)
AFTS of 75% or Greater		27.138***	5.846***	4.315***
		(5.863)	(1.834)	(1.385)
Activities Completed × AFTS of 75% or Greater			1.047***	1.051***
			(0.008)	(0.009)
Race/Ethnicity (Ref. = White)				
Black				0.543
				(0.249)
Hispanic				0.532
				(0.233)
Asian/Pacific Islander				1.451
				(1.049)
Other Race				1.401
				(1.617)
Male (Ref. = Female)				1.071
				(0.169)
Economically Disadvantaged				0.742
				(0.171)
Special Education				0.702
				(0.363)
English Learner				0.444*
				(0.160)
At-Risk				0.679
				(0.151)
Overage				0.606
				(0.159)
Gifted/Talented				1.776**
				(0.345)
Variance Component				
Between-School Variance	7.741***	1.340*	1.270	1.126
	(4.318)	(0.184)	(0.161)	(0.098)
AIC	3715.2	1337.1	1299.9	1272.5
BIC	3728.2	1369.6	1338.9	1383.1
Observations	4934	4934	4934	4934

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$