



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*

Abstract

This report documents findings from a landmark study investigating the impact of Vocabulary.com usage on student achievement. Utilizing a secondary data analysis methodology, we examined achievement score data from teachers at four middle schools in Florida, in which some teachers utilized Vocabulary.com with their students and some did not. We looked specifically at the change on the state standardized English Language Arts (ELA) exams for the same students over a two-year period.

Key findings include: Students using Vocabulary.com had higher year over year growth on the FSA ELA exam than students not using Vocabulary.com. For example, African-American students using Vocabulary.com had an average change in their mean FSA ELA scaled score of 9.58 from 2016 to 2017 while African-American students not using the product had an average scaled score change of only 5.32.

“Vocabulary is a vital building block to success in school and life.”

Jessica Slusser, Director, Getting Smart

Introduction

Increasingly, schools and districts are realizing that to ensure that all students are well-prepared to thrive in a global information-intensive society, students need rich learning experiences that support the development of future ready skills. Central to the development of these future ready skills is the ability to “build and retain word knowledge and develop strategies that help them access complex text.” The development of a strong foundation in vocabulary is also inherently tied to students’ abilities to scale their learning to higher levels. This has important ramifications for K-12 schools focused on closing the achievement gaps within their student population. Research indicates that students with stronger vocabulary are more comfortable building connections between academic concepts and leveraging those connections to expand their reservoir of words and knowledge. Students with less robust vocabulary have more difficulties closing that aspect of the achievement gap because they do not have the word scaffolding to do it on their own. Therefore, the closing of the “vocabulary gap” as described by Jessica Slusser is as much about leveling the academic playing field as it is about preparing students with college and career ready skills. For many schools and districts, vocabulary development is a new social justice issue because of the potential strong impact a rich foundation in vocabulary can have on student achievement and future success in college and career.

Technology has long held the promise of leveling the playing field by helping schools achieve equity in student access to high quality instructional materials. Correspondingly, school district leaders are highly interested in the effective use of digital tools, content and resources to support student learning. Per the 2017 Speak Up Research Project national findings, 96% of district administrators consider the effective use of instructional technology in school as important for students’ future success.ⁱⁱ At the same time, administrators identify several challenges associated with the use of instructional technology, notably, how to evaluate the impact of digital tools on student outcomes. This case study brief and the originating research study aims to address that



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*

K-12 education challenge by providing both a replicable model and key findings about the impact of technology on student learning and the development of college and career ready skills.

About this study

At the request of Vocabulary.com, Project Tomorrow®, the internationally recognized education nonprofit organization, designed and implemented a large-scale, secondary data analysis study to examine potential correlations between the effective use of the Vocabulary.com product and student achievement and growth as measured by state standardized tests. Broward County Public Schools in Florida was invited to participate in the study based upon their implementation of Vocabulary.com in their middle and high schools. The study focused on the use and non-use of Vocabulary.com at 12 schools within the district. In total, 14,200 individual student records from students that took their state standardized tests in both the 2015/16 and 2016/17 school years were examined. This report documents the student achievement results from the annual Florida Standard Assessments (FSA) across four middle schools in Broward County Public Schools, relative to the students’ access to Vocabulary.com within their classroom. Data analyzed included individual student growth from the 2015/16 school year results to the 2016/17 school year results. Additional analysis was conducted based upon the type of English Language Arts courses in which the students were enrolled as well as student ethnicity and race. Student data was organized into sub-cohorts defined by their teachers’ usage or non-usage of Vocabulary.com. Using this methodology, differences in student achievement based upon usage (i.e.; treatment groups) or non-usage (i.e.; control groups) of the product could be clearly identified.

About the schools included in this report

For this study, four middle schools within Broward County Public Schools were identified for inclusion in the secondary data analysis based upon several factors including school demographics and current usage of Vocabulary.com within ELA instruction in grades 7 and 8. Also significant was the percentage of students who were scoring below the satisfactory level (Level 3) on the Florida Standard Assessments in English Language Arts. Key data about the middle school student population demographics and FSA scores are noted in Table 1. The data represents the 2016-17 school year as identified on the Florida Department of Education website, <https://edstats.fldoe.org>.

Table 1: Student Demographics – Middle Schools in this Study

Demographics	Middle School A	Middle School B	Middle School C	Middle School D
Total # of students	1253	1453	1466	1045
Racial/cultural/ethnic identity:				
• African-American/Black	55.4%	59.0%	83.6%	54.4%
• Hispanic/Latinx	24.1%	21.6%	7.3%	28.6%
• White/Caucasian	15.3%	13.1%	6.2%	13.8%
• Asian	2.5%	1.9%	.8%	1.0%



Impact of Vocabulary.com Usage on Student Achievement: an examination of student performance at four urban middle schools in Florida

• Multi-racial	2.4%	3.9%	2.0%	2.0%
Economically-disadvantaged	82.7%	74.3%	87.4%	87.8%
Scoring at Level 1 (Inadequate) or Level 2 (Below Satisfactory) on FSA ELA	58%	52%	61%	61%

Summary of key findings

Analysis of the student data relative to teachers' usage of Vocabulary.com indicates a relationship between usage and achievement. While many factors may contribute to increases in student achievement, particularly on state standardized tests, we believe that the consistency of these findings warrant special attention as a contributing factor to the student outcomes.

1. Across both grade 7 and grade 8, students in classes where their teacher used Vocabulary.com with fidelity as indicated by heavy or high usage as defined by Project Tomorrow, achieved higher mean scaled scores in spring 2017 on the FSA ELA exams and greater growth from 2016 to 2017 than their peers in classes where their teachers did not use Vocabulary.com.
2. This pattern was consistent when the student data was disaggregated for African-American and Hispanic/Latinx students.
3. Additionally, student growth from spring 2016 to spring 2017 where the spring 2016 mean scaled scores were similar between Vocabulary.com using classes and non-using classes also indicate higher achievement for student with access to Vocabulary.com.

Detailed review of the key study findings

Project Tomorrow analyzed the FSA ELA records from 3,714 students at four middle schools within Broward County Public Schools for this report. To support a valid sampling for analysis and to isolate variables, it was important that we segment the study population into cohorts that would be comparable to each other. To do that we undertook several key steps:

- Categorization of the 50 English Language Arts teachers at the four schools based upon their usage of Vocabulary.com into two categories: product using teachers who had integrated Vocabulary.com within their classroom instruction and, non-product using teachers who had not integrated Vocabulary.com within their classroom instruction.
- Identification of teachers and subsequently classes where the class average scaled score in 2016 equated to an achievement level of 1 (inadequate), 2 (below satisfactory) or 3 (satisfactory) using information provided by the Florida Department of Education.ⁱⁱⁱ
- Focus on students in regular English classes and Intensive Reading classes. This required that we eliminate data from students in advanced English classes.



Impact of Vocabulary.com Usage on Student Achievement: an examination of student performance at four urban middle schools in Florida

- Mean scaled scores were weighted based upon the number of students in the class.

Table 2 provides descriptives on the categorization of the teachers and the numbers of students in the respective grades by teacher and includes the 2016 FSA ELA weighted scaled score mean for each category of teachers by usage level and grade level.

Table 2: Middle School Study Participants - Teachers and Students

School	Grade level in spring 2017	Categorization of teachers' usage of Vocabulary.com	Number of teachers	Number of students	Weighted 2016 FSA ELA Scaled Score Mean
Middle School A	Grade 7	Using	4	231	305.30
		Not using	2	153	304.09
	Grade 8	Using	4	257	314.62
		Not using	2	141	310.67
Middle School B	Grade 7	Using	3	305	313.79
		Not using	0	0	NA
	Grade 8	Using	1	113	316.53
		Not using	2	143	321.45
Middle School C	Grade 7	Using	9	466	303.70
		Not using	0	0	NA
	Grade 8	Using	3	206	310.54
		Not using	3	178	307.78
Middle School D	Grade 7	Using	5	221	299.79
		Not using	2	50	296.28
	Grade 8	Using	4	142	308.38
		Not using	2	72	302.63

Beyond examining the data from a specific school or class or even teacher, this report provides new insights into the impact of Vocabulary.com across all four middle schools as the means to interpret the generalizability of the findings. Starting point for the analysis is the comparatives between resulting student data based upon usage of the product vs. non-usage.

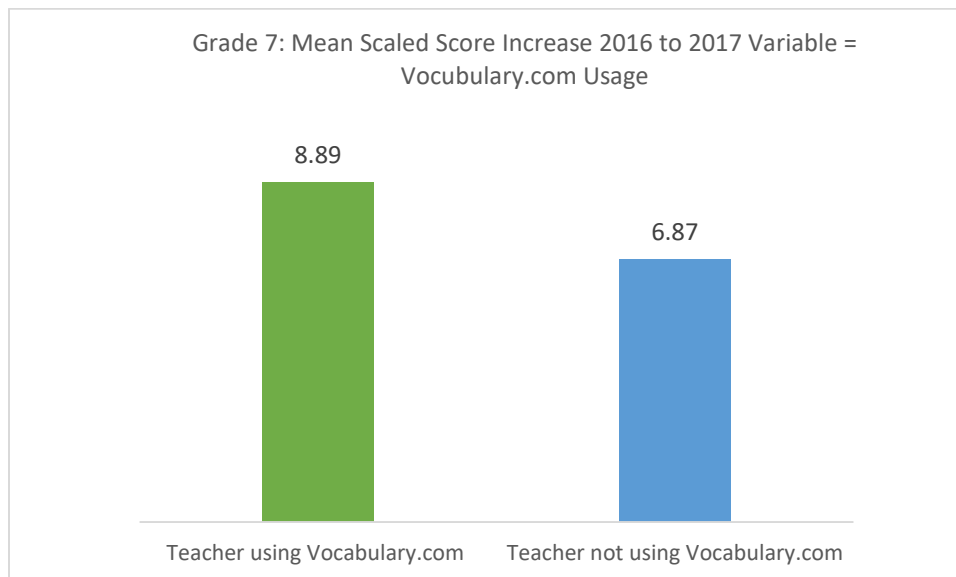
Two key findings were revealed through this comparative analysis. First, across all four schools, classes where teachers used Vocabulary.com had a higher mean scaled score on the spring 2017 FSA ELA than classes where teachers were not using the product within their classroom instruction. For example, 8th grade students in classes where Vocabulary.com was integrated within instruction had had a weighted scaled score mean of 322.95. Their 8th grade peers in classes not using the product averaged a scaled score of 317.63 on the 2017 FSA ELA exam. **Therefore, the 2017 FSA ELA scaled scores were 5.32 points higher for students who had access to Vocabulary.com than students who lacked that access.**



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*

More representative of the impact of Vocabulary.com on student achievement however is the ELA growth evident by comparing the 2016 and 2017 scores for the same students. Charts 1 and 2 below document the change in scaled scores in one year relative to the use of Vocabulary.com for students across all four schools by grade level.

Chart 1: Grade 7 Students' Change in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com – Spring 2016 to Spring 2017

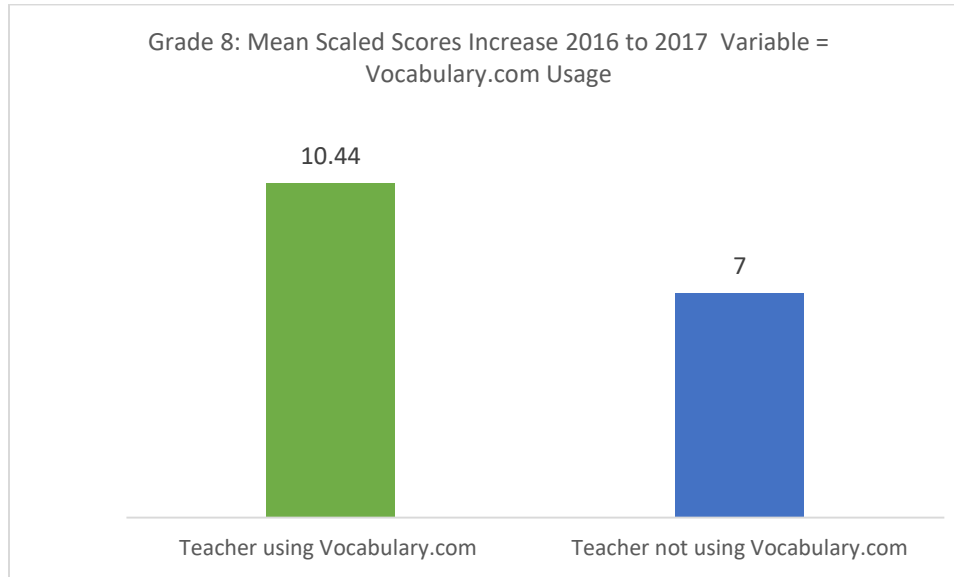


Grade 7	2016 Weighted Mean Scaled Score	2017 Weighted Mean Scaled Score	Growth from 2016 to 2017 – same students
Teachers = using Vocabulary.com	305.64	314.53	8.89
Teachers = not using Vocabulary.com	300.19	307.06	6.87

Chart 2: Grade 8 Students' Change in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com – Spring 2016 to Spring 2017



Impact of Vocabulary.com Usage on Student Achievement: an examination of student performance at four urban middle schools in Florida



Grade 8	2016 Weighted Mean Scaled Score	2017 Weighted Mean Scaled Score	Growth from 2016 to 2017 – same students
Teachers = using Vocabulary.com	312.52	322.95	10.44
Teachers = not using Vocabulary.com	310.63	317.63	7

The consistency of the higher year over year growth for students in the grade 7 and grade 8 classes where Vocabulary.com was part of the instructional mix is significant. **It is also noteworthy that the 8th grade students who used Vocabulary.com within their ELA classes scored at a Level 2 on the FSA exam, moving up from their Level 1 status in 2016.** Students who did not use Vocabulary.com scored at the FSA Level 1 status of inadequate for both 2016 and 2017.

As a frame of context, the mean scaled score growth for 2016 to 2017 statewide was 6 points comparing 2016 grade 6 students with 2017 grade 7 students. The similar mean scaled score growth for grade 8 students in 2017 was 7 points statewide. Per our analysis, students in the classes where Vocabulary.com was utilized outpaced students across the state in mean scaled score growth from 2016 to 2017; grade 7 by 2.89 points and grade 8 by 3.44 points. As indicated earlier, while many factors contribute to student achievement and growth, the scale of the growth as exhibited in this analysis combined with the consistency of the findings underscores the importance of these findings regarding the impact of Vocabulary.com on students' achievement on state standardized tests.



Impact of Vocabulary.com Usage on Student Achievement: an examination of student performance at four urban middle schools in Florida

Within the study the focus was on two courses within the middle school curriculum; a regular English class and an Intensive Reading class. All four schools offered the regular English class to their 7th and 8th grade students. Three of the four schools offered the Intensive Reading course as well as an alternative class to regular English. As with our grade level analysis, students in both courses with teachers using Vocabulary.com had higher growth on their FSA ELA exams from 2016 to 2017 compared to students who did not have access to the product. Table 3 documents the respective FSA ELA growth statistics aggregated across all four schools.

Table 3: Changes in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com – Spring 2016 to Spring 2017 – by ELA Course and Grade Level

ELA Course	Grade Level	Teachers = Using Vocabulary.com	Teachers = Not Using Vocabulary.com
		Change in Mean Scaled Scores	Change in Mean Scaled Scores
Regular English	Grade 7	8.58	4.58
	Grade 8	10.59	7.06
Intensive Reading	Grade 7	9.82	6.92
	Grade 8	10.47	7.52

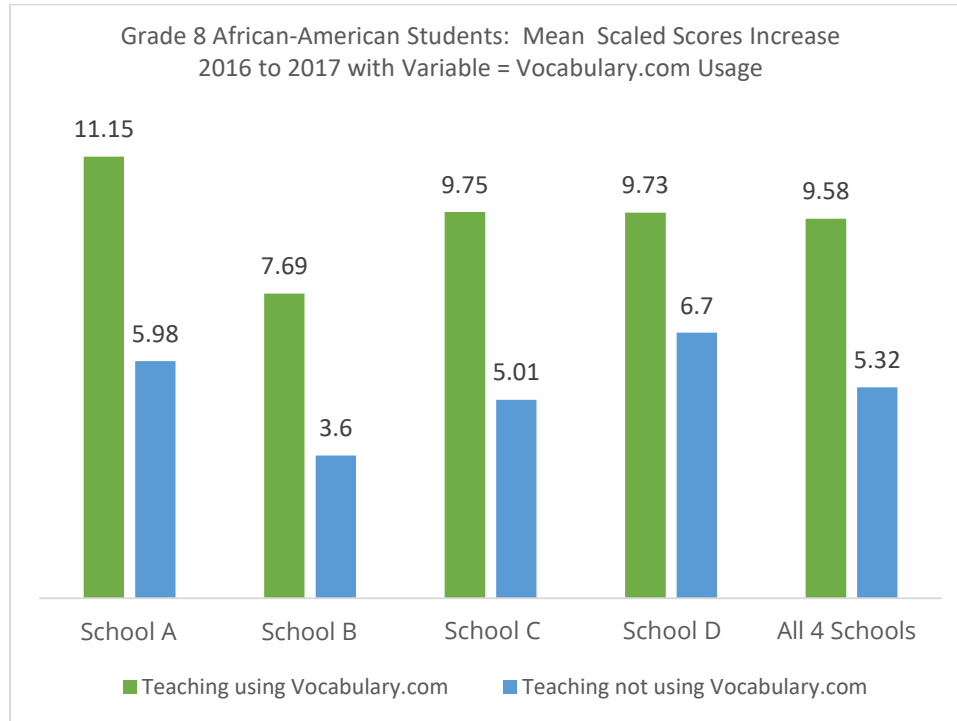
Overall, students in regular English courses at the four studied schools saw an average mean scaled score change of 9.58 points if their teacher employed Vocabulary.com as an instructional tool to support vocabulary acquisition. The increase was slightly large in the Intensive Reading courses. The mean scaled scores for students in those courses increased by 10.14 points when the students had access to Vocabulary.com.

This pattern of higher achievement on the spring 2017 FSA ELA exam and higher growth from 2016 to 2017 was consistent for students identifying as African-American or Hispanic/Latinx as well. Chart 3 displays similar data as illustrated in Charts 1 and 2 but specifically for African-American students in grade 8 across all four schools.

Chart 3: African-American Students' Change in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com - Spring 2016 to Spring 2017



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*



For 8th grade students who self-identify as African-American within the four studied schools (967 students), the access to Vocabulary.com in their class instruction had a significant impact on their scaled score growth from spring 2016 to spring 2017. **Compared to their peers in classes where the product was not available for student use, African-American students in classes where their teachers integrated Vocabulary.com within instruction, the scaled scores for these students rose on average 9.58 points, exceeding the state-wide growth average by 2.58 points.** The growth for African-American students in non-using classes however was only 5.32, 1.68 points below the state-wide growth of 7 points.

To further examine the impact of the use of Vocabulary.com on student achievement and growth, we conducted an additional analysis to review product efficacy for students starting at the same or similar achievement levels in similar learning environments. This focus on a similar “starting point” provides additional validity to the data analysis. To set up this analysis, Project Tomorrow examined the scaled scores of students in regular English classes and Intensive Reading classes across both grade levels. The “starting point” elements for this evaluation include the comparable number of students, course type, and weighted mean scaled score average from spring 2016 across the classes. By isolating these variables, we can focus on the analysis on the impact of Vocabulary.com usage in the classes.

For the regular English classes, we identified 4 teachers whose students’ FSA ELA 2016 scores were in the 307-308-309 range as the similar starting point for the analysis. Two of those teachers used Vocabulary.com within their classes, 2 did not use the product. Table 4 identifies the participating teachers for this analysis and includes the comparable “starting point” data from their students’ data.



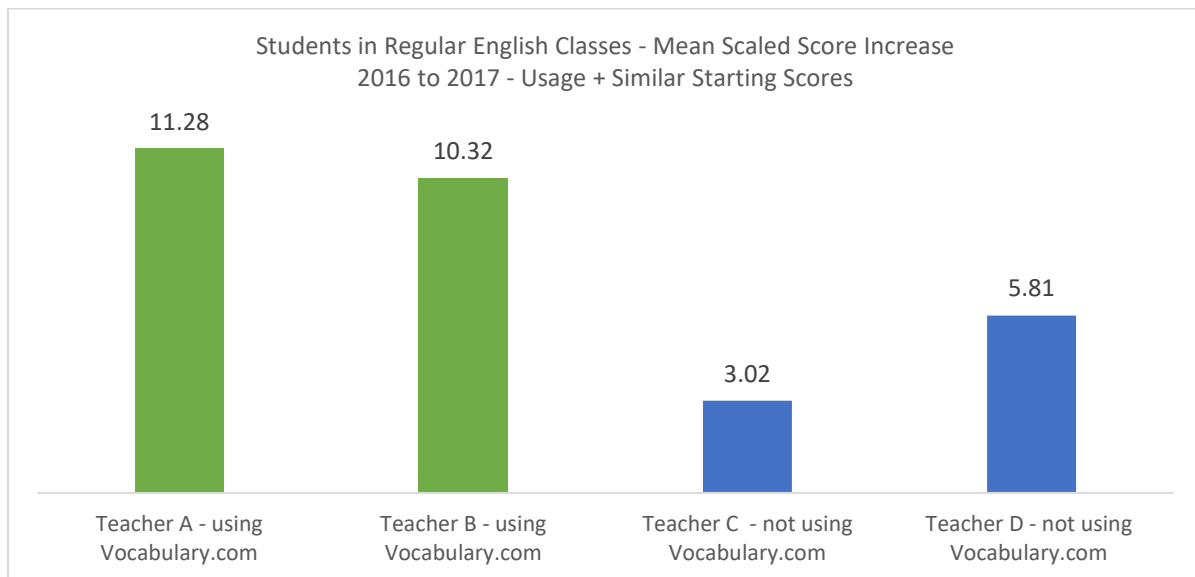
Impact of Vocabulary.com Usage on Student Achievement: an examination of student performance at four urban middle schools in Florida

Table 4: Participants for Starting Point Analysis on the Impact of Vocabulary.com within Regular English Classes

Teacher	Vocabulary.com Usage	Number of students	Weighted Mean Scaled Score for Classes– Spring 2016	Weighted Mean Scaled Score for Classes – Spring 2017
Teacher A	Using	68	309.34	320.62
Teacher B	Using	70	308.68	319.00
		Total = 138		
Teacher C	Not Using	53	307.98	311.00
Teacher D	Not Using	70	309.54	315.36
		Total = 123		

Following the pattern identified with the analysis across all grades and courses and the demographic focus on African-American and Hispanic/Latinx students, **the students in the regular English classes using Vocabulary.com demonstrated higher growth than their peers without that access even when starting at similar mean scaled score from 2016.** Chart 4 illustrates the growth for the students in the four teachers' classes as the change from the average score in spring 2016 to the average score in spring 2017.

Chart 4: Students in Regular English Classes - Change in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com – Spring 2016 to Spring 2017





Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*

For the Intensive Reading course analysis, we identified 5 teachers whose students’ FSA ELA 2016 scores were in the 302-303-304 range as the similar starting point for the analysis. Three of those teachers used Vocabulary.com within their classes, 2 did not use the product. Table 5 identifies the participating teachers for this analysis and includes the comparable “starting point” data from their students’ data.

Table 5: Participants for Starting Point Analysis on the Impact of Vocabulary.com within Intensive Reading Classes

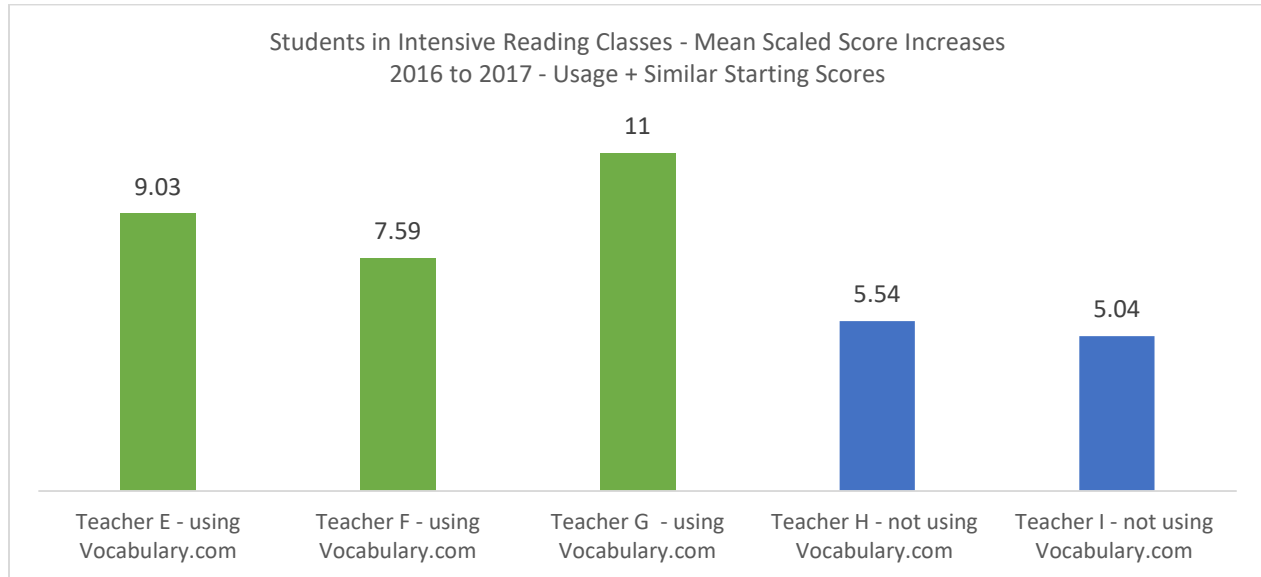
Teacher	Vocabulary.com Usage	Number of students	Weighted Mean Scaled Score for Classes– Spring 2016	Weighted Mean Scaled Score for Classes – Spring 2017
Teacher E	Using	45	303.95	312.98
Teacher F	Using	29	304.55	312.14
Teacher G	Using	56	305.36	316.03
		Total = 130		
Teacher H	Not Using	48	302.94	308.48
Teacher I	Not Using	75	305.80	310.48
		Total = 123		

As with the starting point analysis for the regular English courses, a similar pattern exists when examining the growth in student scaled scores within Intensive Reading classes. **Isolating for the students’ current capacities by identifying students who had similar spring 2016 scores, we see that students who had access to Vocabulary.com scored higher on the 2017 FSA ELA exams than students without access to that instructional tool.** Given the similar starting points, that results in higher year over year growth as illustrated in Chart 5.

Chart 4: Students in Intensive Reading Classes - Change in Scaled Scores on FSA ELA by Teacher Usage of Vocabulary.com – Spring 2016 to Spring 2017



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*



Given the isolation of various variables in both sets of “starting points analysis,” these findings again document the impact of Vocabulary.com on students’ year over year growth on the FSA ELA assessment.

In summary, the study results documented in this report are the result of a secondary data analysis of FSA ELA scaled scores from students in four middle schools within Broward County Public Schools. The key research question driving the data analysis was to assess if a relationship exists between the use of Vocabulary.com within English Language Arts instruction and increased student performance on state standardized tests. While many factors may contribute to increases in student achievement, particularly on state standardized tests, we believe that the consistency of these findings warrant special attention as a contributing factor to the student outcomes. As with all analysis, further examination of results such as these will inevitably yield additional insights into the nature of the relationship between usage and achievement.



Impact of Vocabulary.com Usage on Student Achievement: *an examination of student performance at four urban middle schools in Florida*

Appendix

Overview of study methodology

To complete the secondary data analysis, Broward County Public Schools provided Project Tomorrow with FSA records for students who were members of two specific cohorts. Cohort 1 was comprised of students who took the FSA ELA exam in spring 2016 as 6th graders and then again as 7th graders in spring 2017. Cohort 2 included students who took the FSA ELA exam in spring 2016 as 7th graders and then again as 8th graders in spring 2017. Students' racial/ethnic/cultural heritage was also indicated in the data. The student records were aggregated by school, teacher and ELA course taken during that school year (Advanced English, Regular English, Intensive Reading). Project Tomorrow's analysis used aggregated course and teacher mean scaled scores from the 2016 and 2017 FSA ELA exams. To understand the relationship with Vocabulary.com usage, Project Tomorrow utilized data provided by Vocabulary.com to identify the level of usage of the product by teachers at the study schools. Using data that identified teacher usage based upon the average number of students using the product and the average number of words mastered in total and on average by student, Project Tomorrow created a typology of usage that was used to identify teachers as heavy, high, low or non-users of the product. Student achievement and growth on the FSA ELA tests were analyzed relative to teachers' usage patterns by grade level as well as course type. Examination of differences for students who identified as African-American and Hispanic was also undertaken. The data provided includes basic descriptive statistics.

About Project Tomorrow (www.tomorrow.org)

Project Tomorrow's mission is to support the effective implementation of research-based STEAM learning experiences for students in K-12 schools. Project Tomorrow is particularly interested in the role of digital tools, content and resources in supporting students' development of college and career ready skills. For the past 15 years, the organization has focused efforts on national research projects and the design and implementation of evaluation, efficacy and feedback studies examining the impact of digital tools or technology-enabled learning models in the classroom.

About Vocabulary.com

Vocabulary.com is a platform for systematic, lasting vocabulary improvement that goes beyond rote memorization to truly teach all the meanings and subtle nuances of words. Used in over 42,000 schools in the US, Vocabulary.com easily integrates with any curriculum and automatically adapts to each student's individual ability. The heart of Vocabulary.com is an adaptive learning game that is backed by the world's smartest dictionary. Each week, over 8 million students, teachers, and life-long learners across the globe use Vocabulary.com to master words, build a better vocabulary, and improve literacy.

ⁱ <http://www.gettingsmart.com/2016/02/have-you-heard-of-the-vocabulary-gap/>

ⁱⁱ www.tomorrow.org/speakup

ⁱⁱⁱ <http://www.fldoe.org/core/fileparse.php/5663/urlt/ELA-MathFSAFS1617.pdf>