Vocabulary.com

The Impact of Vocabulary.com Usage on Star Reading

August 2025 | Huan Liu, Ph.D.

Vocabulary.com is an award-winning vocabulary acquisition platform that is built on learning science principles and a powerful adaptive engine to deliver the fastest and most effective way for students to master new words (Zimmer, n.d.). Using a "big data" approach and item response theory to analyze response patterns from billions of questions, Vocabulary.com creates personalized vocabulary instruction for each learner that is truly tailored to his or her needs. As of this writing, Vocabulary.com has served more than 9 billion questions to 4 million students in 46,000 schools across the world.

How Vocabulary.com works

The goal of Vocabulary.com is to enable word mastery, not memorization of a single, simplified definition. The platform achieves this by identifying gaps in students' vocabulary and then systematically exposing students to words they need to learn in a variety of contexts, using various question types, multiple meanings, and adaptive activities. The software adapts to each learner based on his or her responses and reintroduces words from the past until each word is fully mastered. Vocabulary.com's gamification features keep learners engaged and motivated through interactive learning at their own pace, and badges and points track and celebrate their progress. The site can be used for independent and collaborative learning, at home or in the classroom, allowing learners to practice and master new words anytime, anywhere.

Prior research

Prior research has consistently shown the positive effects of Vocabulary.com usage on student learning. For example, a number of studies found that Vocabulary.com usage was associated with improved performance on the Florida Standards Assessments (FSA) and the Florida Comprehensive Assessment Test (FCAT) in reading among middle school students (Bruening et al., 2015; Project Tomorrow, 2019). Positive benefits have also been observed among high school students: Vocabulary.com usage helped boost Missouri standard proficiency rates, and increased Vocabulary.com usage was associated with greater learning gains (Vocabulary.com, 2023).

A more recent study revealed that Vocabulary.com usage is positively associated with high school students' PSAT and SAT reading and writing performance (Liu, 2025), highlighting that students can achieve higher scores when they master more words on Vocabulary.com. Furthermore, a qualitative study has demonstrated the benefits of Vocabulary.com's gamification approach to word learning among high school students in New York (Abrams & Walsh, 2014).

Study purpose

The goal of the present study was to examine the effect of increased Vocabulary.com usage on reading achievement among middle school students in 6th through 8th grade, as measured by the Star Reading assessment. Specifically, we investigated the following research question:

> **Usage effects of Vocabulary.com:** Controlling for baseline performance and demographic characteristics, how did the amount of Vocabulary.com usage relate to students' performance, as measured by the Star Reading assessment?

Data sources

Assessment and Demographic Data. We obtained students' Star Reading performance data during the 2024-25 school year from a large, suburban middle school in Wisconsin. Each student in 6th through 8th grade had a pretest reading score at the beginning of the school year, which served as the baseline, and a posttest reading score at the end of the school year, which was used to examine the impact of Vocabulary.com usage. In addition, the school provided student-level demographic data, including students' gender, race/ethnicity, English learner status, special education status, and economically disadvantaged status.

Vocabulary.com Usage Data. We obtained Vocabulary.com usage data from Vocabulary.com's internal database. When students practice on Vocabulary.com, they answer questions covering various definitions of a word. When students answer enough questions correctly, the word becomes "mastered" and students are rewarded with a 1,000-point bonus. The amount of time it takes to master a word depends on several factors such as the number of meanings a word has, the number of questions students answer correctly or incorrectly, and the number of other words students are learning at the same time. Table 1 shows the descriptive statistics of students' weekly Vocabulary.com usage during the 2024-25 school year.

Table 1. Descriptive Statistics of Students' Weekly Vocabulary.com Usage

Weekly usage	*M*	*SD*	Min	Max
Words mastered	3.11	2.34	0.00	12.21
Questions answered	98.23	47.89	4.05	288.50
Time spent (in minutes)	29.28	11.19	2.16	67.22

Note: *M* = mean, *SD* = standard deviation.

Participants

We included data from students with any amount of Vocabulary.com usage during the study period as well as non-missing demographic and assessment data. Prior to analysis, we removed outliers (n = 24) that had Vocabulary.com usage further than ±3 standard deviations from the mean. The final sample size comprised a total of 757 students in 6th through 8th grade. In the sample analyzed, 53% of the students were female, 67% were White, 23% were economically disadvantaged, 2% were English learners, and 6% were receiving special education support. See Appendix A for descriptive statistics of students' pretest and posttest Star Reading achievement.

Analysis

We specified a multiple regression model to test the effect of Vocabulary.com usage on Star reading achievement. The model regressed the posttest Star Reading scale score on the number of words mastered per week and the following covariates: pretest Star Reading scale score (i.e., baseline performance), gender, race, English learner status, special education status, and economically disadvantaged status.

Each effect is accompanied by a test of statistical significance (i.e., a p-value). The p-value is the probability of observing the current or more extreme data, assuming the effect is zero (Cohen, 1994). The smaller the p-value, the less likely it is that the result occurred at random; p-values less than .05 are considered statistically significant. We also report a standardized regression coefficient (β) for each analysis to gauge the practical significance of Vocabulary.com usage relative to the effects of the covariates.

Results

We found a statistically significant positive association between the number of words mastered per week and students' Star Reading performance. Specifically, with each additional word

mastered on Vocabulary.com per week, students' Star Reading scale scores are expected to increase by 3.01 points (b = 3.01, p < .001). **If students master five more words per week, their Star Reading scale scores are expected to increase by 15.05 points.** Full model results are presented in Appendix B.

The impact of the number of words mastered per week among economically disadvantaged students (n = 177) was even more pronounced. With each additional word mastered on Vocabulary.com per week, their Star Reading scale scores are expected to increase by 3.59 points (b = 3.59, p < .01). If students master five more words per week, their Star Reading scale scores are expected to increase by 17.95 points. Full model results are presented in Appendix C. Figure 1 shows the expected score improvement in Star Reading with five additional words mastered per week.

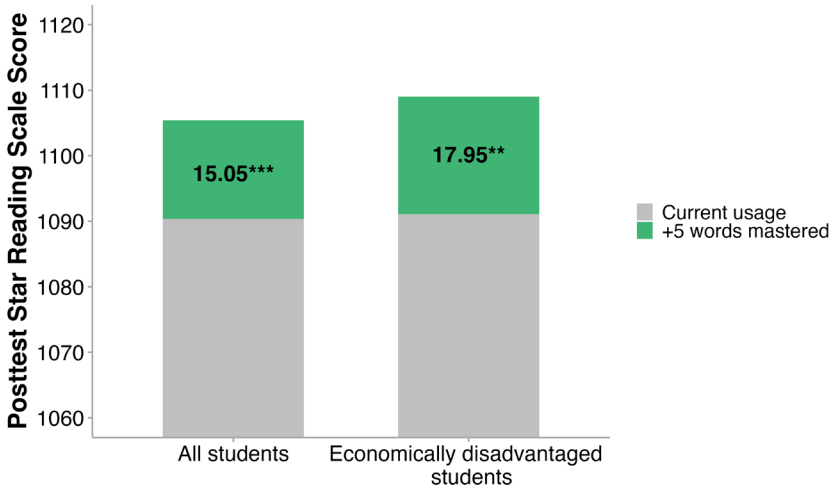

Figure 1. Predicted usage effect of Vocabulary.com

Conclusion

In this study, we examined the effect of Vocabulary.com usage on middle school students' reading achievement, as measured by the Star Reading assessment. Controlling for baseline performance and student demographics, we found that the more words students mastered on Vocabulary.com, the better their Star Reading performance. Moreover, the positive effect was more pronounced among economically disadvantaged students. These results add to the body of research showing that Vocabulary.com is an effective platform that systematically helps students improve their vocabulary (e.g., Abrams & Walsh, 2014; Bruening et al., 2015; Liu, 2025; Project Tomorrow, 2019; Zimmer, n.d.). Regardless of their current levels, Vocabulary.com provides students with opportunities to further expand their vocabulary, leading to improved reading skills and greater learning gains.

References

Abrams, S. S., & Walsh, S. (2014). Gamified vocabulary: Online resources and enriched language learning. *Journal of Adolescent and Adult Literacy, 58*(1), 49-58. https://doi.org/10.1002/jaal.315

Bruening, P., Robbins, S., & Schulte, W. (2015). *Impact of Vocabulary.com on middle school students* (pp. 1-24). https://s3.amazonaws.com/docs.vocabulary.com/research/Vocabulary.com-Impact.pdf

Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist, 49*(12), 997–1003.

Liu, H. (2025). *The impact of Vocabulary.com usage on PSAT/SAT Reading and Writing.* (pp. 1-7). https://s3.amazonaws.com/docs.vocabulary.com/research/The-Impact-of-Vocabulary.com-Usage-on-PSAT-SAT-Reading-and-Writing.pdf

Project Tomorrow (2019). *Impact of Vocabulary.com usage on student achievement: An examination of student performance at four urban middle schools in Florida* (pp. 1-12). https://www.vocabulary.com/articles/success-stories/new-research-links-increased-vocabularycom-use-to-substantial-gains-on-state-literacy-assessments/

Vocabulary.com (2023). *Vocabulary.com usage helps boost Missouri standard proficiency rates among high school students* (pp. 1-4). https://s3.amazonaws.com/docs.vocabulary.com/research/Vocabulary.com_Missouri_HS_study.pdf

Zimmer, B. (n. d.). *Science of learning* (pp. 1-10). https://www.vocabulary.com/membership/Vocabulary.com%20-%20Science%20of%20Learning.pdf

Appendix A: Descriptive Statistics of Students' Star Reading Achievement by Grade during the 2024-25 School Year

Grade	*n*	Pretest				Posttest			
		M	*SD*	Min	Max	*M*	*SD*	Min	Max
6	275	1060.90	56.42	903	1200	1072.98	61.18	896	1274
7	203	1077.35	50.02	925	1248	1093.64	53.40	944	1225
8	279	1102.59	59.70	906	1232	1113.73	60.84	904	1254

Note. M = mean, *SD* = standard deviation.

Appendix B: Full Multiple Regression Model Predicting Posttest Star Reading Scale Score from Vocabulary.com Usage and Covariates

Predictor	*b*	*SE*	95% CI	β	*t*	*p*
(Intercept)	1091.01	2.99	1085.15 – 1096.87	-0.04	365.35	<.001
Pretest Star Reading scale score[1]	0.81	0.03	0.76 – 0.86	0.78	31.90	<.001
Grade 7[2]	8.74	3.05	2.76 – 14.72	0.14	2.87	.004
Grade 8[2]	3.59	2.95	-2.20 – 9.38	0.06	1.22	.224
Gender: male[3]	0.69	2.38	-3.97 – 5.36	0.01	0.29	.770
Race: White[4]	-2.03	2.55	-7.03 – 2.97	-0.03	-0.80	.425
Economically disadvantaged[5]	2.30	2.84	-3.27 – 7.87	0.04	0.81	.417
Special education support[6]	-10.16	5.31	-20.60 – 0.27	-0.17	-1.91	.056
English learner[7]	-0.69	8.21	-16.81 – 15.42	-0.01	-0.08	.933
Words mastered per week[1]	**3.01**	**0.58**	**1.87 – 4.16**	**0.11**	**5.16**	**<.001**

Note. Dependent variable: posttest Star Reading scale score. *b* = unstandardized regression coefficient, *SE* = standard error, CI = confidence interval, β = standardized regression coefficient.

[1] Grand-mean centered

[2] Dummy coded; Grade 6 as reference group

[3] Dummy coded; female students as reference group

[4] Dummy coded; racial minority students as reference group

[5] Dummy coded; students who are not economically disadvantaged as reference group

[6] Dummy coded; students who are not receiving special education support as reference group

[7] Dummy coded; students who are not English learners as reference group

Appendix C: Full Multiple Regression Model Predicting Posttest Star Reading Scale Score from Vocabulary.com Usage and Covariates among Economically Disadvantaged Students

Predictor	*b*	*SE*	95% CI	β	*t*	*p*
(Intercept)	1084.64	5.09	1074.59 – 1094.70	0.06	212.95	<.001
Pretest Star Reading scale score[1]	0.72	0.05	0.62 – 0.81	0.71	14.86	<.001
Grade 7[2]	5.98	5.79	-5.44 – 17.41	0.10	1.03	.303
Grade 8[2]	8.46	6.06	-3.49 – 20.42	0.14	1.40	.164
Gender: male[3]	-2.54	4.80	-12.02 – 6.93	-0.04	-0.53	.597
Race: White[4]	-7.22	4.70	-16.50 – 2.06	-0.12	-1.54	.126
Special education support[5]	-22.61	9.04	-40.44 – -4.77	-0.37	-2.50	.013
English learner[6]	-28.94	13.45	-55.50 – -2.38	-0.48	-2.15	.033
Words mastered per week[1]	**3.59**	**1.21**	**1.20 – 5.98**	**0.14**	**2.96**	**.003**

Note. Dependent variable: posttest Star Reading scale score. *b* = unstandardized regression coefficient, *SE* = standard error, CI = confidence interval, β = standardized regression coefficient.

[1] Grand-mean centered

[2] Dummy coded; Grade 6 as reference group

[3] Dummy coded; female students as reference group

[4] Dummy coded; racial minority students as reference group

[5] Dummy coded; students who are not receiving special education support as reference group

[6] Dummy coded; students who are not English learners as reference group