Use of Khan Academy Official SAT Practice and SAT achievement: an observational study

Khan Academy Official SAT Practice

In spring 2014, Khan Academy entered a partnership with the College Board, the maker of the SAT, to provide free SAT practice. By summer 2015, Khan Academy released Official SAT Practice (OSP). More than 10 million students have used OSP since launch.

OSP creates a personalized plan for each student to prepare for the SAT. Thousands of interactive questions with instant feedback, video lessons, eight full-length practice tests, and additional resources are included. To receive a personalized practice plan, students can either take a series of diagnostic quizzes or link their College Board and Khan Academy accounts. When students link accounts, they consent to data sharing between Khan Academy and the College Board, which enables Khan Academy to access students’ latest SAT Suite of Assessments\(^1\) score data if there is any. Specifically, Khan Academy imports item-level data, similar to what the College Board reports to students on the Question-Level Feedback portion of its score summary report. The Question-Level Feedback report indicates the difficulty level of each item—easy, medium, or hard—and the student’s performance—correct or incorrect. Khan Academy uses those data to initialize or update the student’s corresponding skill levels on OSP. To protect student privacy, Khan Academy does not save or store data from students’ SAT suite.

OSP offers a rich array of features and functionality to help students prepare for the SAT. Given this functionality and the varied needs of individual students, there is no single best way to use OSP. However, we believe there are several OSP behaviors that are broadly beneficial based on how the product is designed, data elements available, and prior research concerning the effectiveness of test preparation strategies. These behaviors constitute a working operational definition of best practices, not a comprehensive definition. In this study, we operationalize three best-practice behaviors on OSP:

1. **Leveling up skills**: As students progress through OSP material, they can achieve new levels in the skills they practice. Overall, leveling up provides a signal that students are consistently advancing in content tested on the SAT and is a marker for learning progress on OSP. This best practice also helps students learn how to monitor their progress.

2. **Taking a full-length practice test**: Taking a full-length practice exam simulates the real test experience and helps students see what they do and don’t know. There are eight full-length online practice exams available on OSP, which can be taken in one sitting or over time.

3. **Following personalized practice recommendations**: OSP provides personalized practice recommendations based on a student’s current skill level and the relative frequency with which skills are tested on the SAT, prioritizing frequently occurring skills that the student has a low level on. Following practice recommendations helps students stay focused when they study and work on areas where they most need to grow.

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\(^{1}\)The SAT Suite of Assessments (i.e., SAT suite) comprises the SAT, PSAT/NMSQT, PSAT 10, and PSAT 8/9
Analytic sample

Participants in this study were students in the 2019 US high school graduating cohort who met the following three criteria: 1) took a PSAT/NMSQT assessment in October of their junior year 2) took a subsequent SAT prior to graduating (either during junior or senior year), and 3) linked their Khan Academy and College Board accounts. A total of 1.3 million students took a PSAT/NMSQT assessment in October of their junior year, prior to taking the SAT. Of those 1.3 million students, 545,640 linked their College Board and Khan Academy accounts. The linked sample reflects 25% of the full population of SAT takers and 42% of the population of students who could have used OSP after their PSAT/NMSQT assessment. The linked sample is demographically similar to the full population of test takers.

Results

In this study, we first descriptively explored different OSP usage patterns. Students’ practice time was generally concentrated within the two months before their SAT test date. Approximately 10% of students spent six or more hours or completed a best practice on OSP. We found moderate positive bivariate correlations between spending six or more hours and each of the other best practice behaviors. On the surface, this is not surprising since those best practice behaviors require time. However, it is important to emphasize the moderate nature of this relationship. Indeed, many students who spent six or more hours on OSP did not engage in any of the best practice behaviors. Conversely, many students engaged in the best practice behaviors without spending six or more hours on OSP.

In order to associate the use of OSP with test takers’ SAT performance, we analyzed OSP usage by students between their PSAT/NMSQT and first SAT. We found that students who spent six hours of practice on OSP scored 21 points higher (.11 effect size) on the SAT than students who did not use OSP (see Figure 1). This trend holds true across student demographics including gender, race/ethnicity, and level of parental education.

We extended our previous work by examining meaningful student behaviors—the best practices described above—while engaging in time learning on OSP. As in our previous analyses of OSP, we see that more time spent on OSP is associated with higher scores on the SAT. Yet, how students spend their time really matters. Roughly 8% of students spent six or more hours on OSP and completed a best practice on OSP. These students scored 39 points higher on the SAT than students who did not use OSP (see Figure 2). This trend holds true across student demographics including gender, race/ethnicity, and level of parental education.

While engaging in best practice behaviors is associated with improved performance, students varied considerably in their use of these behaviors. Indeed, the majority of students in our sample did not engage in any of the best practice behaviors.

Moreover, some differences in student background, household, and demographics are associated with a greater likelihood of engaging in a best practice behavior. It is also important to note that these between-group differences are small in empirical magnitude and do not manifest as meaningful differences among groups in terms of their benefits from using OSP. While these demographic characteristics predict behavior, they are likely rough
indicators of other factors, such as guidance received—or not received—about what good practice looks like. As a whole, these results signal that more work is needed to point students to best practices and motivate their usage across the platform. College Board and Khan Academy will work diligently with our partners across the country through programmatic supports and platform refinements in coming years to ensure all students can follow these best practices.

**Conclusion**

Our findings suggest a positive and significant relationship between OSP usage and SAT achievement. However, how students spend their time on OSP matters. We found greater SAT score improvements when students used OSP for six or more hours with one best practice. Given the correlational research design, we cannot conclude that OSP usage specifically caused these results or know if these results generalize beyond the participants in this study. There could be factors that we were unable to account for in our analyses that may be contributing to these differences. Despite this limitation, the data associating best practices with score increases are promising. However, we need more research on implementation to ensure that when best practices are used more broadly, the associations remain as strong. Further research will help to build our understanding of student progress, any differences in adoption of best practice behaviors, and how supports such as school-day implementation and educator tools can help keep all students engaged and on track.

In the ever-evolving educational landscape, it is our hope that sharing and continuing this research on the evidence for best practices of OSP use can make a difference for the millions of students who use the platform on their path to college so that they can make the most effective use of their time on OSP and ultimately succeed in their SAT efforts.

**Want to learn more?**

This research brief provides an overview of high-level findings from our observational study on the use of Khan Academy Official SAT Practice and SAT Achievement. A more comprehensive technical report with additional details is available at [http://khan.co/OSP Tech Report 2020](http://khan.co/OSP Tech Report 2020)