

The Use of Test Scores in Undergraduate Admission
White Paper

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Overview of the admissions environment

The test optional movement is not new. Test optional has been around since 1990's (Belasco, et. al. 2015). Regardless of the move to test optional, studies of the institutions that have implemented test optional policies have not demonstrated any significant differences in the demographics of enrolled students as a result (Belasco et al., 2015).

Most recently, there has been a resurgence in the conversation around test optional policies in admissions. As a result a number of institutions have moved to test optional policies for a variety of reasons. Reasons most commonly cited by these institutions are for access, diversity and student success.

Institutions like the University of Chicago, who launched a test optional policy in 2018, communicated their intent to broaden the representation of their student body by allowing students to choose to apply with or without a test score. Their already highly selective applicant pool found that a small portion of their pool chose not to submit test scores. These students, however, had test scores and in almost all cases those scores would have made the student eligible for admission (J. Nondorf, personal communication, January 29, 2020). Additional selective institutions have reported similar behavior in the applicant pools. Test optional applicants, in many cases, have test scores, they simply opt not to submit them. The result then is not a broadening of the applicant pool to include those who have not taken a test, but rather to include applicants who would prefer not to report their scores.

There are multiple purposes/incentives for an institution to choose to become test optional. First, some institutions report moving to become test optional in order to diversify their student body. This, as previously stated and shown in multiple research studies does not appear to be realized by many of these institutions. Second, an institution may choose to become test optional in order to eliminate the reporting of scores for students who have lower test scores. As evidenced by research (see here) the greatest effect of test optional policies is that students with lower test scores chose not to submit their scores. If these are not submitted, the school no longer reports those scores thus artificially improving the institution's academic profile and potentially the rankings. U.S. News allows institutions to report no test scores for up to 25% of the enrolling class before the institution takes a point penalty in the rankings.

A recent example of a test optional policy gone awry was documented in the New York Times article *The Impossible Math of College Admissions* written about Trinity College. Trinity implemented a test optional policy only to discover that the only real way for them to achieve the diversity goals they sought was through engaging with consultants who utilized financial aid optimization in order to refine who was admitted to Trinity. The end result had more to do with consultants and financial aid packaging than the test optional policy.

Finally, the most recent reason for an institution implementing new test policies is a result of political pressure on the institution when like peers become test optional. The follow the leader reaction appears to be an ever more emerging trend across all types of institutions. The “followers” in many of these cases are doing so less for enrollment goals than for political positioning in a volatile admissions market that has become hostile toward standardized testing in general.

It is important to understand that there are a wide variety of test policies being enacted by institutions. The most common is the traditional test optional approach which allows the student to choose whether or not to submit a score when applying. In most cases students are not penalized for not submitting a test score. However, there are institutions now implementing limited test optional policies which prohibits students who apply without a test score from being considered for selective, high-profile majors.

Additionally, some institutions like NYU, have moved to the test flexible, which requires a student who chooses not to submit a test score to submit alternate academic or testing evidence. Finally there is the test blind, which means that regardless of whether or not a student submits a test score, it cannot be utilized in the admissions review process. Institutions adopting test blind policies are typically those who are moving toward open enrollment as a means to shore up declining enrollment trends. Northern Illinois University was one of the most recent to announce a test blind policy after multiple years of declining enrollment.

As the number of high school students graduating across the U.S. continues to decline, extreme tactics to achieve enrollment will be increasingly common. Some believe that the test optional movement is one to appear more “friendly” to families. However, the question remains as to how this might limit an institution’s ability to support academic success of the students who do not supply test scores.

Furthermore, increasing concerns about equity are developing as a result of the limited test optional policies, which eliminate the opportunity for students to be considered for all majors/programs if they do not submit a test score. The challenge with institutions implementing these policies is that they are not transparent. Institutions are not publicly sharing with students what majors/programs are not available to them if they chose to apply test optional. Rather, these are implemented behind the scenes and further disadvantage the same students that the test optional policy is said to support. Such policies undermine access for students who are not aware of the implications of their choice while in the application process.

The subsequent institutional issues that arise from these various test policies are seen in the units working to ensure student success. Standardized test scores, most specifically the math sub-score, is highly predictive of a student’s ability to perform in college level calculus. In the absence of a test score, and lacking full understanding of every high school’s strength of curricula placing a student and

supporting their success becomes increasingly challenging. In the case of lower ranking institutions whose aim is to increase applicants and increase enrollment through their test policies, Northern Illinois University as a recent example, may now face retention, persistence and overall student success challenges in the absence of strong academic predictive data.

The SAT was long referred to as an aptitude test. However, in recent years the SAT has been completely re-tooled to be an achievement test and has moved away from the terminology and work as an aptitude test. In rebuilding the SAT, the College Board mapped the test to assess those skills most necessary for first year of college success in math, reading and writing skills. Furthermore, the College Board established a relationship with Khan Academy that allows students to take practice SAT exams, follow test preparation content and upload official SAT and PSAT results into Khan Academy for test help. Khan Academy is free to all students and was part of an effort by the College Board to eliminate high cost, high stakes test preparation as an advantage to high income students.

The ACT has also rebuilt the exam and in 2019 announced that they would allow students to retake specific sections of the exam rather than having to retake the entire test. ACT has also acquired a number of entities, aiming the organization to be better at data analytics and supportive use of the test scores beyond admission purposes.

Review of test validity

Research behind test validity is not new. Both the College Board and ACT conduct extensive validity studies across all types of participating institutions in an effort to better understand and articulate the nature of the test's predictive ability. Purdue annually participates in validity studies tracking the predictive validity of all admissions measures in combination with test scores and without. As a selective institution with a competitive academic profile, it is critical to Purdue to understand a student's academic ability when enrolling them as a student. The role the test scores play in admissions review is central to making an informed admission decision.

There are several ways in which a test score can be utilized in a review of an application for admission. First, if the test score and high school GPA (HSGPA) are not discrepant, then the test score, and the sub-scores can be reviewed to support what is understood from high school coursework and performance. Second is if the test score and HSGPA are discrepant. For instance, if the HSGPA is higher and the test score lower by at least one standard deviation, students are more likely to have discrepant performance. A reviewer must then assess which measure is more indicative of college performance and how will that impact align or not with that student's choice of academic major aspirations.

While the SAT and HSGPA independently predict first-year performance, combining these measures provides a 15% boost in predictive power over using HSGPA alone (National SAT validity study). This

predictive combination strengthens the use of both HSGPA and test score in the admissions review process.

Example:

Students from low income school districts with little or no college preparatory coursework, may exhibit high HSGPA. However, the corresponding test score, and sub section scores, may not support the HSGPA evidence. In cases such as this, if this student's academic interests fell into the STEM realm, the math sub-section data from the test would be essential to understanding the student's relative predicted performance in college level calculus.

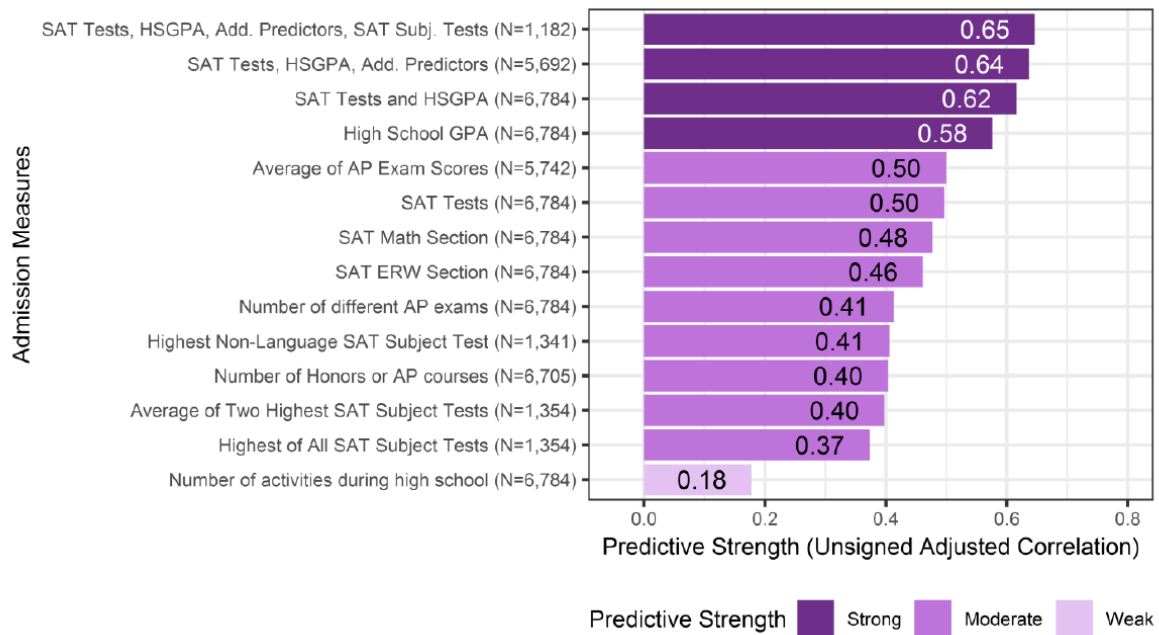
Evidence:

HSGPA predictive strength is .58, when SAT (provided through the validity study) is added that rises to .62. While this increase may not appear large at first, as other factors are added as part of the holistic review the overall predictive validity rises to .65. HS GPA alone is a good predictor of success (in this case first year GPA being the definition of success), but when HS GPA is combined with SAT (and possibly other predictors such as number of AP exams), we see additional gains in the predictive strength of the combined measures, indicating that there is value in considering both measures when evaluating students for admission.

The reason that there is only a small ($0.62 - 0.58 = 0.04$) gain in predictive strength when you add in SAT scores is partly because of multicollinearity between the two variables. There is some overlapping qualities that the two variables are measuring. ACES Admissions Validity Study for Purdue University (p.9) "When you look at the graph, you may find that some of the individual measures with strong correlations do not appear to contribute as much as you might expect to the strength of the prediction when combined with other measures. This is because the measures may overlap with regard to what they are measuring – for example, the HS GPA and the SAT scores measure some, but not all of the same academic abilities."

Figure 1.

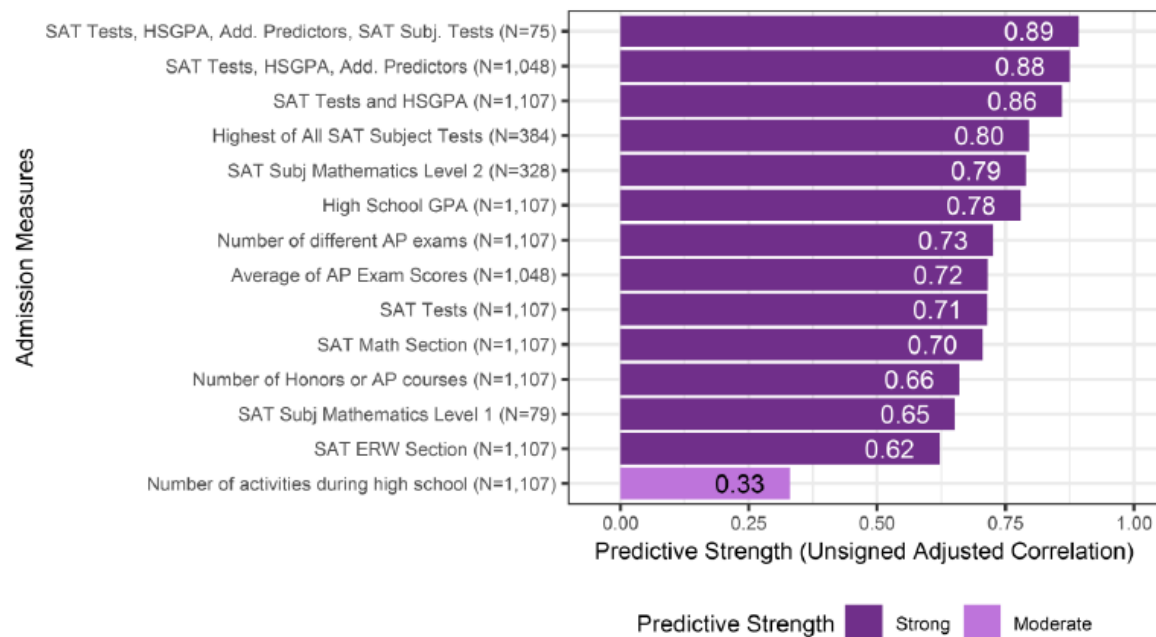
Predictive strength of admissions measures across all applicants and all majors



When validity is assessed for STEM majors, for example here Engineering, the predictive strength of SAT tests is even stronger. Thus supporting the critical need for test score data in predicting a student's potential performance in their first year.

Figure 2.

Predictive strength of admissions measures across Engineering applicants



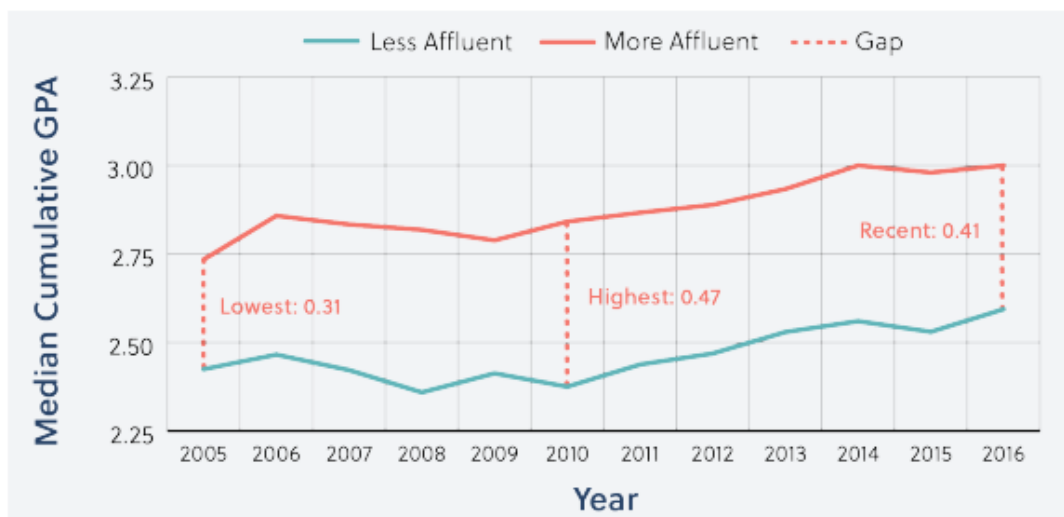
In addition to the validity studies conducted by both testing entities, the University of California system recently conducted an in-depth review of the use of test scores in admissions. The review was entirely conducted and authored by faculty across the UC System. The results of their findings resoundingly support the critical need for test scores as an informational element in the review of applications for admission.

High School Grade Point Average

Furthermore, many studies on the grade inflation across high schools in the US, shed more light on the significant variability that high school GPA might represent in a review of academic credentials (NCES, 2004). As shown below, between 1998 and 2016, when SAT scores remained relatively flat, high school GPA, conversely showed a steep increase over time. These steep increases in high school grades are not equitably distributed across all schools. “From 2005 to 2016, more grade inflation occurred in schools attended by more affluent youngsters than in those attended by the less affluent” (Gershenson, 2018, p. 6).

Figure 3.

HSGPA increases at higher rates in more affluent schools



Note: Less affluent schools are defined as those with more than 50 percent of students eligible for free or reduced-priced lunch; more affluent schools have less than 50 percent.

Rampant grade inflation in K-12 is leading to grade compression where by the distribution of grades is narrowing over time. This results in many more students with a 4.0 GPA but also makes an “A” grade less meaningful. The narrowing distribution diminishes the predictive nature of high school GPA (HSGPA) making it less reliable as an evaluation instrument. (Fordham Institute). Therefore, the use of HSGPA and test scores combined is necessary in more accurately predicting a student’s first year college GPA. In the absence of test score evidence inflated HSGPA will over-predict first year performance, leading to incorrect student placements and potential declines in retention and persistence. Thus, elimination of test scores in the admissions process, and over-reliance on HSGPA could cause even greater inequities for some students. Given that grade inflation is not parallel between more and less resourced schools/families, this will disproportionately advantage already well-resourced students who attend high school where they are savvier, and have increased the GPA of students over time.

Admissions Review and Context

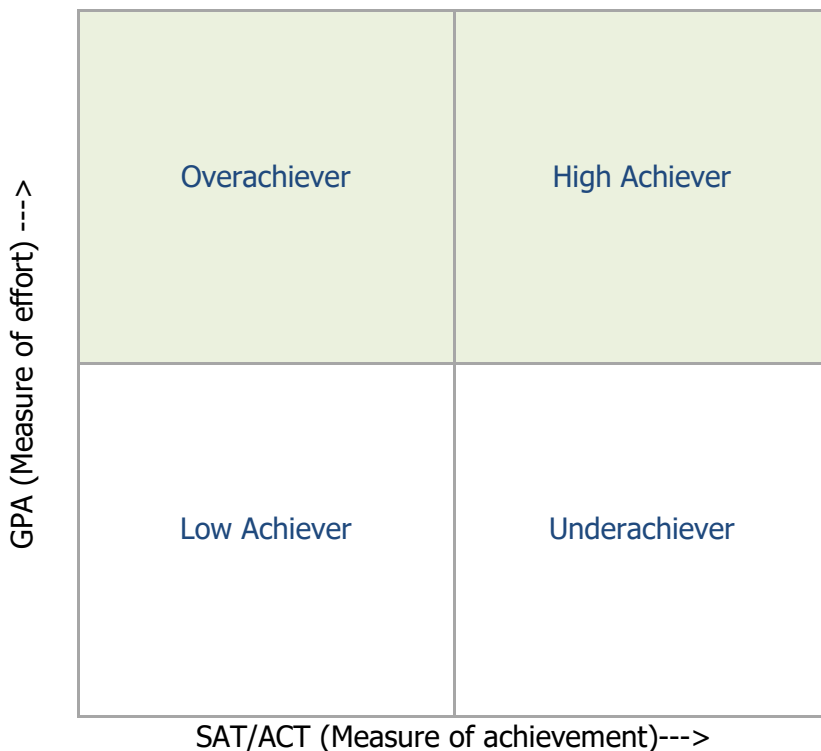
The use of test scores in admission review is never utilized to penalize or disadvantage students in any way. Rather, the test scores are an additional quantifiable data element in a comprehensive admission review. Test scores serve to compliment the high school GPA when understanding a student’s academic achievement in order to place them for the greatest opportunity for success at Purdue.

The holistic review process utilized at Purdue means a comprehensive evaluation is conducted such that that no applications are filtered out of review based on test scores or HSGPA floors. All applications are reviewed fully and assessed for first the eligibility and second for their competitiveness for the selected major. Therefore there is no single factor that determines whether or not a student is offered admission, but rather the evaluation of the entire context of their submitted application documentation which informs that decision.

Since SAT and ACT are more measures of achievement (present and future) or aptitude to be assessed and GPA is more of a measure of applicant's cumulative effort during high school or the applicant's resilience/persistence (Ralston et al., 2017), it stands to reason that both are vital at predicting postsecondary success. The two metrics are different measures that in combination predict success. Relying solely on one measure would be painting an incomplete picture of the applicant. Not having a complete picture, may be a disadvantage to the applicant if they are unable to succeed at our institution. The 2x2 below shows how these two measures work together to create a more complete picture of the applicant.

Figure 4.

Measure of effort and achievement as a combination of HSGPA and Test Score



Purdue admissions has also begun to incorporate the use of a new tool called Landscape into the evaluation process. The recent creation of Landscape allows reviewers to understand even more deeply the economic divides that happen in our students' lives. It is not a tool, again, that can ever disadvantage a student. But rather, Landscape provides a view not of the student themselves, but a snap shot of the neighborhood and school data based on national databases that are publicly available. While not an assessment of a student themselves, it offers a contextual view into the environment in which a student may have undertaken both their personal and academic lives.

Due to the fact that context matters, and environments, both school and home, play a role in a student's academic life, Landscape is critical to utilizing any test score provided with a better contextual understanding.

EXAMPLE:

If a student has provided an SAT total test score of 1190, but the Landscape data shows that the school average total SAT is a 1050, there is a much better understanding of this student's performance relative to their school environment. That is not an end all, be all, measure but this understanding mitigates the incidence of comparing this test score to that of a student in a well-resourced environment with a much higher average total score.

Unlike the use of GRE/GMAT in graduate school, there are fewer resources for students to supply to support academic achievement documentation at the undergraduate level. Graduate school applicants are able to supply academic papers, documentation of involvement and productivity in research, as well as references from respected professors which support their application. Undergraduate applicants do not have these same resources nor would they represent the caliber necessary to evaluate a student should like items be incorporated. Furthermore, with nearly 56,000 undergraduate applications for admission, reviewing scholarly papers and research studies submitted from students would significantly burden the process and opens the process up for a great deal of subjectivity.

Other uses of test scores

Some, but not all, scholarships both at Purdue and external to Purdue utilize test scores as an academic criteria when awarding scholarship funds. A change in admission criteria which could result in applicants choosing not to submit a test score may also render that applicant in-eligible for some scholarships.

Additionally, due to the highly predictive nature of the sub-scores of the standardized tests, the math section is frequently utilized for math placement purposes. The absence of standardized test scores would invariably increase the workload and cost of assessing the math level of incoming students and

could also increase the error rate of placements. The potential negative impact on student experience in their first Purdue math course could have multiple ramifications including student satisfaction, persistence and retention.

Purdue Retention and Graduation by Test Score

The predictive nature of test scores do not end with a student's predicted first year GPA. When assessed across multiple years, it is evident that test scores are predictive of retention and graduation at Purdue.

Table 1.

First year Purdue West Lafayette retention rates for students from 2014 through 2018 by SAT and concorded ACT score bands.

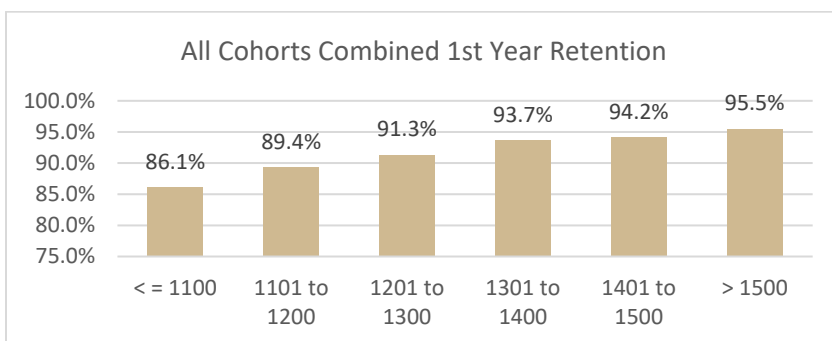
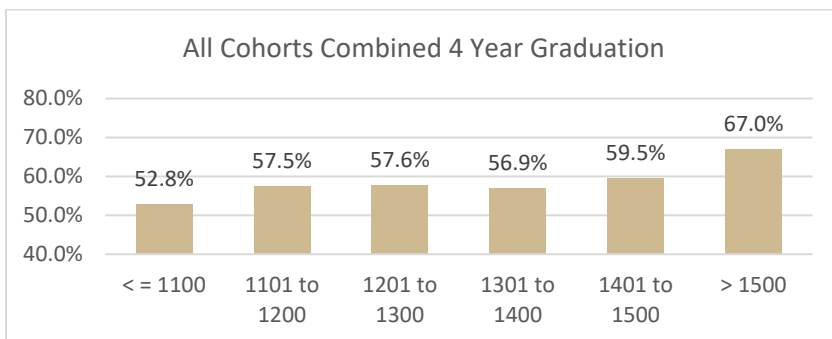


Table 2.

Four year Purdue West Lafayette graduation rates for students from 2011 through 2015 by SAT and concorded ACT score bands.

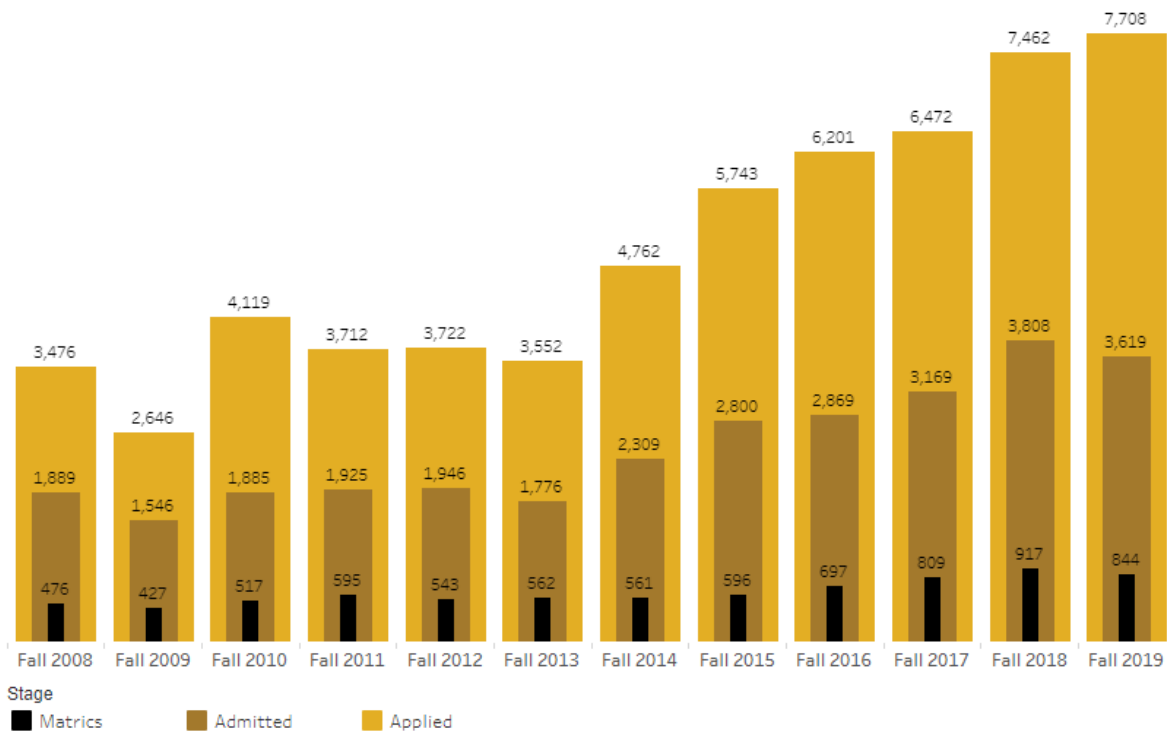


The charts above provide statistical evidence of the strength of test scores in predicting student success. This is meaningful not only for the admission process, but also for further understanding which students might benefit from additional academic support early in their academic studies.

Diversity in Purdue Undergraduate Enrollment

Table 3.

Undergraduate Underrepresented Minorities – Applications, Admits and Matrics



Applications from underrepresented minorities have increased over time, especially in the years following the adoption of the Common Application (2014 and beyond). From Fall 2014 to Fall 2019, we saw an increase of 2,946 URM applications. That is an increase of 61.9%. During that same time period, there was an increase in admits and matrics, though not always a year over year increase. Admits increased by 1,310 or 56.7% and matrics increased by 283 or 50.4%.

It is important to note that the gains in underrepresented (URM) enrollment represent larger increases than the projected demographic increases published by WICHE's Knocking at the College Door (2016). By comparison, WICHE projected an increase of URM high school graduates of 9% for the Midwest and 25% for Indiana (Dashboards, Percent Change in Graduates: <https://knocking.wiche.edu/percent-change-in-graduates>). Granted, this is not an apples to apples comparison considering that these were projections based on 2001 to 2013 actuals and this does

not consider the quality of those high school graduates—whether they would be admissible to Purdue or not. Nevertheless, an enrollment increase of 50.4% vastly outpaces any projected demographic growth of these same populations.

Conclusion

When reviewing all of the aspects that surround both the use of standardized tests in admissions and the institutional motivations to develop test optional policies it is evident that it would not benefit Purdue to adopt any related policies that change the use of standardized tests in the admissions process.

While proponents of the movement argue that tests are bad, and that the test preparation industry creates disparities in access, their arguments find weak ground to stand on. With the advent of Khan Academy, free for all students, to prepare for the tests, the emergence of Landscape to assess test scores in context, and the increasing inflation of high school GPA's, it seems there are increasingly more arguments in support of the value of test scores than against.

Many struggling institutions have moved to test optional policies, Purdue is fortunate to have not struggled as so many have to fill the new enrolling class. Although these successes are not a given, all information and resources available must be utilized to continue to help Purdue recruit the best, the brightest, and the appropriate numbers of students. The horizon of the college admissions recruitment arena will become ever more competitive as struggling institutions become more desperate to fill their seats and maintain financial viability.

If the question for Purdue is around increasing diversity, perhaps test optional is not the only avenue to achieve the means. While early in the process, efforts to establish a network of Purdue Polytechnic High Schools throughout the state in underserved areas, could support the construction of a pipeline of students to Purdue that have not previously been in pursuit of four year post-secondary degrees. Furthermore, partnerships such as that which was recently announced between Modern States/Klinsky Foundation and Purdue also aims to reach students with little to no access to college preparatory academic course work and provide them with a pathway to post-secondary studies. These efforts and many more which might yet be on the horizon provide methods to build pipelines of diverse students for Purdue without requiring the institution to implement admissions policies which could have negative impacts once the students arrive.

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