

I GET YOU: SIMPLE TOOLS FOR UNDERSTANDING YOUR STUDENT POPULATIONS AND THEIR NEED TO SUCCEED

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College admission typically requires students to present their high school GPA and a standardized score, such as ACT or SAT. High school GPA is usually attributed to students' cumulative effort during their high school career and is often used as a measure of resilience. The ACT score allows students' aptitude to be assessed. Contemporary admission practices, however, often rely on a combination of scores that allow ranking a potential student and viewing them as a high- or low-potential based on a single number. While such practice is efficient for making quick admission decisions, it is detrimental for identifying students' particular needs while in college. Such students with academic challenges may require help understanding the subject matter, while students who lack essential study- or time-management skills may require assistance emphasizing the behavioral component of being in college. Lack of a simple way to estimate potential challenges within the populations comprising the student body often results in treating the population that doesn't necessarily need help and overlooking the segments that may require extra or a different type of attention. To quickly understand the differences in student population, a tool was developed that parcels an incoming cohort into four achievement quadrants: low achiever, high achiever, over-achiever, and underachiever. This study explores the usability of this tool in determining at-risk population, and understanding behavioral differences and reported academic needs for intervention design.

Introduction/Rationale

Student success is consistently the hottest topic in higher education; while colleges and universities do their best to bring in fully capable new classes and retain those who are already on campus, equally rigorous attempts are made to ensure that every one of those students has a successful and meaningful tenure while pursuing their degrees. That is why universities do their best to stay continuously attuned to student academic, financial, and behavioral needs in order to enhance their probability of succeeding.

A highly discussed and continuously researched area, student success is viewed as a multidimensional concept that is predicated on academic readiness as well as personality factors, such as aspirations, perseverance and interest, and is affected by a variety of socioeconomic and demographic variables (Adelman, 2006; Allen, 2013; Kyllonen, 2005, 2012; Mattern, Patterson, & Wyatt, 2011). Existing research operationalizes student success as a combination of the first-year GPA and fair progress toward degree assessed through retention, fulfillment of degree requirements and graduation (Bowen, Chingos, & McPherson, 2009; Saupe & Curs, 2008; Sawyer, 2013). In order to measure student success before graduation, student success is operationalized in terms of sequential metrics, such as first-term and first-year GPA, and one-year and subsequent retention. Graduation serves as an ultimate marker of success. The existing body of research indicates that collegiate GPA is closely related to levels of retention; studies show that first-semester and first-year GPA create a baseline, predictive of student retention and graduation (Bowen et al., 2009). Additional findings suggest that a first-term GPA below 2.0 is indicative of higher withdrawal rates after the first year (Ishitani, 2008; Murtaugh, Burns, & Schuster, 1999).

Student success is influenced by multiple factors. Existing research points out that academic or cognitive factors, such as students' ability to comprehend and retain the academic material as well as students' initial levels of readiness/preparedness, play a significant role in students' ability to succeed (Burton & Ramist, 2001; Mattern, Patterson, Shaw, Kobrin, & Barbuti, 2008; Mattern et al., 2011; Wyatt, Kobrin, Wiley, Camara, & Proestler, 2011). Wyatt et al. (2011) find that students who meet the benchmark for a standardized test score

(SAT) associated with a probability of a student earning a B– or higher during their first semester of college tend to not only to be more likely to enroll in college, but also retain, take more core curriculum and rigorous courses, as well as receive higher grades in college. Similar findings are associated with ACT college readiness benchmarks (Allen, 2013) and indicate a higher probability of receiving a higher college GPA, retaining, and graduating for students who meet such benchmark. In addition to the cognitive factors, an array of other noncognitive factors has an equally important effect.

Noncognitive factors are represented by several broad groups describing the multiplicity of aspects that define unique ways students will experience college. For instance, demographic indicators include gender, ethnicity, age, and geographic location; economic indicators include socioeconomic status (SES), financial need, and first-generation status (Adelman, 2006; Geiser & Santelices, 2007; Zwick & Himelfarb, 2011); personal factors are defined by self-efficacy, interest, motivation and resilience, and engagement, including extracurricular engagement history as well as plans for cocurricular activities on campus (Kyllonen, 2012; Schmitt, 2012; Woosley & Shepler, 2011). Adelman (2006) also notes the importance of aspiration and anticipation as a measure of future orientation and success. While the effectiveness of such biodata is often debated due to their self-reported nature, the existing body of research points out that demonstrated and planned engagement (measured by participation in student clubs and organizations, taking part in leadership activities, and socializing with peers) is associated with retention, performance, and career orientation (Kyllonen, 2012; Schmitt, 2012). Faruggia, Han, Watson, Moss, and Bottoms (2016) suggest that students with low scores on noncognitive measures require an early intervention to facilitate their subsequent success in college.

A subset of contemporary studies of student success argue that, controlling for demographic and economic factors, it is a combination of student ability and perseverance that ultimately leads to their walk across the stage (Sawyer, 2013; Westrick, Le, Robbins, Radunzel, & Schmidt, 2015). Ability is viewed as student natural capacity to learn, exposure to multiple systems of knowledge, readiness for higher level work,

and academic preparation. Perseverance refers to a combination of motivation and persistence that is oriented toward completion of long-term goals.

Literature Review

ABILITY

Student ability is viewed as one of the core metrics predicting student success. Composed of cognitive characteristics such as general aptitude and grounded in one's exposure to various systems of information and knowledge as well as a certain level of preparedness, it provides a starting point for future academic achievement.

Research notes that prior knowledge of or familiarity with content of a subject helps improve students' performance and cognitive abilities (Carstens & Beck, 1986; McCormick & Pressley, 1997). Thompson and Zamboanga (2004) make a distinction that, while being independent from the sheer aptitude, prior knowledge facilitates new learning. Researchers, however, make a point that reliability and validity of the prior knowledge is essential, as having a wrong baseline (or prior knowledge that is incorrect) has the opposite effect obstructing potential progress (P. A. Alexander & Judy, 1988; Dochy, Segers, & Buehl, 1999; Fisher, Wandersee, & Moody, 2000).

Studies point out that measures of aptitude and ability are strongly associated with the first-year GPA and retention in college (Burton & Ramist, 2001; Kobrin, et.al. 2008; Mattern et al., 2008). Preexisting differences in students' aptitude and ability are shown to influence the outcomes in course exams (Thompson & Zamboanga, 2004)

Student ability, with respect to their academic achievement and college success, is commonly measured by results of the standardized precollegiate test scores, such as ACT and SAT, both composite and subject sub-scores. ACT composite score, a typical college admissions metric, is designed to provide insight into students' academic ability and their achievement in college preparation classes (ACT, 1997; Goldman & Hewitt, 1975; Noble & Sawyer, 2004; Sawyer, 2010, 2013).

PERSEVERANCE

Student perseverance of effort along with consistency of interests is frequently addressed in terms of "grit"—a

label pioneered by Duckworth (Duckworth, Peterson, Matthews, & Kelly, 2007). Grit is defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007, p. 1087). Contemporary literature suggests resilience or perseverance as more well-suited labels (Credé, Tynan, & Harms, 2016), since the construct involves interaction of multiple factors, such as one's ability to follow through on a goal regardless of obstacles. It tends to be conceptualized as perseverance of effort, consistency of interest, motivation, and commitment to long-term goals (Credé et al., 2016; Duckworth et al., 2007; Krampe & Ericsson, 1996).

Studies of student perseverance reveal that people who persist appear to be less distracted by short term goals and setbacks and often achieve high performance by consistent practice for the sake of reaching expertise on well-defined tasks (Krampe & Ericsson, 1996; MacNamara, Hambrick & Oswald, 2014). Arouty (2015) notes that resilience is a strong predictor of one-year retention in college. Bowman, Hill, Denson, and Bronkema (2015) found that levels of resilience predicted increases in college GPA over time. Finally, in her pivotal study of grit, Duckworth highlighted that undergraduates at an elite university who scored higher in grit earned higher GPAs than their peers, despite having low SAT scores (Duckworth et al., 2007). Wentzel (1989) notes that GPA is positively related to concerted efforts to be a successful student, which amounts to being dependable and responsible, understanding things, doing one's very best, and getting things done on time. These findings are later confirmed by Nofle and Robins (2007), who state that conscientiousness was the strongest predictor of both high school and college GPA, as well as by Hough and Oswald (2008), who, in their study of organizational behavior, find that, controlling for cognitive ability, conscientious behavior is associated with high performance as well as organizational leadership. In their reexamination of grit, Credé et al. (2016) also highlight the importance of conscientiousness as an important component of perseverance and success. Kyllonen (2005, 2012) emphasizes the importance of noncognitive factors in predicting college readiness and success especially for students from first generation or low socioeconomic background who are underprepared academically (reflected in a

combination of high school GPA, standardized test scores, and coursework).

The relationship between grit and academic success has been widely debated. One view is that grit predicted academic achievement-related outcomes such as GPA and retention in the contexts of military and elite universities (Duckworth et al., 2007; Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014). In a study examining the impact of grit on the academic success of Black male collegians at predominantly White institutions, it is also revealed that grit predicts college grades after controlling for background traits and prior academic achievements. However, a recent meta-analytic study (Credé et al., 2016) found that only a moderate, rather than strong, relationship exists between grit and academic success. This study also highlighted that a student's perseverance of effort is a better predictor of academic performance than consistency of interests, which coincides with Bowman and colleagues' (2015) finding that perseverance of effort predicted increases in college GPA over time. As such, high school GPA could be viewed as an acceptable measure of student perseverance of effort. Despite the possible difference in grading scale and curriculum, high school GPA demonstrates the cumulative effort exhibited by a student over time and under the conditions where not every subject matter or activity are perceived as equally interesting, motivating, or important. Students' ability to sustain a high level of GPA in such situations is considered indicative of a certain degree of persistence, although it is important to also note that GPA contains a certain measure of academic ability as well, as it would be impossible to achieve high GPA without mastering the subject matter as well as behaviors that lead to the mastery (Goldman & Widawski, 1976; Noble & Sawyer, 2004; Stiggins, Frisbie, & Griswold, 1989). In their study of multiple student cohorts, Geiser and Santelices (2007) demonstrate that, controlled for SES and parental education, high school GPA remains a highly predictive indicator of student collegiate GPA and graduation.

MAP-WORKS VARIABLES

Making Achievement Possible (MAP-Works) is a web-based program to assess students' earliest college experiences, expectations, and behaviors, to assist

faculties and professional staff in guiding students toward academic success (Woosley & Jones, 2011). MAP-Works identifies at-risk students early in the term, allowing students who have difficulties to receive early interventions smoothing the transition from high school to college (Woosley & Jones, 2011). Universities such as Ball State, Iowa State, and the University of Illinois, which utilized MAP-Works, have reported an increase in student retention rates (M. W. Alexander, Woosley, Truell, & Zhao, 2010). The MAP-Works instrument mainly focuses on factors under three categories: academic integration (e.g., academic self-efficacy, academic behavior), self-assessment (e.g., communication skills, time management, self-discipline), and social integration (e.g., homesickness, peer connection) (Woosley & Shepler, 2011).

BENEFITS OF COMBINED MEASURES

Both high school GPA and ACT scores are widely used in college admissions as measures that provide a stable baseline for a student's potential success in higher education. While each measure taken individually allows for some understanding of student potential, using the two combined presents a more compelling and multifaceted assessment of their ability to achieve.

For instance, Westrick et al. (2015) found that measures of ability coupled with measures of student interest allow for full assessment of student academic performance, persistence, and success. Earlier studies (Noble & Sawyer, 2004) demonstrate that prediction of moderate levels of college GPA (e.g., 2.0) based on high school GPA are more accurate than predictions based on ACT scores, while prediction of high levels of college GPA (e.g., 3.0) based on ACT scores are more accurate than predictions based on high school GPA. This finding emphasizes the difference in scope of concept measurement captured by each score and highlights the necessity for looking at measures in conjunction (Sawyer, 2013). Atkinson and Geiser (2009) highlight the primacy of the high school GPA in predicting collegiate success, but indicate that predicting later collegiate performance is best by combining high school GPA with SAT scores. This finding is echoed in a later study by Zahner, Ramsaran, and Steedle (2014).

Purpose of the Study

Using high school GPA and ACT scores as key metrics for college admission is a common practice among public universities across the country. While colleges bring in students who fit the general requirements and are interested in continuing their journey on campus, it should not be assumed that all students will have the same educational experience: the differences in their ACT and GPA scores, and their reflection on students' levels of resilience and ability ensure internal diversity that might not be instantly apparent.

Existing research points out that the two measures tell part of a story regarding student achievement potential, and, taken together, they complement each other and allow for deeper and more specific insights into student ability and resilience. Understanding the usability of these metrics beyond mere admission practices can allow higher education researchers and practitioners to investigate multiple dimensions of student ability and resilience and leverage the information to help improve student success and enhance student experience on campus.

This study originated from an internal applied project concerning the high failure rates (i.e., volume of D, F and W results) in a number of undergraduate courses. Examining grades in conjunction with the type of course did not provide conclusive results, and the question of failure rates being the outcome of student performance versus a pedagogical phenomenon remained open. However, examining the failure rates while taking into account the combinations of student ACT and high school GPA scores revealed a more interesting story:

Using a combination of average ACT and high school GPA scores resulted in four quadrants describing students based on their perceived achievement potential: low achiever, high achiever, overachiever and underachiever.

Using the mean score for the incoming class, four achievement categories were produced. Students with high school GPA and ACT below average were placed in the Low-Achieving category, while students with both scores above average were dubbed High Achievers. Students with an above-average GPA and below-average ACT were placed in the Overachiever category,

Figure 1. Student Potential: Achievement Groups

Achievement Group		HS GPA	
		Below Average	Above Average
ACT	Below Average	Low Achiever	Overachiever
	Above Average	Underachiever	High Achiever

and those scoring below average GPA and an above-average ACT were grouped in the Underachiever category (Figure 1).

Using student quadrants as separate variables allowed for quickly separating the courses experiencing the high failure rates due to level of academic preparation from those with potential issues with content delivery. The simplicity and usefulness of this tool prompted further inquiry into the quadrant metric, resulting in this study.

The purpose of this study is to examine whether the quadrants created through the combinations of high school GPA and ACT scores, indeed, capture the differences in student abilities and behaviors that are otherwise hidden from view, yet are indicative of student performance and challenges that students might experience on their path to success on a university campus:

Research Question 1: Are there differences between student success metrics across the four achievement quadrants?

1a: Are there differences in first semester GPA across the four achievement quadrants?

1b: Are there differences in retention across the four achievement quadrants?

1c: Are there differences in graduation rates across the four achievement quadrants?

Research Question 2: Are there any differences between student MAP-Works Variables across the four achievement quadrants?

2a: What are the differences in student precollegiate engagement across the four achievement quadrants?

2b: Are there differences in academic and college-related behavior across the four achievement quadrants? What are these differences?

Answering these questions will help to establish validity for this approach and lay the groundwork for further, more rigorous research into a full validation of this approach. In the meantime, conducting an

exploratory analysis of student achievement groups and their innate differences may provide a practical tool for gaining a quick insight into the incoming population. This tool can aid academic practitioners in proactively identifying students in need of help, as well as identifying the type of help they may require.

Methodology

This study uses data collected from the offices of Admissions, Registrar, and Financial Aid of a large Midwestern university. The data include U.S. domestic full-time students who enrolled as first-time freshmen between the fall 2008 and fall 2015 terms ($N = 40,143$). Utilizing multiple entering classes allowed for tracking the multiple years of cohort retention as well as six-year graduation rates. Of the total population included in the study, 45% are female and 13% are multicultural students.

Data included variables related to demographic, economic, and academic characteristics outlined by the existing body of research and practice as relevant for understanding student success. Thus, the data set contained such variables as ethnicity, gender, first-generation status (defined as neither parent having completed a four-year degree), in-state versus out-of-state status, academic major (declared vs. undeclared), college, Pell eligibility, and indicators of academic preparedness such as ACT score, high school rank, and high school GPA.

Variables pertaining to engagement and personality factors were extracted from the ACT student profile that students complete prior to taking their ACT test, and Map-Works, a first-year survey typically filled out post-enrollment within the first month of being on campus. These variables included self-ranking indicators of perceived need for help in math, reading, or other college skills, and college-related behaviors such as time management, note taking, and avoiding distraction. These variables were measured using a 7-point Likert scale (1 = low, 7 = high). Additional variables with dichotomous choice (0 = No, 1 = Yes) indicated student engagement in various extracurricular activities while in high school (e.g., participation in a science contest, community service, music, politics, or athletics) and students' plans to continue them while in

college. Finally, measures of student perceived social integration, need for academic or life-skills assistance, homesickness, and certainty in chosen major and future occupation using the 7-point Likert scale (1 = low, 7 = high) were considered.

To explore the research questions in greater depth, multiple methods of statistical analysis were used. In order to assess whether there are significant differences in the means or frequencies on the aforementioned variables across the four student groups, a series of chi-square tests were conducted for categorical variables (e.g., one-year retention, six-year graduation, gender, Pell-eligible) and one-way analysis of variance (ANOVA) for continuous variables (e.g., first-semester GPA, precollegiate engagement, general adaptation, high school achievement). If a significant ANOVA test result was obtained, a more detailed analysis of differences among the group means was performed. Follow-up post hoc Bonferroni tests were conducted to provide specific information on all six possible pairwise comparisons (low achiever vs. underachiever; low achiever vs. overachiever; low achiever vs. high achiever; underachiever vs. overachiever; underachiever vs. high achiever; overachiever vs. high achiever). In other words, the post hoc tests were used to examine which group means were significantly different from each other. Data were analyzed using STATA 14.0.

Results

The first research question inquired about the presence of differences in traditional student success metrics across the student population in the four quadrants. Traditional success metrics include students' first-semester GPA, one-year retention, and six-year graduation rate. The results confirm that there are, indeed, differences in student success between the achievement groups. ANOVA demonstrated that groups are substantially different from each other with the level of significance of $p < .001$ (Table 1) across each of the success dimensions.

Specifically, low and underachievers, on average, have lower first-semester GPA compared to their over- and high-achieving peers. There is almost one point difference in first-term GPA between high and low achievers, while the difference between low and under-

Table 1. Differences in Student Success Metrics Across the Student Quadrant

	Df	F	Prob > F
First-semester GPA	3	1814.18	0.000
One-year retention	3	240.87	0.000
Six-year graduation	3	382.34	0.000

achievers is only 0.049. While there is a difference in first-term GPA between high and overachievers, the gap is fairly small—0.3. All of the differences between the groups are statistically significant at the $p < .05$ level or higher (Tables 2a and 2b).

In regard to one-year retention, the same pattern persists: low and underachievers retain at a similar rate, while over- and high achievers also show similarity in retention. For example, the average one-year retention rate for all four groups is 87%; however, it is 79% and 80% for low- and under-achieving groups, and 90% and 94% for over- and high achievers. All intergroup differences are statistically significant on a $p < .001$ level except for those between low- and under-achieving students: they perform the same (Tables 3a and 3b).

The final student success metric, six-year graduation rate, presented the same pattern among the groups: There is no statistical difference between graduation rates among low- and under-achieving students (59% vs. 58%), and a minor (yet statistically significant)

difference in rates between over- and high-achieving students (82% vs. 85%). The most drastic difference remains, however, between the overall higher and lower achieving groups. All differences are significant at $p < .001$ level (Tables 4a and 4b).

Additional demographic inquiry demonstrated that, while low- and high-achieving groups are similarly composed by gender, the over-achieving group tends to be largely female (64%). The underachiever group is composed of mostly males: 79% (Table 5).

The four groups also differ by their socioeconomic status (Table 6). Students in low- and over-achieving quadrants are more likely to come from financially constrained households (31% and 26%, respectively), compared to their peers in under- and high-achieving categories (19% and 15%). Additionally, opposite to their low- and over-achieving peers, under-achieving as well as high-achieving students are less likely to be first generation (i.e., coming from families where neither parent holds a four-year degree).

The second research question inquired about the differences in pre-collegiate engagement across the four quadrants. The ANOVA Results demonstrated that there were significant group differences in four precollege engagement dimensions: music (defined as participation in high school vocals, band, or string orchestra),

Table 2a. Mean First-Term GPA (Years 2013–2015)

Group	Mean	Std. Dev.	Freq.
Low Achievers	2.42	0.81	4,565
Underachievers	2.47	0.87	2,507
Overachievers	3.01	0.66	3,112
High Achievers	3.34	0.60	6,589

Table 3a. Group Differences in One-Year Retention (Years 2013–2015)

	Low	Under	Over	High	Total
Not enrolled second fall	977	528	303	394	2,202
Enrolled second fall	3,760	2,089	2,840	6,245	14,934
Total	4,737	2,617	3,143	6,639	17,136
Retention rate	79%	80%	90%	94%	87%

Table 2b. Difference in Mean First-Term GPA Pairwise Comparisons

	Low Achievers	Underachievers	Overachievers	High Achievers
Low Achievers				
Underachievers	0.049*			
Overachievers	0.587***	0.538***		
High Achievers	0.913***	0.864***	0.326***	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; ANOVA test statistics: $F = 1814.18$, $p < .001$.

Table 3b. Difference in One-Year Retention Pairwise Comparisons

	Low Achievers	Underachievers	Overachievers	High Achievers
Low Achievers				
Underachievers	0.004			
Overachievers	0.110***	0.105***		
High Achievers	0.147***	0.142***	0.037***	

Note: *** $p < .001$; Pearson $\chi^2 = 693.5$, $p < .001$.

Table 4a. Group Differences in Six-Year Graduation Rates (Year 2008–2010)

	Low	Under	Over	High	Total
Did not graduate in 6 years	1,639	872	383	659	3,553
Graduated in 6 years	2,350	1,196	1,712	3,880	9,138
Total	3,989	2,068	2,095	4,539	12,721
Graduation rate	59%	58%	82%	85%	72%

Table 4b. Difference in Six-Year Graduation Rate Pairwise Comparisons

	Low Achievers	Underachievers	Overachievers	High Achievers
Low Achievers				
Underachievers	-0.011			
Overachievers	0.228***	0.239***		
High Achievers	0.266***	0.276***	0.038**	

Note: *** $p < .001$; Pearson $\chi^2 = 1,100$, $p < .001$.

Table 5. Gender Composition (Years 2013–2015)

	Low	Under	Over	High
Male	2,610	2,062	1,135	3,706
Female	2,128	555	2,008	2,933
Total	4,738	2,617	3,143	6,639
Share, Female	45%	21%	64%	44%

Table 6. Pell Eligibility (Years 2013–2015)

	Low	Under	Over	High
Everyone else	2,962	2,008	2,278	5,626
Pell eligible	1,342	461	789	985
Total	4,304	2,469	3,067	6,611
Share, Pell	31%	19%	26%	15%
Not first generation	20,664	11,732	9,541	28,881
First generation	10,570	2,546	4,510	5,492
Total	31,234	14,278	14,051	34,373
Share, First Gen	34%	18%	32%	16%

politics (participating in the government of the student body or debate team), athletics (being involved in a sport), or community service. In terms of anticipated college engagement, except for athletics, group differences lie in the other three dimensions (Table 7).

Compared to high achievers, all the other groups were less likely to be engaged in music, politics, or community service, except for the over-achieving students who demonstrated more engagement in athletics, as opposed to other peers. It is also found that high-achieving students were more likely to express interest in music and community service compared to the other three groups. It is also noted that overachievers and low-achieving peers had similar levels of interest in music and athletics, and higher achievers and low achievers had similar levels of interest in politics. Underachievers were as likely to be interested in community service as their high-achieving cohorts (Table 8).

As an additional metric of precollegiate engagement, high school achievements were compared across the

Table 7. Precollegiate Engagement and College Engagement Expectations

High School Engagement	Low	Under	Over	High
Music***	28.95	33.51	36.03	46.11
Politics***	10.93	12.49	17.17	20.86
Athletics***	45.80	44.73	52.87	52.32
Community service***	34.19	35.09	46.53	50.70
Anticipated College Engagement				
Music***	12.33	18.52	13.35	23.27
Politics***	6.69	10.94	7.44	11.34
Athletics ^{ns}	19.46	18.64	19.46	18.84
Community service***	21.97	24.74	27.90	33.82

Note: All numbers listed in this table are shown in percentage; values highlighted in dark gray are significantly higher than the values highlighted in light gray; *** $p < .001$.

Table 8. High School Achievement

	Low	Under	Over	High
Won a science contest***	2.55	3.88	4.32	5.93
Received an athletic letter***	39.24	33.62	45.17	44.06
Took part in community service***	12.37	14.08	19.16	19.29
Started a business	4.29	3.89	4.52	4.44

Note: All numbers listed in this table are shown in percentage; values highlighted in dark gray are significantly higher than the values highlighted in light gray; *** $p < .001$.

four groups using such metrics as winning a science contest, receiving an athletic letter, taking part in a community service, and starting a business (Table 8). Results revealed that all four groups were less likely to start a business in high school. Additionally, low achievers are less likely to win a science contest and take part in community service compared to other three groups, while high- and over-achieving students were more likely to receive an athletic letter and take part in community service, compared to those in low- and under-achieving quadrants.

To explore additional engagement practices, general adaptation factors from the first-year survey were examined. Results demonstrated that, compared to the other three groups, underachievers felt less connected to their peers, less likely to be satisfied with the institu-

Table 9. General adaptation, Self-Reported

	Low	Under	Over	High
Peer connection*	5.51	5.41	5.66	5.54
Homesickness:	3.68	4.08	3.66	3.91
Separation***				
Social integration*	5.53	5.37	5.62	5.56
Satisfaction with the institution***	5.83	5.66	5.94	5.93

Note: Values highlighted in dark gray are significantly higher than the values highlighted in light gray. Response items are rated on a 7-point Likert scale (1 = low, 7 = high); * $p < .05$; *** $p < .001$.

tion overall, and self-reported the least amount of social integration. They also experienced higher levels of homesickness than low- and overachievers (Table 9). All differences are statistically significant at $p < .05$ level or less.

The third research question asked whether there were differences across the groups in academic and college-related behaviors. To answer this question, precollegiate metrics on students' perceived need for help and first-year behavioral metrics were used. Results demonstrated that, while compared to the other two groups, high achievers were more likely to perceive the need for help with creating an education plan, they were less likely to think they needed help with subject matters or study skills except reading. Additionally, both over- and low achievers perceived the need for help with writing. All the groups perceived the need for help with math, compared to high achievers, and low and underachievers indicated perceived need for help with study skills (Table 10). All differences are statistically significant at a $p < .001$ level.

Table 10. Precollegiate Perceived Need for Help, Self-Reported

Expressed Need for Assistance	Low	Under	Over	High
Educational plan***	34.47	31.88	36.77	35.30
Writing***	13.62	11.79	12.06	8.73
Reading***	15.70	9.40	15.84	15.84
Study skills***	31.39	27.68	22.19	17.32
Math***	21.71	12.61	15.51	7.43

Note: All numbers in this table are shown as percentages; values highlighted in dark gray are significantly higher than the values highlighted in light gray; *** $p < .001$.

Table 11. Aspirations

	Low	Under	Over	High
Major Uncertainty***	2.02	2.00	2.00	1.95
Graduate School Expectation*** (%)	29.72	43.79	32.82	51.19

Note: Values highlighted in dark gray are significantly higher than the values highlighted in light gray; *** $p < .001$.

An additional metric that served as a proxy for engagement was consideration of student aspirations and certainty in the chosen major. These are consistent with suggestions found in Adelman (2006) about the importance of aspiration and anticipation in student success. Results demonstrated that only high-achieving students were more likely to be certain than peers in any other achievement quadrants. With regard to pursuing a graduate degree, high achievers as well as underachievers were more likely to consider it as a future option, as opposed to low and overachievers (Table 11).

Finally, comparing the differences in means across the four groups in items regarding student self-assessment after arriving on campus, the findings demonstrated that when comparing academic abilities in math ability, underachievers perceive themselves similar to the high-achieving group. When comparing writing ability, low achievers perceive themselves similar to overachievers. Comparing the academic behaviors—such as time management, making lists, attending class, and the like, underachievers rank themselves lower than any other group, including the low achievers. Meanwhile, overachievers rank themselves the highest among the groups on the same set of behaviors. Moreover, no significant differences were found across the four groups in self-reported ability to avoid distraction—students all perceive themselves to have a relatively high ability to resist distraction (Table 12).

Discussion

Our results demonstrated that there are definite distinctions between the student populations in the four achievement quadrants. These differences remained across all metrics of student success—first-term GPA, retention and graduation rates, and reflected in sets of behaviors, interests, and engagements as well.

Table 12. First-Year Survey Behavioral Factors, Self-Reported

	Low	Under	Over	High
Writing ability***	4.83	5.08	4.88	5.26
Reading ability***	4.29	5.2	4.81	5.63
Math ability***	4.86	5.56	4.81	5.52
Time management***	5.4	4.85	5.72	5.39
Making lists***	5.09	4.38	5.66	5.26
Class attendance*	6.76	6.68	6.92	6.82
Note taking***	6.09	5.79	6.24	5.99
Study scheduling***	5.07	4.67	5.16	4.84
Avoiding distraction	5.07	4.67	5.16	4.84

Note: Values highlighted in dark gray are significantly higher than the values highlighted in light gray. Response items are rated on a 7-point Likert scale (1 = low, 7 = high); * $p < .05$; *** $p < .001$.

The first research question inquired about the differences in traditional measures of student success across the quadrants. The results revealed that not only there are statistically significant differences across all four student categories, but there is a distinct difference between the low/underachievers and over-/high-achieving student populations. Underachievers—students with high academic ability and low levels of persistence (above-average ACT and below-average GPA)—tend to consistently behave similarly to low-achieving students who lack both ability and resilience. Thus, compared to their less gifted but more persistent (overachievers) and high-achieving peers, underachievers tend to have a substantially lower first-term GPA and retain at lower levels during their first year. Additionally, only 58% of these students graduate within six years, compared to 82% and 85% of those in the over- and high-achieving quadrants and 59% of low achievers.

Understanding such gaping differences in student success, considering that underachieving students tend to show academic promise, required additional exploration of sociological and behavioral factors that might influence such gaps in achievement. Exploring additional data from the ACT student profile and the first-year survey that focused specifically on student engagement, perceived help needs, and academic behavioral practices, we found that differences exist across the four student groups and that they are consistent with the success findings. When it came to comparing disciplined behaviors that are expected of

college-goers, such as making lists, attending class, taking notes, scheduling study time, and avoiding distraction, underachievers ranked themselves the lowest of all four groups, including their low-achieving counterparts. The overachievers ranked themselves the highest of all four groups.

Our findings are consistent with existing research, which provides additional validation for the metric explored in this study. For instance, a variety of studies often describe high-achieving students as bright, curious, intelligent, motivated, and driven to accomplishment (Davis & Rimm, 2004; Ruban & Reis, 2006). These students are also often described as possessing an arsenal of adaptive self-regulatory methods that help them succeed in academic settings (Risemberg & Zimmerman, 1992; Schunk, 1998). Low achievers and underachievers, on the other hand, are frequently discussed as being more anxious and less self-efficacious (VanZile-Tamsen & Livingston, 1999). These students are believed to set lower academic goals, lack persistence, and engage in maladaptive academic behaviors (Borkowski & Thorpe, 1994). Our study highlights the deficiency in general adaptation of low- and under-achieving students on campus: they report having less connection to peers and satisfaction with their college experience. Additionally, they tend to exhibit worse academic behaviors than their higher-achieving cohorts. These are consistent with McCoach and Siegle (2001), who demonstrate that high-achieving students exhibited more positive academic self-perceptions, motivation/self-regulations, goal valuation, attitudes toward school, and attitudes toward teachers than low-achieving students.

Consistent with Peterson (2000), who notes that higher achieving students who attended college were more certain of their career direction, our results demonstrate that, compared to their high-achieving peers, neither of the three other groups exhibits certainty in their chosen major. The same study points out that under-achievers are less likely to be engaged in campus activities than their higher achieving peers. Our results align with these findings as well: of all extracurricular activities that were statistically significant for high school engagements across the four groups (music, politics, athletics, and community service), only the high-achieving group was more likely to engage.

Another important finding that emerged during the analysis was this: under-achieving students perceive their abilities and aspirations to be similar to those of their high-achieving peers. At the same time, their behavior and performance are more aligned with those in the low-achieving quadrant. Low- and over-achieving groups aren't planning on pursuing a graduate degree, while both under- and high-achieving students are considering graduate school. Given their demographic characteristics—higher income and higher ability students—it is possible to suggest that this aspiration is natural since both groups are less likely to be first-generation students and are likely to be more aware of graduate school as an option.

These findings imply that levels of ability and resilience play an important role in student college experience. Depending on the quadrant assigned by the metric developed for assessing student achievement potential, students will require very different types and degrees of help that will allow them to succeed. Understanding these tacit differences across the incoming student population appears to be a crucial aspect of facilitating student success efforts on a university campus.

Limitations and Future Direction

While the results of this study demonstrate that there are tangible differences across the student groups defined by the achievement quadrants, there are also limitations that should be considered while applying the tool in other settings. For instance, the tool was developed using the average scores—high school GPA and ACT Composite—that describe a student academic profile typical for this university. These scores and combinations might need to be adjusted and reevaluated based on the academic profile of the institution wanting to use the tool.

It is equally important to note that, while the vast body of research confirms that both ACT and GPA reflect student potential to achieve (Noble & Sawyer, 2004; Sawyer, 2013; Westrick, 2015), there is a multiplicity of other factors, both internal and external to the student, that may affect the actual achievement outcomes (Credé et al., 2016). This means that classifying student within one of the quadrants can only serve as a starting point to identify possible need for help as well

as the type of help a student might require. Thus, by no means is the quadrant system intended to be used as a definitive measure of a student's individual abilities.

Finally, this tool was constructed using the average academic scores for the incoming cohorts combined across multiple years. In its current state, it assumes little change in either academic assessment or student preparation and ability reflected in the scores. Potentially, examining cohort-specific distribution of students across the quadrants can provide additional insight into the overtime stability and accuracy of the tool. With that, a complete statistical validation of the tool is important to solidify the scope of its application. Therefore, future studies employing additional methodologies are under way.

Conclusion

This study focused on designing and exploring uses of a simple tool that allows enrollment managers as well as field practitioners—advisors and other student services providers—to gain a quick insight into the incoming student population and identify potential challenges and opportunities for interventions that can help increase student success. Results demonstrated that students experience different challenges and needs based on their placement within an achievement quadrant.

For example, high-achieving students are both high ability and high resilience, so they will not require any additional help unless they ask for it. Low achievers, on the other hand, lack in both dimensions, which means help across the board—academic, study skills, and life skills as well. On the other hand, overachievers have mastered the study skill and require mostly academic intervention. Underachievers tend to have natural potential to grasp academic concepts, however, lack in time management and application of self.

Ultimately, understanding and predicting student success is more complex than applying a simple quadrant metric to the incoming class. Yet, having a tool to quickly assess potential needs of the new cohort as well as having historic understanding of the challenges within the student population can enhance an institution's level of preparedness and ability to provide students with targeted and meaningful ways to increase their chances of success in a practical and timely manner.

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