

EVALUATING TEST-OPTIONAL ADMISSIONS AND A
COMPLEMENTARY TEST-EXCLUDED SCHOLARSHIP STRATEGY AT A
MIDWEST PUBLIC FLAGSHIP UNIVERSITY

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This dissertation is dedicated to my family, whose support through this journey was instrumental in reaching the light at the end of the tunnel. Juanita, JR, and Christina, you have always been an endless source of motivation, strength, and love right when I needed them the most.

This work is also dedicated to my departed loved ones. Pedrito, I know you are cheering for me in heaven, with Papá, Mamá Pere, Papá Manuel, tía Meme, Abuelita Albina, and Mamá Carmela.

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Abstract

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EVALUATING TEST-OPTIONAL ADMISSIONS AND A COMPLEMENTARY TEST-EXCLUDED SCHOLARSHIP STRATEGY AT A MIDWEST PUBLIC FLAGSHIP UNIVERSITY

Institutions of higher education across the country are experiencing unprecedented internal and external challenges. In an increasingly competitive environment to recruit and enroll students, while maintaining goals of access and diversity, colleges and universities are resorting to policies that support these goals. In this vein, and with the purpose of increasing enrollment for underserved student populations, the test-optional admissions movement started gaining popularity particularly as the COVID-19 world health pandemic ensued.

In this context, the present study seeks to determine if the adoption of a test-optional admissions policy and a test-excluded scholarships strategy were supportive of broadening the access, recruitment, and retention of students from underrepresented minority (URM) backgrounds. The overall structure of the research study was a comparative analysis of pre- and post-policy implementation and used descriptive statistics to compare the two groups representing six years of entering student cohorts, 2018 to 2023, with 2021 representing the year when the policy and strategy went into effect. Independent two-sample *t*-tests were also used to determine statistically significant change for post-implementation. The selected institution of analysis was a Midwest public flagship university (MPFU).

Some of the findings demonstrated a positive impact on URM student access, including the increase in applications and admitted students. While enrollment rates for the URM group

resulted in significant change, it had the opposite effect of declining numbers. On the other hand, URM students received institutional scholarships at significantly higher rates after the adoption of the test-optional and test-excluded scholarship strategy. These last results supported the recruitment and retention of URM students.

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Chapter I: Introduction and Background

The Movement Toward Test Optional

The movement toward the adoption of test-optional policies as part of the criteria for gaining college admission continued to gain strength over the last decade. Research studies such as those conducted by NACAC (2018) found a strong correlation between the adoption of test-optional admissions policies and increases in the enrollment of underserved student populations.

The movement de-emphasizing standardized tests in college admissions, including the SAT and ACT, gained more popularity during the 2020 COVID-19 world health pandemic, which highlighted and, to some extent, accelerated several important trends in the higher education admission process. As colleges and universities grappled with decisions involving a radical switch of their teaching delivery methods caused by the pandemic, students and their families were left wondering about changes in the way they search for and apply to colleges. Indeed, colleges and universities had to adjust to virtual tours and zoom informational sessions to serve prospective students and their families.

The onset of the 2020 pandemic forced many colleges and universities to adhere to the test-optional movement as testing sites in the US and around the world became unavailable (Adams, 2020; Camera 2020). Without these test results or even with their wide-spread delay as students struggled with finding alternative test sites, many institutions had to either make the submission of test results optional or simply remove the requirement as part of their admissions criteria.

Problem Statement

Access to higher education or the opportunity for members of society to gain a post-secondary education and benefit from a socio-economic standpoint has broadened over the years.

However, the journey to achieve this broader access has not been without difficulty. Despite the advancements made in this area, there is still an ongoing struggle for attaining a college education, particularly for underrepresented minorities (Renner, 2007; Stulberg & Long, 2011). As Baum (1995) stated, making higher education more equitably accessible would increase productivity, expanding human capital and allowing for more productive resources and in general contributing toward the betterment of society.

Alongside improving access to higher education as a nationwide goal, institutions should also assess how affordable they are to students and their families. Broadening access and enhancing affordability go hand in hand with supporting students seeking a higher education. In this sense financial aid becomes an essential tool for institutions to ensure that college attending remains affordable (Jones-White et al, 2013).

Even though the original goal for the creation of standardized tests such as the SAT¹ and the ACT² was to level the playing field in college admissions, a greatly debated argument around student access to higher education has been the value of these standardized tests and whether these are designed to disadvantage students from underrepresented backgrounds (NACAC, 2022; Fair Test, 2007). Different studies have questioned the value of standardized testing in predicting student success and posit better predictors. Atkinson (2005) proposed a more comprehensive and holistic method for assessing students when seeking admissions. ; Bowen et al. (2018) and Hartnett (1989) demonstrated a weak ability of the SAT to predict academic success in college for African American students; ; Crouse & Trusheim (1988) posited that high school grades were

¹ SAT Scholastic Assessment Test, College Board, designed to measure cognitive reasoning.

² ACT American College Testing, Educational Testing Service), designed to measure practical reasoning.

better predictors than the SAT I score; Geiser & Studley (2002) and Fair Test (2007) found that the SAT II combined with high school grades was a better predictor tool than the SAT I alone; and ; and Soares et al. (2011) proposed that other admissions criteria such as high school grades, college courses and essays ensure a more equitable treatment of underrepresented minorities

The emergence of test-optional admissions as an alternative path to the traditional admissions criteria based on standardized testing, gained impetus during the COVID-19 world pandemic. Although test-optional admissions have been slowly espoused by some colleges starting in 1960 (Fair Test, 2022), its adoption peaked under the closing of testing sites around the globe, which resulted from the public health crisis that started in 2020. Since then, the number of colleges and universities that do not require standardized test scores in their admissions process has continued to increase, reaching over 1,800 institutions by fall of 2022 (Fair Test, 2022).

Purpose and Significance of the Study

The purpose of the present study is two-fold. On one hand it seeks to determine if the adoption of test-optional admissions policies broadens access to higher education in the specific case of a midwestern public flagship university. Secondly, the study explores the impact of a complimentary test-excluded scholarship awarding strategy in both broadening access and looking at retention.

This study is significant because it adds to the growing body of knowledge about the impacts of the test-optional admissions movement in American higher education. A few studies have examined the impact of test optional policies from an institutional change perspective (DeRousie, 2014; Gage, 2017); focused on access and diversity (Bautista, 2018; Lofaro, 2021; Pellegrino, 2020; Pennant, 2018); analyzing the effect on student success (McCubbin, 2018); and

others with dual lenses of the impact of financial aid and admissions policies (Morgan, 2016). Particularly, in a post-world pandemic era, it will be important to follow how institutions continue to adopt test-optional and related policies with the goal of improving access and affordability for all students, including those from underrepresented backgrounds.

The importance of the study could also be explained from both the institutional and the student perspectives. For colleges and universities this type of studies can shed some light regarding why these policies are adopted and especially what is the impact on students in terms of access, affordability, and retention. On the other hand, from the student perspective, the reasons behind how students react to the implementation of test-optional policies and complementary strategies will also continue to be critical for higher education decision-makers. The study of the impact of this type of policy and strategies in enrollment and retention, particularly of students from URM backgrounds, should provide valuable indicators for both scholars and practitioners in the field.

Research Questions

In an effort to determine the effects of the adoption of a test-optional policy and a test-excluded strategy at a midwestern public flagship university on the levels of access and affordability of students from underrepresented backgrounds, I seek to answer the following research questions.

1. How does a test-optional admissions policy help increase college access of students from URM backgrounds?
2. How does a complimentary test-excluded scholarships strategy help recruit and retain students from URM backgrounds?

Definition of Terms

Throughout the present study I used several terms that should be defined to delimit their meaning for a consistent understanding as they appear in the upcoming chapters. These terms are defined as follows.

Access. The opportunity for members of society to gain a post-secondary education and benefit from the resulting socioeconomic advancement that educational credentials provide (Long, 2011).

Admissions. The process that involves the coordination of activities that track students from prospect to enrolled (NAIS, n.d.). For Hayes (2015) college admissions is the integration of seven recruitment marketing strategies. These “Ps” strategies include: product as education; price as tuition; place as the geographical location and points of access; promotion as marketing communications; physical evidence as the campus and what it has to offer; processes as marketing educational experiences from a service perspective; and people as students and the staff who serve them.

Admissions/Acceptance Rate. The admission or acceptance rate is the number of students an institution admits because they match their admissions criteria as a ratio of the number of students who applied (Clinedinst, 2019).

Affordability. The Lumina Foundation states that there is no common definition of what’s affordable. They developed a “Rule of 10”³ model that estimates what students should be expected to contribute for their education.

³ The Rule of 10 considers three major components to provide a general guideline for how affordable college should be and includes time, income and hours of work.

Enrollment/Yield Rate. The number of students that colleges enroll as a ratio of the number of admitted students is the enrollment or yield rate (Bouchrika, 2022).

Financial Aid. Includes all financial aid provided to students by the institution and includes all different forms, from federal grants and loans to institutional and private scholarships (Jackson, 1990).

Higher Education Policy. An education policy in the field of higher education based on a set of official agreements or a plan usually adopted by the governing body of an organization operating in the field of higher education (Komotar, 2021).

Merit-based aid. Financial aid provided to students based on academic and testing performance (Stater, 2009).

Need-based aid. Financial aid provided to students based on their level of financial aid (Stater, 2009)

Predictive Power. Capacity to predict students' success in college, assigned to standardized tests aligning test scores and college performance measured as GPA at the end of the freshman year (Morgan, 1989).

Scholarships. Financial aid offered to students by educational institutions, non-profit organizations, and private organizations, which does not need to be repaid. It is offered based on academic merit, talent, or a particular area of study (Federal Student Aid, n.d.)

Standardized Tests. Determine students' potential and mastery of course content and assist in course placement for those being admitted to college (Bautista, 2022).

Test Optional Admissions. Institutional policy adopted by colleges that provides student applicants with the option to submit or not their standardized test scores in the process of admissions (Musico, n.d.).

Test Flexible Admissions. Institutional policy adopted by colleges that gives student applicants the option to provide a different test than the SAT or ACT, such as the AP (advanced placement) exam to meet the admission criteria (College Board, 2023).

Test Blind Admissions. Institutional policy adopted by colleges where tests will not be considered in the application criteria whether the applicant submits the test score (Musico, n.d.)

Test Excluded Scholarships. Institutional strategy adopted by colleges, particularly those who have instituted test-optional admission policies, to support access (Bello & Feder, 2023).

Study Limitations

Even though the research questions for the present study can be answered by an analysis based on descriptive statistics, a more advanced inferential analysis may provide a deeper level of detail, particularly when focusing on the categorical variables linked to underrepresented minorities. The same may be true for the comparison of the two timeframes of the analysis, that is, pre and post implementation of the test-optional policy and test-excluded strategy. A multivariate time-series inferential analysis could result in a more nuanced output when looking at the variables' behavior between the time periods and as they influence each other. Inferential analysis could certainly be a natural next step in future research, for this institution or for a larger scope study.

Another limitation to this study relates to the possible impact of the COVID-19 world health pandemic and its resulting implications on higher education institutions and students,

including those of socioeconomic nature. There are a handful of studies that have looked at the pandemic impact on college enrollment (Le Flore et al., 2022), and others centered in college type (Bulman & Fairlie, 2021), student populations, and student development (Franco et al., 2023). However, more research is needed to determine the impact of the world pandemic on specific institutional policy, such as involving admissions criteria, and student enrollment of historically marginalized groups.

Organization of the Study

In the following chapter of this study, I conduct a literature review that first provides a framework that includes concepts of college access and affordability, and more specifically college admissions. I then continued the review with the test-optional admissions movement as an alternative path to traditional admissions criteria, and standardized testing as a foundation of the traditional path. I explore the supporting and advocacy views for both paths as well as positions that detract from or oppose them.

Chapter III continues with presenting the methodology used for the study, including the research design, data analysis and study limitations. Chapter IV follows with the results of the quantitative analysis, and Chapter V ends with the discussion of findings, recommendations, and conclusions for the study.

Chapter II: Literature Review

The adoption of policies aimed at streamlining college admissions and removing barriers that disproportionately hurt students from underrepresented minority groups has gained popularity in American higher education (Hiss & Franks, 2014; Syverson et al., 2018). One of the more recent trends aimed at broadening college access is the adoption of test-optional admissions, which continues to increase in both private and public selective institutions (NACAC/NASFAA, 2022). Along with test-optional policies universities are also considering and implementing test-optional or test-excluded scholarships as a complimentary policy aimed at avoiding the financial disadvantage of students applying to their institutions. The recommendations in the NACAC/NASFAA (2022) report emphasize caution with standardized tests and a financial aid policy that overly rewards traditional assessment factors such as academic merit and achievement. This study seeks to investigate these two issues and their influence on access and admissions, particularly of students from underrepresented backgrounds.

The literature needed to understand how test-optional policies and scholarship practices influence each other, as well as their relationship with institutional goals, begins with an introduction to college access. From this broad perspective I explore its relationship with equity and equality, finding similarities and differences in these concepts, which are important to understand later policy implementation. Once the research outlook of access to college is reviewed, I turn to defining and framing admissions in the context of its relevant metrics for policy implementation and their connection to college selectivity. As complimentary strategies to admission policies and within the context of college affordability, I also review the research on financial aid and test-optional scholarship policies, which are being used with the intent to support access, affordability, and retention, particularly for underrepresented minority students.

After considering the research on admissions and financial aid and their possible connections in their broader context of promoting equitable access, I turn to focus on standardized testing, including its historical setting, evolution, and proliferation as an important factor in the college admissions criteria. I discuss the similarities, differences, and contributions to college admissions of two main standardized tests (i.e., SAT and ACT) along with analysis of the criticisms of standardized testing, highlighting the contrasting views of support and censure. Finally, I address the movement behind a test-optional admission policy that is counter to the use of standardized testing as a required criteria element in college admissions.

I will complete the literature review with the presentation of the conceptual framework for the present study, which will be later discussed considering the quantitative descriptive analysis and its respective findings.

College Access, Equity and Equality

In higher education access and equity are important terms used in the institutional and research perspectives, although for the purpose of this study the focus is on the institutional lens. In a context of social justice, college access and equity in higher education have increasingly gained global importance (Wilson-Strydom, 2015). In the same vein, concepts of equity and social justice remain as priority issues in the discussions within higher education (Brennan & Naidoo, 2008).

It is important to point out that higher education adopted the concepts of equity and equitable access from society in general. Brennan & Naidoo (2008, p. 288) posit that higher education imports equity and social justice agendas from the wider society and like other large organizations, aims at making improvements in these aspects as they fulfil their mission.

Even though college access or the opportunity for members of society to gain a post-secondary education and benefit from socioeconomic advancement has broadened over the years, the path to equitable access to higher education has not been easy. Despite the gains we have attained over the years, it is still an ongoing struggle (Renner, 2007; Stulberg & Long, 2011). Access and equity are intertwined concepts, but they are not the same. According to Stulberg & Long (2011), access is the opportunity for members of society to gain a post-secondary education and benefit from the resulting socioeconomic advancement that educational credentials provide.

The terms equity and equality are also close in meaning but they can lead to very different outcomes, particularly for marginalized groups (Milken Institute School of Public Health, 2020). The concept of equality means that each individual or group is provided with the same resources and opportunities. Conversely, equity recognizes that the circumstances of each individual or group could be different, so resources and opportunities are allocated based on individual needs to obtain equal outcomes (Milken Institute School of Public Health, 2020).

The Race Matters Institute (2019) advocates for the power of clear and shared language for advancing racial equity. In this context they use equality to refer to inputs (individuals receive the same resources) and use equity to signify outcomes, that is that different individuals or groups necessitate differential resources to achieve the same goal.

From an economic standpoint Sandy Baum (1995) argues that equitable access to college for bright and promising students, but whose ability to pay is limited, should be a priority based on a principle of efficiency. Baum further explains that broadening equitable access to obtain a college education would also increase the potential to increase productivity, consequently society would possess more human capital hence more productive resources (Baum, 1995).

Edward Renner posits that the principle of equality in higher education demands that minority students receive the same opportunity than white students (2007, p. 42). Under the same definition of terms of the Race Matters Institute (2019), Renner adds that a “no difference” procedural rule in the name of equity could in fact contribute to outcomes that disadvantage students from underrepresented groups.

For institutions of higher education, it is important then to understand the differences between access, equity, and equality, especially in the formulation of institutional policies to advance fair and equitable access to higher education. For the purpose of this study, access to higher education will be considered from the perspective of increasing applications, admissions and enrollment rates for students from diverse backgrounds, along with the adoption of programs or interventions that facilitate the admissions process, ease requirements and mitigate obstacles for these students. Furthermore, equitable access to college will be understood as supporting groups of students that have been historically underserved, oppressed, or otherwise undermined by the admissions process to college.

Historical Context of College Access

Historically, since the early 1900s as society began to open, industrialize, and expand, higher education institutions had to adapt to the changing times. With the expansion and the specialization of the knowledge-based economy, society demanded that their institutions adapted to these advances, which along with the democratization of access to higher education, represented positive changes related to scientific, economic, and social progress (Lucas, 2006; Thelin, 2011).

At the start of the Republic, higher education in the United States was restricted to an elite minority of mostly White men from a privileged socioeconomic status. Even as states with

no colleges prior to independence from England chartered new institutions, several years passed before they were able to open their doors to students (Geiger, 2005). The growth and standardization of American higher education took hold in the late 1800s with the implementation of an elective curriculum and the expansion of universities. The rapid growth in the number of universities resulted from the addition of areas of study such as engineering, business, education, and specialties that included forestry, medicine, dentistry, architecture, and music. Another important element about the growth of higher education was the assimilation of women who, by 1890, were attending mostly single-sex institutions and by 1913 those numbers almost doubled as more colleges became co-educational (Geiger, 2005).

In the United States, the massification of post-secondary education after World War II, and consequently its positive impact in American socioeconomics, has been a model followed by other nations in the globe (Dill, 2022). An obvious benefit of public policy that promotes expansion of higher education is the broadening of access for groups in society who previously did not participate in higher learning. The G.I. Bill of Rights was adopted in 1944 (National Archives Foundation, n.d.) and provided various benefits to the veterans of WWII, including grants for school and college tuition. Even though the impact of the G.I. Bill should not be underestimated, its benefits were available only for veterans of WWII. Other groups that have been marginalized based on their gender, race or religion did not benefit from the G.I. Bill unless they were veterans.

In 1947, President Harry S. Truman commissioned a report on the status of American higher education for the first time in American history. The resulting report or the Truman Commission, as it is broadly known, prompted impactful initiatives in support of access and equity. This report, despite its critics (Thelin, 2004), had an important effect on higher education

since it created the first national discussion around needed policies to broaden access to colleges and universities (Gilbert & Heller, 2013). One of the key recommendations of the Commission involved college access, stating that the college attendance rate should double by 1960. It recognized that the federal government should play a prominent role in broadening college attendance by providing financial assistance to level the playing field for students with limited financial resources. This recommendation was also a reflection of the Commission's concern to make higher education equally accessible to all students despite their race, creed, sex, or national origin (Gilbert & Heller, 2013).

Although the Commission had broadened the national discussion on racial discrimination, since the 1930s the National Association for the Advancement of Colored People (NAACP, 2012) was an important agency litigating against segregation at the national level. The NAACP's efforts along with the President's Committee on Civil Rights (Harry S. Truman Library & Museum, 2012), contributed to improving civil rights in America. Another historical milestone for equitable access to higher education was the Supreme Court's decision in *Brown v. Board of Education* (1954) that reversed the ruling of equal but separate public education. Despite the ruling however, particularly in the southern states, the race gap in higher education continued for several years. It was not until the passage of the Civil Rights Act of 1964 and the more aggressive enforcement of the law that we started to see the needle move in a more significant way towards helping racial minority students gain access to higher education (Gilbert & Heller, 2013).

Equitable access to higher education also involved ending religious discrimination and broadening access to women. Regarding the former and during the time when the report from the Truman Commission was issued, there was ample evidence of discrimination against Jewish

students. However, the shortage of students during World War II and the subsequent state laws against the religious discrimination in college admissions prompted the elimination of the systematic discrimination of students from Jewish backgrounds (Gilbert & Heller, 2013). In the case of women, the passage of both the Civil Rights Act of 1964 and Title IX of the Higher Education Act (HEA) amendment of 1972 (Federal Register, 2020) helped increase the opportunities for women in higher education. Even though the growing enrollment of women compared to men in the last decades has been supported by data from the Department of Education (National Center for Education Statistics [NCES], 2022), there is still evidence of women's underrepresentation in key STEM areas such as engineering at 12%, computer and mathematical science at 26%, and chemistry and material science at 39% (American Association of University Women [AAUW], 2015).

Now that I have outlined the broader concepts of college access, equity, and equality, as well as their interconnectivity, within this framework I turn to address college admissions and factors that are relevant for institutional decisions on policy implementation. To better understand college admissions, I start with a brief historical summary followed by key definitions and factors that underlie policy decisions and selectivity.

College Admissions

Historically, American higher education was restricted to a privileged few (Altbach et al, 2005; Hutcherson, 2019; Lucas, 2006; & Thelin, 2004). Starting with the first colonial colleges and through the era of post-independence, college was intended for White men from a high socioeconomic status to acquire an education limited to a narrow curriculum. However, since the 1940s when thousands of returning veterans were admitted to college with free tuition through a

national incentive program, much has changed in American higher education (Altbach et al, 2005; Hutcheson, 2019; Thelin, 2004).

Additionally, over the last decades, the population of college students has shifted, despite stereotypes entrenched in the institutional mindset of American higher education. College students are now more racially and ethnically diverse and include older or returning students and students from a broader socioeconomic background, including first-generation students (Settersten, 2015). The image of the “typical” college student – recent high school graduate, attending four-year institutions full-time and living on campus – has evolved to include a good portion of students attending community college towards two-year degrees, going to classes part-time, being financially independent and having dependents of their own (Deil-Amen, 2015). Students exhibiting these less traditional characteristics have become more the norm than the exception, conforming in many cases a marginalized majority as institutions are still struggling to properly serve these groups of students (Deil-Amen, 2015).

The current function of college admissions has also evolved since the massification of American higher education, which started in the 1940s with the adoption of the G.I. Bill of Rights in 1944 (National Archives Foundation, n.d.) and the issuance of the Truman Report in 1947. Both events contributed to broadening college access to WWII veterans and population groups that had historically been excluded from a college education, particularly those of low-income stratus (Gilbert & Heller, 2013).

As applications grew, institutions adapted to handle the process of admitting students effectively by professionalizing and specializing in areas that had before been isolated and distributed among different academic units. Admissions is currently considered a subset of enrollment management, which resulted from the need of institutions to ensure that the recruiting

and retention of their student body reflected their mission and goals (NAIS, n.d.) According to Hossler and Bean (1990) “enrollment management is both an organizational concept as well as a systematic set of activities designed to enable educational institutions to exert more influence over their student enrollments and total net tuition revenue derived from enrolled students” (p.5).

In contemporary higher education institutional missions respond to several characteristics that define each type of institution (Lucido, 2015). There are public and private colleges, two-year and four-year institutions. Other universities focus on liberal arts, professional education, or STEM (science, technology, engineering, and mathematics). Consequently, the mission of the institution does have an important implication on the philosophy that supports its admission policy (Lucido, 2015).

In the late 1990s a group of about fifty admissions deans of four-year institutions were gathered under the College Board sponsorship in a series of summits with the purpose of developing models in the admission selection process (Perfetto and the College Entrance Examination Board, 1999, as cited in Lucido, 2015). These discussions resulted in a classification of two models in the admissions process: the “eligibility model” and the “selectivity model.” The former responded to matching students’ application materials with the admissions criteria for each institution – usually high school diploma and grades – i.e., all students are admitted if they match the admission criteria for the institution. The “selectivity model” refers to an additional set of factors being considered in the admission criteria, such as standardized testing, essays, letters of reference, and other requirements aimed at selecting a smaller number of students than the actual number of applications (Lucido, 2015).

Definition of Admissions

Defining admissions in a more simplistic and operational form, it involves the coordination of activities that tracks students from prospect to enrolled (NAIS, n.d.). In a more advanced definition, Hayes (2015) proposes the process of admissions within the context of strategic enrollment management, as the integration of seven recruitment marketing strategies. From a marketing perspective Hayes' seven "Ps" strategies include: product as education; price as tuition; place as the geographical location and points of access; promotion as marketing communications; physical evidence as the campus and what it has to offer; processes as marketing educational experiences from a service perspective; and people as students and the staff who serve them.

Envisioning admissions in higher education as the strategic integration of marketing focused activities is the result of the privatization movement, which started in the 1980s to address reductions in federal student aid programs and in-state student subsidies to public colleges (Priest et al., 2006). The transition, from low-tuition institutions largely dependent on state funding to institutions dependent on tuition revenue and other sources of income to support their operations, pushed institutions, particularly public universities, to behave more like for-profit corporations (Priest et al., 2006).

In a competitive higher education environment understanding admissions as a recruitment marketing function is essential to achieving institutional goals, particularly for institutions that run their admissions process under the "selectivity model" (Lucido, 2015). According to Hayes (2015) marketing should be integrated in all key functions of a university, including enrollment management and in particular admissions. Consequently, recruitment marketing plays an essential role in identifying target student populations through research and creating and

maintaining communication channels with prospective students, constantly learning from what students value and expect in their future college experience, and communicating what the institution offers along those values (Hayes, 2015).

As part of the research activity in the recruitment marketing enterprise (Hayes, 2015), there are three key concepts to understand in the college admissions process: the number of applications, the number of admitted students, and the actual number of students that a college or university enrolls.

Application Number.

Applications are the total number of students who apply to college. Between 2020 and 2023 colleges have experienced a 24% increase in the number of college applications, according to a Common Application report (2023). This report explains in part the growth in the number of applications by individual students applying to more than one school, a number that has also been increasing over the years. The College Board (n.d.) advises students to apply to five to eight colleges to ensure acceptance into an institution that is suitable to their academic goals, expected student experience, and financial resources.

Admissions Rate and Enrollment Rate.

The admission or acceptance rate is the number of students an institution admits because they match their admissions criteria as a ratio of the number of students who applied (Clinedinst, 2019). The number of students that colleges enroll as a ratio of the number of admitted students is the enrollment or yield rate (Bouchrika, 2022), which depends on two distinct factors: college desirability (Ezarik, 2022) and college capacity⁴. From the student perspective, the decision on

⁴ Annual capacity of a university is the number of students that can be admitted for each study program with restricted admission. Annual admissions capacity is estimated on the basis of the staff and the curriculum.

selecting a specific college depends on the level of desirability the college has on prospective students and parents (Eduventures, 2023; Ezarik, 2022). Regarding the college's perspective on the number of students it enrolls, this number depends on the institution's capacity to support students based on their own physical, academic, and service resources (University of Hohenheim, n.d.).

Selectivity and Acceptance Rates

Selectivity is measured in terms of the institution's admissions or acceptance rate. Higher selectivity equates to lower admissions rates, and lower selectivity aligns with higher admission rates. Highly selective colleges like those considered in the Ivy League and other top-ranked schools in the United States have admissions rates that hover between 4% and 12%, while institutions ranked among the top global universities could have admissions rates of up to 43% (Bouchrika, 2022; Carlton, 2022).

In the United States, the average college acceptance rate is 68% and more than half of all U.S. colleges and universities report acceptance rates of 67% or higher (citation?). This means that most higher education institutions in the United States have qualification requirements that match the application profiles of most applicants (Bouchrika, 2022). Colleges with acceptance rates of 60% or more are considered as having more open access or flexible admission policies than those whose admissions rates are lower, and hence are more selective. Acceptance rates of 50% or higher are deemed as high acceptance rates, while rates of 10% or below are considered low acceptance rates (Bouchrika, 2022). The more selective the institution, the less open is its access. From the perspective of an applicant, the more selective an institution, the lower the to be admitted.

According to Lucido (2015), many institutions, from community colleges to regional public and private universities, have open access or minimal selectivity in their admissions policies, however, there is an important sector in higher education that restricts admissions based on specific criteria and requirements. The author mentions open admission and eligibility models as the most direct expression of admission, where all who can benefit and fit the minimum requirement – such as completing high school – are admitted. A good example of institutions with open admissions policies are community colleges, although there are certain cases where the demand exceeds college or program capacity so entry may require additional high school or community college work (Lucido, 2015).

On the other hand, schools that fall under Lucido's selectivity models use a combination of students' academic and personal qualities in the selection review, where academic credentials receive the greatest weight. From the students' perspective selective schools are sought because of their prestige, reputation, ranking, and quality and scope of academic offerings (Ezarik, 2022). Per Hayes' (2015) recruitment marketing model, selective schools compete to attract the best qualified students while seeking to ensure diverse and inclusive applicant pools.

It is important to understand selectivity in college admissions as the present study's research focus is within the context of public research universities in the Midwest. Schools classified more specifically as public, four-year, full-time, selective, lower transfer-in, research doctoral institutions, with comprehensive programs (Carnegie Classification, n.d.) usually fall under the public flagship grouping (Douglass, 2016) and are selective in their admissions criteria.

Enrollment Trends

A way to gauge access to higher education is by assessing enrollment trends. Higher or lower enrollment numbers over time become an indicator of how the access and affordability needles move, including access for historically underserved or underrepresented groups (Hemelt & Marcotte, 2016). College enrollments in the United States grew consistently after World War II despite demographic drops in college-age students during the 1980s. According to Dey and Hurtado (2005), between 1975 and 1994, fall enrollment in colleges and universities increased over 25%, and at a slower rate of 11% between 1988 and 1998. The authors indicated that much of this growth was caused by the increased access to higher education by non-traditional students, including those over age 25, part-time students, and new students coming from racial and ethnic minorities almost 80%; (Dey & Hurtado., 2005).

From 1998 to 2010, enrollment continued to grow steadily from 14 million to 21 million, almost a 67% increase. However, since 2011 and through 2020, total enrollments in the United States have consistently declined with enrollments of less than 20 million between public and private institutions (Duffin, 2022). This decline worsened during the COVID-19 world pandemic and continued through post-pandemic time when the dip in the number of Americans under 18, along with a strong labor market, contributed to even fewer high school students choosing to attend college (Marcus, 2022). Results from several focus groups and surveys point to other reasons for the decline in enrollment, even pre-pandemic, including skepticism about the worth or value of obtaining a college degree, negative press about college admissions scandal and student loan debt, and the increasing cost of tuition that makes attending college too expensive for increasingly larger groups in society (Marcus, 2022). Grawe (2018) predicted an enrollment cliff by 2025 due to a sharp decline in high school graduates, particularly across the Northeast

and Midwest over the next 15 years, based on declining demographic trends (Grawe, 2021). The impact of these projections in enrollment supports the continuing decline for the last 20 years.

Amid enrollment declines, and despite numerous efforts to broaden access to higher education from individual institutions, private and public organizations, and state and federal agencies, access and equity gaps are still evident. Attempts to increase equitable access to college have included preferential admissions (largely as affirmative action) since the early 1960s and 1970s, however racial gaps still exist (Renner, 2007). Other initiatives that have failed to move the racial equity needle in a significant way, included state and federal financial aid (such as Pell grants) and Promise programs⁵ (Delaney & Hemenway, 2020). And there have been other initiatives that resulted counter to the access of minority groups, such as state-sponsored prepaid tuition plans (Renner, 2007).

In a 2022 podcast presented by the Education Advisory Board (EAB), the CEO of the National Association for College Admission Counseling, Dr. Angel Perez, indicated that underrepresented minority students continue to attend college at lower rates than their White counterparts and this disproportion shows at both the undergraduate and graduate level (Rhyneer, 2022). Perez added that in 2020, the systemic historical obstacles that underrepresented minorities were still facing were aggravated not only by the pandemic, but also by the racial reckoning and the financial challenges occurring across the United States.

In the next section of this literature review I focus on the relevance of college affordability, particularly as it pertains to students from under-privileged backgrounds. I then

⁵ Promise programs make an early commitment to fund postsecondary studies. They deliver easily interpreted qualifications stated upfront. Depending on the program students can qualify based on geographic stipulations or geographic location. These programs can be private, state, or private/state partnerships.

expand to more specifically addressing the role of financial aid policies in aiding and supporting students. Additionally, I will explore how these policies are also part of the institutional strategy for recruiting and retaining students.

College Affordability

Along with the equitable access to higher education, financing the cost of attending college is another important element in admissions, particularly from the student perspective. Financial aid has become one of the essential tools for ensuring that college attending remains affordable (Jones-White et al., 2013). Students and their parents base the decision of applying to one or more colleges in part on how accessible and affordable the institutions are. The cost of financing higher education, along with the perceived value that a college can offer, are top decision factors when applying to college from the point of view of both students and parents (EAB, 2022). In this section, I present a historical perspective of higher education's implementation of broad policies and programs to help students afford the cost of higher education. It is important to understand these historical milestones because they set the foundation on which subsequent programs are based, including those developed by individual institutions through policy and program implementation. I follow by a review of the different forms of financial aid, highlighting their impact on college affordability. I end this section with a note on the impact of financial aid on college retention, which could support further policy exploration when considering complimentary admissions and scholarships policies.

A Brief View of Historical Milestones in Advancing Affordability

Since the Truman Commission report of 1947, which advocated for the elimination of financial barriers that “prevent a qualified young person from receiving the opportunity for higher education” (PCHE, 1947), there have been several federal initiatives to support college

affordability across society. Starting with the Higher Education Act (HEA) of 1965, the federal government has established measures, including Title IV, that implemented widely available programs of postsecondary student aid through grants and federally insured loans. A prime example of these programs started with the Educational Opportunity Grants awarded to institutions via the states who left the determination of who would receive the grants in the hands of colleges and universities (Gilbert & Heller, 2013).

During the 1960s, as legislators debated whether to allocate aid to institutions or to students to offset the cost of tuition, Congress made the decision in favor of aiding students directly (Reuben, 2020). Since then, colleges have competed for students who qualify for financial aid, despite some efforts to counter the competition incentive such as The College Scholarship Service created in 1954 and the Overlap Group, which started in 1958. The former group used a standardized system to assign qualified students to available slots in member institutions. The Overlap Group had the purpose of offering financial aid to students in a way that avoided competition among its members. In 1989, the Justice Department opened an investigation into the Overlap Group for violating the Sherman Antitrust Act as they saw the coordination of financial aid offers as a price-fixing method (Reuben, 2020).

There have been several re-authorizations of the HEA since its inception, including those instituted in 1972, 1978, and 1992, with a trend that emphasized direct aid to students in the form of loans over grants. In 1972 the adoption of Basic Grants (now called Pell Grants) envisioned a foundation for all forms of aid where students could apply directly to the federal government (Gladieux, 1995). The participation of banks as the managers and distributors of loans guaranteed by the federal government has varied. During the Clinton administration, there was a shift back to direct lending, and in the Obama administration, Congress passed a health care

reform bill that included a move to complete direct lending, cutting banks entirely out of the student loan process (Gilbert & Heller, 2013).

Institutional Financial Aid

Financial aid in most universities refers to public and private funding resources available for students as they apply to college and as they continue their education through graduation. These funding sources come in the form of federal or state grants, loans from the public sector, or institutional and private grants in the form of scholarships. Additionally, students and parents have access to student loans from private financial institutions (Dynarski & Scott-Clayton, 2013; Long, 2010).

Considering the different sources of financial aid and the fact that no single form of financial aid is enough to cover the full cost of attending college, financial aid is usually provided in the form of a package, which could be a mix of grants, loans, and work (Hansen, 1983). The distribution of this financial aid will be reflective of the socio-economic position of the students and their families, the type of college that they will be attending, and the financial aid resources available to the institutions (Hansen, 1983).

Merit Aid and Need-based Aid.

Distribution of aid can be based on merit, known as academic grants, or on need, where specific criteria by the public or private grantor are used. The government is the largest provider of grant aid based on financial need, including large national programs such as Pell Grants, federal loans, and state programs structured around individual state resources, historical circumstances, and needs (Federal Student Aid, n.d.).

Both merit and need-base aid support the financing of higher education, particularly for students with limited financial means. Research conducted by Baker & Velez (1996) on financial aid highlights its positive impact on students' access and persistence, however specific forms of aid such as grants and fellowships are the most supportive as compared to loans.

A notable trend in the evolution of financial aid in American higher education was the development of a more standard practice in the 1990s of using merit aid and other discounts as part of recruitment efforts (Reuben, 2020). Merit aid is understood as scholarships and grants awarded to students based on their academic, athletic, or extracurricular achievements. Merit aid can be determined by various metrics such as high school GPA, advanced courses, national academic recognition, and academic rankings. Even though, there is abundant research that demonstrates that merit aid favors students of higher income families (Binder & Ganderton, 2002; Cornwell & Mustard, 2002; Dynarski, 2002; Farrell, 2004; Heller, 2004; Heller & Rasmussen, 2002; St. Johh,2004), it became more of a norm across the nation because of its strong tie to recruitment. The trend of merit aid remains strong now and only a small number of institutions with well-established reputations and foundations, such as Ivy League schools and other highly selective colleges, offer need-only aid (Reuben, 2020).

From the institutional lens, one of the traditional ways to recruit students for colleges and universities is through a strong financial aid policy designed to support those who need it the most, particularly students from underprivileged backgrounds for whom a higher education is an important factor to obtain social mobility (Long, 2010; Stulberg & Long, 2011). However, one of the significant challenges for institutions of higher education as they review and implement their institutional policies is to find an equitable balance between the several forms of financial aid they offer, that is merit aid versus need-based aid, and loans (Jones-White et al., 2014). This

balance is critical to the achievement of their enrollment goals and as they consider equitable access to attain and retain an academically prepared and diverse student population.

Student Loans.

Student loans are still a form of financial aid, but it is the least preferable to support cost affordability of attending college (Baker & Velez., 2014). The policy implications for colleges are that institutions should aim at keeping a positive balance toward grants as compared to loans, as the latter implies a level of commitment and income planning for students that could prove hard to manage, in particular for students who come from low SES (Baker & Velez, 2014; Jones-White et al., 2013; St. John & Noell, 1989).

Social and economic pressures have worsened over the last 30 years resulting in the national student debt⁶ surpassing other major debt groups such as credit card and auto loan debt in 2010 (USA Facts, 2021). Student debt surpassed a trillion dollars for the first time in the third quarter of 2013, amounting to 1.0T, while auto loan debt was at 845B and credit card debt at 672B. By the second quarter of 2019, student debt had reached 1.5T, while auto loan and credit card debt reached 1.3T and 868B respectively (USA Facts, 2021; Hanson, 2023).

In 2022, the Biden administration announcement about their loan debt forgiveness program stated that those earning less than \$125,000 per year could see their student loan debt reduced by up to \$20,000 and has generated a good deal of debate across the country (Herder, 2022). Supporters of this decision among community college leaders believe that this decision could make a significant difference for an important number of individuals and their families.

⁶ The federal government awards most student loans. There are three major types: subsidized loans, unsubsidized loans, and PLUS loans.

They further expect that many students who stopped out or dropped out of college could be considering returning to college once the burden of debt lifts.

During the public unveiling of this unprecedented loan forgiveness plan, President Biden alluded to the college debt burden indicating that it is “so heavy that even if you graduate, you may not have access to the middle-class life that the college degree once provided.” (Lu, 2022, para 2). Attending college in America requires an important financial commitment from students and their families, even if colleges provide different levels of student financial aid. Student loan debt amounted to \$1.7 trillion in early 2022 according to FRED, Federal Reserve Bank of St. Louis.

Even if the Biden administration’s loan forgiveness program lures students who have not completed degrees or those who want to pursue different or higher degrees, it would not be enough to soften the current decline in college attendance and the demographic cliff predicted by Nathan Graw (2018). Colleges will need to strengthen their recruitment policies to at least maintain their enrollments and, given the competition for high school students across the United States, this will not be an easy endeavor.

Student Loans for Underrepresented Minorities.

The national conversation on student debt has become even more heated when referring to the burden that it places on students from underprivileged backgrounds. If the total student loan debt is broken down by income group, those from the bottom 20% to the middle 20% bear over 60% of all student debt. And the average student debt per student increased from \$10,260 in 1989 to \$34,290 in 2016⁷. By 2016, the average student debt for families had doubled the

⁷ After adjusting for inflation

average of auto loans and grew to six times the average of credit card debt. In this context, student debt became the largest financial burden⁸ for American families (USA Facts, 2021).

Seen with a race lens, ethnic groups from lower socioeconomic status bear a heavier burden than their counterparts. The racialization of student debt became more evident in the early 2000s and by 2013 the disparity had tripled, where White students held in average 18% of student debt and Black households held 32% of total student debt (Houle & Addo, 2022). The disparities become even more ominous in student-loan default, where Black graduates are more than five times more likely to default compared to their White peers ten years after graduation (Houle & Addo, 2022).

Researchers Houle and Addo (2022) posited that immediately following their graduation Black students reported 85% more debt than White students, and even more worrisome was the finding that this disparity grew more than twice ten years after graduation. The researchers argued that these racial disparities are rooted at the time people of color start to gain access to higher education, because coincidentally this is when public support to higher education was reduced making the cost of attending college more expensive. State and national cuts to higher education, intentional or not, resulted in attending college harder to afford, particularly for those from lower SES families. Sociologists Seamster and Charron-Chenier (2017) referred to the growing debt gap between racial groups as an example of “predatory inclusion,” the concept that even though Black students have gained greater access to colleges and universities, they have done so under unequal and exploitative terms.

⁸ Excluding mortgage debt

Lastly, the national debate on the student debt crisis has also magnified the difference between higher education being an individual or common good in society. Public opinion has shifted over the last three decades from thinking that the cost of going to college should be borne by the individual—parents and students—to believing that the government should be a primary player in covering college cost (Fischer, 2022). Public pressure on post-secondary institutions has hence increased, expecting that government and colleges and universities provide more financial support to their students through financial aid (state and federal grants and loans) and scholarships (institutional and private merit and need based).

For the last 20 years, the cost of tuition has risen (Kerr & Wood, 2022; USA Facts, 2021) and student loan debt has surpassed unprecedented historical levels in 2013 reaching over 1 trillion dollars (Hanson, 2023). Additionally, families are struggling with an impending recession (Tepper, 2022), high inflation, and stagnant household income (Dickler & Nova, 2022). Thus, attending college may not be as viable a choice for ensuring a positive future. Considering financial support to students is essential when assessing admissions and retention policies.

Financial Aid and Retention.

After students enroll in college, if they remain in their same institution for two, four or six years, these periods calculated as percentages are referred to as retention rates. Otherwise, if we consider the length of time in years that students stay enrolled in an institution of higher education (regardless of where the students first enrolled) in terms of percentages, then we are referring to persistence rates (National Student Clearinghouse, 2023). For the purpose of this study, I will focus on retention rates.

Although enrollment rates overall declined as a result of the world pandemic of 2020, the decline of first-year retention rates were generally smaller as compared to the decline in

enrollment rates. Retention rates at public two-year colleges decreased by 4.9% while public four-year colleges showed a small increase of 1.4%. These rates are an important indicator of eventual degree completion, so that explains their relevance when considering student success (Howell et al.,2021).

Researchers have found a positive correlation between financial aid and student retention and persistence (Alon, 2011; Dynarski, 2008; Patel & Richburg-Hayes, 2012; Scott-Clayton, 2011). Tinto (2006) posits that students income levels impact access to higher education, however, even though access has increased for low-income students, the gap between wealthy and poor students in four-year degree completion remains. Although Jensen (1981) found a small positive effect on the persistence of recipients of financial aid for the freshman class at Washington State University, he cautioned about the absence of a realistic measure for the external financial support needed to complete their education. The author further advised to consider methodological and policy issues when evaluating research findings. These considerations have become much more complex as financial aid from fifty years ago, when financial aid served almost exclusively low-income students through federal grants. Nowadays the financial aid landscape is much more complex, with colleges, states and the federal government providing grants and loans to families from all income levels (Dynarski, 2013).

In this context, research confirms the beneficial effects of financial aid on retention and persistence, although there are many other factors that more directly correlate with increased retention, including sociological, psychological, and economic factors (Tinto, 2006). For institutional policy consideration, it is relevant to explore options that can bring not only broaden access like a test-optional admissions policy, but one that could support funding college attending, such as test-optional scholarships.

Financial Aid Policy Outlook

Research conducted by Baker & Velez (1996) on financial aid highlights its positive impact on students' access and persistence, however specific forms of aid such as grants and fellowships are the most supportive as compared to loans. More specifically, institutions of higher education should shift the scale to favoring grants as opposed to student loans. Both are supportive of financial aid policies that make access more affordable, however in an environment when colleges are still trying to close equity gaps, institutions need to be cautious about keeping the right balance to achieve their enrollment goals (Jones-White et al., 2014).

The question remains as to how financial aid policies and programs could better support underrepresented minority students in their quest to obtain tertiary education. The EAB podcast featuring Dr. Perez focused on questions prompted by a recent report supported by the Lumina Foundation. The report, "Toward a More Equitable Future for Postsecondary Access," was conducted by the National Association for College Admission Counseling and the National Association of Student Financial Aid Administrators (2022) and highlighted several actionable items at the institutional, state, and federal levels to improve the access of African American and other diverse and under-represented populations.

The recommendations in the NACAC/NASFAA (2022) report emphasize caution with standardized tests and a financial aid policy that overly rewards traditional assessment factors such as academic merit and achievement. Regarding standardized testing, the report states that this process can be inherently inequitable to low-income students, who in turn are heavily represented by students of color (NACAC/NASFAA, 2022). Additionally, the report instills caution about the process for awarding scholarships stating that it, too, can be averse to underrepresented minorities. For instance, institutions are pressed to implement scholarship

programs that target students with a high academic achievement outlook (based on high school Grade Point Average and advanced college credit). In many cases, this process excludes students from low-income and other underrepresented minority groups. In that same vein, the institutional application process for scholarship consideration often includes the completion of essays prompting students to write about difficult experiences from their own lives. Although writing about one's life challenges could be cathartic and empowering for some, it could be a traumatic experience for underprivileged minorities who feel marginalized and even victimized by the process (NACAC/NASFAA, 2022).

After reviewing the relevant factors in college admissions, addressing the interconnectedness of college access and affordability with the dual role of supporting students and aiding institutions achieve their recruitment goals, I turn next to examine standardized testing. Standardized testing remains an important element of the admissions criteria for several institutions, however since the inception of the test-optional movement in higher education and the world pandemic in 2020, there has been a significant institutional switch towards the adoption of test-optional policies. In the next section I will also review the weight of standardized testing in the admissions criteria, along with positions of advocacy and criticism regarding the use of these tests.

Standardized Testing in Admissions

Universities that use selectivity as part of their entrance process rely on standardized tests, such as the SAT and ACT. These assessments claim to measure academic readiness and predict how successful students could be once in college. The SAT is generally viewed as an aptitude test, whereas the ACT is an assessment of mastery of the high school curriculum (Claybourn, 2022). Both the SAT and ACT are nationally recognized standardized tests used by

colleges and universities to determine admission for those students seeking access to higher education. The original purpose for both exams was focused on the promotion of student access to colleges and universities across America. Since their origins, these standardized tests have evolved to determine students' potential and mastery of course content and assist in course placement for those being admitted (Bautista, 2022). The tests have been historically tied to certain regions in the country, although they are equally accepted by colleges and universities in the U.S.

Originally designed to level the playing field for college admission, these assessments have come under fire as actually decreasing college access for students from underprivileged backgrounds who, research has demonstrated, do not perform as well on these tests as their White, higher income counterparts (Helms, 2006; Messinger, 2020; Newman et al., 2007; Syverson et al., 2018). In this portion of the literature review, I describe the purpose of these assessments followed by a summary of research that demonstrates the negative impact of these tools on underrepresented minority students.

Predictive Power of Standardized Testing

The broad acceptance of standardized tests in college admissions stems from their capacity to predict academic success in college, known as their predictive power. Understanding what these tests measure and therefore claim to predict is important in assessing their utility. In general terms, the predictive power of standardized tests aligns with the direct relationship between the test scores and college performance measured as the GPA at the end of the freshman year (Morgan, 1989). The statistical analysis that determines the relationship between the standardized test scores and first year college academic performance computes the correlation coefficients and related statistics between these variables. The College Board (which manages

the SAT) has conducted numerous studies validating the SAT along with other admissions criteria (including high school class ranking). Over the years, the College Board has published reports that summarize collective data from hundreds of validity studies. Together these studies can provide guidelines for individual institutions as they look to assess their admissions criteria (Morgan, 1989).

After the 2016 redesign of the SAT, the College Board conducted a research validity study focused on first year grade point average (FYGPA) and retention to the second year (Westrick et al., 2019). Their analysis was based on correlations between the predictors (SAT scores and High School Grade Point Average – HSGPA) with FYGPA and included logistic regression analyses for predicting a student’s likelihood of earning 2.50 or higher. This level of grade was identified as an appropriate threshold that aligned with the student’s ability to manage college work and remain enrolled through graduation (Westrick et al., 2019).

Per the 2016 College Board study, using SAT scores in conjunction with High School Grade Point Average (HSGPA) can help an institution predict the probability of student success when attending college. If only HSGPA is used, the prediction of success is weaker, thus using both metrics together better predicts the college’s ability to identify applicants who have a higher likelihood of performing well academically (Westrick et al., 2019).

The SAT and the ACT

The SAT is an aptitude test. In fact, the letters of the exam initially stood for “Scholastic Aptitude Test” (College Board, 2020). Aptitude tests are considered similar to intelligence tests because they measure a wide set of abilities or skills, including for example, written comprehension, reasoning, and numerical calculations. Unlike intelligence tests (e.g., IQ),

however, aptitude tests measure how a person can apply their intelligence under different scenarios (Thomas, 2022).

The earliest version of a standardized test used in admissions dates back to the early 20th century. The College Entrance Examination Board was developed in 1900 by presidents from 12 universities with the purpose of administering admission tests (PBS, n.d.). Although the first tests were done in essay form during the mid-1920s, the College Board assigned Carl C. Brigham as the chair of the committee to develop an admissions test that could be used by a larger scope of schools. Brigham and his committee developed the Scholastic Aptitude Test (SAT) which was applied for the first time to 8,040 high school students in 1926, but multiple-choice questions were not introduced until 1935 (Lim, 1993; PBS, n.d.).

By 1957, high school students taking the SAT for college admissions passed half a million. However, in 1959, a competitive new organization was formed, American College Testing (ACT), which soon became the leading rival of the SAT. In 1960, the University of California System began requiring the SAT for college admissions, becoming ETS' largest client (PBS, n.d.) In its modern form, the SAT, or SAT I, which measures reasoning, is the most widely accepted for standard admissions, while the SAT II, considered an achievement or subject test, is required by only a few colleges (Geiser & Studley, 2002).

The ACT was designed by E.F. Lindquist to measure practical reasoning acquired in school, differing from the SAT that focused on cognitive reasoning (Bautista, 2018). After just one year, the ACT was taken by more than 130,000 students, becoming a major presence in college admissions testing (ACT, 2022). In 1937, International Business Machines (IBM) developed a machine that automatically provided the scoring of test results in printed form, which later evolved to the method of optical recognition that is currently still used in test scoring

(Arndt, 2011). IBM's automated scoring method allowed for the processing of massive numbers of standardized tests in an efficient and cost-effective way. In 1943, the ACT test was administered to over 300,000 high school seniors across the country, establishing that a standardized multiple-choice test could be applied to massive number of students. In 1948, Conant was a critical agent in bringing together all major testing centers in the country by merging them into one private not-for-profit organization, the Educational Testing Service (ETS), as a new testing agency in Princeton University, and Chauncy became its first president.

Current Status of the SAT and ACT

The world health pandemic of 2020 significantly halted the normal flow of high school students taking the SAT and ACT nationally, as most test localities had to close to adhere with health safety restrictions. In 2022, the numbers of test takers had increased compared to 2021 but they had not reached pre-pandemic levels (Jaschik, 2022). Regarding the actual scores, the high school class of 2022 scored their lowest average (average composite score) in over 30 years, and the SAT also had a lower average score, 1050, as compared to 1060 in 2021. Even though the effects of the pandemic on learning and academic achievement could be considered as possible contributing factors, testing experts caution about over emphasizing the level of impact, particularly around who took or not the test (Jaschik, 2022).

When the 2022 scores for both the SAT and the ACT are disaggregated by ethnicity, Asian students still score better than others, however, students from underrepresented student groups are still trending below their White and Asian peers. On the SAT, Asian students perform best at an average score of 1229, followed by White students with 1098, Latino students with 964, and Black students with 926. On the ACT, Asian students who did not complete the core readiness courses to prepare for the ACT obtained the top average score of 23.7 (out of 36),

followed by White students with an average score of 22.7, Hispanic students with an average score of 20, and Black students with an average score of 17.6 (Jaschik, 2022).

Criticism of Standardized Testing

One of the most debated topics around expanding access to higher education is the standardized testing requirement to gain college admission. An argument defended by the NACAC (2022) and Fair Test sustains that standardized tests such as the SAT and the ACT are designed to disadvantage students from under-privileged backgrounds. Furthermore, there are numerous studies supporting the weak connection of SAT and ACT scores in terms of their predicting power about later college success as measured by FYGPA, cumulative GPA, graduation rates and degree completion (Baron & Norman, 1992; Hartnett, 1989; Bowen et al., 2018). Considering the research evidence that points at the weak connection between standardized tests and student success, researchers and proponents of test blind or test-optional admissions policies posit that using other methods or criteria (high school GPA, advanced college courses, essays, etc.) will ensure a more equitable treatment of underrepresented minorities or historically marginalized student groups (Soares et al., 2011).

Although standardized tests have been used broadly as an important factor in admissions criteria for institutions where selectivity is being used, many question the value these assessments deliver in terms of predicting student academic success as they enter college. These criticisms include: a weak correlation to student success; better predictors of success; the tests' creation of more rather than fewer social disparities; and the misuse of scores in college rankings. I discuss each of these criticisms in this section.

Correlation with Student Success. According to the National Center for Fair & Open Testing (2007), the SAT was designed to predict first-year college academic performance but

almost no research has been conducted to find a correlation between student academic success beyond the first year. Even when predicting academic success in the first year of college, Fair Test sustained that the College Board's claims of a SAT verbal and SAT math correlations of .47 and .48 respectively with First Year Grade Point Average (FYGPA) were deceptive. Fair Test indicated that to determine the level of prediction between the SAT I (Reasoning Test) and first year college grades, the correlation coefficient should be multiplied by itself, with the resulting predictive ability (r squared) of the SAT I at just .22. Therefore, the true predictive power of the SAT I regarding FYGPA would be less than what they claimed since it only explains 22% of the variation of freshmen academic grades (Fair Test, 2007).

The poor correlation between the SAT and college grades was also evidenced in additional validity studies conducted at the University of California and Bates College. At the University of California, the SAT I and SAT II explained only 12% and 15% of the FYGPA, and when combining the SAT II and HSGPA the increase in the score was negligible. Finally, the University of California study underscored the increased susceptibility of the influence of the applicants' SES for the SAT I (Fair Test, 2007).

Also, in assessing the predictive power of the SAT, researchers from Bates College found that when comparing five years of students who submitted SAT scores with those who did not, the latter group had only a minimum score difference in their FYGPA. Furthermore, one of these studies also showed that students' self-evaluation proved to be a better predictor of students' first year academic performance than the SAT scores (Fair Test, 2007).

Other Predictors of Student Success. When looking for long-term student success predictability, detractors of the SAT such as Crouse and Trusheim (1988) posit that high school grades are better predictors than the SAT I score at predicting success based on bachelor's degree

completion (Hatrnett, 1989). In another study conducted at the University of Pennsylvania Baron and Norman (1992) analyzed the power of high school class rank, SAT I (Reasoning Test), and SAT II (Subject Test) in predicting cumulative college GPAs. They found that both the SAT I and SAT II were weak predictors at explaining only 4% and 7% of the variation in college grades. Class rank was the better predictor of the three by explaining 9% of the variation. Additionally, even when combining SAT I and class rank, the statistic increased to only 11%.

In 2005, partly in response to criticism by then President of the University of California system, Dr. Richard Atkinson, the SAT Reasoning or SAT II were updated to be marginally harder. In 2001, Dr. Atkinson (2005) made a public declaration that the university should move away from relying on quantitative metrics narrowly defined and adopt procedures that would assess applicants in a more comprehensive and holistic way, stressing multiple factors in the admissions process. Since that first declaration however and based on a subsequent study by Geiser and Studley (2002), Dr. Atkinson admitted that the SAT II was a better predictor of college grades than the SAT I alone, particularly when combined with high school grades and other combinations of the SAT I and SAT II scores. Critics of the predictive power of the ACT regarding college academic performance pose similar arguments to those presented for the SAT. Per Fair Test (2007), both the ACT and the SAT are weaker predictors of college academic performance than HSGPA alone and provide a slight boost if combined with high school grades.

Equity and Socioeconomics. Standardized testing was thought of as a mechanism for leveling the playfield in its origin. However, studies have shown that instead of broadening access for all, standardized tests create more social disparities: generally, women score lower than men; there is a correlation between family income and test scores; and racial disparities are emphasized (Soares et al., 2011).

In the 1960s, the College Board had a major issue that shed light on the underrepresentation of Black students in higher education. Historically, Black students in the United States score consistently lower than White counterparts particularly in aptitude tests such as the SAT and the ACT. Jencks and Lewis (1998) posited that a consistent lower aptitude score for Black students implied not only societal inequities but a sort of innate deficiency or disability. The ETS rejected the researcher's interpretation by claiming that what the SAT measured was not actually aptitude but rather abilities that were acquired over the course of several years, i.e., achievement. This is how the ETS adjusted the reference to the SAT acronym from Scholastic Aptitude Test to Scholastic Assessment Test (Carlock, 2014).

Criticism over standardized testing used for college admissions continued, particularly as it related to how disadvantaged students from impoverished families with less privileged educational and cultural experiences scored lower than their more advantaged counterparts (Carlock, 2014; Hutcherson, 2019). ETS eventually renounced its claim that the SAT measured either aptitude or the accumulation of knowledge and renamed the test in 1995 to SAT Reasoning Test with the purpose of maintaining brand recognition. As such, the renamed test keeps the name, SAT, however the letters no longer represent an initialism. Carlock, 2014).

In standardized testing used for college admissions decisions, a student's test scores are compared to the scores of other students or to the mean of groups of students with the purpose of determining the student's merit for admissions consideration. Helms (2006) and other authors such as Newman et al. (2007) posited that if the mean or the individual test scores used for comparison are influenced by racial or cultural factors not assessed by the test, then the said test yields scores that are unfair to that student. Helms (2006) defined test fairness as the "removal from test scores of systematic variances attributable to experiences of racial or cultural socialization, and it is

differentiated from test-score validity and cultural bias.” (p. 845). The author further stated that assessment decisions in lower scoring groups from test scores that differ by racial groups are hence potentially unfair.

It is important to note that according to Fair Test, SAT scores poorly predict the variation when analyzed in conjunction with college grades for students grouped on the basis of their gender, race, age and SES. For instance, women, on average, score lower than their male counterparts on the SAT but receive, on average, better grades in college. A different study found that the SAT under-predicted the college academic performance of students from families where English was not their first language. And yet another study from researchers at the University of Miami that compared Hispanic and non-Hispanic White students found that the SAT under-predicted the college academic performance for Hispanic students (Fair Test, 2007). Researchers have also demonstrated the weak ability of the SAT to predict academic success in college for African American students. This poor predictability was found not only for FYGPA, but also for undergraduate class rank, graduation rates, and degree completion (Bowen et al., 2018).

Now that I have presented a research review that helps frame test-optional admissions and the possibility of a complimentary test-optional scholarships policy, in the next section I expand on the literature about the movement that fueled the adoption of test optional admissions. Test optional admissions initiated as an alternative to traditional admissions criteria that uses standardized testing scores to determine the readiness or admissibility of a prospective student (NACAC/NASFAA, 2022). I review the different rationales in the institutional adoption of test-optional policies, along with the advances and challenges institutions are experiencing in the implementation of these policies. I then followed with a few of the criticisms that researchers and scholars have brought up in reference to the implementation of test-optional policies or the

discontinuation of standardized testing as a criteria factor in college admissions. Finally, I review a test-optional scholarship policy as a complimentary strategy to support affordability and retention for students that chose to apply to colleges that have adopted test-optional admissions.

The Emergence of Test-Optional Policies

Despite the creation of the SAT in 1926 and the ACT in 1959 as a way of leveling the playing field in college admissions, some institutions began to realize that these tests did not treat all students the same. Underrepresented students did not have the same access to test preparation and were not performing as well as their wealthier counterparts (Messinger, 2020). Nonetheless, for decades and since their creation, test scores have been one of the most used admissions criteria, along with GPA and the rigor level of courses taken in high school (Messinger, 2020). However, in 1960, some colleges began to make the submission of test scores an optional requirement in the admissions process (FairTest, 2022).

Test-optional policies allow students to decide whether they want to include their standardized test scores with their application. Test-blind or test-free options indicate that an institution will not consider test scores in their admission criteria even if these scores are submitted (Musico, n.d.). Test-flexible colleges allow students to select which test or tests they want to submit. Test-optional policies are the most common in the United States college environment, while test-blind and test-flexible policies are much less common. For instance, there are 81 test-free colleges among over 1,800 accredited, 4-year colleges and universities with test-optional or test-free testing policies, as monitored by FairTest (n.d.).

The movement deemphasizing the use of standardized testing as a requirement to access higher education has been gaining strength for some time, but particularly during 2021 and 2022. The COVID-19 world pandemic of 2020 accelerated the adoption of test-optional practices in the

United States but also in international centers where these tests were delivered. Over the last decade, colleges and universities across the nation have implemented test-optional admission policies for different reasons but with one common premise, broadening access to students, particularly to those of diverse or under-served backgrounds. In general, a test-optional admissions policy assumes that standardized test scores may not necessarily represent a student's full potential for success in college. It also offers the student the option of whether to submit test scores in their application package.

Rationale for the Adoption of Test-Optional Policies

Institutions that have considered and implemented test-optional policies are concerned about perpetuating the advantage to students of higher economic status and social class that standardized testing provides, heeding the findings of numerous research studies (Bennett, 2021; Syverson et al., 2018). The impetus for the test-optional movement is also supported by trends on how student promise and success are being considered and evaluated. These trends are moving away from standardized metrics for student outcomes and adopting a more holistic approach that allow students to provide proof of their academic potential through portfolios highlighting co-curricular activities, community and service commitment, and leadership (Syverson et al., 2018).

Based on research conducted by non-profit organizations with a focus on equity in education, such as The Cooke Foundation, there is a concern that low-income students are not applying to enough colleges so they can in turn have multiple aid offers to compare (Jaschik, 2017). With an application process that offers self-reported test scores, a student with limited financial resources would be more likely to apply to more institutions and hence broaden the scope of the resulting potential aid offers. To support a test-optional policy, and to eliminate barriers in the admissions application process, several institutions are opting for the practice of

self-reporting test scores (Jaschik, 2017). When students self-report test scores they do not need to request an SAT or ACT official test scores to submit to their college of choice as part of the application process. In practice, students apply to multiple institutions at one time, so the official test score fees represent a financial burden to students, especially to those from families of low socio-economic status. By instituting a self-reported test practice institutions broaden student access while making the application process more affordable. However, despite more institutions adopting test-optional and test-blind approaches, other factors such as the institution's name recognition and ranking discouraged more widespread use. Regarding the connection of standardized testing to college ranking though, in June of 2020 U.S. News and World Report decided to rank schools that did not include SAT or ACT for their admissions decisions (Anderson, 2020), removing that ranking factor as an obstacle to test-optional movement.

Advances and Challenges of the Test-Optional Movement

A study published in 2018 by the National Association for College Admission Counseling (NACAC), indicated that after the adoption of test-optional admissions policy there were increases in the enrollment of underserved student populations and no significant slide on GPA and graduation rates during the transition. The authors also posited that because of the influx of students from lower socioeconomic status, institutions had to extend support to these students through additional financial aid (Syverson et al., 2018). Additionally, the NACAC study found that non-submitters were represented in larger proportion by underrepresented minorities and even though this group of students performed at a lower academic level than submitters, there were no significant difference in terms of graduation rates and in some cases non-submitters graduated at higher rates than their submitter peers (Syverson, 2018). Another quantitative study conducted by Bennett (2021) found that the adoption of test-optional policies

could increase enrollment of underrepresented minority groups. Specifically in the private institutions in his study, there was an increase in enrollment of Pell Grant recipients and women.

As of Fall 2022, more than 1,800 higher education institutions do not require standardized test scores. According to a release by the National Center for Fair & Open Testing (FairTest, 2022) the noted institutions practice test-optional or test-blind admissions, including many recognized private, public, and highly selective colleges and universities. Across the nation, some large institutional systems, like the University of California with 226,000 undergraduate students, have stopped using standardized test scores as part of their admissions criteria. Top-ranked, elite institutions such as Harvard, that stopped the standardized testing requirement at the onset of the pandemic, have chosen to remain test-optional for the moment, and in Harvard's case, will remain test-optional for the next four admission cycles (Cooper, 2022).

Criticism of Test-Optional Policies

Even though test-optional practices are becoming more accepted in the United States and advocates for fair and equitable access to higher education praise their implementation in support of underrepresented minority students, there are certain groups and researchers that are cautious. These critics warn of the tendency to overgeneralize positive findings; the downside of disregarding standardized testing for specific institutions or populations where it could be useful; and the failure to identify appropriate and equitable ways to replace standardized tests with the right criteria in the admissions process. I will discuss each of these below.

Overreliance on Test-optional Policies. Non-profit consortiums such as the Common App, have warned of the overreliance on test-optional policies as a panacea to increase access to underrepresented minorities. The Common App, a nonprofit membership organization with a goal to simplify, unify, and equitize college application, has recently reported an important

increase in the number of low-income, underrepresented minorities, and first-generation students using their platform to apply to college. Their report (Herder, 2022, para. 3) indicated that between academic years 2013-2014 and 2021-2022, first-generation students using the Common App platform increased by 90% and underrepresented minority students by 131%. However, their report also clarified that demographic shifts in high schools did not directly account for these increases, but the growth focused in areas in the South, Southwest, and Midwest regions correlated with the addition of flagship schools as members of their organization (Herder, 2022, para. 4).

Disregard Standardized Testing where It Is Useful. In a 2020 study, Chetty, along with a group of researchers (2020) concluded that using SAT and ACT scores along with an income-neutral method of allocating students to colleges, could increase the representation of students from low- and middle-income families at selective colleges in a substantial manner. However, as the authors demonstrated, test scores should be considered in conjunction with an income-neutral allocation where colleges continue to enroll students based on both academic and non-academic credentials but discount family income from the rate of enrollment (Chetty et al., 2020). The authors added that, for the most selective colleges, the proportion of students from middle-class family incomes would increase substantially, however students from the bottom quantile would not present significant difference since proportionally only a few of them have SAT and ACT scores sufficiently high to apply (Chetty et al., 2020).

According to Cooper (2022), for highly selective elite colleges, standardized testing provides an advantage to students from middle and low-income families wanting to gain access to top colleges. The author asserted that if top colleges like Harvard admit students solely based on their standardized scores (with a benchmark of 1400 or higher in the SAT) the resulting

student body would include more students from mid- to lower-income families as compared to those from wealthier family backgrounds (Cooper, 2022). Cooper warned that if these colleges were to drop the standardized test requirements, this would increase the subjectivity used in their admissions processes, such as personality scores, which were highly questioned by Asian student advocates groups, who alleged this type of admission criteria discriminated against Asian-American students (Cooper, 2022).

Other researchers such as Griffore (2007) have cautioned about the overgeneralization of standardized testing critics. For example, if a test is used to guide students' individual decisions, these decisions could lead to success or failure depending on the context of the decision making and the reasons behind them. The author concluded that it is not always right to avoid the use of valid tests only because of racially or culturally based variances.

Replace Standardized Testing with Appropriate Criteria. In 2021, Hossler and his team from the Center for Enrollment Research Policy and Practice at the University of Southern California conducted a study that included test-optional admissions policies and holistic review. Their findings concluded that institutions used different criteria for their admissions decisions, and in an environment where standardized test scores provide the only standard measure that students and families have clear and direct access to, the absence of these scores lead to even less transparency of admissions criteria to those seeking higher education (Hossler, 2021). These researchers also highlighted the element of academic merit to assess college access. Without standardized test scores, colleges will need to find other standardized measures such high school grades or rigor of courses, along with conducting holistic reviews of applications that include review of essays, references, non-academic activities, community service and the like. The authors posed the question of how merit could be redefined to include underprivileged students who had

none or limited access to broader cultural capital through best schools, books, museums, and opportunities to travel. This is a question that is still being considered as institutions reshuffle their processes to include admissions criteria that balance academic quality and equitable access for all students.

Test-Optional Scholarships as Complimentary Policy to Test-Optional Admissions

As I have presented through this literature review, equitable access and affordability are intertwined. Additionally, I suggest that financial aid policies be considered as a complimentary strategy to the adoption of test-optional policies.

Once institutions started to move towards test-optional admissions practices, they realized that they also needed to address their scholarships portfolios, especially merit-based grants that were tied to previous standardized testing criteria. Policies on how this type of aid is granted to students vary depending on the institution. Although test-optional admissions will not likely impact need-based aid such as federal, state, or institutional grants, Pell grants and loans, colleges do not have a standard rule on handling merit-aid, and the differences could even be based on the specific school or department within the college (Powers, 2022).

Traditionally, colleges have been utilizing test scores as one of the criteria with most weight when evaluating the awarding of merit aid. However, as the test-optional movement experienced an onslaught of new adopters at the start of the pandemic, colleges were left with the question of whether to consider test scores for their merit scholarships. A number of these institutions decided to go test-excluded in their merit aid awarding process for their Fall 2021 entering class, including Penn State, Miami University, University of Maryland, and Indiana University (Hall, 2020; Messinger, 2020).

For the application cycle of 2021, and while the test-optional admissions adoption continued to spread throughout the states, more institutions adopted test-optional merit aid policies to complement their test-optional admissions. These included public universities such as Michigan State University, Arizona State University, Texas Tech University, and Indiana University. In the same vein, private universities like Boston, Gonzaga, Baylor, Vanderbilt, Miami of Ohio, and Notre Dame, also indicated in their web sites that submitting standardized test scores was not a requirement to be considered for merit aid (Hall, 2021).

A more recent study posits that since the beginning of the 2020 World Pandemic undergraduate admissions has become less standardized test dependent, and by fall 2023 more than 80% of all four-year colleges and universities do not require the submission of ACT and SAT scores (Bello & Feder, 2023). On the other hand, students and parents still believe that most merit scholarships require standardized tests in their application process. This belief is confirmed in a report released by the National Center for Fair & Open Testing (FairTest), however this same report found that only a quarter of all current merit aid have test requirements (Bello & Feder, 2023).

The report from Bello & Feder (2023) shared findings from a study that included a broad sample of four-year public flagship universities from all fifty states that are test-optional in their admissions criteria. Their study also included the state and institutional merit aid in their forms of scholarships or grants. Besides from the disinformation found in students and parents about test requirements in most merit aid, another major finding of their study concluded that financial aid hurdles (such as test requirements for scholarships) remain as a main impediment for college access for thousands of qualified applicants.

The review of this literature suggests that higher education institutions should strongly consider the decoupling of test requirements in their merit aid as part of their admissions criteria, particularly if they are already test optional. Moreover, for transparency, consistency, and efficiency, matching their scholarships requirements to those of admissions would make the most sense to their applicants while supporting the institutional goals of broadening access and affordability.

Conceptual Framework

Recent research about the impact of test-optional policies on student access to higher education, including students from underrepresented backgrounds or low socioeconomic status, have been grounded on theories or models centered on student choice. Morgan (2016) used Hossler and Gallagher's college choice model (1987) which identified three different phases of the college choice process: predisposition of students to attend college, search for information on potential colleges, and choice of the selected institution followed by the decision to enroll. While Szczepanski-Dugo (2023) based her study on Perna's model (2006) of college choice which recognizes the influences that various levels of the environmental context – schools, communities, higher education institutions, and the social, political, and economic context – have on the students' decisions to seek a tertiary education.

Yet, other researchers, still focusing on the student, have used developmental models such as Vygotsky's Zone of Proximate Development, which identifies the difference between students who do not need additional assistance as they go through the admissions process and students who need support from educators, administrators, parents, or peers to gain admissions to a higher education institution (Pennant, 2018).

Finally, researchers like Bautista (2018) have used theoretical frameworks based on concepts of social constructs. In a study that sought to measure the impact of standardized testing on students of diverse upbringing, Bautista (2018) used Critical Race Theory to highlight the relationship of capitalistic production and exploitation to standardized testing.

For the purpose of this study, I will use the Guided Pathways for Student Success as an evidence-based framework. This conceptual model was built upon previous research on student access and outcomes mainly focused on two-year institutions or community colleges. The Guided Pathways movement originated in 2004, when community colleges shifted priorities to a confluence of a dual commitment: student access and success (Gardner et al., 2021). A report issued by the University of Florida's Institute of Higher Education (2019) posited that although the original Guided Pathways model had been successfully applied in two-year community colleges, its benefits could be extended to four-year institutions. This conceptual approach leverages institutional capacities and a clear student roadmap focused on academics and the student's overall experience. The model further states that by integrating an institutional guided pathways approach, four-year colleges can foster student success through intentional and structured educational experiences, allowing students to efficiently and effectively navigate their student journey from point of entry to completion (Institute of Higher Education, 2019).

The adapted Guided Pathways model to four-year institutions present four student phases as premises to consider in the development of guided pathways to student success. The four student phases are: recruitment (when the college is seeking to identify and enroll prospective students), early progress (when the institution is developing students' acculturation to the academic community), advanced progress (when the institution is preparing students' specialization within a discipline), and transition (when the institution is helping students to

complete courses and move into the workforce) (Institute of Higher Education, 2019). Another important aspect of the Guided Pathways model is the inclusion of model domains as depicted in Table 1.

Table 1

Guided Pathways Model Domains

Guided Pathways Model Domains	
Asset Points	<ul style="list-style-type: none"> • Student feeling positively supported • Outcomes: enrollment, retention
Partners	<ul style="list-style-type: none"> • Salient to student success • Internal or external, per student phase
Processes	<ul style="list-style-type: none"> • Approaches and change management • Build asset points or mitigate pressure points
Interventions	<ul style="list-style-type: none"> • Evidence-based programs • Support asset points or mitigate pressure points
Policies	<ul style="list-style-type: none"> • Institutional-level policies • Support asset points or mitigate pressure points
Pressure/Friction Points	<ul style="list-style-type: none"> • Common barriers and challenges experienced by students
Essential Institutional Capacities	<ul style="list-style-type: none"> • Operational capacities salient to each student phase

Note. Adapted from “Guided Pathways for Student Success” by S. Garner, G. Mehaffy, and P. Markham, 2021, SOVA, p. 75. <https://www.gcsu.edu/sites/default/files/documents/2021-10/Final%20Gates%20Report%20Pages%20%281%29%20%281%29%5B1%5D.pdf>

The context and research questions of this study closely relate to several of these conceptual domains, including asset points with outcomes of enrollment and retention, pressure points with obstacles to the student journey including financial aid and processes, policies that can support the student’s journey, and interventions and institutional capacities that can build on the student overall experience.

Gaps in the Literature

Even though institutions have been adopting test-optional policies for some time, the World Pandemic of 2020 accelerated their adoption mainly because of the unavailability of testing locations in the U.S. and internationally. Likewise, adoption of a complementary test-excluded scholarship strategy has for the same reason increased throughout the higher education landscape (NACAC/NASFAA, 2022).

There are a few studies that have looked at isolated elements of the admissions criteria, such as the value of or otherwise deemphasis of standardized testing (McCubbin, 2018), holistic review (Boyce, 2019), and other methods of assessing applicants. In addition, there are even fewer studies that look at the impact of test-optional or test=optional scholarships policies or a joint strategy when paired with test-optional policies (Morgan, 2016), since it was recent that the ensued of the 2020 pandemic catapulted many institutions to modify their scholarships criteria.

Pellegrino (2020) found in her mixed-methods research of public and private universities a positive correlation between the adoption of test optional policies and the access of under privileged students. However, the research did not demonstrate a clear association between the adoption of test optional policies and the rationale behind the institutional decision to implement such policies. Pellegrino's data samples included undergraduate student groups admitted between 2006 and 2016.

Moret recently, Bennett (2021) published a study examining changes in application behavior and student demographics for private institutions that adopted test-optional polices in a 10-year timeline, from 2006 to 2016. Although Bennett found evidence of some positive trends in the admissions of students from underrepresented backgrounds, he did not detect clear evidence of changes in application or yield rates. While both research studies conducted by

Pellegrino (2020) and Bennett (2021) used data sets within a similar timeline, the current study focuses on a later data sample of beginner student cohorts, from 2018 to 2023, and conducts a quantitative analysis in a four-year flagship public institution.

This study fills a gap in the literature particularly as it combines the adoption of a test-optional policy in conjunction with a test-optional scholarship strategy. The analysis of the impact of this combined strategy will demonstrate if there were increases in application and enrollment numbers, particularly from student groups considered underprivileged, including low socioeconomic status, ethnic minorities, and women.

Since their adoption both practices, test-optional admissions, and test-optional scholarships, experienced a significant uptake during the 2020 health crisis caused by the pandemic, it can be assumed that for some institutions their adoption was in a way forced by the circumstances, while in other cases it might have accelerated a plan that was already being considered. Although this study does not address the institutional reasons behind the adoption of this combined strategy, it can shed some light on its impact on students, particularly those from non-privileged backgrounds.

Summary

In the literature review chapter, I first addressed the broader concept of college access and its connectivity with equity and equality. I then turned to review college admissions in the context of the United States and from both perspectives of access and affordability, particularly in the case of underrepresented minorities. I followed with highlighting the interconnectivity between access and affordability from the student lens, and the financial aid policies that institutions implement to achieve a double goal: support students and reach their recruitment and enrollment objectives.

Subsequently I reviewed the research on standardized testing as part of the traditional criteria in admissions, offering both points of view of advocates and detractors and how their inclusion has diminished overtime as institutions favor test-optional policies. I then turned to explore research conducted since the start of the test-optional movement. In this vein, I presented the rationale behind its adoption, advances, and challenges that institutions face when considering implementation of test-optional admission policies. I also addressed different views in support and in opposition of test-optional criteria, which offer windows of research that still need to be conducted.

From a financial aid perspective, I then focused on the discussion of test-optional scholarships as a complementary strategy to test-optional policies, with the objective of supporting students from both the access and affordability perspectives, and specifically as it pertains to students from underprivileged and underrepresented backgrounds.

As the final sections of the literature review, I presented the general conceptual framework for the present study, the Guided Pathways for Student Success model, and concluded with gaps in the literature.

Chapter III: Methodology

The purpose of this chapter is to present the methodology for this quantitative study regarding a pre and post comparative analysis of the implementation of a test optional policy with a complementary test-excluded strategy in a public Midwest flagship institution. The exploratory nature of this study presents a strong rationale to conduct a quantitative analysis as a first step for an ongoing and growing line of research. In addition, the availability of a rich data set containing student cohorts with variables that could explain factors connected to access and affordability, as well as other important demographic characteristics associated with underrepresentation of certain applicant groups, provides a good backdrop for the analysis that seek to answer the research questions.

The specific research questions of the study, research design and methodology are further explained in the following sections.

Research Questions

Questions about test-optional admissions policy and a complimentary test-excluded scholarships strategy provide direction for this study. The research questions are:

1. How does a test-optional admissions policy help increase college access of students from URM backgrounds?
2. How does a complimentary test-excluded scholarships strategy help recruit and retain students from URM backgrounds?

Discussion about both, the methodology and research design for the quantitative analysis follow below.

Methodology

In this chapter I focus on the research methodology to be used in the institutional implementation of both a test-admissions policy and a complimentary test-excluded strategy and the resulting impact on students of underrepresented background. The quantitative methodology used for this research is based on a descriptive statistical analysis and it is grounded in the post-positivist theory. According to Ryan (2007), the classical positivist paradigm presents limitations to modern research in education as a social science. A post-positivist paradigm posits that there is no absolute truth in research associated with empiricism and supports the existence of individual or subjective perspective of reality when conducting research (Panhwar et.al, 2017). Although the research analysis in this study was quantitative, which could be construed within a positivist framework, as a researcher I recognized that my views and values and hence the knowledge advanced could not be totally neutral. Furthermore, I also acknowledged ethical considerations by adhering to institutional protocols that ensured the ethical protection of the research subjects. Both knowledge neutrality and ethical considerations are highlighted by Ryan (2016) as two significant reasons why researchers in different knowledge fields moved away from positivist paradigms.

The quantitative analysis is exploratory in the sense that it reviewed relevant variables for students' demographics, their status in the admissions process as well as their academic performance and continued enrollment with the purpose of identifying trends and indicators related to access, retention and affordability. The exploratory nature of this study sets the ground for further analysis that could involve quantitative and qualitative methods. As a first step, an exploratory quantitative study is a sound decision given the contextual circumstances for this research. Access to a rich data set for six years of entering cohorts at the institution of analysis

also reinforced the decision of a quantitative exploratory. The campus where the data was obtained has experienced an upward trend on URM representation and has made efforts to improve access, retention and affordability through other programs and interventions, such as active participation in the American Talent Initiative, ATI⁹ program (2022), and the expansion of financial aid to selected groups of URM students. In addition, the MPFU campus enrolls a balanced representation of the state in which it is located, that is, in terms of gender (48.5% male, 51.5% female for the 2023 entering cohort) and regional representation by including all counties in their freshman class for the last several years. Because of this contextual framework, the MPFU campus offers a data set without significant over or underrepresentation of certain student populations that could skew the analysis and results.

The research analysis in this study will be comparative based on the pre and post policy implementation over different years and entering student cohorts, from 2018 to 2023. The policy implementation became effective for the Fall student cohort of 2021. The rationale behind the selection of this comparative study is rooted on the underlying institutional consideration for the adoption of the policy, which seeks to increase access among a new generation of students that include more low- and middle-income students, first generation, and students from underrepresented minorities (Johnson, 2020).

Institution of Analysis

The institution selected for this study is a public research university in the Midwest, the flagship of a statewide university system, referred from hereon and for the purpose of this study as MPFU. The Midwest city where MPFU is located presents to the researcher an interesting

⁹ The goal of the American Talent Initiative (ATI) is to bring top colleges and universities together with the philanthropy and research communities to expand access and opportunity for talented low- and moderate-income students.

location for the analysis as it has consistently enrolled a balanced student population based on residency and international attendance. The enrollment of students of color has increased over the years. In 2018 the proportion of degree-seeking students of color among domestic students hovered around 24%. In 2023 this percentage reached almost 30%.

In January of 2020, the faculty council at MPFU reviewed and approved the request to implement a test optional admissions and scholarships policy to be effective for the entering student cohort of the Fall of 2021. In the context of the test-optional movement, the office of enrollment management had been following the enrollment outcomes of similar institutions that had adopted test-optional and test-free admissions criteria at the national level. Enrollment managers for MPFU also assessed research published by the NACAC, which showed early evidence of beneficial outcomes, including increased numbers of applications, particularly from historically marginalized or underrepresented minorities (URM).

Along with the adoption of a test-optional admissions policy the institution made the decision to adjust the merit academic scholarships criteria to exclude the SAT/ACT test requirement. This test excluded decision was intended to complement the test-optional admissions policy by not financially disadvantaging students who opted for the non-submission of SAT/ACT scores in their application.

The term financial aid leveraging applies in enrollment management to the strategic effort to meet enrollment targets within the concept of constrained optimization (Martineau, 2017). That is, on one hand institutions of higher education have significant constraints on their financial resources, and on the other hand their ability to attract academically qualified students is at least partially linked to the offering of competitive merit-based aid packages. The emphasis

here is on merit aid because it is this type of aid that is more easily under the control of colleges and universities.

Therefore, the assignment of merit-aid or merit-based scholarships has traditionally used standardized test scores in their selection criteria. The institution in this study decided to change this traditional criterion to a test-optional scholarships policy, implementing it along with the test-optional admissions criteria.

Data Collection

The dataset to be used for this study was collected from the institutional archives of MPFU and included the undergraduate entering student cohorts for the fall of 2018, 2019, and 2020 (pre-implementation), 2021, 2022, and 2023 (post-implementation). Fall of 2021 was the first cohort with test-optional admission and test-excluded criteria.

The entire dataset for this study includes all applicants for the beginner cohorts of fall 2018 through fall 2023 (see Table 2 for dataset headings), which translates into approximately 280,000 total observations, encompassing numbers of applications, admitted and enrolled students. Regarding this specific timeline for the selected dataset, it is important to point out that the COVID-19 world health pandemic delivered its grip in the U.S. in the first quarter of 2020. The settling of the pandemic resulted in swift shifts from in-person to virtual lectures and service delivery in colleges and universities across the nation. SAT/ACT testing sites also experienced massive closings, which precipitated an increased adoption of test-optional admissions practices as institutions responded to cause the least disruption of their planned admission funnels.

Table 2

Factors/Variables Fields (dataset headings in Excel view)

Index	Cohort	Apply	Admit	Enroll	Residency	Race_Ethnicity	URM_Indicator	Gender	Gender_Indicator	Pell_Recipient	Amount_of_Unmet_Need	FAFSA_Submission
1	2018	1	1	1	Domestic Nonresiden	White	0	M	0	0	0	1

Table 2 Continued

OEM_Scholarship_Recipient	Test_Submission_Status	SAT	HSGPA	Yr_1_IUB_GPA	Retain_IUB_Yr_2	Yr_2_IUB_GPA	Retain_IUB_Yr_3	Yr_3_IUB_GPA	Retain_IUB_Yr_4	Yr_4_IUB_GPA
1	1	1430	3.84	3.479	1	3.519	1	3.513	1	3.419

The broader implications and impact of the COVID-19 world pandemic on all the different aspects of college students and higher education are still being studied and are not the subject of this dissertation. However, it should be mentioned that the health pandemic had parallel and assumed implications that were socioeconomic in nature (Nicola et al., 2020), including a lingering recession and several indicators of social unrest. Specifically, when analyzing the data to answer the research questions of this study, I should exercise caution when interpreting and discussing results, leaving room for additional research that could include implications of the pandemic and its socioeconomic ramifications in the higher education field.

Research Design

The overall structure of this research study is a comparative analysis of pre and post policy implementation of a test-optional admissions policy and a complementary test-excluded scholarships strategy. The analysis will use descriptive statistics to compare the samples.

Therefore, the data to be studied is organized into two groups representing three years of entering

student cohorts for the fall of 2018, 2019, and 2020; and three years of entering student cohorts for the fall of 2021, 2022, and 2023.

To answer the two research questions the study examines specific variables for six years of entering student cohorts, from 2018 to 2023. The data points include numbers of applications, admissions, enrollments, and demographic indicators such as Pell recipients, ethnicity, academic award recipients, and high school and college performance measures. For the second research question under the element of retention, the study uses similar data points to include analysis reflecting enrollment and retention rates to the second year. I will use Retention to Year 2 consistently for both pre and post implementation years as data for Year 2 is available for the respective cohorts except for the cohort of 2023 as Retention to Year 2 for this year was not yet available when the data set was collected.

The data analysis tools to be used in this study are Microsoft Excel and SPSS. Since the methodology used for the analysis is descriptive statistics, the Excel software provides all the necessary functionality to conduct a thorough analysis of the data set. Excel also provides the use of additional features such as visualization through comparative bar charts, line graphs, scatter plots and box and whisker plots. SPSS provides the necessary features for hypothesis testing, particularly when answering the second research question.

Factors to Consider

For the present study and its respective data analysis I consider relevant factors in the institutional adoption of test-optional admissions and test-excluded scholarships and the impact of their implementation on students of URM backgrounds. The inclusion of these factors or variables in this study is based on their primary scope (cohort year, admission status), and indicator type as it reflects or not affiliation or relationship with URM students. Table 3

summarizes all variables to be included in the data analysis. This table also includes the category or classification of the variables that were measured from the dataset. The classification is based on their nature, role, and measurement scale.

Table 3

Summary of Factors/Variables

Data Points/Variables	Category	Pre-Implementation			Post-Implementation		
		2018	2019	2020	2021	2022	2023
Number of Applicants	Quantitative/Discrete						
Number of Admitted	Quantitative/Discrete						
Number of Enrolled	Quantitative/Discrete						
Residency	Categorical/Nominal						
Race/Ethnicity	Categorical/Nominal						
Gender	Categorical/Binary						
Pell Recipient	Categorical/Binary						
Amount of Unmet Need	Quantitative/Discrete						
FAFSA Submission	Categorical/Binary						
OEM Scholarship Recipient	Categorical/Binary						
Test Submission Status	Categorical/Binary						
SAT Score	Quantitative/Continuous						
High School GPA	Quantitative/Continuous						
College GPA (Yr 1, Yr2, Yr3, Yr4)	Quantitative/Continuous						

Based on the research questions that seek to determine whether there is a connection between the adoption of these policies and an increase of access and retention of underrepresented students, I summarized the different variables grouped by indicator type and the research questions they seek to answer in Table 4. Detailed explanation about the significance of each variable and the rationale behind their selection follows.

Table 4

Summary of Factors/Variables by Indicator Type and Research Question

Indicator	Factors/Variables	Research Question
Basic	Cohort	Both Research Questions
Demographic	Race/Ethnicity . URM American Indian/Alaskan Native Black/African American Hispanic/Latino Native Hawaiian/Pacific Island Two or More Races . Asian . White Gender . Male . Female Residency . Resident . Non-Resident	
Size	Number of Applications Number of Admitted . Admitted/Acceptance Rate Number of Enrolled . Enrolled/Yield Rate	RQ1: How does a test-optional admissions policy help increase college access of students from URM backgrounds?
Performance	Test Submission Status SAT HSGPA College GPA	RQ2: How does a test-optional and complimentary test-excluded scholarship strategy help recruit and retain students from URM backgrounds?
Financial Need	FAFSA Submission . FAFSA Subm Rate Unmet Financial Need Pell Recipient . Pell Recp Rate	
Financial Aid	Scholarship Recipient . Scholarship Recp Rate	
Retention	Retention . Retention Rate Yr2 . Retention Rate Yr3 . Retention Rate Yr4	

Demographic Factors. I consider Race/ethnicity, Gender, and Residency as relevant categorical variables to analyze the data highlighting underrepresented students, with a deeper look at men and women students, and residents and non-residents. These are common variables selected by researchers who have focused on measuring the impact of institutional intervention on minority students (Pellegrino, 2020; Pennant, 2018).

It is important to note that the variable Race/ethnicity contains seven sub-groups including American Indian/Alaska Native, Asian, Black/African American, Hispanic/Latino, Native Hawaiian/Pacific Island, Two or More Races, and White (as shown in Table 5 representing an Excel screen shot for the corresponding variable). The original dataset collected for this study contained this variable grouped by these seven subgroups, so it was not my decision to organize data under this variable in such fashion. Having a combined variable where race and ethnicity are not separated could represent a limitation for the data analysis and ensuing discussion, particularly as belonging to one of such groups does not clearly determine if it is race or ethnicity, or even if the selection could have different if the student marked for instance “White” when their ethnicity also reflects Hispanic ancestry. The following Excel screen shot breaks down the Race/Ethnicity subgroups for the dataset.

Table 5

Ethnicity Categories



Row Labels
American Indian/Alaska Native
Asian
Black/African American
Hispanic/Latino
Native Hawaiian/Pacific Island
Two or More Races
White

As Fuller references “a race is a group of people who are categorized as similar based on some physical attributes, and an ethnic group shares a common culture and sense of shared history” (2004, p.10), consequently every person reflects both, race, and ethnicity. I will keep this distinction in mind as the data analysis is conducted and especially in the subsequent findings, discussion, and conclusion sections.

Race and ethnicity can overlap in the sense that one racial category can encompass more than one ethnicity and vice versa (Wade, 2010), so for the purpose of this study I should keep this understanding when conducting the data analysis and especially during the discussion of the results or findings. It is important to note that the institutional archival data set that I obtained presented the Race/Ethnicity data point in a combined format with the seven subgroups as shown in Table 4, so student applicants had the option to choose one category during the application process.

I plan to conduct different levels of data analysis with the Race/Ethnicity variable, from the more disaggregated level, i.e., by Race/Ethnicity subgroup that will group all the Race/Ethnicity subgroups (except for “White” and “Asian”) into the URM grouping. By doing so I will be able to run specific data analysis for URM and non URM groups with the opportunity to also break the analysis down by the Race/Ethnicity subgroups. This level of analysis should provide additional significant differences or trends over time, especially when comparing the pre and post implementation years.

Factors of Size. I include numbers of applications, admissions, and enrollment as a first research choice. These numbers for the longitudinal data set of student cohorts between 2018 and 2023, represent three years of both pre and post policy implementation groups. The data will be analyzed based on these two comparison groups across all the rest of the variables. Previous research has used factors of size, such numbers of applications, admitted and enrolled students in helping to determine access to higher education, particularly for students from underserved or under privileged backgrounds (Belasco et al., 2015; Bennett, 2022; Pellegrino, 2020).

The factors being considered to answer each of the research questions show numbers of applications, admissions, and enrollment. In order to summarize the data and facilitate the quantitative analysis, I will convert these numbers into their respective rates. The conversion uses a simple mathematical formula to obtain the rates as shown in Table 6. These rates are detailed in Table 7. As indicated before, this table also includes the category or classification of the variables that were measured from the dataset.

Table 6

Rates of Admissions, Enrollment and Retention Formulas

Rate of Admissions = $\frac{\text{Number of Admitted}}{\text{Number of Applicants}}$
Rate of Enrollment = $\frac{\text{Number of Enrolled}}{\text{Number of Admitted}}$
Rate of Retention = $\frac{\text{Number of Returning Students}}{\text{Number of Students in Previous Year}}$

Table 7

Rates for URM: Admissions, Enrollment, Retention and Award Recipient

Rates	Category	Pre-Implementation			Post-Implementation		
		2018	2019	2020	2021	2022	2023
Rate of admissions for URM pre test-optional	Quantitative/Continuous						
Rate of admissions for URM test-optional	Quantitative/Continuous						
Rate of admissions for non-URM pre test-optional	Quantitative/Continuous						
Rate of admissions for non-URM test-optional	Quantitative/Continuous						
Rate of enrollment for URM pre test-optional	Quantitative/Continuous						
Rate of enrollment for URM test-optional	Quantitative/Continuous						
Rate of enrollment for non-URM pre test-optional	Quantitative/Continuous						
Rate of enrollment for non-URM test-optional	Quantitative/Continuous						
Rate of URM admitted acad award recipient	Quantitative/Continuous						
Rate of URM enrolled acad award recipient	Quantitative/Continuous						
Rate of non-URM admitted acad award recipient	Quantitative/Continuous						
Rate of non-URM enrolled acad award recipient	Quantitative/Continuous						
Rate of retention URM enrolled acad award recipient	Quantitative/Continuous						
Rate of retention non-URM enrolled acad award recipient	Quantitative/Continuous						

Factors of Performance. As another important choice to analyze the data for this study, I include the Test Submission status categorical variable since it is considered a clear indicator of students’ response to the option of whether to submit their standardized test scores when applying to the institution. Even though data in the first three years post-implementation of the test-optional policies, there are cases where students who indicated test-optional in their application submission did submit their test results. Similarly, data for the post-implementation cohorts also show cases where students opted for submitting their test results but did not submit them. There are various reasons why these situations occur when students enter the process of admission applications including errors in the electronic submission and errors in the students’ actions as large proportion of students apply in average to eight schools (College Board, n.d.).

Specifically, to answer the research question that looks at the impact of the policy implementation on student retention, I include performance indicators such as High School GPA,

Standardized Test scores (SAT)¹⁰, and College GPA. These academic performance variables have been used in research that explores their relationship with student retention. Aitken (1982) used college GPA to explore its impact on student satisfaction, performance, and retention. Snyder et. al (2003) studied the relationship between student success and retention for high school GPA, gender, and SAT scores. Murtaugh et.al (1999) found that attrition increased with age and decreased with higher levels of high school GPA and first quarter college GPA. Interestingly, the authors also found that attrition was higher with non-residents than with resident students. In addition, research centered on the impact of first-year interventions (Clark and Cundiff, 2011; Schneider et.al, 2015) have found a positive relationship between the implementation of such programs and an increase on GPA. The factor of student retention to the second year is relevant as one of the indicators of student success and it is closely related to other measures of performance such as college GPA. Factors of Financial Need. These are factors indicating financial need or low SES and are categorical variables comprising: FAFSA Submission, Unmet Financial Need, and Pell Grant Recipient. The selection of these factors is supported by previous research, including Morgan (2016) who found FAFSA filers responded positively to financial aid, and Hiss and Franks (2014) and Pellegrino (2020) who reported increased enrollment in recipients of Pell grants.

¹⁰ Converted SAT scores based on ACT to SAT (Princeton Review) or old SAT (pre-2016) and new SAT (College Vine)

Factors of Financial Aid. The categorical variable of Award/Scholarship recipient is a financial aid indicator and has been linked to both student enrollment and retention. Previous research on financial aid and its impact on student retention has found that there is a link between receiving an scholarship award and an increase in student retention (DesJardins et.al, 2002) and more specifically St. John & Starkey (1995) and Paulsen & St. John (2002) found that low-income students are more responsive to grants whereas students from lower to middle income stratus respond more favorable towards loans and work study funding. Regarding the impact of financial aid on student recruitment or enrollment there has been extensive research supporting a positive effect in student enrollment (McPherson & Schapiro, 1991; Seftor & Turner, 2002; Van Der Klaauw, 2002; Witherspoon, 1992) that supports the selection of the Award/Scholarship recipient factor. Descriptive statistics for this variable in conjunction with the variable of Unmet need was conducted to determine the type and significance of their interaction.

Factors of Retention. These are factors directly related to the retention of students to Years 2, 3, and 4. The data set collected for the study had retention for years up to Year 4, however since the last year of available data was 2023, only data of retention to Year 2 is available for all the cohorts included in the study.

Protection of Participants

As posit by Richard Barke (2009), the Institutional Review Boards (IRBs) in the U.S. must identify and assess the risk to human research subjects in the conduction of research. In that vein, the institutional dataset collected for this study was obtained following the appropriate acknowledgement and approval processes, including submitting and obtaining IRB approval as

shown in Appendix A. The collected dataset did not include any individual identifiers such as name or student ID at the student record level.

Data Preparation

Before proceeding with the data analysis, I will prepare the data to ensure there is no missing information under any of the variables that could cause skewness in the subsequent findings or results.

An important decision was made to exclude 25,967 observations corresponding to international student applicants because given their status they do not qualify for scholarship awarding. Preliminarily, the collected dataset did not present obvious signs of missing data. I run COUNTIF formulas for the variables and only twenty-one cases of missing information were identified under the Residency variable. This number was minimal, so I made the decision to discard these instances. In the same vein, seven observations under the Gender variable were identified as missing information and were discarded.

The use of quantitative tools in addressing comparative analysis aims at reducing the complexity of the data by graduating similarities and differentiations, hence improving the generalization of results (Reale, 2013). However, the author cautions researchers to be careful about the quantification of values that otherwise have a qualitative nature. In this vein, codification of categorical variables will be conducted with precaution in mind.

In the case of categorical variables, I coded them with the purpose of aggregating sub-groups, such in the case of underrepresented groups; and to assign a numerical value to non-numerical variables such is the case for male and female categories, and resident and non-resident status. Coding facilitates the analysis of categorical variables, as well as the comparison

of specific groups within a categorical variable, for example in the case of gender (female and male). See Table 8 for a detail of the coding to be used for the respective categorical variables.

Table 8

Dataset Coding by Variable

Variable/Cohort Year	Indicator Type	Coding	Pre-Implementation			Post-Implementation		
			2018	2019	2020	2021	2022	2023
Index	Basic	Count						
Cohort	Basic	Year						
Apply	Basic	Count						
Enroll	Basic	1=Enroll, 0=Not-enroll						
Residency	Demographic	Resident, Non-resident						
Residency_Indicator	Demographic	1=Res, 0= Non-Res						
Race_Ethnicity	Demographic	White,Black/African American, Asian, Hispanic/Latino, Native Hawaiian/Pacific Island, American Indian/Alaskan Native, Two or More Races						
URM_Indicator	Demographic	1=URM, 0=Non=URM						
Gender	Demographic	Male, Female						
Gender_Indicator	Demographic	1=Male, 0=Female						
Pell_Recipient	Financial Need	1=Pell, 0=No Pell						
Amount_of_Unmet_Need	Financial Need	Continuous Amount						
FAFSA_Submission	Financial Need	1=FAFSA, 0=No-FAFSA						
OEM_Scholarhisp_Recipient	Financial Aid	1=Scholarship, 0=no Scholarship						
Test_Submission_Status	Performance	1=Test, 0=no Test						
SAT	Performance	Continuous Test Score						
HSGPA	Performance	Continuous HS GPA						
Yr_1_IUB_GPA	Performance	Continuous IUB GPA Year 1						
Retain_IUB_Yr_2	Performance	1=Retain Yr2, 0=no Retain Yr2						
Yr_2_IUB_GPA	Performance	Continuous IUB GPA Year 2						
Retain_IUB_Yr_3	Performance	1=Retain Yr3, 0=no Retain Yr3						
Yr_3_IUB_GPA	Performance	Continuous IUB GPA Year 3						
Retain_IUB_Yr_4	Performance	1=Retain Yr4, 0=no Retain Yr4						
Yr_4_IUB_GPA	Performance	Continuous IUB GPA Year 4						

Regarding the Residency variable, there is a category labeled “Missing” however, the count for these observations resulted in 3,031 cases. In this case I made the decision to keep the observations for further consideration and analysis as the number was significant enough where discarding these data could result in discounting information that could otherwise prove relevant to the study.

Data Analysis

Based on the data collected for the six years of entering student fall cohorts (2018 to 2023) I plan to generate a range of descriptive statistics to analyze the data. First, I will explore the data by using frequency tables through measures of central tendency (MCT) for the

categorical variables such as gender and ethnicity. I will use measures of dispersion (MoD) that revealed information about the spread of the data and its variability. According to Jones and Goldring (2021) this preliminary data exploration helps me identify trends and potentially missing data from certain groups.

Very important during this phase of the analysis are the decisions around specific variables that contained more than one level (Jones & Goldring, 2021). To illustrate this point, I will group the race/ethnicity category in four levels, which is consistent with previous studies on the impact of institutional policy on underrepresented minority groups (Lofaro, 2021; Pellegrino, 2020; Pennant, 2018). After ensuring that the data is correctly labeled, I will run frequency descriptives for each variable to identify any potential outliers for categorical data. The data show a few indicators of outliers however, I chose not to remove them to prevent skewing the results of the data analysis (Draper & Smith, 2014). I plan to present descriptive statistics with and without outliers for variables where identified.

I will use MS Excel to analyze the historical quantitative student cohort data in this study. Two-time groups will be compared, specifically the cohorts that applied, were admitted, and enrolled before the implementation of the test-optional and test-excluded policies and after their implementation. The statistical data for underrepresented minority students will be compared for each pre and post implementation groups by using the means and standard deviations to determine if significant change is evidenced from fall 2018 to 2020 and fall 2021 to 2023 for the respective admissions cycle.

Descriptive statistics will be used to uncover differences between variables for the analyzed time periods: application, admission and enrollment for underrepresented minority students, ethnicity, gender, SAT/ACT, HS GPA, College GPA, Test Submitter, Pell recipient,

and Retention (based on 2nd year enrollment). The data will be uploaded into Excel spreadsheets, graphics, charts, and tables to allow for the comparison of data output.

Specifically, to answer the first research question of “How does a test-optional admissions policy help increase college access of students from URM backgrounds?”, I will calculate the volume of applications as well as the rates of admissions and enrollment to determine if there were increases when compare year over year as I look for trends. An upward trend in applications, admissions and enrollment would positively align with broader access. The analysis will be broken down for URM and non-underrepresented variables, which will help with the comparative analysis as I look to identify trends for URM as a group and for the URM sub-groups. Analyzing trends in time as well as contrasting outcomes for the pre and post implementation groups will be important in determining if access increases for students of URM groups.

In addition, I will conduct a second level of analysis by introducing the Gender and Residency variables for the analysis described above. This will further detail the URM and non-URM groups by their gender (male/female) and residency status (resident and non-resident). Female students continue to be considered minorities in certain college programs such as those related to the STEM field. On the other hand, residency status is associated with lower tuition rates for residents and higher tuition rates. Also, financial need or low SES indicator variables, including Pell recipient, FAFSA submission, and level of Unmet need will be analyzed for all URM and non-URM groups and subgroups, and for Test submitters and non-submitters as part of this comparison within the pre and post time frames.

A third level of analysis will be based on descriptive statistics, particularly for continuous variables related to performance (SAT, HSGPA and College GPA) and, financial need or low

SES (Amount_of_Unmet_need). I will compare the mean (SAT) and median GPA¹¹, as well as levels of Unmet need for URM and non-URM groups and subgroups for both pre and post policy implementation. Along with broadening access for URM students it will be relevant to determine if there are significant differences in performance and low SES indicators for these student groups in a pre and post policy implementation comparison. Finally, this analysis will be further advanced by introducing the Test submission indicator to determine if there are trends and observable differences between these two groups particularly in the post policy implementation period.

In conjunction with the rate of admissions calculations and descriptive statistics analysis I will illustrate the most relevant outcomes with line graphs with the analysis of variables across time, clearly indicating the point in time that marks policy implementation, that is pre and post 2021.

To answer the second research question of “How does a complimentary test-excluded scholarships strategy help recruit and retain students from URM backgrounds?” I will use the basic indicators of Cohort and Enrollment to calculate the rate of enrollment across time, year over year, and for the pre and post policy implementation groups. For this analysis I will also include the URM and non-URM variable groups, with the respective URM subgroups and the Residency and Gender indicators.

As with the analysis for the first research question, advancing the analysis to include performance indicators (SAT, HGPA, and College GPA), low SES indicators such as Pell

¹¹ When the variability of the values is such that tends to skew the distribution, such as in GPAs a better measure of central tendency is the median over the mean as it is less impacted by extreme outliers or non-symmetric distribution scores. (Orman, 2023).

recipient and Amount of unmet need could offer trends and change differences in the URM and the non-URM groups and subgroups when analyzed in the context of pre and post implementation. And finally, at this point of the analysis I will introduce the Test submitter indicator to determine whether there is any level of impact for the URM and non-URM groups within the pre and post implementation framework.

The next level of analysis will use descriptive statistics for performance indicators of continuous nature (SAT, HSGPA and College GPA) and, for indicators of low SES (Amount_of_Unmet_need). These performance factors are associated with retention research that found a positive relationship between higher levels of SAT and GPA and higher rates of retention. As indicated for the first research question I will compare the mean (SAT) and median GPA, as well as levels of Unmet need for URM and non-URM groups and subgroups for both pre and post policy implementation, but in this case looking at the variances from the perspective of enrollment. The variable of Unmet need adds a financial indicator that could be relevant for both, recruitment, and retention. Here, I plan to analyze the data from the perspective of Scholarship recipient as well. The way both financial variables behave in the analysis could depend on the URM and non URM groups that are being compared in the context of pre and post implementation. The Test submission indicator will be included lastly as I continue with the analysis.

With the purpose of determining whether a significant change occurred in the levels of retention, I will use the Retention to Year 2 factor. This variable is dichotomous, indicating whether the student retained (continued to be enrolled) the second year after first time matriculation or enrollment. This variable is also consistent throughout the period being analyzed, from the first entering cohort in the pre implementation period in the Fall of 2018 to

the last entering cohort presenting a value for this variable in the Fall of 2022. I will calculate the retention rate to Year 2 for all URM and non-URM student groups and subgroups and analyze how these groups did when performance factors (SAT, HSGPA, College GPA), Low SES indicator (Pell recipient), and Test submitter indicators are being considered across the pre and post implementation timeframe of the study.

It is important to note that the number of years to be included for the pre implementation period in the Retention to Year 2 analysis will encompass all three years (2018-2020), whereas for the post implementation period I will only include two years (2021 and 2022) because these are the only years with Retention to Year 2 collected data. The student cohort corresponding to year 2023 does not show data for the Retention to Year 2 data as it was too early in the cycle for the collection of retention data. In addition, the volume of applications for the pre implementation timeframe is comparable to the volume of applications for the post implementation period, specifically due to the increase in applications prompted by the adoption of test-optional policies at MPFU.

Finally, I will conduct a *t*-test to determine if the variances between two groups (pre and post policy implementation) are statistically significant. The decision to choose a parametric *t*-test was based on Mishra, et.al (2019) who stated that a *t*-test may be used when two groups differ from each other as is the case for an independent two-sample test. The assumptions for the use of a *t*-test include continuous data, homogeneity of variance and close to normal distributions, all which applied to the sample used in the present study.

For this study, a *t*-test statistics value is found by finding the difference between the mean of the post implementation sample and the mean of the pre implementation sample, divided by the common variance of the two samples as shown in the formula below.

$$t = \frac{m_A - m_B}{\sqrt{\frac{S^2}{n_A} + \frac{S^2}{n_B}}}$$

Where A represents the pre-policy implementation group and B represents the post-policy implementation group. Also, m_A and m_B represent the pre and post-policy implementation means respectively, n_A and n_B represent the sizes of both groups respectively, and S^2 is an estimator of the common variance of the two samples, which is calculated as follows:

$$S^2 = \frac{\sum (x - m_A)^2 + \sum (x - m_B)^2}{n_A + n_B - 2}$$

A second step following the t -test statistics formula will be to find the p -value based on the t -test statistic, by using the p -value formula in Excel, as follows:

$$p\text{-value} = \text{T.Dist.2T}(\text{ABS}(t\text{-stat}), \text{df})$$

Where the formula calculates the p -value for a t distribution, two tails, using the absolute value of the t -statistic given the sample size. If the p -value is lower than the selected α level of confidence of 0.05, the null hypothesis is rejected with a significant level of confidence (Howell, 2022).

A t -test will be calculated for the Retention to Year 2 variable, for all students first, and then for the URM and non URM groups and subgroups comparing the pre and post implementation timeframe. In the same vein the t -test will be run for Admission or Acceptance rates, enrollment rates, and the Scholarship recipient indicator, considering the URM and non-URM groups and subgroups within the pre and post implementation context.

The *t*-test will allow me to make interpretations about population parameters based on sample data for the two pre and post implementation groups. These interpretations will further detail the second research question by determining the level of significance based on Admissions or Acceptance rates, Enrollment rates, Retention to Year 2 rates, and Scholarship recipient rates for URM students in the pre and post timeframe. The description of the first and second research question and their corresponding sets of hypotheses follow.

Research Question 1: How does a complimentary test-optional admission policy help increase college access of students from URM backgrounds?

Ho: there is no significant statistical difference in Acceptance rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is significant statistical difference in Acceptance rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

Ho: there is no significant statistical difference in Enrollment rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Enrollment rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

Research Question 2: How does a test-optional and complimentary test-excluded scholarship strategy help recruit and retain students from URM backgrounds?

Ho: there is no significant statistical difference in Retention to Year 2 for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Retention to Year 2 for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

Ho: there is no significant statistical difference in Scholarship recipient rate for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Scholarship recipient rate for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

Methodology Limitations

The focus of this study on the flagship of a public Midwest research university without considering other campuses in the system presents a limitation in scope. The choice of narrowing the scope to the flagship campus makes sense to me as the researcher in that enrollment for the data sample balanced residency and exhibited a consistent diversity presence. In addition, the flagship has maintained a public goal of increasing minority representation.

While the present quantitative and descriptive study offers a good first step to explore the implications regarding access, recruitment, and retention for URM student groups, the implementation of institutional policies usually has a rationale underpinned by multiple factors. A qualitative analysis to shed light on the institutional rationale through surveying enrollment

managers and academic and university leaderships was not part of this study but could be valuable as future complementary research.

In the same vein, even though the research questions for the present study could be answered by an analysis based on quantitative observations, comparisons, descriptive statistics, and to some extent interpretations based on statistical significance, a more advanced inferential analysis may provide a deeper level of detail, particularly when focusing on the categorical variables linked to underrepresented minorities. The same may be true for the comparison of the two timeframes of the analysis, that is, pre and post implementation of the test-optional policy and test-excluded strategy. A multivariate time-series inferential analysis could result in a more nuanced output when looking at the variables' behavior between the time periods and as they influence each other. Inferential analysis could certainly be a natural next step in future research, for this institution or for a larger scope study. Again, the decision to conduct an exploratory quantitative analysis on the collected data samples is based on the recognition that this approach could result in solid outcomes which would in turn become the foundation for further qualitative and inferential analysis. Future analysis could focus on the same institution or extrapolating it to include other campuses in the same university system, or institutions of similar characteristics such those belonging to the Big Ten Academic Alliance¹².

Another limitation to this study relates to the possible impact of the COVID-19 world health pandemic and its resulting implications on higher education institutions and students, including those of socioeconomic nature. There are a handful of studies that have looked at the

¹² The Big Ten Academic Alliance was established by the presidents of the [Big Ten Conference](#) members in 1958 as the athletic league's academic counterpart. Initially known as the Committee on Institutional Cooperation, the consortium's name was changed to the Big Ten Academic Alliance in 2016 to better reflect the composition of the member institutions.

pandemic impact on college enrollment (Le Flore et al., 2022), and others centered in college type (Bulman & Fairlie, 2021), student populations (Franco et al., 2023), and student development (Franco et al., 2023). However, more research is needed to determine the impact of the world pandemic on specific institutional policy, such as involving admissions criteria, and student enrollment of historically marginalized student groups.

Summary

In this chapter I presented the methodology for this quantitative study to answer the research questions based on a descriptive statistical analysis grounded in the post-positivist theory. The research questions seek to determine if the implementation of test-optional admissions and a complementary test-excluded scholarship strategy increase college access and help recruit and retain students of underrepresented backgrounds.

The quantitative analysis is exploratory in the sense that reviewed relevant variables for students, demographics, their status in the admissions process as well as their academic performance and enrollment. The analysis is also comparative as it focuses on pre and post policy implementation of test optional policies in a six-year span of entering student cohorts.

The institution selected for this study is a public research university in the Midwest (MPFU). A data set collected from institutional archives represents entering student cohorts from fall 2018 to fall 2023. The first three years corresponded to a pre policy implementation timeline and the last three years aligned with the implementation of a test-optional and complimentary test-excluded strategy. Consequently, the overall framework of this study is a comparative analysis of a pre and post policy implementation.

To answer the research question focused on broadening access to URM students, the study examined variables that included numbers of applications, admissions, enrollments, demographic indicators such as URM and non-URM groups (including their race/ethnicity subgroups), Gender and Residency; performance indicators including SAT, HSGPA and College GPA; low SES indicators such as Pell recipients, and Amount of Unmet need; and a Test submitter indicator. In the same vein and to answer specifically the second research question under the element of retention, the study used similar data points as the first research question but highlighting an analysis to include Enrollment and Retention rates to the second year, plus Scholarship recipient rates. Specific techniques to answer both research questions will include rate calculations, summary time observations and comparisons, descriptive statistics, and significance testing for the pre and post policy implementation timeframe.

The quantitative historical institutional data for this study was analyzed using MS Excel for most of the descriptive statistics and data visualization; and SPSS for the hypothesis testing part of the analysis. Next, Chapter IV presents a detailed analysis of the results and findings of the study.

Chapter IV: Results

The purpose of this study was to examine how the adoption of test-optional and test-excluded policies contributed to increased access, recruiting and retention for students of URM backgrounds at MPFU. For the quantitative analysis I addressed the following questions:

1. How does a test-optional admissions policy help increase college access of students from URM backgrounds?
2. How does a complimentary test-excluded scholarships strategy help recruit and retain students from URM backgrounds?

The results section details the findings of the data analysis explained in the previous chapter and will answer the research questions. Relevant findings are addressed by each individual factor and by the indicators established in the methodology section, specifically Table 3, of this study. Results related to factors of size such as number of applicants, admitted and enrolled students, including admitted and enrolled rates, will be presented to answer the first research question. Results related to factors of performance, including financial need, financial aid, and retention will be detailed to address the second research question. Descriptive statistics were used for the quantitative analysis to summarize and organize the data set. The analysis was run for both the pre-implementation cohorts (2018-2020) and the post-policy implementation cohorts (2021-2023). The summary descriptive statistics is shown in Table 9.

Table 9*Pre-Implementation Descriptive Statistics*

SAT		HSGPA		Yr_1_IUB_GPA		Yr_2_IUB_GPA	
Mean	1262.793	Mean	3.65732	Mean	3.300418	Mean	3.37268
Standard Error	0.478695	Standard Error	0.001208	Standard Error	0.004254	Standard Error	0.00351
Median	1280	Median	3.8	Median	3.463	Median	3.48
Mode	1370	Mode	4	Mode	4	Mode	4
Standard Deviation	162.1435	Standard Deviation	0.402843	Standard Deviation	0.629004	Standard Deviation	0.49303
Sample Variance	26290.52	Sample Variance	0.162283	Sample Variance	0.395646	Sample Variance	0.24308
Kurtosis	-0.29346	Kurtosis	1.74654	Kurtosis	3.294713	Kurtosis	1.70338
Skewness	-0.37198	Skewness	-1.36778	Skewness	-1.58481	Skewness	-1.17872
Range	1010	Range	3.22	Range	4	Range	4
Minimum	590	Minimum	0.78	Minimum	0	Minimum	0
Maximum	1600	Maximum	4	Maximum	4	Maximum	4
Sum	1.45E+08	Sum	406646.5	Sum	72143.84	Sum	66691.4
Count	114731	Count	111187	Count	21859	Count	19774
Largest(1)	1600	Largest(1)	4	Largest(1)	4	Largest(1)	4
Smallest(1)	590	Smallest(1)	0.78	Smallest(1)	0	Smallest(1)	0
Confidence Level(95)	0.938236	Confidence Level(95)	0.002368	Confidence Level(95)	0.008339	Confidence Level(95)	0.00687

Post-Implementation Descriptive Statistics

SAT		HSGPA		Yr_1_IUB_GPA		Yr_2_IUB_GPA	
Mean	1312.437	Mean	3.716132	Mean	3.313842	Mean	3.342428
Standard Error	0.623249	Standard Error	0.001087	Standard Error	0.004614	Standard Error	0.005578
Median	1330	Median	3.89	Median	3.463	Median	3.429
Mode	1370	Mode	4	Mode	4	Mode	4
Standard Deviation	146.0985	Standard Deviation	0.387154	Standard Deviation	0.607934	Standard Deviation	0.492346
Sample Variance	21344.76	Sample Variance	0.149888	Sample Variance	0.369584	Sample Variance	0.242405
Kurtosis	0.149733	Kurtosis	3.322274	Kurtosis	3.278008	Kurtosis	1.038454
Skewness	-0.59552	Skewness	-1.74846	Skewness	-1.53562	Skewness	-0.97887
Range	940	Range	3.3	Range	4	Range	3.6
Minimum	660	Minimum	0.7	Minimum	0	Minimum	0.4
Maximum	1600	Maximum	4	Maximum	4	Maximum	4
Largest(1)	1600	Largest(1)	4	Largest(1)	4	Largest(1)	4
Smallest(1)	660	Smallest(1)	0.7	Smallest(1)	0	Smallest(1)	0.4
Confidence Level(95)	1.221573	Confidence Level(95)	0.00213	Confidence Level(95)	0.009045	Confidence Level(95)	0.010934

Summary Table 9 depicts measures of central tendency such as the mean, median, and mode; and measures of variance, including standard deviation. Specific measures of mean or

average, and median were used in analyzing several of the factors selected for the study. Mean and variance were also utilized in the application of *t*-test statistics to determine the significance of post-policy implementation change for some of the factors, including admitted, enrolled and retention rates.

As described in the methodology chapter, factors selected under the Basic (Cohort) and Demographic (Race/Ethnicity, Gender) indicators were used to answer both research questions. Regarding the first research question, which focused on how these factors help increase college access for URM students, the factors were grouped by the Size indicator (Number of Applications, Number and Rate of Admitted/Accepted students, and Number and Rate of Enrolled students).

In the case of the second research question, which centered on how these factors help the institution to recruit and retain URM students, the analysis included factors classified under the following indicators: Performance (Test Submission status, SAT, HSGPA, and College GPA); Financial Need (FAFSA Submission, Unmet Financial Need, and Pell Grant Recipient); Financial Aid (Scholarship Recipient); and Retention.

First Research Question: How Does a Test-optional Admissions Policy Help Increase College Access of Students from URM Backgrounds?

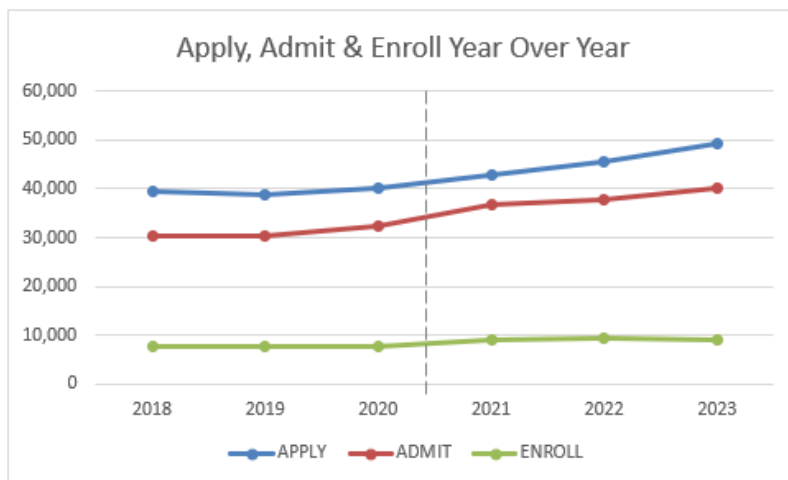
The following factors of size were analyzed to determine if they had an impact on broadening college access for students of underprivileged backgrounds. The specific findings of the study analysis follow.

Applicants, Admitted and Enrolled

To answer this question numbers of applicants, admitted, and enrolled students were considered for the descriptive analysis throughout the study period. The analysis of the data resulted in a constant increase in the number of all undergraduate applicants, admitted, and enrolled students based on a year-over-year comparison as shown in Figure 1. However, the increase for the post-adoption of test-optional and test-excluded policies for the corresponding cohorts of period 2021-2023, indicated a slightly higher increase for applications and admissions when compared to the pre-adoption timeline for the cohorts 2018-2020.

Figure 1

Application, Admission, and Enrollment Numbers Year Over Year



As depicted in Table 10, when the descriptive analysis focused on ethnic student groups it still resulted in constant increases in numbers of applicants, admitted, and enrolled students for the overall study period. However, it is worth noting that White students presented slightly higher increases when compared to their URM and Asian counterparts.

Table 10*Sum of Applicants, Admitted and Enrolled Student by Ethnicity*

Cohort	Ethnicity	Sum of Apply	Sum of Admit	Sum of Enroll
2018	URM	8,373	5,056	1,375
2019	URM	8,905	5,457	1,480
2020	URM	9,196	6,047	1,546
2021	URM	9,566	7,231	1,738
2022	URM	10,256	7,392	1,756
2023	URM	11,613	8,140	1,920
2018	ASIAN	2,977	2,561	553
2019	ASIAN	3,110	2,662	645
2020	ASIAN	3,710	3,283	714
2021	ASIAN	4,197	3,844	886
2022	ASIAN	4,930	4,426	1,031
2023	ASIAN	6,050	5,308	1,052
2018	WHITE	28,123	22,710	5,589
2019	WHITE	26,785	22,170	5,674
2020	WHITE	27,147	23,039	5,393
2021	WHITE	29,075	25,710	6,493
2022	WHITE	30,341	26,084	6,425
2023	WHITE	31,758	26,748	6,130

When the descriptive statistical analysis turned to the change rate of the numbers of applicants, admitted, and enrolled students from the previous year as shown in Table 11, White students resulted in the highest increase rates for the 1st year of policy implementation, that is an increase of 6% in applications, 8% in admissions, and 25% in enrollment. URM students followed this increase trend with 1% increase in applications, 9% in admissions, and 8% in enrollment. Asian students on the other hand showed a decrease in the applications and admissions change rates from the previous year as the rate went down 6% in applications and 6% in admissions. However, Asian students resulted in a 13% jump in the change rate from the previous year for enrollment.

Table 11*Rate Change of Applicants, Admitted and Enrolled Students by Ethnicity*

Status	Cohort	URM	ASIAN	WHITE
Applied	2019	6%	4%	-5%
	2020	3%	19%	1%
	2021	4%	13%	7%
	2022	7%	17%	4%
	2023	13%	23%	5%
Admitted	2019	8%	4%	-2%
	2020	11%	23%	4%
	2021	20%	17%	12%
	2022	2%	15%	1%
	2023	10%	20%	3%
Enrolled	2019	8%	17%	2%
	2020	4%	11%	-5%
	2021	12%	24%	20%
	2022	1%	16%	-1%
	2023	9%	2%	-5%

Note. Rate of change from previous year.

Still referencing the results in Table 11, after the 1st year of policy implementation in 2021, while URM students showed a constant increase in the number of applications from the previous year, in the subsequent years of 2022 and 2023, the change rates of admitted URM students from the previous year declined 18% in 2022, gaining 8% back in 2023. In the same line, the change rate in the numbers of enrolled URM students declined 11 points in 2022, increasing back 8 points in 2023. These results indicate that even though numbers of applications, admissions and enrolled students continued to increase year over year, URM students had declines in their admission and enrollment rates during post-policy implementation.

For post-policy implementation years White applicants showed a 3% decrease in the change rate when compared to the previous year for the 2022 cohort, gaining 1% back in 2023. This same decrease pattern resulted in White admitted students losing 11% in 2022 and gaining 2% back in 2023. For White enrolled students the change rate declined was the sharpest, losing

21% in 2022 and an additional 4% in 2023. This indicates that White students experienced declines in their rates of application, admissions and enrollments when compared to total numbers during post-policy implementation cohorts.

As I continued with the quantitative graphic analysis, the opposite trend in the change rate from the previous year for Asian applicants resulted in a constant increase for 2022 and 2023 with an additional 4% and 6% respectively. For admitted Asian students the change rate when compared to the previous year went down by 2% and up by 5% for the same time frame, while enrolled Asian students presented a constant decline of 8% and an additional 14% for the same post-policy implementation years. These results indicate that the influence of test optional on applications and admissions for Asian students proved mixed for the post-implementation period, with initial declines and modest recoveries by year 2023.

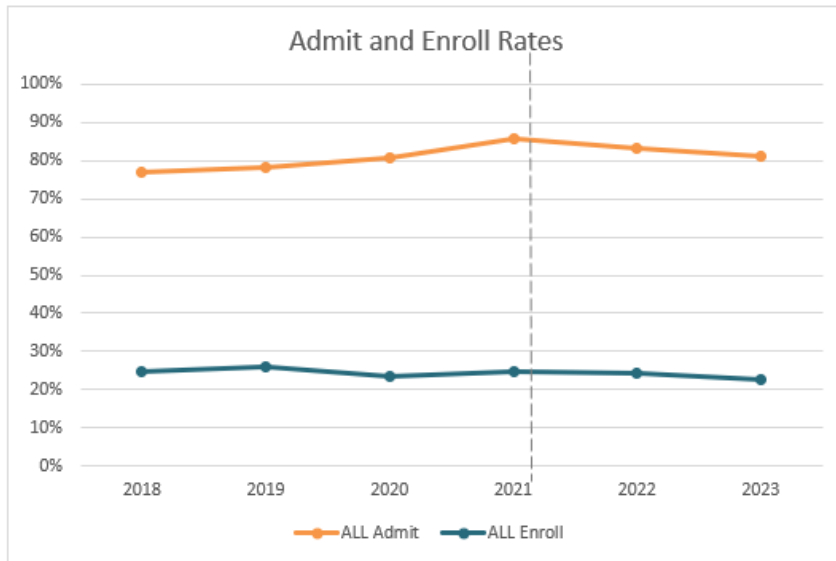
Admit and Enroll Rates

As indicated in the methodology chapter, an admit rate is defined as the proportion of admitted students when compared to all applicants. In the same vein, an enroll rate is calculated as the percentage of students who enrolled or matriculated from all admitted students.

Descriptive analysis of the data resulted in a substantially flat trend year over year for both, admit and enroll rates during the pre- and post-policy implementation cohorts as depicted in the line chart in Figure 2, showing admit and enroll trends over time. These results also showed a slight increase in 2021 for admit rates.

Figure 2

Admit and Enroll Rates for All Students



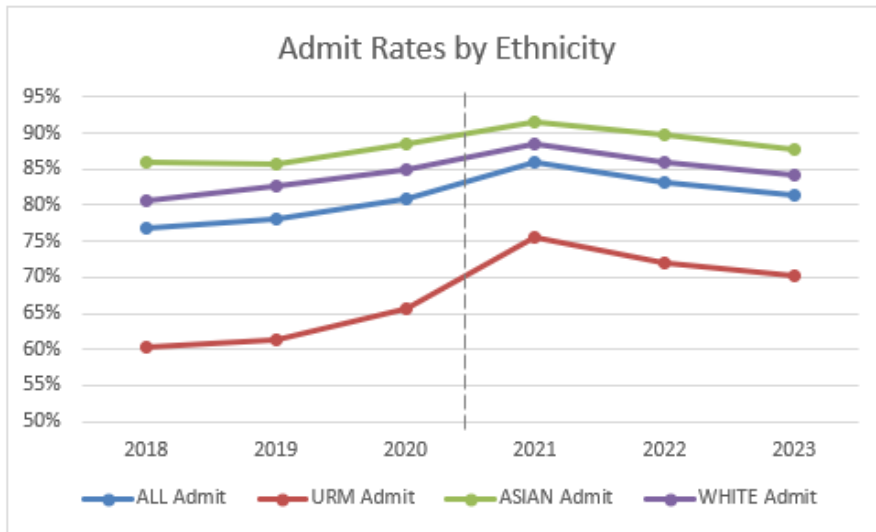
When the analysis focused on the admission rates for specific ethnic groups, URM resulted in the highest increase when pre- and post-policy implementation cohorts were compared. Per Figure 3, URM students showed an increase of approximately 10% in their admission rates between 2020 and 2021. This group of students had already demonstrated an increase year over year during pre-policy implementation cohorts but the jump in the admissions rate for cohort 2021 was the highest among the ethnicity groups. Although the admission rates for the URM group declined by about 3% in 2022 and another 2% in 2023, these subsequent rates were still at higher levels than those of pre-policy implementation cohorts.

While for White and Asian students the analysis findings also indicated higher admission rates for post-policy implementation cohorts, the increase for 2021 was comparable for both groups but substantially lower than their URM peers (see Figure 3). The data analysis also showed that admission rates came down slightly when comparing the cohorts following the first

year of policy implementation. However, as it was the case with URM students, the respective admission rates for White and Asian students were still higher than pre-policy implementation years.

Figure 3

Admission Rates by Ethnicity



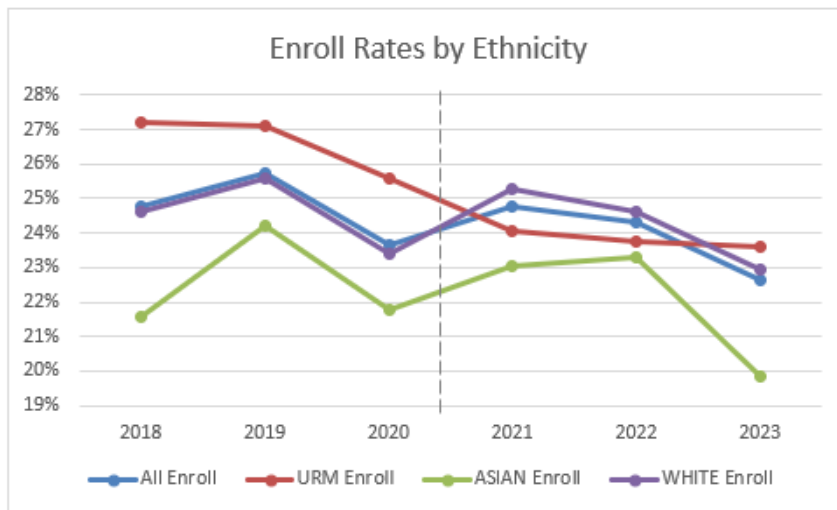
Regarding the analysis of enrollment rates of student groups of different ethnicities, the data depicted a decline of over 1% for students of URM backgrounds for the first year of policy implementation (see Figure 4). The opposite trend occurred with Asian and White students as the quantitative analysis resulted in increases in their admissions rates of 1.3% and 1.8% respectively. And just as it occurred with URM students, White students also presented decreases in these rates for 2022 and 2023. On the other hand, the analysis resulted in another increase in the admissions rate of Asian students for 2022 (two increases in a row since policy implementation) and an important decline among the ethnic groups with a cut of 3.5% in 2023.

When considering race and ethnicity, these results indicate that admit rates for all ethnicity groups increased after policy implementation and most significantly for URM students.

However, enrollment rates declined for URM students, while for Asian and White students resulted in a spike for the first year of policy implementation, with subsequent declines for 2022 and 2023 (see Figure 4).

Figure 4

Enrollment Rates by Ethnicity



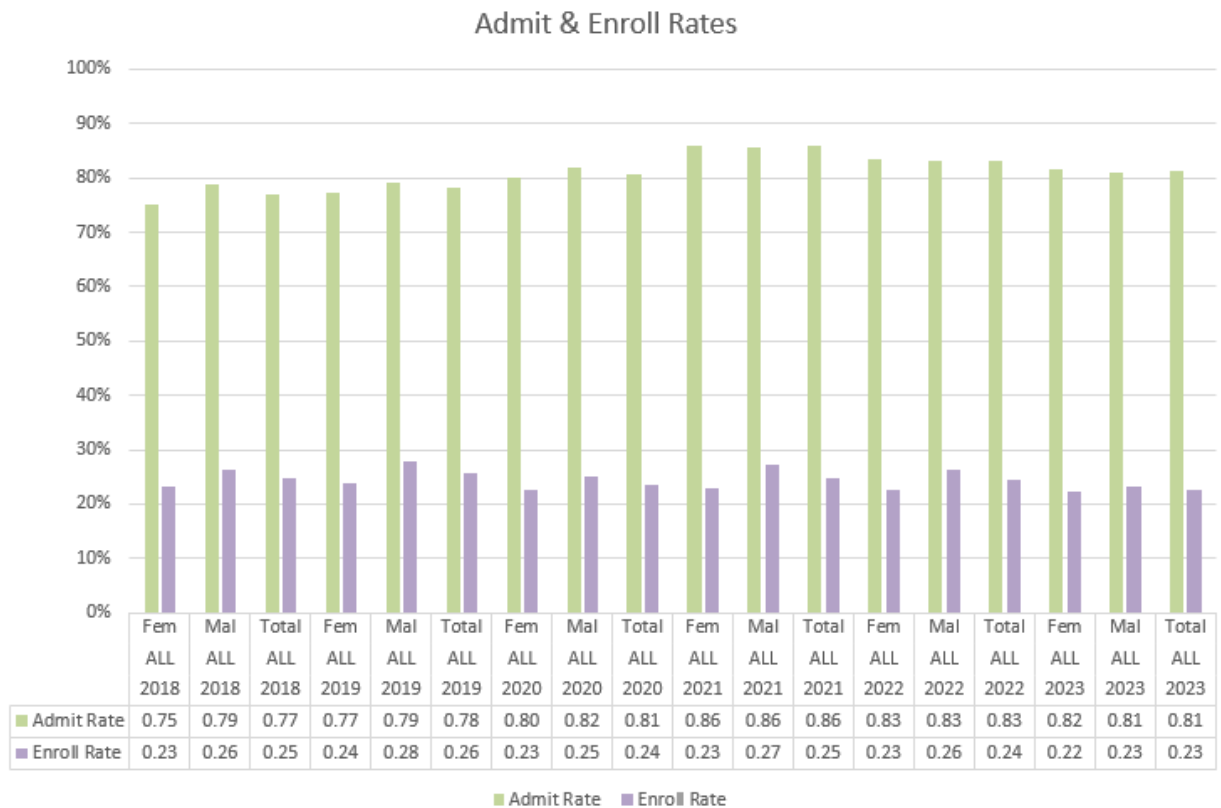
At this point of the analysis findings regarding admit and enroll rates, I turn to those related to gender. Although the present study did not include female students as a unique group under the URM classification, I thought that the analysis of gender could provide a deeper level of understanding when URM students are viewed with a gender lens.

For all undergraduate female applicants, the admit rates fell behind their male counterparts year over year through the 2020 cohort, as represented in Figure 5. However, the difference between female and male applicants become almost negligible for post-policy implementation cohorts. Starting with the cohort of 2021 the admit rate of female applicants were slightly higher when compared with male applicants. However, the enroll rates for all female applicants always stayed behind that of their male counterparts year over year, from 2018

through 2023. It is important to note though, that for the cohort of 2023 the difference between the enroll rates for male and female students was the smallest for the entire analyzed period, as female students had an enrolled rate of only 1.03 points lower than male students (see Figure 5).

Figure 5

Admission & Enrollment Rates by Gender



URM female students also showed lower admit rates by approximately 5% than URM male students for post-policy implementation (see Figure 6). However, this difference becomes almost null for test-optional cohorts, particularly for 2022 and 2023 when the admit rates are the same for female and male URM students. On the other hand, Asian female students showed higher admit rates than Asian male students –albeit by a small difference– for almost all the analyzed cohorts except for 2018 and 2020 as shown in Figure 7. And White female students

reported lower admit rates than white male students during the pre-policy implementation period of 2018-2020 but resulted in higher admit rates for the post-implementation period of 2021-2022 (see Figure 8).

Figure 6

Admission & Enrollment Rates by Gender for URM Students



For Asian female students (see Figure 7) the pattern of obtaining lower enroll rates than Asian male students were maintained through the entering cohort of 2021, however, in 2022 and 2023 Asian female students surpassed the enroll rates of Asian male students by 1% and 2% respectively as depicted in Figure 7.

Figure 7

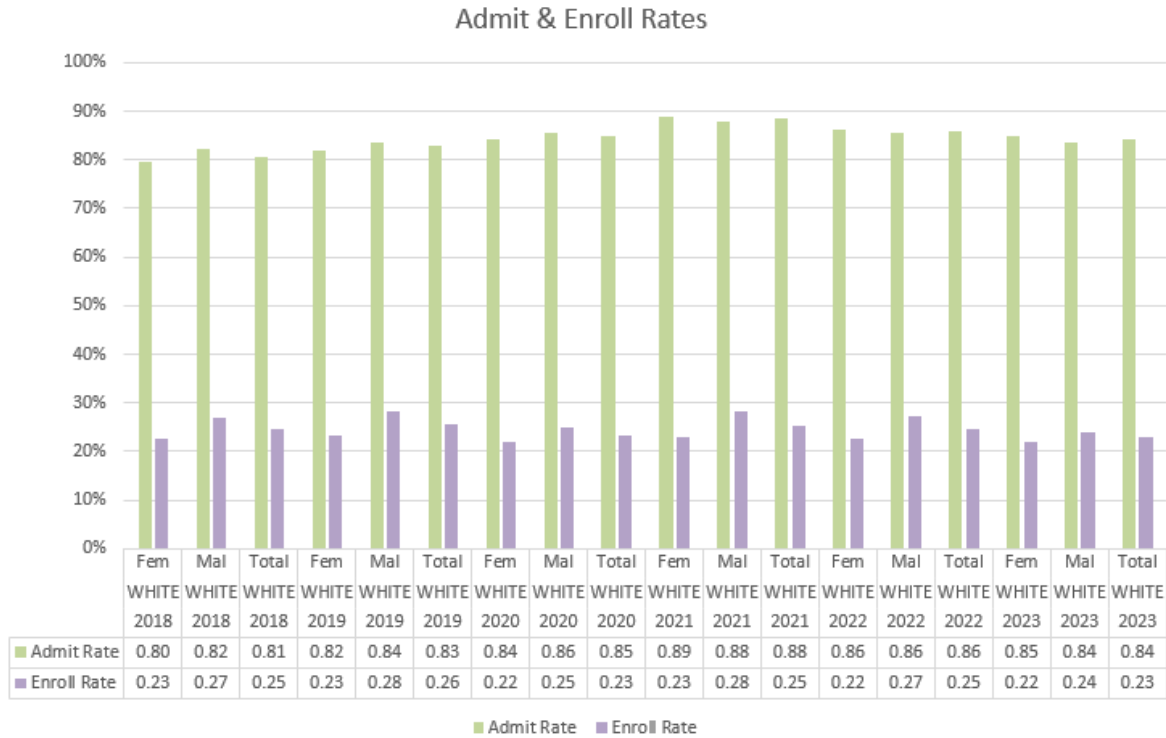
Admission & Enrollment Rates by Gender for Asian Students



URM and White female students also showed the same pattern of lower enroll rates when compared to male students for the entire study period (see Figures 6 and 8). However, the enroll rates for URM female students differed only 1% or 2% lower than their male peers. Whereas White female students had between 2% and 5% enroll rates lower than White male students for the study period.

Figure 8

Admission & Enrollment Rates by Gender for White Students



Hypothesis Testing for First Research Question

At this point of the statistical analysis, I adopted an inferential statistic, a two-sample *t*-test, to determine the statistical significance of the policy implementation in this study, that is when comparing both groups of cohorts, pre- and post-policy implementation. The results of the *t*-statistics and hypothesis testing for the admission and enrollment rates follow.

Admit Rates.

Ho: there is no significant statistical difference in Acceptance rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is significant statistical difference in Admit or Acceptance rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

An independent two-samples *t*-test was conducted to compare the admit rates between pre- and post-policy implementation cohorts. For the hypothesis analysis the table summary statistics showing the *t* value or *t* statistics and respective *p*-value appear in Table 12.

Table 12

t-Test to Determine Statistical Significance for Pre- and Post-Policy Implementation: Admit Rates

Admit Rates-ALL t-Test: Two-Sample Assuming Equal Variances			Admit Rates-URM t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.78569861	0.83485188	Mean	0.62473867	0.72586459
Variance	0.0004163	0.00051851	Variance	0.0008284	0.00077499
Observations	3	3	Observations	3	3
Pooled Variance	0.00046741		Pooled Variance	0.0008017	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	-2.78452167		t Stat	-4.37424538	
P(T<=t) one-tail	0.02479438		P(T<=t) one-tail	0.00596421	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.04958876		P(T<=t) two-tail	0.01192842	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	
Admit Rate-Asian t-Test: Two-Sample Assuming Equal Variances			Admit Rate-White t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.86703874	0.89700548	Mean	0.8279673	0.86206804
Variance	0.00024407	0.00037171	Variance	0.00042342	0.00044565
Observations	3	3	Observations	3	3
Pooled Variance	0.00030789		Pooled Variance	0.00043453	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	-2.09163789		t Stat	-2.00353677	
P(T<=t) one-tail	0.05231843		P(T<=t) one-tail	0.05782432	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.10463686		P(T<=t) two-tail	0.11564864	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	

The *t*-test results showed that, assuming equal variances, there was a significant difference in the admit rates between pre- and post-policy implementation cohorts $t = -2.78$, $p = 0.049$, 95%. With a resulting *p*-value (see Table 13) rounded up to a .05 it equated to the alpha (α) value of .05 level of confidence, hence the null hypothesis (H_0) could be rejected as it was

statistically significant. Consequently, the alternate hypothesis or H_1 was accepted with the rejection of the null hypothesis H_0 , concluding that there appeared to be significant statistical difference in the admit rates for students of all ethnic groups after the implementation of the test-optional admissions and test-excluded policy. In turn this meant that I could conclude that for all admitted students the implementation of test-optional and test-excluded scholarships resulted in a significant statistical difference in their admit rates.

Table 13

Summary t-Test Statistics and P Value: Admit Rate

YEAR ETHNICITY	Admit Rate	YEAR ETHNICITY	Admit Rate
2018 ALL	0.768297	2018 URM	0.603846
2019 ALL	0.780644	2019 URM	0.612802
2020 ALL	0.808154	2020 URM	0.657569
2021 ALL	0.858700	2021 URM	0.755906
2022 ALL	0.832517	2022 URM	0.720749
2023 ALL	0.813338	2023 URM	0.700939
t-Test	P Value	t-Test	P Value
	0.049589		0.011928
2018 ASIAN	0.860262	2018 WHITE	0.807524
2019 ASIAN	0.855949	2019 WHITE	0.827702
2020 ASIAN	0.884906	2020 WHITE	0.848676
2021 ASIAN	0.915892	2021 WHITE	0.884265
2022 ASIAN	0.897769	2022 WHITE	0.859695
2023 ASIAN	0.877355	2023 WHITE	0.842244
t-Test	P Value	t-Test	P Value
	0.104637		0.115649

As depicted in Table 13, the analysis run for the same pre- and post-implementation cohorts for only admitted students of URM backgrounds resulted in a stronger p value of .012 compared to the α value of ≤ 0.05 , I rejected the null hypothesis concluding that there was a significant positive statistical difference between pre and post implementation periods.

On the other hand, for Asian and White admitted students the analysis could not reject the null hypothesis at the resulting p values of .105 and .116 respectively (as shown in Table 13), hence the analysis did not find a significant statistical difference after the implementation of the

test-optional and test-excluded scholarships for these specific ethnic groups. Overall, regarding admissions rate, the results of this analysis indicate that the adoption of the test-optional admissions policy and test-excluded strategy was supportive of broadening the access for URM as the increase of their admit rates was significant during policy implementation.

Enrollment Rates.

Ho: there is no significant statistical difference in Enrollment rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Enrollment rates for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

An independent two-samples *t*-test was conducted to compare the enroll rates between pre- and post-policy implementation cohorts. To determine statistical significance of the enrollment rates when comparing pre- and post-policy implementation, particularly for URM students, I run a *t*-test for the respective cohorts as shown in Table 13.

Table 14

t-Test to Determine Statistical Significance for Pre- and Post-Policy Implementation: Enroll Rates

Enroll Rates-ALL t-Test: Two-Sample Assuming Equal Variances			Enroll Rates-URM t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.24726036	0.2391113	Mean	0.26627646	0.23792679
Variance	0.00011112	0.00012617	Variance	8.4607E-05	5.1258E-06
Observations	3	3	Observations	3	3
Pooled Variance	0.00011864		Pooled Variance	4.4866E-05	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	0.91629296		t Stat	5.18362717	
P(T<=t) one-tail	0.20567892		P(T<=t) one-tail	0.00329493	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.41135784		P(T<=t) two-tail	0.00658985	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	
Enroll Rates-Asian t-Test: Two-Sample Assuming Equal Variances			Enroll Rates-White t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.2252381	0.22054073	Mean	0.24537194	0.24268108
Variance	0.00021891	0.00037612	Variance	0.00011976	0.00014649
Observations	3	3	Observations	3	3
Pooled Variance	0.00029752		Pooled Variance	0.00013312	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	0.33353812		t Stat	0.28563458	
P(T<=t) one-tail	0.37773986		P(T<=t) one-tail	0.39466951	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.75547971		P(T<=t) two-tail	0.78933902	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	

The *t*-test results showed that, assuming equal variances, there was no significant difference in the enroll rates for students of all ethnic groups between pre- and post-policy implementation cohorts $t = .92$. $p = 0.414$, 95%. With a p value higher than the set significance value of .05, I failed to reject the null hypothesis, indicating that there is insufficient evidence to conclude that the mean enroll rates are significantly different between pre- and post-policy implementation cohorts (see Table 15).

Table 15

Summary t-Test Statistics and P Value: Enroll Rate

YEAR	ETHNICITY	Enroll Rate	YEAR	ETHNICITY	Enroll Rate
2018	ALL	0.247865	2018	URM	0.271954
2019	ALL	0.257486	2019	URM	0.271211
2020	ALL	0.236430	2020	URM	0.255664
2021	ALL	0.247846	2021	URM	0.240354
2022	ALL	0.243048	2022	URM	0.237554
2023	ALL	0.226440	2023	URM	0.235872
t-Test	P Value	0.411358	t-Test	P Value	0.006590
2018	ASIAN	0.215931	2018	WHITE	0.246103
2019	ASIAN	0.242299	2019	WHITE	0.255931
2020	ASIAN	0.217484	2020	WHITE	0.234081
2021	ASIAN	0.230489	2021	WHITE	0.252548
2022	ASIAN	0.232942	2022	WHITE	0.246320
2023	ASIAN	0.198191	2023	WHITE	0.229176
t-Test	P Value	0.755480	t-Test	P Value	0.789339

In a similar case for White and Asian students when analyzed individually, the *t*-test results showed that, assuming equal variances, there was no significant difference in the enroll rates for White ($t = .29$, $p = .789$, 95%) and Asian ($t = .33$, $p = 0.76$, 95%) students between pre- and post-policy implementation cohorts. Consequently, here too I failed to reject the null hypothesis, concluding that the mean enrollment rates do not differ significantly between the pre- and post-policy implementation groups (see Table 15).

On the other hand, for students of URM background when analyzed individually, the *t*-test results showed that, assuming equal variances, there was significant difference in the enroll rates for URM students between pre- and post-policy implementation cohorts $t = 5.184$, $p = 0.007$, 95%. Consequently, I can reject the null hypothesis and conclude that for URM there was a significant statistical difference in enrollment rates after the implementation of test optional and test excluded scholarships as shown in Table 15. However, the significant difference is depicted by lower values of enrollment rates for the post-policy implementation period, an effect that was opposite to the original purpose of the policy.

The results presented here indicate that in answering the first research question the number of applications, admissions and enrollments increased after policy implementation.

These increases were higher for applications and admissions and lower for enrollments for students of all ethnic groups. And admit rates showed statistically significant increase for post-policy implementation cohorts, particularly for URM students. I could conclude that these parts of the results align with broadening access to college. On the one hand, enrollment numbers for all students showed flat trends over the study period, and enrollment rates showed no significant change for Asian and White students. And although URM students showed a significant change in the mean of enrollment rates post-policy implementation, the declining enrollment rates reflected an effect contrary to the one intended by the test-optional policy.

Given the conceptual framework for this study in the Guided Pathways for College Success model (Gardner et al., 2021), the institutional presence is an important component through its different domains, such as policies and interventions. From this context and the mixed findings for the first research question, MPFU should continue to leverage its resources as part of its institutional role of closing the access gap for URM. The test-optional admission policy and the complementary test-excluded scholarships strategy have set the institution on the right path to better access of diverse and underserved students, however their flat or declining rates in enrollment are relevant indicators that there is more to be done.

In addition, from the institutional perspective, the mixed findings for the first research question opens other avenues for MPFU to not only strengthen their current policies and programs supporting URM but to delve into areas that have not been considered yet, including the full impact of the COVID-19 health pandemic on URM students and their families.

Second Research Question: How Does a Test Optional and a Complimentary Test-excluded Scholarship Strategy Help Recruit and Retain Students from URM Backgrounds?

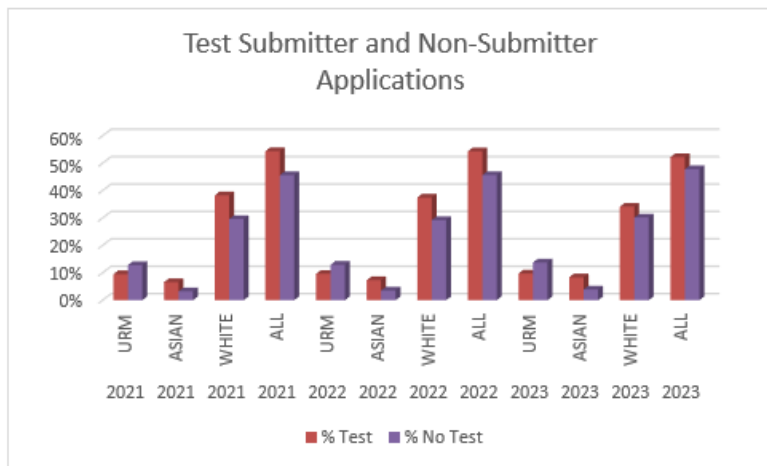
The following factors of performance (Test Submission, SAT, HSGPA, and College GPA), financial need (FAFSA and Unmet Need), financial aid (Scholarship Recipients), and retention (Retention to Year 2, and Retention to Year 3) were analyzed to determine if they had an impact on the recruiting and the retention of students of underprivileged backgrounds. The specific findings of the study analysis follow.

Test Submission

Even though academic preparedness was not a factor directly related to broadening access for this study, it has often been linked to retention. During the pre-policy implementation period students applying for admission to MPFU had to submit test scores as part of the admissions requirements. Even though after policy implementation the submission of test scores became optional, applicants were still submitting them at a rate higher than those opting for not submitting test scores. In the entering cohort of 2021 54% of all applicants chose to submit their test scores and 46% opted for not submitting them. For the cohorts of 2022 and 2023 this percentage breakdown was almost unchanged as shown in the bar chart depicted in Figure 9.

Figure 9

Applications for Test Submitters and Non-Submitters by Ethnicity



The larger proportion of applicants choosing to submit test scores remained the same for Asian and White students. However, applicants from URM background opted for not submitting test scores at a higher proportion than those choosing to submit them for the entire post-policy implementation period. This behavior pattern was also reflected for URM students who were admitted and then enrolled for the cohorts between 2021 and 2023 as depicted in Figure 10 and 11 respectively.

Figure 10

Admissions for Test Submitters and Non-Submitters by Ethnicity

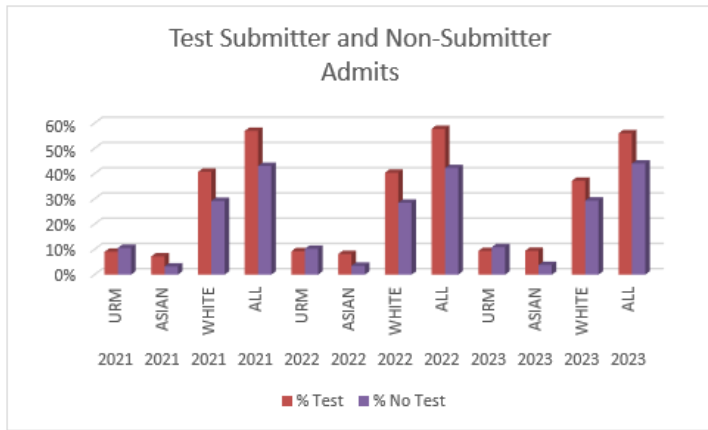
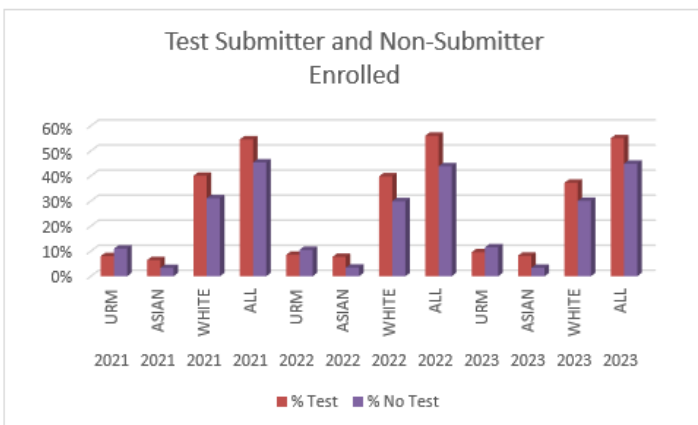


Figure 11

Enrollment for Test-Submitters and Non-Submitters by Ethnicity

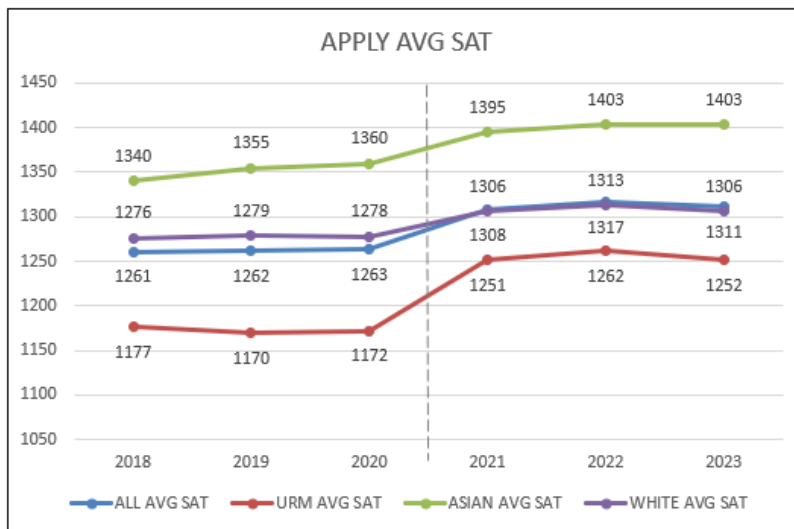


SAT

Data from descriptive statistics as shown in the line bar chart in Figure 12 also provided a basic answer on performance variables such the SAT. The average (mean) of all applicants SAT exhibited a flat performance year over year from 2018 to 2020, however it increased in 2021 by 50 points, peaking close to 1320 in 2022 and settling back to 1310 in 2023 (as shown in Figure 12).

Figure 12

Average SAT for Applications by Ethnicity



The average (mean) SAT trend for of all applicants is also reflected on URM, Asian and White student groups, however while URM and White students peaked on their SAT average scores in 2022 it settled back to 2021 scores (Figure 12). On the other hand, Asian students maintained a slightly higher upward trend on their average SAT scores from 2021 to 2023.

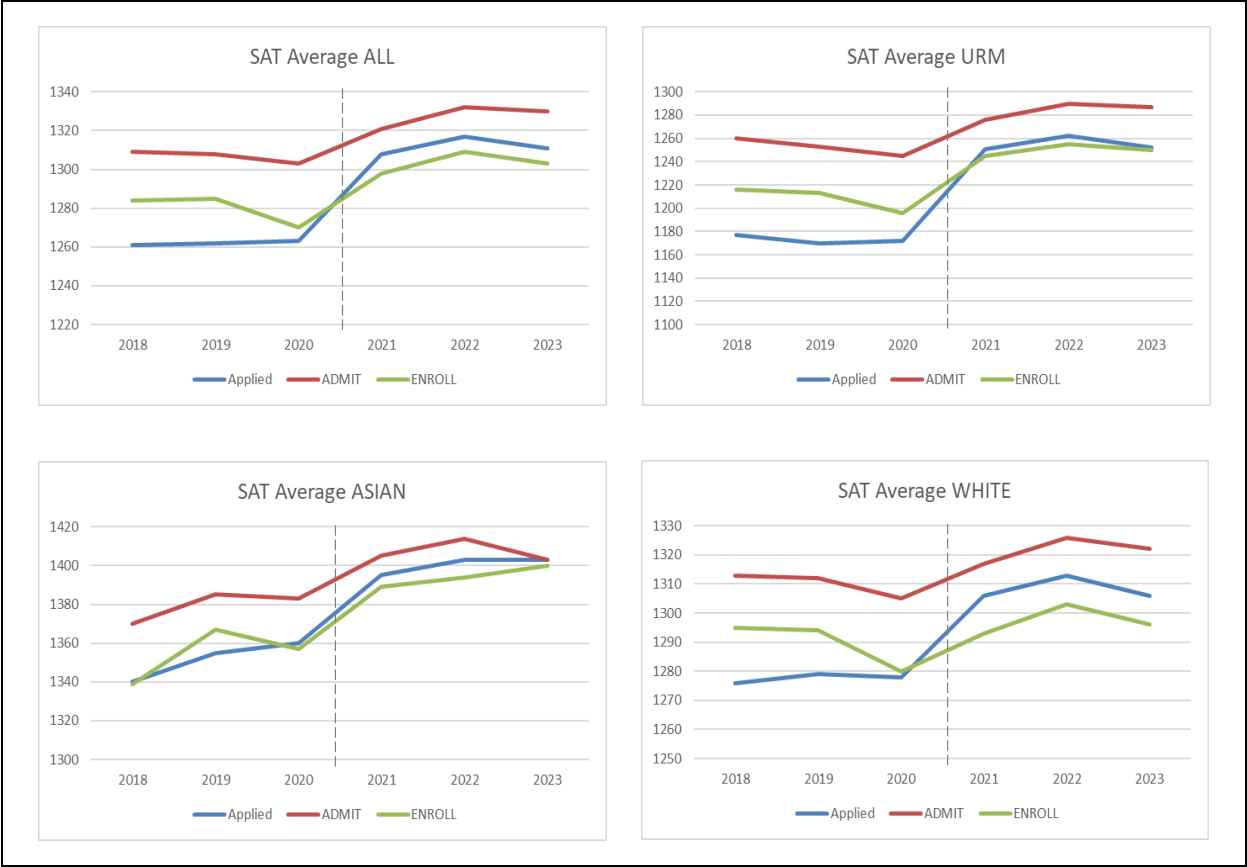
SAT average scores, represented by their means, for admitted and enrolled students followed a similar growth pattern for the study period, particularly resulting in a higher increase with the 2021 cohort when the MPFU implemented the test-optional policy. A notable difference

in the descriptive statistics analysis was found in a dip in average SAT scores during the 2020 cohort for students from all groups, including URM as shown in Figure 13. While the average SAT scores for applicants of all student groups stayed flat for the three pre-policy implementation cohorts, the average score for admitted and enrolled students resulted in lower average scores in 2020, coinciding with the occurrence of the COVID-19 world health pandemic.

Another interesting result from the descriptive analysis was the flip in the apply and enroll trends for the mean SAT. Before the implementation of the test-optional policy the SAT mean scores were lower for applicants than enrolled students, however, starting with the 2020 cohort the average SAT scores of applicants surpassed the average scores of enrolled students (see Figure 13). On the other hand, for URM students the gap between the SAT scores for applicants and enrolled students was the closest among all ethnic groups and it became almost negligible in the 2023 cohort, when the average SAT was 1252 for applicants and 1250 for enrolled students (see Figure 13). These descriptive insights could mean that students with higher SATs were becoming overall more selective regarding their decision to enroll at MPFU, and from all ethnic groups URM students were the less selective.

Figure 13

Average SAT for Applications, Admissions, and Enrollment by Ethnicity



Regarding the finding that confirmed that Asian and White students were choosing to still submit their SAT scores at higher rates than those who did not send them, it could open the door to assumptions of privilege or the perception of advantage. For these students, their SAT scores were strong enough that they “perceived” not sending them could disadvantage them from other opportunities, including perhaps school or community-based grants. On the contrary, students from URM backgrounds were the only ethnic group submitting their SAT scores at lower rates than those who sent them at MPFU. If the underpinning factors for these decisions are based on conceptions of privilege or theories of price sensitivity (Brent, 2021; Price & Sheftall 2015), these could be further explored by additional research.

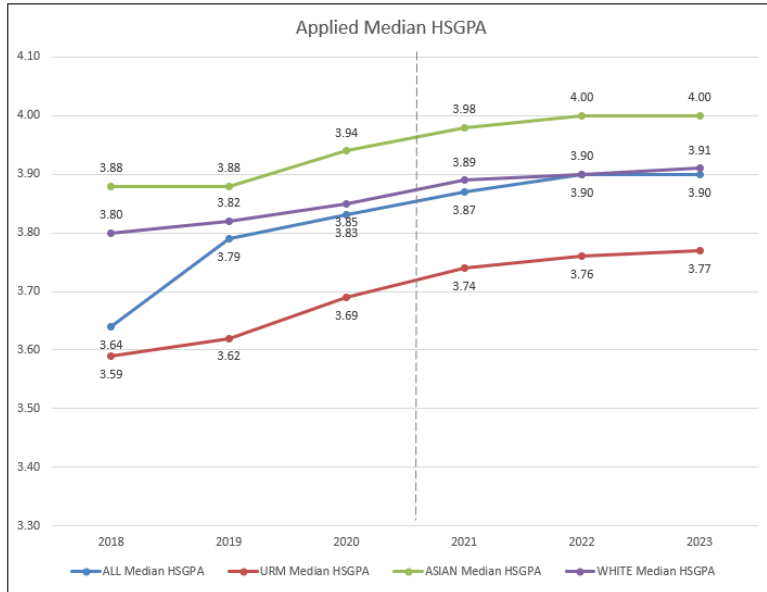
HSGPA and College GPA

Regarding HSGPA and College GPA I decided to use the median as measure of central tendency instead of the mean or average when comparing performance across the study timeline. According to Buffington (2022) in data analysis where the dataset presents extreme values or reports a skewed distribution, the mode is advantaged over the median as the former reflects more intuitively a “typical” value from the distribution. Following this rationale, the use of a median over the mean in institutional data analysis of student GPA is also the preferred method at MPFU.

All undergraduate applicants depicted a median HSGPA upward trend year over year, starting with 3.76 in 2018 to 3.90 in 2023 as shown in the line chart in Figure 14. This upward trend was repeated for the three ethnic groups analyzed in the study, with URM showing the largest growth or 19 points, followed by Asian students with 12 points and White students with 11 points (Figure 14). However, the analysis could not confirm a higher growth in HSGPA performance for the post implementation years. In most cases the growth remains comparable for pre- and post-implementation years.

Figure 14

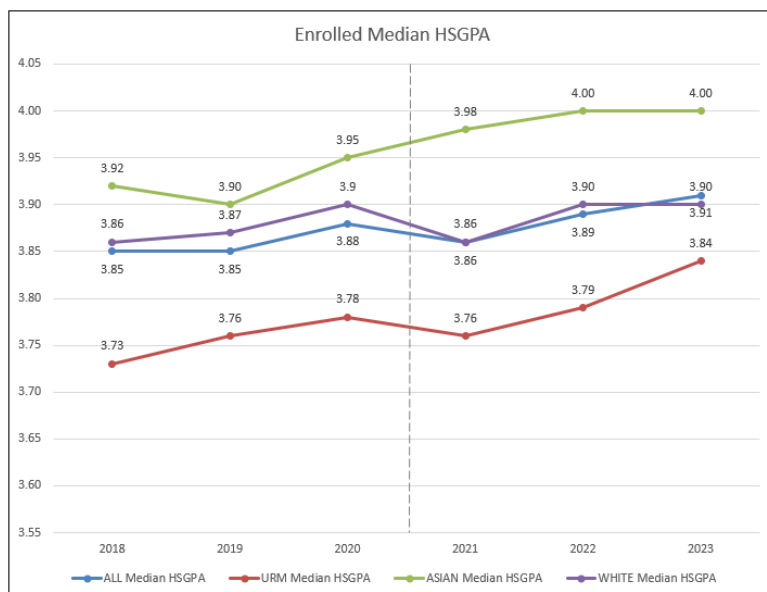
Median HSGPA for Applications by Ethnicity



When the analysis turned to enrolled students, the median HSGPA still showed an upward growth trend for all ethnic groups as represented in Figure 15, however the start of the post-implementation period during the entering cohort of 2021 presented a dip in the median HSGPA for both URM and White students.

Figure 15

Median HSGPA for Enrollment by Ethnicity

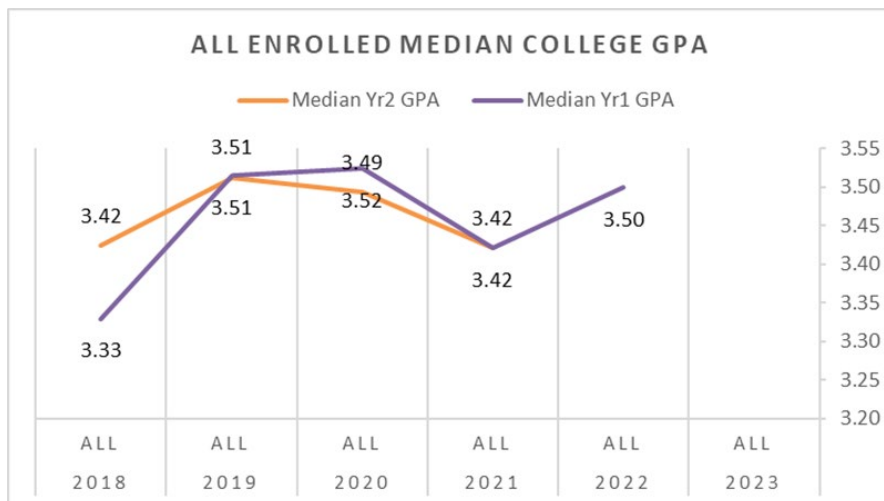


Asian students on the other hand showed an increase of 2 points in their median HSGPA for the same cohort (see Figure 15). For the subsequent post-implementation cohorts of 2022 and 2023 the median HSGPA performed at higher levels than the pre-implementation cohorts in this study.

For all enrolled undergraduate students, the median College GPA for Year 1 depicted the line chart in Figure 16 shows an upward trend for 2019 and 2020, dipping in 2021 and recovering in 2022 but to a lower GPA than the highest median obtained in 2020. GPA median performance for Year 2 for all students reached its highest point in 2019 at 3.51 but decreased year over year to 3.42 in 2021, the last year recorded in the dataset used for this study.

Figure 16

Median College for Year 1 and Year 2 for All Enrolled Students



Asian students showed the highest levels of median College GPA (see Figure 17), with White students (see Figure 18) performing in the middle of the range, and URM students (see Figure 19) performing at the lower levels. All ethnic groups behaved similarly to the linear trend presented in Figure 16, however the score dip of 2021 is lesser for Asian Students.

Figure 17

Median College GPA for Year 1 and Year 2 for Enrolled Asian Students

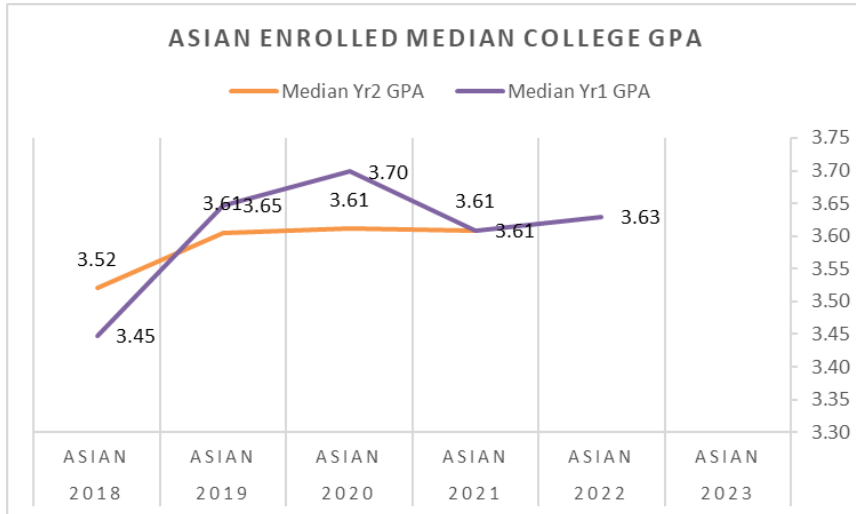


Figure 18

Median College GPA for Year 1 and Year 2 for Enrolled White Students

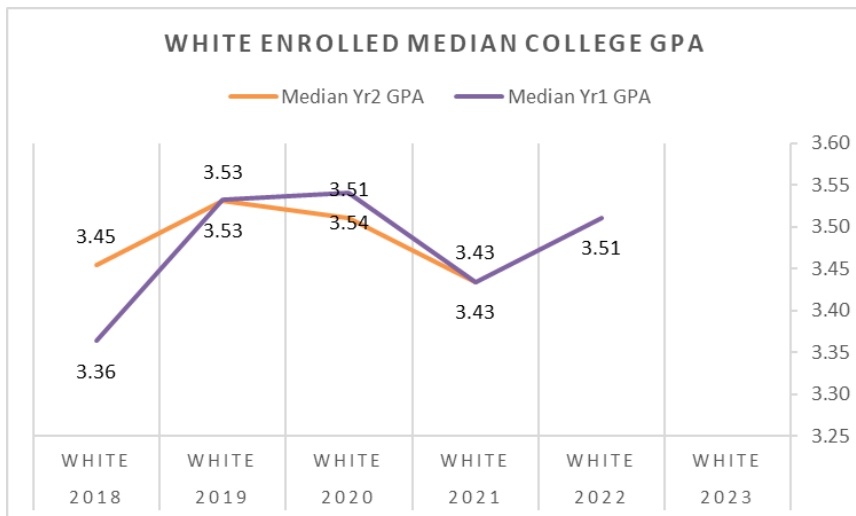
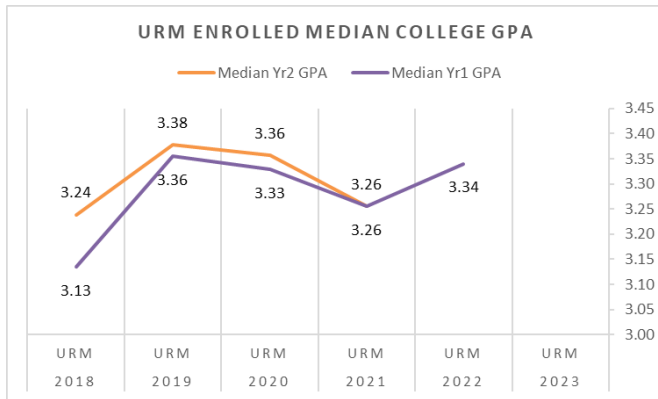


Figure 19

Median College GPA for Year 1 and Year 2 for Enrolled URM Students

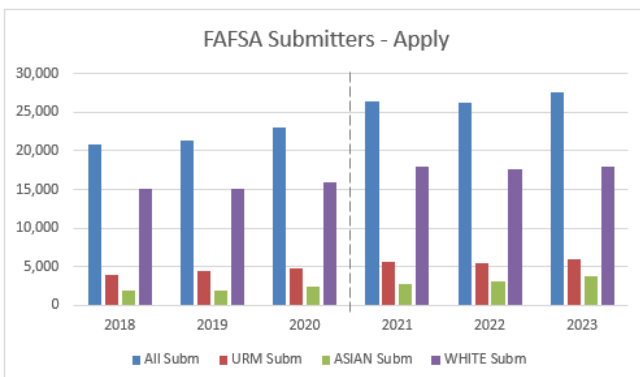


FAFSA and Unmet Need

The overall number of applicants who submitted a FAFSA application increased year over year, from close to 4,000 in the 2018 cohort to approximately 6,000 in the 2023 cohort as shown in the bar chart in Figure 20. This same growth pattern is maintained for URM, Asian and White students, with a marked increase in FAFSA submissions for White students in the 2021 cohort. FAFSA submissions for White student applicants went from almost 16,000 in 2020 to 18,000 in 2021 and the number of submissions stayed close to that number for the cohorts of 2022 and 2023.

Figure 20

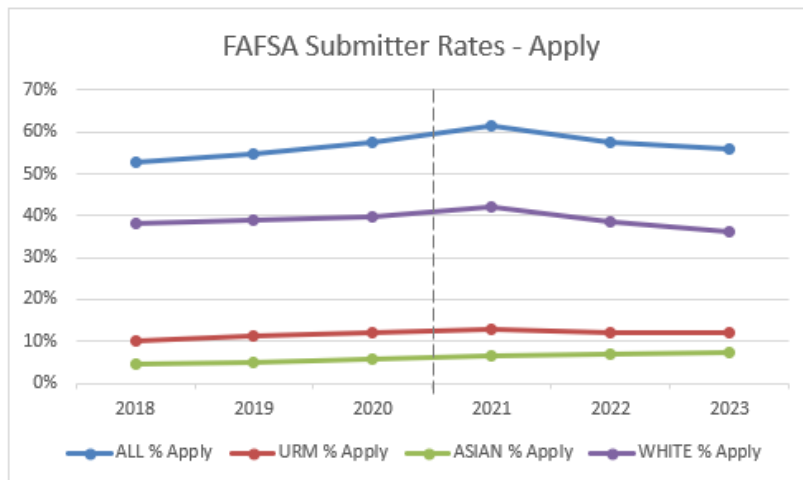
FAFSA Submissions for Applications by Ethnicity



The percentages of FAFSA submitters for applicants greatly differed depending on their ethnicity. Overall applicants submitted FAFSA forms between 54% and 60% for the period of study, peaking at 62% in the 2021 cohort (see line chart in Figure 21). URM student applicants submitted the FAFSA between 8% and 12% for this same period. Asian students submitted FAFSA applications between 5% and 7%, while White applicant students submitted the FAFSA between 36% and 42% for the research period.

Figure 21

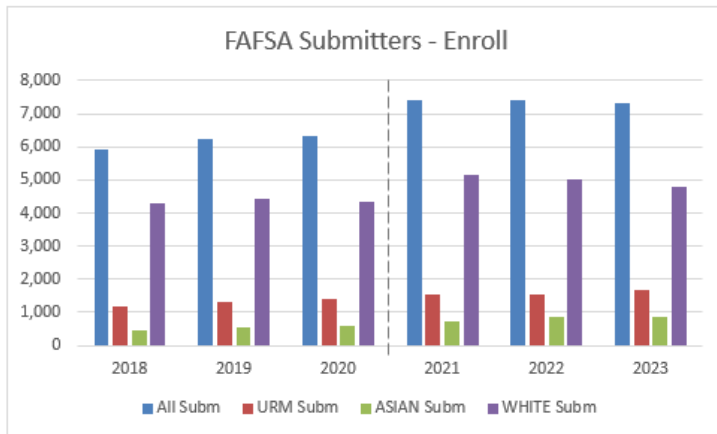
FAFSA Submissions Rate for Applications by Ethnicity



Students who enrolled also submitted FAFSA applications at increasing numbers for the study period as presented in the bar chart in Figure 22, and this held true for all students as well as for students from URM backgrounds and Asian students. However, enrolled White students submitted FAFSA applications at consistent numbers for pre-policy implementation years (2018-2020), i.e., around 4,200. In 2021 the number of enrolled FAFSA submitters grew to 5,100, which coincides with the jump in FAFSA submissions of White student applicants for the same year.

Figure 22

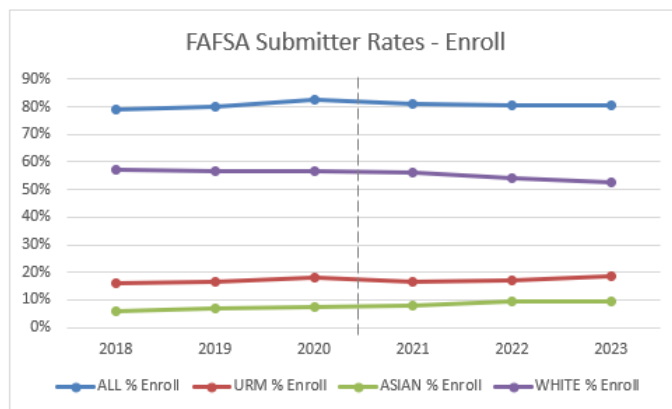
FAFSA Submissions for Enrollment by Ethnicity



As presented in the line chart in Figure 23, for enrolled students overall the percentages of those who submitted the FAFSA went from 79% in 2018 to 82% in 2020, falling to around 81% for the 2021, 2022, and 2023 cohorts. Showing a similar percentage variation pattern URM students went from around 16% of FAFSA submissions in 2018 to over 18% in the entering cohort of 2020, going down to 16.5% for the 2021 and 2022 cohorts and peaking at 18.5% in 2023.

Figure 23

FAFSA Submission Rates for Enrollment by Ethnicity



On the other hand, enrolled Asian and White students showed opposite patterns respect to their FAFSA submissions. Asian students submitted the FAFSA at increasing rates, starting at 6% in the 2018 entering cohort and peaking slightly over 9% for the cohorts of 2022 and 2023 (see Figure 24). Depicting the opposite pattern, enrolled White students decreased their FAFSA submission rates in a constant fashion from 57% in 2018 to less than 53% in 2023 as shown in Figure 23.

The number of applicants and enrolled students who submitted the FAFSA had an overall growth trend for the period of study, particularly for White students who peaked in the number of FAFSA submissions for both applicants (12.5%) and enrolled (18%) during the 2021 cohort.

However, to better understand the impact on access and affordability post implementation of test-optional and test-excluded scholarships policies the FAFSA variable could be analyze in tandem with the variable of Unmet Need, which is another way to indicate actual financial need as measured based on the estimated family contribution (EFC)¹³.

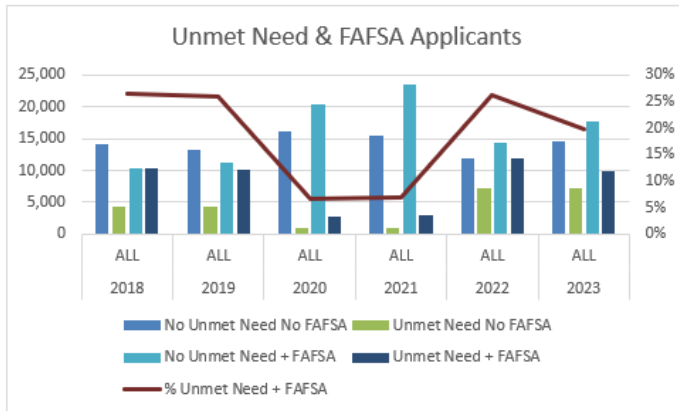
As shown in the line and bar chart in Figure 24 for the pre-policy implementation period in this study, all applicants with unmet financial need and who submitted the FAFSA stayed almost unchanged at around 10,000 for the 2018 and 2019 cohorts but exhibited a substantial drop for the 2020 and 2021 cohorts. For the post-policy implementation cohorts of 2022 and 2023 these numbers surged back to around 10,000 for all applicants. In the same line, the percentage of all applicants with unmet need who submitted the FAFSA suffered a significant

¹³ Expected Family Contribution (EFC) or Student Aid Index (SAI) as defined per new FAFSA regulation released by the Federal Government to be effective in 2024.

decline from 25% to 5% during the cohorts of 2020 and 2021, recuperating to 25% and 20% respectively for the post-policy implementation cohorts of 2022 and 2023.

Figure 24

FAFSA Submissions and Unmet Financial Need for All Applicants



When students from URM, Asian, and White ethnicity groups were considered, the analysis found similar patterns of behavior in terms of unmet need who filed the FAFSA. That is a dive in the number of applicants with these demographic characteristics who presented unmet financial need and who filed the FAFSA as depicted in Figures 25, 26 and 27, respectively.

Figure 25

FAFSA Submissions for URM Applicants and Unmet Financial Need

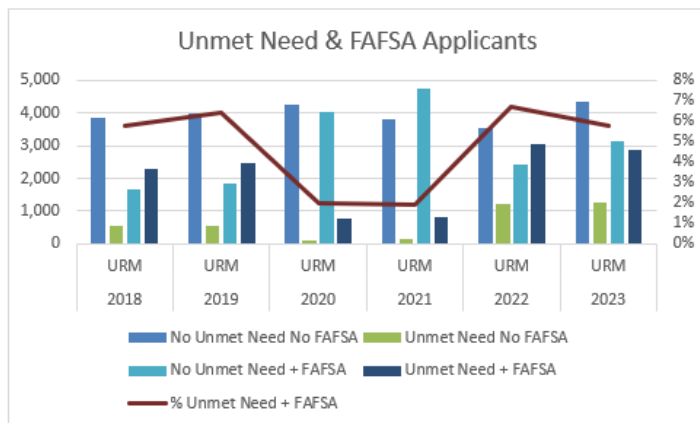


Figure 26

FAFSA Submissions and Unmet Need for Asian Applicants

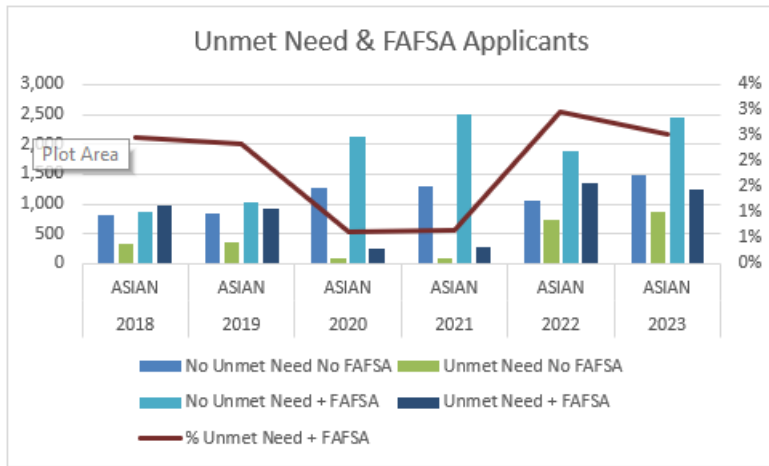
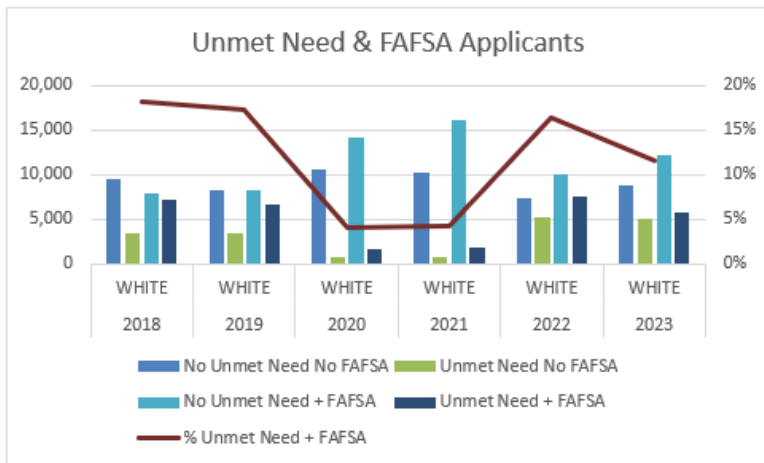


Figure 27

FAFSA Submissions and Unmet Need for White Applicants

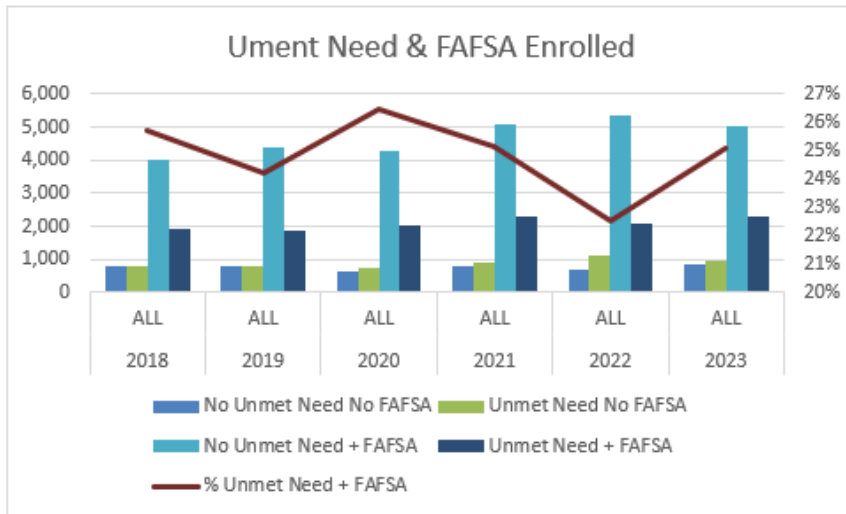


When the FAFSA and unmet financial need analysis turned to all enrolled students for the study period, the number of students with unmet need who also filed a FAFSA showed a slight increase for the post-policy implementation cohorts. However, the percentage of this same group of students when compared to all who enrolled peaked at 26% for the 2020 cohort and fell

to 22% for the 2022 cohort, finally recuperating to 25% for the 2023 cohort as depicted in the line and bar chart in Figure 28.

Figure 28

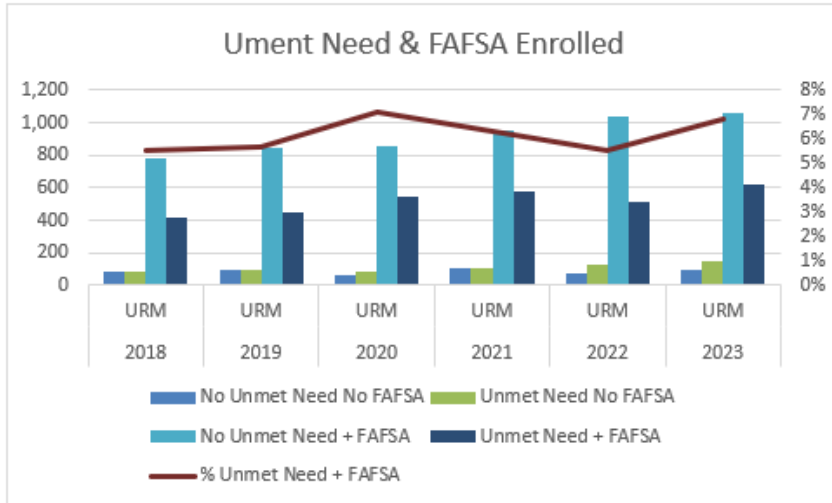
FAFSA Submissions and Unmet Financial Need for All Enrolled Students



In the case of enrolled students from different ethnic backgrounds, URM students with unmet financial need who also submitted the FAFSA showed slightly higher numbers in the post-policy implementation cohort years (see Figure 29). In the same vein as when considering all enrolled students, URM with financial need who submitted the FAFSA showed percentages that peaked in 2020 at 7%, fell to 5% in 2022 and raised back to 7% in the last cohort of this study.

Figure 29

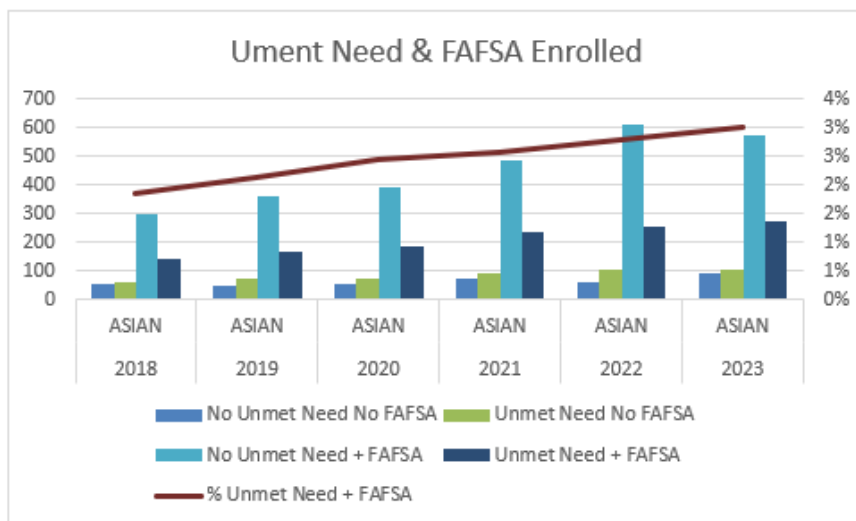
FAFSA Submissions and Unmet Financial Need for Enrolled URM Students



On the other hand, Asian students presented the steadiest difference between pre and post policy implementation cohorts, both in number of students with unmet financial need who submitted the FAFSA and in percentages as compared to all students enrolled (see Figure 30). Asian students demonstrated a constant increase in numbers from 140 in the 2018 cohort to 273 in the 2023 cohort. Likewise, their percentage of all enrolled students went from 1.86% to 3% for the respective cohorts as depicted in Figure 30.

Figure 30

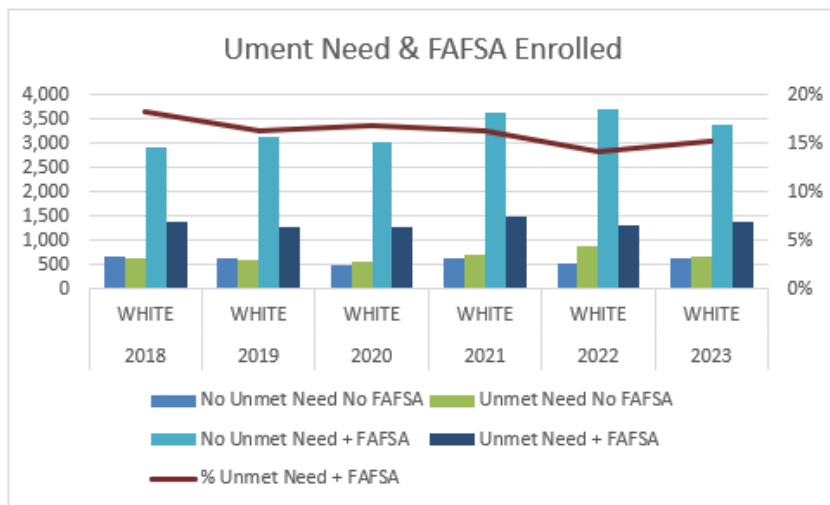
FAFSA Submissions and Unmet Financial Need for Asian Enrolled Students



And finally, White students showed the lesser change in terms of both numbers and percentages when grouped and analyzed based on their financial need and FAFSA submission. Their numbers for all cohorts showed only slight change staying between 1,300 and 1,500, with percentages ranging between 15% and 18% as illustrated in Figure 31.

Figure 31

FAFSA Submissions and Unmet Financial Need for White Enrolled Students



Pell Recipients

As defined in the methodology chapter, recipients of Pell grants for MPFU are those students who qualify for financial aid per guidelines determined by the Federal Student Aid, an office of the U.S. Department of Education. To be eligible students should submit the FAFSA form and once received schools use this information to determine eligibility (Federal Student Aid, n.d.).

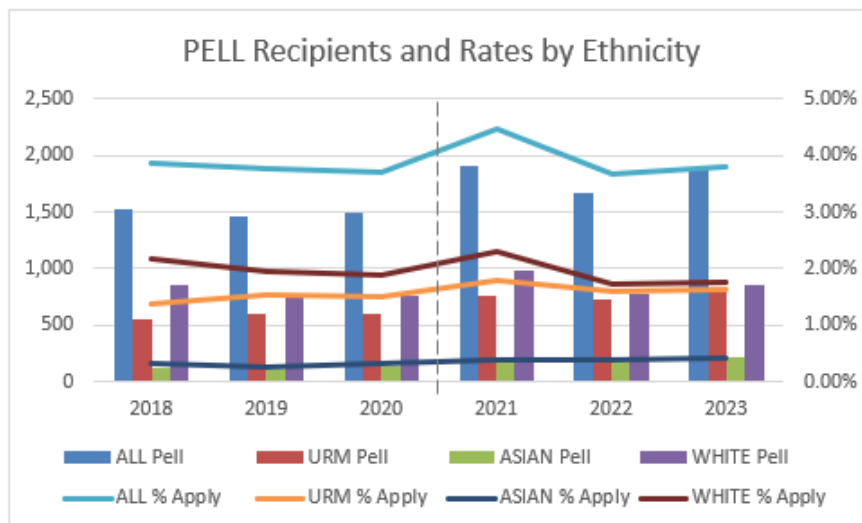
As shown in Figure 32, the descriptive statistics analysis resulted in an overall year-over-year increase in the number of students who applied and were eligible to receive a Pell Grant. This increase trend jumped significantly in the first year of the test-optional policy

implementation, going from 1,490 to almost 1,916 Pell recipients, settling to 1,675 in 2022 and going up to 1,874 in 2023. Similarly, the Pell recipient rate as a percentage of all applicants showed a flat trend for pre- policy implementation cohorts, increasing from 3.72% in 2020 to 4.47% in the first year after the policy was in effect. However, the Pell recipient rate settled to similar rates when compared to pre-policy implementation, that is ranging between 3.68% and 3.79%.

URM student applicants presented a constant increase in the number of Pell recipients during all the years in the study period, with an important increase in the 2021 cohort when the test-optional and test-excluded policy was implemented. The number of Pell recipients among URM students went from 603 in 2020 to 763 in 2021. Asian and White students receiving Pell grants were found with similar increase trends for the study period, including a notable spike in the first year of policy implementation as shown by the line and bar chart in Figure 32.

Figure 32

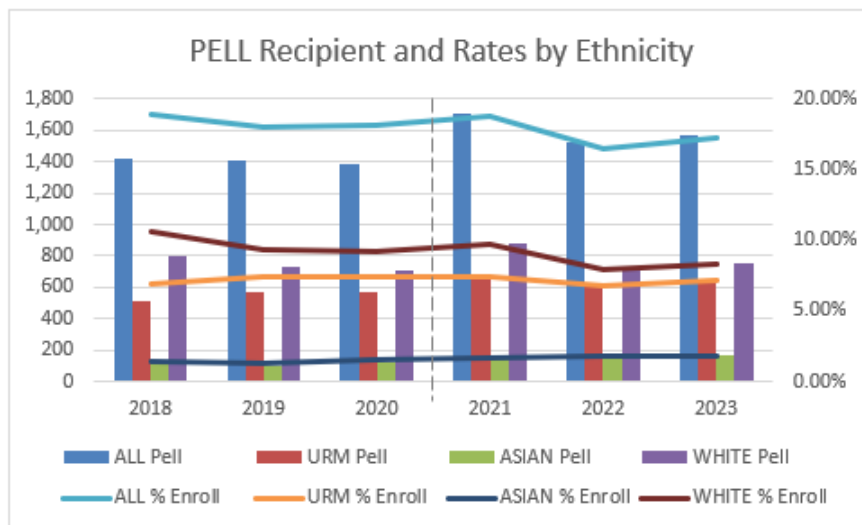
Pell Recipients and Rates for Applicants by Ethnicity



Regarding enrolled students, the patterns for numbers of Pell recipients and corresponding rates as a percentage of enrollment were similar to those found for applicants. Even though URM, Asian and White students who enrolled presented increases in their Pell recipient numbers and rates as percentages of all enrolled, these increases were smoother than those found for applicants as depicted in Figure 33. Also, after an increase for the year of policy implementation, the number of Pell recipients and their rates settled down to numbers closer to those found during the pre-policy implementation cohorts.

Figure 33

Pell Recipients and Rates for Enrolled by Ethnicity



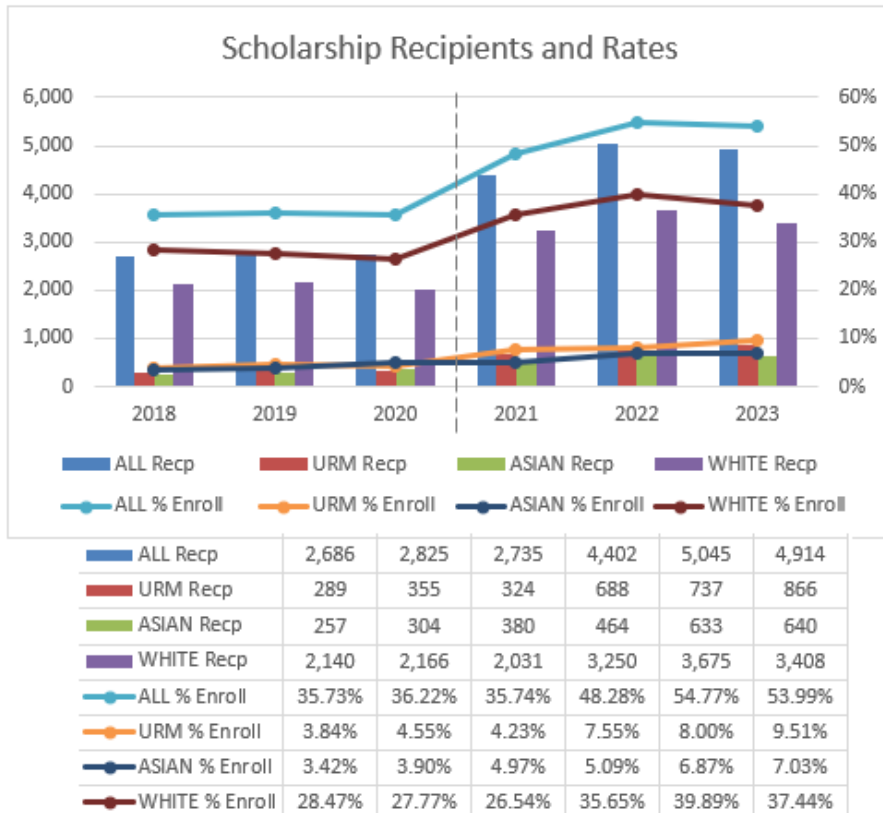
Scholarship Recipients

As shown in Figure 34, enrolled students for each entering cohort during the pre-implementation years, when the awarding of scholarships had test scores as part of the selection criteria, exhibited a flat number of scholarship recipients year over year, specifically for the fall cohorts of 2018 through 2020. For the post-implementation years, that is after the test-excluded scholarships policy was in effect, the numbers of scholarships recipients increased significantly,

approximately 1,600 students, and consequently the rate of students receiving scholarship awards based on the total number of enrolled students also increased at comparable levels (close to 12.5 points) as indicated in Figure 34.

Figure 34

Scholarship Recipients by Ethnicity



The growth of the scholarships recipient rate (as a percentage of all students enrolled) was significant for URM students when comparing entering cohort years for pre- and post-test excluded scholarships policy implementation as shown in Figure 34, where the change in number of URM students receiving scholarships more than doubled from 324 URM receiving a scholarship at a 4.23% rate in 2020, to 866 URM receiving an award at a 9.51% rate in 2023. Asian students still showed a significant increase in numbers of scholarship recipients for post-

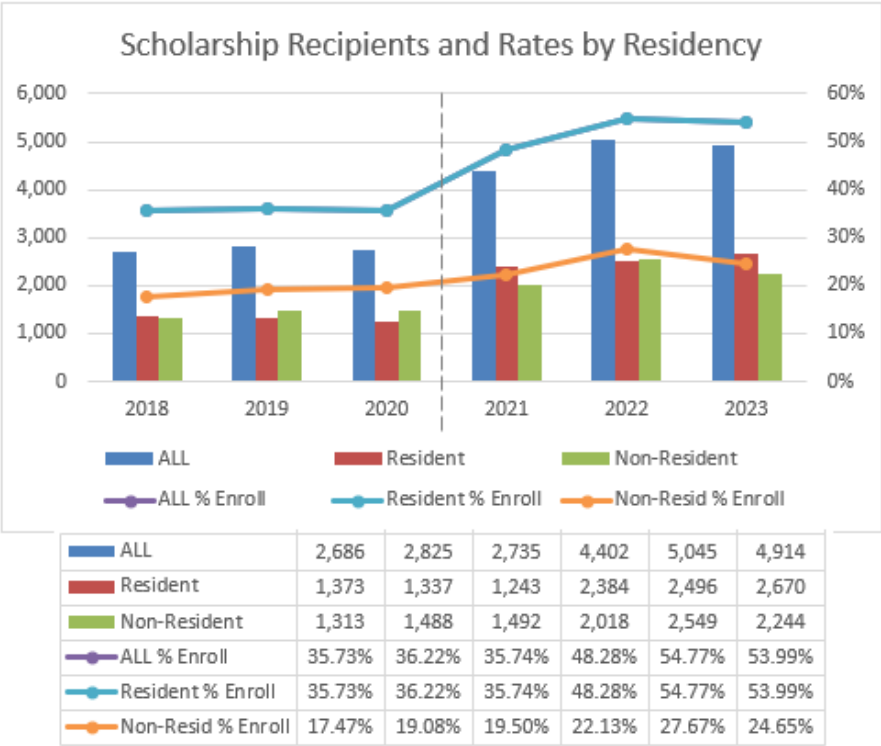
implementation years, going from 380 recipients at a 3.90% rate in 2020, to 640 recipients at a 7.03% rate (see Figure 34).

In the case of White students, post-policy implementation years indicated the highest increase when compared to their peer URM and Asian students. The number of White students receiving a scholarship in 2020 was 2,031 at a 26.54% rate. This number increased for the 2021 entering cohort to 3,250 at a 35.65% rate, peaked to 3,675 at a 39.89% rate in 2022, but dropped down slightly to 3,408 at a 37.44% in the last cohort analyzed in this study as shown in Figure 34.

In terms of Residency, the number of residents receiving scholarships experienced the sharpest growth as compared to their non-domestic resident counterparts when comparing pre- and post-policy implementation cohorts (see Figure 35). Domestic residents went from 1,243 enrolled students receiving scholarships at a 16.24% rate in 2020, to 2,650 students receiving an award at a 29.33% rate in 2023 as depicted in Figure 15. Nondomestic residents also experienced an increase in the scholarships recipient number in 2021, peaking on 2022 with 2,549 receiving a scholarship at a 27.67% rate, but decreasing in their number of recipients slightly to 2,244 in 2023 at a 24.65% rate (see Figure 35).

Figure 35

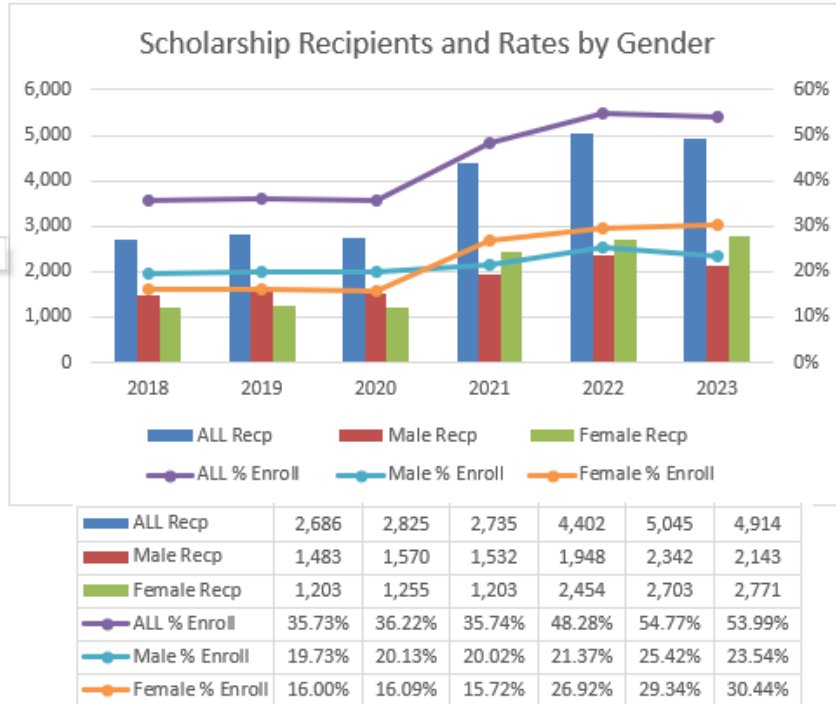
Scholarships Recipients and Recipient Rates of Enrollment by Residency



Regarding gender, female students exhibited a similar increase pattern for number of scholarship recipients when compared to the domestic resident scholarship recipients as depicted in Figure 36. Female students presented a more significant increase in their scholarships recipient numbers for post-policy implementation year over year, going from 1,203 award recipients in 2020 at a 15.72% rate, to 2,771 recipients in 2023 at a 30.44% rate. Whereas male students experimented growth in scholarship recipients at a lesser level as shown in Figure 16.a, with 1,532 students receiving awards in 2020 at a 20.02% rate, increasing to 1,948 recipients in 2021 at a 21.37% rate, peaking to 2,342 recipients in 2022 at a 25.42% rate, however coming down slightly to 2,143 awardees in 2023 at a 23.54% rate.

Figure 36

Scholarship Recipients and Recipient Rates of Enrollment by Gender



Retention

Retention rates for students of all ethnic groups resulted in an overall flat performance year over year and as the analysis compared the pre- and post-policy implementation period as shown by the line chart in Figure 37. Retention to the 2nd year rates for all students peaked at 90.11% in 2019 and dropped down to 89.08% in 2020, both pre-policy implementation years. Retention to the 2nd year for all students took another slight dive in 2021 at 88.35% and recovered to 89.30% in 2022, a bit higher than the retention level in 2020 as shown in Figure 38. Retention to the 3rd year for all students peaked at 84.74% in 2019 and decreased slightly in 2020 staying mostly flat for 2021.

Figure 37

Retention Rates for Year 2, Year 3, and Year 4 for All Students

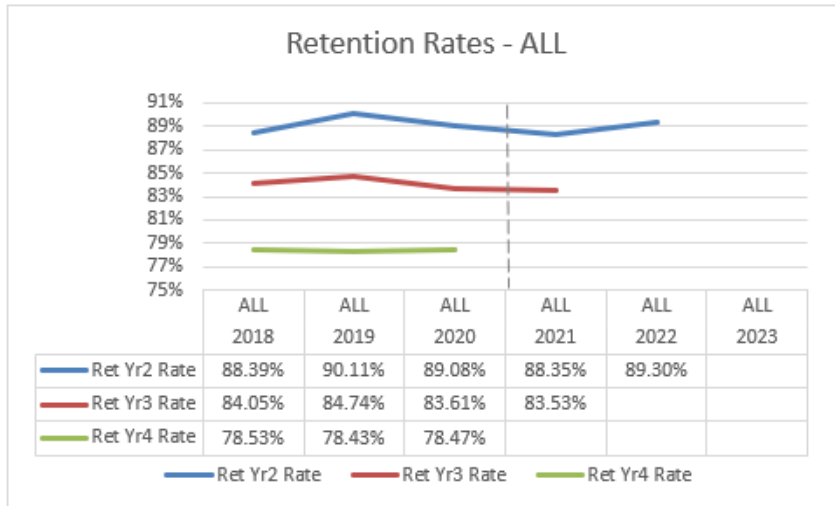
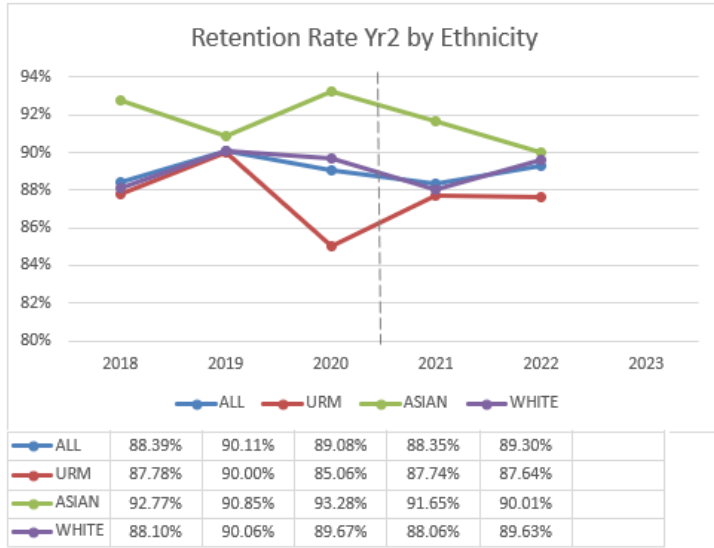


Figure 38 shows that retention to 2nd year performance for students of URM backgrounds behaved similarly to students from all ethnic groups, resulting in the highest rate of 90% in 2019, decreasing to 85% in 2020 and recovering to 87.74% in 2021, and 87.64% in 2022. Figure 40 shows that retention to 3rd year for URM students dropped from 82.40% in 2018 to 77.36% in 2020 and experienced a recovery to 79.29% in 2021. On the other hand, Asian students presented a bit different 2nd and 3rd year rate retention rates behavior peaking performance in 2020 at 93.28% and 89.08% respectively, as opposed to 2019, as shown in Figure 39 and 40 respectively. However, both retention rates dropped a few points for 2021 and 2022, to 91.65% and 90.01% for each of these cohorts.

Figure 38

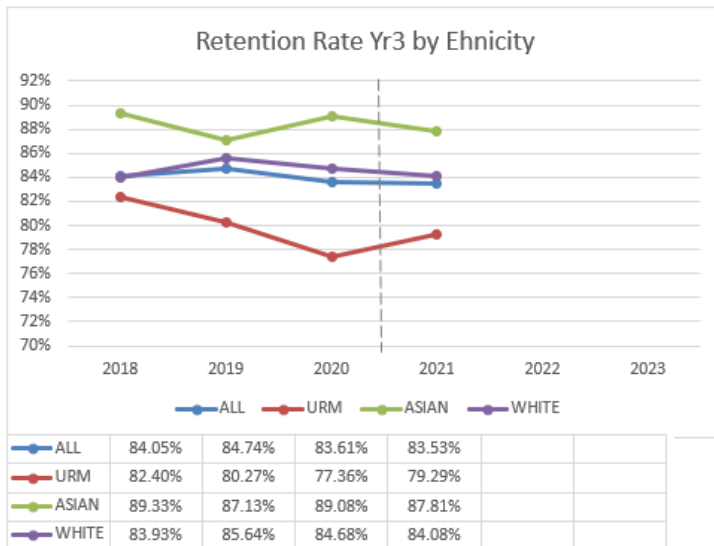
Retention Rate for Year 2 by Ethnicity



In the same manner, retention rates in the 3rd year came down a couple of points to 87.81% per Figure 39. Finally, regarding White students' retention rates to 2nd and 3rd years exhibited the least variance of all ethnic groups (see Figures 39 and 40), peaking at 90% and 85.64% in 2019 respectively. Both retention rates dropped marginally to 88.06% and 84.08% in 2021 and recovered to 89.63% retention rate to 2nd year in 2022 as represented in Figure 38.

Figure 39

Retention Rate for Year 3 by Ethnicity



Hypothesis Testing for Second Research Question

As indicated in the methodology chapter, I adopted an inferential statistic at this point of the data analysis to determine the statistical significance of the policy implementation when comparing both groups of cohorts, pre- and post-policy implementation. The results of the t -statistics and hypothesis testing for the retention rates and scholarship recipient rates follow.

Retention Rates.

Ho: there is no significant statistical difference in Retention to Year 2 for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Retention to Year 2 for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

An independent two-samples t -test was conducted to compare the retention to Year 2 rates between pre- and post-policy implementation cohorts. For the hypothesis analysis the table summary statistics showing the t value or t statistics and respective p value appears in Table 16.

Table 16

t-Test to Determine Statistical Significance for Pre- and Post-Policy Implementation: Retention Rates

Ret Rate Yr2-ALL			Ret Rate Yr2-URM		
t-Test: Two-Sample Assuming Equal Variances			t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.891806	0.884695	Mean	0.876133	0.876935
Variance	7.85E-05	0.000137	Variance	0.000613	5.22E-07
Observations	3	2	Observations	3	2
Pooled Variance	9.79E-05		Pooled Variance	0.000409	
Hypothesized Mean Diff	0		Hypothesized Mean Diff	0	
df	3		df	3	
t Stat	0.787145		t Stat	-0.04341	
P(T<=t) one-tail	0.244327		P(T<=t) one-tail	0.484051	
t Critical one-tail	2.353363		t Critical one-tail	2.353363	
P(T<=t) two-tail	0.488654		P(T<=t) two-tail	0.968101	
t Critical two-tail	3.182446		t Critical two-tail	3.182446	
Ret Rate Yr2-Asian			Ret Rates Yr2-White		
t-Test: Two-Sample Assuming Equal Variances			t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>		<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.922989	0.908288	Mean	0.892778	0.888492
Variance	0.000163	0.000134	Variance	0.000108	0.000123
Observations	3	2	Observations	3	2
Pooled Variance	0.000154		Pooled Variance	0.000113	
Hypothesized Mean Diff	0		Hypothesized Mean Diff	0	
df	3		df	3	
t Stat	1.299237		t Stat	0.442157	
P(T<=t) one-tail	0.142349		P(T<=t) one-tail	0.344154	
t Critical one-tail	2.353363		t Critical one-tail	2.353363	
P(T<=t) two-tail	0.284697		P(T<=t) two-tail	0.688309	
t Critical two-tail	3.182446		t Critical two-tail	3.182446	

The *t*-test results showed that, assuming equal variances, there was no significant difference in the retention to Year 2 rates for all students between pre- and post-policy implementation cohorts $t = .79, p = .489, 95\%$. Therefore, I failed to reject the null hypothesis, as the test indicated insufficient evidence to conclude that the mean retention to Year 2 rates differed significantly between the pre- and post-policy implementation cohorts (see Table 16).

Regarding retention rates to the second year for all ethnic groups and for the pre and post implementation cohorts from 2018 to 2023, the *t*-test two sample analysis assuming equal variances resulted in *p* values higher than the α value of 0.05. Therefore, I was unable to reject the null hypothesis. The *p* value for all ethnic groups was equal to 0.488654 as shown in Table 14. The *p* value for students of URM background equated to 0.968101, and the *p* values for

Asian and White students resulted in 0.284697 and 0.68809 respectively as depicted in Table 14. All these p values were higher than the α value of 0.05 statistically necessary to reject the null hypothesis. Consequently, the analysis based on retention rates to the second year indicated no significant statistical difference between the cohorts for the pre and post policy implementation, this means that the analysis failed to reject the null hypothesis, or H_0 . The table showing the t value or t statistics and respective p -Value used for this hypothesis testing appears in Table 17.

Table 17

Summary of Two-Sample t-Test for Retention Rate to Year 2

YEAR	ETHNICITY	Ret Rate Yr2	YEAR	ETHNICITY	Ret Rate Yr2
2018	ALL	0.901141	2018	URM	0.877818
2019	ALL	0.890762	2019	URM	0.900000
2020	ALL	0.883514	2020	URM	0.850582
2021	ALL	0.892966	2021	URM	0.877445
2022	ALL	0.876424	2022	URM	0.876424
2023	ALL		2023	URM	
t-Test	P Value	0.488654	t-Test	P Value	0.968101
2018	Asian	0.927667	2018	White	0.881016
2019	Asian	0.908527	2019	White	0.900599
2020	Asian	0.932773	2020	White	0.896718
2021	Asian	0.916479	2021	White	0.880641
2022	Asian	0.900097	2022	White	0.896342
2023	Asian		2023	White	
t-Test	P Value	0.284697	t-Test	P Value	0.688309

Scholarship Recipients Rate.

H_0 : there is no significant statistical difference in Scholarship recipient rate for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

H₁: there is a significant statistical difference in Scholarship recipient rate for URM students after the implementation of the test optional admission policy and the complementary test excluded strategy.

An independent two-samples *t*-test was conducted to compare the scholarship recipient rates between pre- and post-policy implementation cohorts. For the hypothesis analysis the table summary statistics showing the *t* value or *t* statistics and respective *p* value appear in Table 18.

Table 18

t-Test to Determine Statistical Significance for Pre- and Post-Policy Implementation:

Scholarship Recipient Rates

Schol Rec % of Enroll-ALL t-Test: Two-Sample Assuming Equal Variances			Schol Rec % of Enroll-URM t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2		Variable 1	Variable 2
Mean	0.35897517	0.52345695	Mean	0.04210039	0.08353723
Variance	7.9262E-06	0.00125276	Variance	1.2547E-05	0.00010619
Observations	3	3	Observations	3	3
Pooled Variance	0.00063034		Pooled Variance	5.9369E-05	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	-8.02370393		t Stat	-6.58645772	
P(T<=t) one-tail	0.00065454		P(T<=t) one-tail	0.0013758	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.00130908		P(T<=t) two-tail	0.0027516	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	
Schol Rec % of Enroll-Asian t-Test: Two-Sample Assuming Equal Variances			Schol Rec % of Enroll-White t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2		Variable 1	Variable 2
Mean	0.04094075	0.06330762	Mean	0.27593403	0.3766121
Variance	6.2673E-05	0.00011621	Variance	9.5555E-05	0.00045429
Observations	3	3	Observations	3	3
Pooled Variance	8.9444E-05		Pooled Variance	0.00027492	
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	4		df	4	
t Stat	-2.89651299		t Stat	-7.43661527	
P(T<=t) one-tail	0.02213626		P(T<=t) one-tail	0.00087297	
t Critical one-tail	2.13184679		t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.04427252		P(T<=t) two-tail	0.00174594	
t Critical two-tail	2.77644511		t Critical two-tail	2.77644511	

To analyze the impact of the implementation of admissions policies at MPFU regarding recruitment and enrollment, this study considered both the number of scholarship recipients and the percentage of these scholarship recipients compared with the total number who enrolled, that is, the scholarship recipient rate. The *t*-test results showed that, assuming equal variances, there was a significant difference in the scholarship recipient rates for all students between pre- and post-policy implementation cohorts $t = -8.02, p = .001, 95\%$. Based on these results I could reject the null hypothesis, indicating that there was sufficient evidence demonstrating that the mean scholarship recipient rates differ significantly between the pre- and post-policy implementation cohorts (see Table 19).

Table 19

Summary of Two-Sample t-Test for Scholarships Recipient Rate

Year	Ethnicity	SCHOL Rec	% of Enrolled	Year	Ethnicity	SCHOL Re	% of Enrolled
2018	ALL	2,686	0.357323	2018	URM	289	0.038446
2019	ALL	2,825	0.362226	2019	URM	355	0.045519
2020	ALL	2,735	0.357376	2020	URM	324	0.042336
2021	ALL	4,402	0.482834	2021	URM	688	0.075463
2022	ALL	5,045	0.547655	2022	URM	737	0.080004
2023	ALL	4,914	0.539881	2023	URM	866	0.095144
t-Test	P Value	0.000526	0.001309	t-Test	P Value	0.001445	0.002752
2018	ASIAN	257	0.034189	2018	WHITE	2,140	0.284688
2019	ASIAN	304	0.038979	2019	WHITE	2,166	0.277728
2020	ASIAN	380	0.049654	2020	WHITE	2,031	0.265386
2021	ASIAN	464	0.050894	2021	WHITE	3,250	0.356477
2022	ASIAN	633	0.068715	2022	WHITE	3,675	0.398936
2023	ASIAN	640	0.070314	2023	WHITE	3,408	0.374423
t-Test	P Value	0.017328	0.044273	t-Test	P Value	0.000523	0.001746

In the same research line, the *t*-test results showed that, assuming equal variances, there was a significant difference in the scholarship recipient rates for each of the ethnic student groups between pre- and post-policy implementation cohorts. These results were as follows, for White students $t = -7.44, p = .002, 95\%$, for URM students $t = -6.59, p = .003, 95\%$, and for

Asian students $t = -2.90, p = .044, 95\%$. Consequently, I could reject the null hypothesis, concluding that there is enough evidence to demonstrate that the mean scholarship recipient rates differ significantly between the pre- and post-policy implementation cohorts, including students of URM backgrounds. These results imply a positive outcome in student recruitment and retention after the adoption of a test-optional policy and a complementary test-excluded scholarship strategy, specifically for underprivileged students.

Even though the Retention Rate to Year 2 resulted in no significant change for either of the ethnic student groups included in the study, the scholarship recipient rates increased significantly for URM students after the adoption of the test-excluded scholarships strategy. These mixed results supported retention partially as scholarships granting is tied to student persistence (Alon, 2011; Dynarski, 2008; Patel & Richburg-Hayes, 2012; Scott-Clayton, 2011). However, direct retention rates after policy implementation were not indicative of a positive change for URM students. This inconsistency in the findings suggests that increasing retention might be linked to other factors not measured in this study, including contextual or environmental aspects that could not be easily quantified.

Summary

In this chapter I presented the findings of the statistical analysis conducted as described in the methodology section of the study. For the first research question of “How does a test-optional admissions policy help increase college access of students from URM backgrounds?” I presented the results that centered in the analysis of factors of size as organized in chapter III. Factors of size were comprised of number of applications, admitted and enrolled students and their respective admit and enroll rates. I wrapped up the findings for the first research question with

the results from the hypothesis testing conducted to determine the significance of the policy implementation for both, admit and enroll rates.

Although the numbers of applicants, admitted, and enrolled students for the research period showed increased growth year-over-year, the upward trend was greater for the numbers of applicants and admitted students of all ethnicities. These first results were overall supportive of broadening access. On the other hand, despite the increase in applications and admissions, the number of all enrolled students remained flat, with a slight uptick for the post-policy implementation cohorts. Confirmation of the significance of this result was addressed by hypothesis testing later.

Based on the analysis of the raw data, when comparing numbers of applicants, admitted and enrolled students by ethnicity, URM and Asian students showed the higher increases year-over-year with greater increase levels in post-policy implementation years. Asian students showed the most increases for both number of applications and admissions. These results are also indicative of a positive outcome of broadening access, specifically as the increases were more notable for URM and Asian students.

From the admit and enroll rates perspectives the data analysis showed flat rates year-over-year with no significant increase for post-policy implementation cohorts, except for a slight increase in admit rates during the 2021 cohort, including a small increase for URM students. A more nuanced analysis was conducted by looking into differences not only by ethnic groups but also by gender. While overall admit rates for female students stayed behind those of their male peers during pre-policy implementation, starting with the 2021 cohort the admit rate of all female students increased slightly over the admit rates of all male students. On the other hand, the enroll rates of all female students continued to fall behind their male counterparts through the entire

study period. This pattern was also true for White and URM female students during the study period, except for Asian female students, who enrolled at higher rates than their male peers during the post-policy implementation cohorts, specifically for the entering classes of 2022 and 2023.

Hypothesis testing to determine the statistical significance in the admit or acceptance rates after implementing a test-optional policy resulted in the rejection of the null hypothesis (H_0) when all students were considered, confirming that policy implementation had an overall positive impact on the admit rates of all students. When the t -test analysis was applied to each of the ethnic groups separately, URM students resulted in even a stronger significance value, concluding that the implementation of the test-optional policy did have a positive and significant effect in the admission of URM students. On the other hand, hypothesis testing for Asian and White students as individual groups, resulted in values that could not statistically reject the null hypothesis, thus concluding that for these students the implementation of the test-optional policy did not have a significant effect in their admission rates.

When the hypothesis testing turned to enrollment rates for all students, the analysis could not reject the null hypothesis, determining that the implementation of a test-optional policy did not have a statistically significant impact on the enrollment of all students. Although the t -test for the enrollment rates of URM resulted in a statistically significant value, the effect was negative, therefore deriving that less URM students chose to enroll in proportion of all students who matriculated.

For the second research question of “How does a test optional and a complementary test-excluded scholarship strategy help recruit and retain students of URM backgrounds?” I presented findings that focused on factors of performance, financial need, financial aid, and retention.

These factors are associated with the recruiting and retention of students as determined by research presented in Chapter III (Aitken, 1982; Murtaugh et al., 1999; Snyder et al., 2003). I completed the presentation of findings with the results of the hypothesis testing that sought to determine the level of statistical significance that the policy implementation had on the recruitment and retention of URM students.

While this study seeks to confirm the benefit of a test-optional policy to improve access to higher education, particularly of students from URM backgrounds, it still considered that the SAT score, when available, could be a useful factor among others in predicting performance. Particularly in the case of a “test-optional” policy, students can still choose to submit their SAT scores if that is their preference. The data analysis for the post-policy implementation years confirmed this statement.

Once the test-optional policy was implemented for the entering cohort of 2021, an important proportion of applicants chose to still submit their SAT scores at an average of 54% over 46% who opted for not submitting them. However, the analysis found that students from URM backgrounds were the only ethnic group that opted for the non-submission of test cores at higher proportion than those who submitted them. This finding is supportive of the adoption of a test-optional policy, particularly as it aimed to broaden access. Once URM students were presented with an option to submit their SAT scores, a requirement that had historically disadvantaged them, a larger proportion of them chose to not submit their scores.

From the academic preparedness perspective, the SAT scores showed an important increase, approximately 50 points, for all applicants after the policy implementation. This result could be explained by the benefit of having an option. Once students had a choice to send their

scores, those who sent them did so because their scores were strong, therefore the SAT scores post-policy implementation exhibited a spike once the policy was implemented.

While the average, determined as the mean, SAT scores for applicants of all student groups stayed flat for the three pre-policy implementation cohorts, the average score for admitted and enrolled students resulted in lower average scores in 2020, coinciding with the occurrence of the COVID-19 world health pandemic. Starting with the 2020 cohort the average SAT scores for enrolled students surpassed the average scores for applicants. In the case of URM the gap between SAT scores for applicants and enrolled students resulted as the closest among ethnic groups, becoming almost trivial for the 2023 cohort. These results could align with students becoming more selective once they had an option to submit their SAT scores.

Academic preparedness or pre-college performance was also analyzed through the HSGPA of all applicants for the study period. For both applicants and enrolled students, the analysis showed an upward trend year over year, with not an obvious increase for the post-policy implementation cohorts. For enrolled students the data analysis presented a dip in HSGPA in the first year of the policy implementation period. Subsequent post-policy implementation years showed a recovery in HSGPA to levels higher than pre-policy implementation cohorts.

Median (as opposed to mean) College GPA as a measure of academic performance was another factor analyzed that showed an upward trend for both median Year 1 and Year 2 GPA but experienced a dip in 2020 and 2021. URM students exhibited the lower median GPA as compared to White and Asian students for both years and throughout the study period. URM and White students fell about the same GPA points the first year of policy implementation, while Asian students GPA showed the least change. In all cases students' GPA recovered to similar score levels as those of pre-policy implementation cohorts.

Next, I presented results from the analysis of financial need, that is, FAFSA Submissions, Unmet Financial Need, and Pell Grant Recipients. FAFSA submissions for all applicants showed constant increase year over year in the study period, but the growth was constant with no substantial increase for post-policy implementation cohorts. This increase pattern became more subtle when only enrolled students were considered in the analysis. On the other hand, the percentage of FAFSA submitters for applicants differed greatly contingent on the ethnic group. Although all student groups exhibited a submission rate increase for the first year of the test-option and test-excluded policy implementation, White students presented a slightly higher increase rate than Asian and URM applicants. However, FAFSA submission rates of enrolled students resulted in slight decreases for first year of the post-policy implementation cohort but recovered to pre-policy implementation levels for 2022 and 2023, particularly for URM and Asian students.

When the factor of Unmet Financial Need was combined with FAFSA submissions, the number of applicant students with unmet financial need who filed FAFSA stayed almost unchanged at around 10,000 for the first two years of the pre-policy implementation cohorts, took a significant dip for cohorts 2020 and 2021 at less than 5,000, and exhibited a recovery surpassing 10,000 for the 2022 cohort. This recovery for post-policy implementation years is more noticeable for White students. When the analysis turned to students who enrolled, URM students with unmet financial need who filled the FAFSA hovered around 5% and 7% for the study period, peaking at 7% in 2020, dropping to 5% in 2022 and recovering to 7% in 2023. Enrolled Asian students with unmet need who filed the FAFSA exhibited a constant increase rate that went from 2% in 2018 to 3% in 2023, while White students resulted in a constant decline

rate of enrolled students with unmet need who submitted the FAFSA, going from 17.5% in 2018 to 15% in 2023.

The number of Pell recipients for URM and its respective rate as a percentage of all applicants slightly increased for post-policy implementation hovering around 1.8% through 2023. White students showed similar results, with a spike in 2021 around 2.4% and settling down to 1.9% in 2022 and 2023. The analysis with enrolled students showed very similar patterns as those exhibited for applicants.

Levels of financial support for students have been linked to retention (St. John & Starkey, 1995; DesJardins et al., 2002; Paulsen & St. John, 2002) and this was an important consideration for MPFU as they implemented the test optional and test-excluded policies. Consequently, Scholarship Recipients were a factor of financial aid included in this study per its link to retention. The number of all enrolled students who received scholarships increased substantially for the post-policy implementation period, which is also demonstrated by the increase of the percentage rate of scholarship recipients when compared to the numbers of enrolled students. In this case the increase of enrolled students receiving scholarships was more significant for White students when compared to their URM and Asian counterparts. When the variables of residency and gender were analyzed in conjunction with the number of enrolled students receiving scholarships, state residents experienced the sharpest change during the post-policy implementation years. In similar fashion, female students received the most scholarships during the post-implementation period when compared with their male counterparts.

Retention rates to Year 2 remained overall flat during the study period for all students with very slight uptakes in 2019 and 2022 where it hovered around 89%. When the analysis turned to include ethnicity, Asian students retained to Year 2 at higher rates than all other ethnic

groups, between 90% and 93% for all cohorts. White students retained to Year 2 at rates ranging from 88% to 90%, and URM students retained to Year 2 at the lowest rates, between 85% and 90%.

The last analytical step in answering the second research question was hypothesis testing. The purpose of this level of analysis was to confirm statistical significance retention rates and scholarship recipient rates for students, when comparing the pre- and post-policy implementation cohorts. When all ethnic groups were considered for retention rates to Year 2, the *t*-test results could not support the rejection of the null hypothesis, concluding that there was not a statistically significant change in their retention rates for Year 2 after the implementation of the test-optional and test-excluded policies.

Finally, the *t*-test for the scholarship recipients' rates resulted in the rejection of the null hypothesis, hence supporting the positive effect of the policy implementation for all ethnic groups. White students showed the highest statistical significance, followed by students from URM backgrounds and lastly Asian students in order of level of significance.

Chapter V: Discussion, Limitations, Implications and Recommendations

As established in Chapter I, the purpose of the present study was two-fold, it sought to determine if the adoption of test-optional admissions policies broadened access to higher education, and if implementing a complimentary test-excluded scholarship had a positive impact in both recruitment and retention.

In this chapter I will discuss each of the relevant study findings organized in the same sequence used in the analysis, that is by factors of size, performance, financial need, financial aid, and retention. I will then complete the detailed discussion section with the review of the hypothesis testing results as applied to answer each research question. Next, I will provide a summary of the discussion section.

I will finish this chapter by identifying the limitations of the present study, followed by a review of the potential implications for institutions and practitioners, the presentation of recommendations for future research and a conclusion statement.

Discussion by Factors

In this section I turned to a detailed discussion of the results for each of the factors or variables used in the analysis. These factors were grouped by size, performance, financial need, financial aid, and retention to frame the discussion in the sequence set by these variables and the respective research questions.

To answer the first research question about the impact of the test-optional policy implementation in broadening access for URM students, I will discuss the factors of size.

Factors of Size

Among the factors related to size or volume, number of applicants, admitted, and enrolled students were first analyzed. The analysis resulted in sharper increases for applicants and

admitted students of all ethnic groups during the post-policy implementation cohorts. These increases were more notable for URM students for both applicants and admitted students. This finding is consistent with previous research as it relates to increases in number of applicants (Belasco et al., 2015; Pellegrino, 2020; Saboe & Terrizzi, 2019), and number of admitted students (Pellegrino, 2020). In contrast, other researchers have presented studies that resulted in no significant increases in applications as in the study conducted by Szczepanski-Dugo (2023), although her research included 68 four-year institutions in its population sample with two treatment groups for a much earlier study period of 2010 to 2015. Since the population for the current research study was the institution of analysis, a Midwest Public Flagship University or MPFU, other combination factors could have a relative impact on the number of applicants, admitted and enrolled students that are only specific to this particular institution, therefore any assumptions or implications about the findings should consider the contextual scenario around MPFU.

Unlike the increase trends depicted by admit and enroll numbers, admit, and enroll rates resulted in an overall relatively flat annual yearly trend for both the pre- and post-policy implementation cohorts. However, admit rates for URM students resulted in a slightly higher increase during the first year of policy implementation, while the admit rates for Asian and White students did not show any notable increase. This finding could support a positive impact stemming from the policy implementation for URM students as the effect of the size factor for admitted students is positive in terms of quantity or number of admits, and rate or number of admits divided by the number of applicants for that ethnic group.

Lastly based on findings from the independent two-sample *t*-test to compare the admit rates between pre- and post-policy implementation I concluded that the increase in admit rates

for all students, and particularly for those of URM backgrounds was significantly different. This finding supports the institutional objective of broadening access through the adoption of test-optional policies. Previous empirical study findings are coherent with increased admit percentages for students of unprivileged backgrounds (Bennett, 2020; Pellegrino, 2020; Syverson et al., 2018; Szczepanski-Dugo, 2023). However, Other studies found no significant change in the admission rates of URM students, including Belasco et al. (2015) and Saboe & Terrizi (2019). It is important to note that the recent Szczepanski-Dugo (2023) found a significant admit rate for Latino students but not for Black students.

For the rates of enrolled students on the contrary, the independent two-samples *t*-test comparing enroll rates for the pre- and post-policy adoption, resulted in no significant change for White and Asian students. Conversely, the *t*-test conducted for the enrollment rates of URM students resulted in a significant statistical change, although at lower enrollment rates for URM students this finding was contrary to the intent of the test-optional policy. This finding was consistent with previous research by Belasco (2014) and Szczepanski-Dugo (2023) whose research posited declining enrollment for underserved students. On the other hand, this result does not agree with research by Pellegrino (2020) whose study found increased enrolment for Latino and Native Hawaiian Pacific Islander students, and by Pennant (2018) whose research determined a significant effect for African American enrollment after the establishment of a test-optional admission policy.

Next, to answer the second research question about the impact of the adoption of the test-optional and test-excluded strategy in the recruitment and retention of URM students, I will discuss findings related to factors of performance, financial need, financial aid, and retention.

Factors of Performance

Before the test-optional and test-excluded scholarship policies were implemented at MPFU, applicants were required to submit SAT scores. It is interesting to note that the descriptive statistics analysis resulted in an overall higher proportion of applicants choosing to submit their SAT scores even after the test-optional policy was implemented. This finding could also be associated by related research conducted by Belasco et al. (2014), where the authors of the study found that test-optional liberal arts colleges reported an increase in SAT scores. On the other hand, a closer analysis based on an ethnic breakdown showed that even though White and Asian students continued to submit SAT scores at higher rates than those who opted not to submit them, URM students submitted their SAT scores at lower rates than those who opted for non-submission. The finding of URM taking advantage of the test-optional policy at higher rates than their counterparts aligns with previous research positing that marginalized students had historically scored at the lowest SAT ranges when compared with White and Asian students (Buchman, 2010). In addition, this finding was also consistent with a study conducted by Robinson & Monks (2005) about the effect of a test-optional admissions policy on the size and racial composition of the applicant pool, yield rates of submitters and non-submitters and their respective academic performance. The authors found that lower performers in HSGPA and SAT tended to withhold their scores and those who did were more likely to have lower average GPA than submitters.

The present analysis also resulted in a significant increase in the average SAT scores submitted by the entering student cohorts after the implementation of the test-optional policy at MPFU. This increase trend was similar for applicants, admitted, and enrolled students and for all ethnic groups. Research conducted by Belasco et al. (2014) had similar findings in a study

involving a sample of 180 selective liberal art colleges across the USA. The authors suggested that higher SAT scores are more likely to reflect the appearance of selectivity than diversity in institutions adopting test-optional policies.

In another relevant finding of the present study, the descriptive analysis resulted in a decrease of average SAT scores for all students during the 2020 cohort, when the COVID-19 health pandemic had already spread across the globe and was causing havoc at all levels of society. As presented in the literature review chapter, the 2020 entering cohort experienced the full impact of the COVID-19 pandemic, which caused the nationwide closing of testing sites. Prompted by the unavailability of authorized locations to take the SAT, many colleges and universities started to adjust their admissions policies from test-required to test-optional or test-free processes (Schaeffer, 2020). These changing policies, plus the lower availability of test-preparation courses might have caused confusion and lowered the level of preparedness that students would have otherwise had when taking the SAT.

Still related to the SAT mean scores, the analysis identified a switch between the applicants and enrolled students' trend. While the SAT scores were lower for applicant students than enrolled students for the 2018 to 2020 cohorts, starting with the post-policy implementation cohort of 2021, the SAT scores of applicant students resulted in higher mean scores than those of enrolled students. This result could be associated with the institution becoming less selective in a context where the number of applications kept increasing year over year, even at higher rates after the implementation of the test-optional policy, but financial pressures called for larger classes. In this same trend of lower selectivity, URM however were enrolled at increasingly higher average SAT scores when compared to all URM applicants. This could mean that the

institution was slightly turning up the selectivity dial for students of URM backgrounds when compared to other ethnic groups.

The median HSGPA for all applicants showed an upward trend for all the cohorts in the study, with no notable shift for post-policy implementation cohorts. This median GPA growth was consistent across all ethnic groups as well and the analysis did not indicate a significant change post-policy implementation. Regarding the constant growth of the median HSGPA, could be related to a grade inflation factor¹⁴. A report released by ACT (2023) indicated that GPA for high school students continued to rise between 2010 and 2022 across all subjects, and this growth did not correspond with improvements in other measures of achievement. While the average increase in HSGPA for all students was .05 when comparing pre- and post-policy implementation cohorts, the ACT report (2023) indicated an average spike of .1 nationwide, both upward trends for roughly the same period.

Considering median HSGPA for all enrolled students in the study, the analysis resulted in a notable drop for the first post-policy implementation cohort with a recovery to higher scores for the 2022 and 2023 cohorts. It is important to note that only enrolled Asian students did not show the decline in median scores for the 2021 cohort. Their scores continued with an upward trend through 2023. The decrease in median HSGPA for White and URM students during the 2021 cohort could be explained in part by the COVID-19 health pandemic implications, which included school closings and a rapid switch to on-line learning.

Median College GPA during Year 1 and Year 2 for all enrolled students followed an increase pattern for the first two years of the study, with a subsequent decline in the 2020 and

¹⁴ Grade inflation is when the assignment of grades does not align with content mastery (ACT, 2023)

2021 cohorts. The more significant decrease in GPA occurred in the 2021 cohort. At this point I considered the potential impact of the COVID-19 health pandemic on student performance, including grades. There is research (Rodriguez-Planas, 2022) that supports the negative impact on college grades from the COVID-19 health pandemic as institutions across the USA had to rapidly change their teaching modes to online, disrupting not only traditional learning but also campus life. However, there is research that supports an increase, albeit small, in college GPA for students who changed from in-person to on-line learning during the pandemic (Cavanaugh, et al., 2022). For the subsequent cohort of 2022, at least the median GPA for Year 1 recovered to a level almost identical to the highest score for the pre-policy implementation period.

Factors of Financial Need

During the study period the number of applicants who submitted the FAFSA increased year over year at an overall constant number with no notable shifts, particularly for the post-implementation cohorts. This constant increase in numbers could be explained by the growth in overall applications for the same study period. However, when I turned the analysis to the rate of FAFSA submissions, starting in the 2021 cohort applicants who submitted the FAFSA declined as a proportion of all applicants. Applicants from White ethnic background showed a much sharper decline when compared to URM students who showed a more subtle downturn in their FAFSA submission rates. This difference could be explained by the premise that in general White students are less price sensitive than their URM peers (Brent, 2021; Price & Sheftall 2015), consequently they are less preoccupied with financing their education and the possibility of receiving financial aid. On the other hand, the analysis indicated that Asian students who applied to the institution continued to submit their FAFSA at constant increasing rates for the study period. Asian students exhibited the highest performance metrics in this study and are

believed to also have a high level of price sensitivity (Lalwani & Wang, 2019), this could explain the higher proportion of students in this group opting to submit the FAFSA.

The number of FAFSA submitters who matriculated also resulted in an upward trend over the study period, although displaying a minimal increase for students of URM and Asian backgrounds. The rate for all FAFSA submitters on the other hand presented a peak during the 2020 cohort, a steady decline for 2021 and 2022, and a recovery in 2023 that surpassed the highest score during the pre-policy implementation period. This behavior could be related to the COVID-19 health pandemic as a result of student confusion and uncertainty given the important disruptions in their learning and changes in admissions processes. The case for White FAFSA submitters in the matriculated group resulted in a steady decline of their submission rate for the entire study period, showing no notable shift for post-policy implementation years. I could speculate that this decline could be linked to White students being overall less price sensitive than their peers (Brent, 2021; Price & Sheftall 2015), and exhibiting lower levels of financial need when compared to other ethnic groups.

When the analysis combined the factors of FAFSA submission and Unmet Financial Need, enrolled URM students resulted in submission percentages within a range of 5%-7% for the study period, while Asian students showed a constant increase from 2% in 2018 to 3% in 2023. Enrolled White students on the contrary, resulted in constant submission rate declines, losing around 1.5% (15%) by then last study cohort. Although these results do not provide an obvious change supported by the policy implementation, they indicate that URM students with financial need submitted the FAFSA at a constant rate, resulting in no significant change for students with the highest need of financial need. On the other hand, Asian students with financial need presented a steady increase year-over-year in their FAFSA submission rates, although

without a notable shift for post-implementation cohorts. On the contrary, White students with financial need showed a constant decline in their FAFSA submission rate for the study period. These results did align with the premise of price sensitivity for both Asian and White students (Brent, 2021; Price & Sheftall 2015). However, the assumption of high price sensitivity for URM students did not hold, consequently I conclude that there are other factors hampering a significant increase in FAFSA submission for this group of students with high financial need, including a lack of understanding about the process itself and the benefits of submitting the FAFSA, as reported in a report from the United States Government Accountability Office (2024).

Factors of Financial Aid and Retention

For the factor of Scholarship Recipients analyzed for the study period, its rate of increase in proportion of all enrolled students resulted in a positive and significant change for post-policy implementation cohorts. Although the growth rate was significant for both URM (almost doubled) and Asian students, White students resulted in the sharpest rate increase. In addition, residents and female students presented the largest increases in their scholarship recipient rates when the indicators of residency and gender were included in the analysis. These positive results are consistent with previous research that found a beneficial relationship between factors of financial aid and preparedness with student persistence. In a in a six-year retention study at a midsized university in southeastern USA, Millea et al. (2018) found that factors like academic preparedness and financial aid supported student persistence.

These results align with the overall proportion of applicant numbers, admitted and enrolled students by ethnic groups, as White students represent the largest proportion, followed by URM and Asian students. Similarly, residents comprised the largest proportion of enrolled

URM, while female students also surpassed their male peers in the URM portion of the dataset. These results about the positive impact of financial aid factors in the recruitment of students is consistent with previous research (McPherson & Schapiro, 1991; Seftor & Turner, 2002; Van Der Klaauw, 2002; Witherspoon, 1992) as indicated in the findings chapter. However, there is no specific previous research about a complementary test-excluded scholarship strategy.

In regard to the factor of Retention Rate to Year 2 results from the statistical analysis indicated an overall flat performance for all students for the study period with slight increases for the 2019 and 2022 cohorts. Asian students resulted in the highest retention rates, followed by White students and URM students with the lowest retention rates. Considering the impact of the policy implementation though, all ethnic groups behaved similarly, exhibiting flat retention rates throughout the study, without any important changes for the post-policy implementation cohorts. These results are consistent with Szczepanski-Dugo (2023) whose research sought to determine if a test-optional policy influenced a first-year retention rate in a study that included 68 institutions through a five-year period. The author found no significant difference in the retention rates of students after the policy-implementation.

Wrapping up the findings discussion for the second research question, after the application of the independent two-samples *t*-test to compare the retention rates to Year 2 for all students between the pre- and post-policy implementation cohorts, I concluded that there was no significant change in the retention rates after policy adoption. This finding is consistent with the study conducted by Szczepanski-Dugo (2023) who found no significant change in retention or graduation rates after the adoption of a test-optional admissions policy.

In terms of the Scholarship Recipient rate for enrolled students the *t*-test resulted in a significant statistical increase for students of all ethnic groups. The analysis showed the most

significant increase for White students, followed by URM and Asian students. Although I could not identify past empirical studies that sought to find the relationship between the adoption of a test-optional policies and a complementary test-excluded scholarship strategy with the rate of scholarship recipients, there were authors who had found increased enrollment of Pell Grant recipients like Hiss and Franks (2014), Maguire (2018); Pellegrino (2020), and Syverson et al. (2018). Although Pell Grants are federally funded, they are still considered financial aid and, in some cases, could be supplemented by institutional dollars, so I could at least infer an indirect relationship with institutional aid such is the case of scholarships in this study.

Discussion Summary

Overall findings from the statistical analysis in this study supported some positive outcomes in improving the access for URM, as related to the first research question; and in supporting recruitment and retention for URM, as related to the second research question.

For the first research question and to determine positive change in underserved student representation for post-policy implementation, the first part of the analysis was based on descriptive statistics for factors of size: number of applicants, admitted, and enrolled students comparing pre-and post-policy implementation cohorts. Admit and enrolment rates were also analyzed for the same student cohorts for the study period. The overall findings for these factors were positive regarding growth year-over-year of applicants, admitted, and enrolled students, with a particularly largest growth for URM students. Results from an independent two-sample t -test confirmed a statistically significant increase in the admit rates of all students after the adoption of the test-optional policy. These results were particularly strong for URM students. Consequently, these first findings confirmed the positive impact of broadening access for students that are generally considered underserved after policy implementation.

Finally, as indicated in the findings chapter of this study, although some results supported a broader access for students of underserved backgrounds, the actual enrollment rates of this group of students declined after policy implementation. This opens the question of what else could the institution do to close the access gap for URM students. Quantitative research could be very strong in providing trends or confirming significant changes when running a comparative analysis, but the story it tells us is often not complete and can leave us with more questions than answers. It was counterintuitive to confirm that although URM students were applying and being admitted at stronger rates after policy implementation, they were not choosing to enroll at higher rates. Environmental factors could be influencing the final decision of not to matriculate for this group of students. The COVID-19 health pandemic and familial considerations could have played an important role supporting a decision of not to enroll at MPFU.

To answer the second research question related to supporting recruitment and retention after the adoption of a test-excluded scholarships strategy, the study findings were related to factors of performance, financial need, financial aid, and retention. Linked to academic performance and retention the variables of test-submission, SAT, HSGPA and College GPA were analyzed with mixed results. Even after the implementation of the test-optional policy, applicants, admitted, and enrolled students chose to submit test scores in general at a higher proportion than those who opted for non-submission of their test scores. The exception was for URM students who submitted test scores at a lower percentage during the post-policy implementation study period, concluding that underserved students took advantage of the test-optional policy in larger proportion than their White and Asian counterparts.

In terms of the SAT mean scores these maintained an upward trend throughout the entire study period, with a sharper increase after the policy implementation. However, the higher SAT

scores of those who voluntarily chose to submit them could be partially explained by the students deciding to submit their scores because they were strong, and students might have assumed that these good scores could help them with admission to specific college programs or majors.

HSGPA and College GPA resulted in lower scores overall for the post-policy implementation cohorts. I assumed that these lower score trends could be in part explained by other external factors that could have influenced the downward trend, including the negative impact of the COVID-19 world pandemic.

The analysis of variables indicating financial need such as FAFSA and Unmet need resulted in more meaningful findings when combined in the descriptive statistics analysis. The increase in FAFSA submitters was more noticeable for students with unmet financial need, particularly for post-policy implementation cohorts and for both applicants and enrolled students, although the increase was a bit more subtle for the latter group. The increase was also greater for URM students in this analysis.

When the descriptive statistical analysis turned to financial aid and retention factors, Scholarship recipient numbers among enrolled students and Scholarship recipient rates when compared to the overall enrollment were significantly higher in the post-policy implementation years. The increases for both factors were also more significant for students from URM backgrounds. On the other hand, Retention to Year 2 remained flat with only slight uptakes for the 2019 and 2022 cohorts, concluding no significant change for the post-policy implementation period in the analysis.

Finally, an independent two-sample *t*-test of the scholarship recipient rates resulted in a statistically significant increase for all students after the adoption of a test-optional policy and a complementary test-excluded strategy. This result was particularly significant for URM students,

concluding that adoption of the policies was supportive of the recruiting and retention of students in general but, specifically of those from underprivileged backgrounds. On the other hand, the application of the same *t*-test resulted in no significant change for the retention rates to Year 2 for students of all ethnic groups.

Limitations

The present study has several limitations from the methodological, contextual, and inclusiveness perspectives. From the methodological lens, this study applied descriptive statistics in the analysis of the identified relevant factors and used hypothesis testing to determine the significance of the change of some key variables after policy implementation. However, the study did not go further to identify the relations or correlations between variables or other inferences about the population. In this sense, the findings of this study could be expanded by a multivariate time-series inferential analysis to examine variable dependency or relationship between the pre- and post-policy implementation periods.

From the contextual perspective, this study focused on one institution of analysis, MPFU, so the quantitative analysis and findings pertained to one institution within a narrow set of internal and environmental circumstances, including the type of institution, the size of its enrollment, its location, and its institutional mission and goals. In addition, the COVID-19 world health pandemic did create an environmental, hence external, consideration that influenced institutional and student behavior at several levels. The pandemic is not only as a health issue with a world-wide impact, but also in the case of the USA, as a disruptive force that had far reaching social and economic consequences, which are still felt throughout higher education (Bulman & Fairlie, 2021; Franco et al., 2023; Howell et al., 2021).

Regarding the inclusiveness lens, this study was based on a quantitative descriptive analysis which narrowed the study design to a set of factors that could be measured. There are other sets of factors that could be qualified and proved relevant to the understanding of how an institutional policy is thought out and implemented. For instance, through qualitative analysis, the rationale behind the test-optional admission and test-excluded strategy adopted by MPFU could provide important elements for future adaptability and direction for these initiatives.

Finally, as a professional in the finance and enrollment management areas of higher education, with over 30 years of experience, I had some preconceived notions and possible biases given my role as a practitioner. I tried to be open minded as I decided on the research topic, questions and overall design and methodology of the study. After the analysis that produced the present results, I was surprised to realize that some of these findings run contrary to previous assumptions. These unexpected findings though presented the opportunity to propose additional research on the true impact of institutional policies meant to support student access and retention.

Implications

The conceptual implication of the present study relates to the Guided Pathways for Student Success model (Institute of Higher Education, 2019) which posits that leveraging institutional capacities within a clear plan that focuses on academics and the students' overall experience the institution will be best positioned to support student success. The Guided Pathways model also incorporates four student phases, two of which – recruitment and early progress – were included in this study through the analysis of factors of size, performance, financial need, financial aid, and retention.

The present study also referred to several domains of the Guided Pathways model (see Table 1), including the premise that the test-optional policy was an institutional level decision partially motivated by the objective of broadening access to a diversity of students. This same motivation prompted MPFU to implement its test-excluded strategy, which would be considered as an intervention in the Guided Pathways model. Both institutional initiatives were also intrinsic to the first and second research questions, which answers generally concluded that the implementation of these policies contributed, at least in part, to broaden access and support recruitment and retention for students of URM backgrounds.

It could be assumed, that with the implementation of the test-optional admissions policy and the test-excluded scholarships strategy – intervention – the institution sought to alleviate pressure points for students by converting them to asset points, both dimensions of the Guided Pathways model (Institute of Higher Education, 2019). For example, with the adoption of a test-optional policy MPFU would seek to improve student diversity, that is broadening access to underprivileged student groups such as underrepresented minorities. The analysis resulted in increased numbers of applications, admitted and enrolled students after policy implementation, these are palpable outcomes under the Guided Pathways model. And MPFU would also aim at supporting recruitment and retention while addressing current issues of financial need with the implementation of a complementary test-excluded initiative.

Although the analysis did not result in a significant increase of retention rates to Year 2 for URM students, it did result in a significant increase in the scholarship recipient rate for all students, including those of URM backgrounds. This statistically significant positive change aligned with addressing common barriers or challenges experienced by students – pressure points – including financial support. Finally, MPFU resorted to at least one of its essential capacities,

another important domain of the Guided Pathways model, to financially support an institutional scholarship program that did not require the submission of test scores.

The implications for higher education practitioners and institutions are also tied to the potential application of the Guided Pathways conceptual model (Institute of Higher Education, 2019). Although the present study did not include all the elements of the model, the findings of the present study support the potential benefit of a comprehensive framework that has both, proactive and intentional institutional dimensions – policies, interventions, and financial support; that are centered on student success – measured on outcomes that support access, recruitment, and retention.

Recommendations for Future Research

In a mixed-method study conducted by Garner et al. (2021) of 15 four-year institutions from a broad range of types, including publics, privates, flagships, research focused and regionals, they found that the Guided Pathways model was applicable to four-year institutions within certain parameters. The authors posited that institutions exploring the applicability of the Guided Pathways model should consider a close examination of their disaggregated data to find what could be improved for the student experience. Their study also recommended that for a successful implementation of the framework institutions should have a strong commitment to eliminating barriers to student persistence, and a focus on integrative and fully encompassing interventions with the objective of supporting and enhancing the student experience.

Based on this previous study by Garner et al. (2021), the applicability of other dimensions of the Guided Pathways to Student Success model (Institute of Higher Education, 2019), including partnerships internal or external to the institution, could be further explored in future research. State partnerships focused on careers paths that are reflective of current job

development plans or needs, community partnerships to leverage internship opportunities, private funding opportunities to enhance financial support programs, and inter-campus programs to support transfer articulation are a few examples of potential areas that could benefit with additional research efforts.

In addition, other aspects of the Guided Pathways model like change management under processes, interventions, policies, and institutional capabilities, could be studied from either the institutional or the student lens or could even be combined through a mixed methods approach for a more comprehensive analysis under this conceptual framework. All these with a common goal of supporting student success.

Regarding specific areas of the present study that could be further investigated, additional research centering on underserved student populations with financial need who do not submit the FAFSA, could be impactful. As the present study demonstrated, URM students with financial need were not submitting the FAFSA at increasing rates, even after the implementation of a test-optional and text-excluded complementary strategy, which were meant to broaden access, support recruiting and retention. When they opt to not file the FAFSA, URM students are losing critical opportunities to be granted different options of additional funding to support their education. Morgan (2016) found that students who file the FAFSA positively responded to both merit and need based institutional financial aid, consequently increasing their chances for retention.

Other factors that could be further explored include demographic variables such as gender, a more disaggregated ethnicity variable, and combinations of both categories. For instance, female students could exhibit cultural or societal differences depending on the specific ethnic group. An analysis including a correlation method for these two categories of variables

could bring a more nuanced finding for the research questions used in this study. In addition, factors of financial need could also benefit from a correlational analysis when combining variables such as unmet financial need, Pell recipients, and FAFSA submission. Based on these potential findings MPFU could adjust current programming, implement new initiatives, collaborate with external agencies (state government, community colleges), or recalibrate and optimize their current financial aid and scholarships offerings aimed at supporting a diverse student population

Some of the findings in this study, including enrollment rates for students of URM backgrounds, demonstrated that despite policies meant to help close the access gap, there was still work to do. Even though the analysis resulted in increasing numbers of applicants and admitted URM students after policy implementation, the enrollment or yield rates remained flat or declined. Additional mixed-method research could potentially help unearth possible answers as to why URM students were not choosing to enroll at higher rates.

Conclusion

The purpose of the present study was twofold. First it sought to determine if the adoption of a test-optional admissions policy had a positive impact on broadening access to students of URM backgrounds. Second, the study aimed at finding if the implementation of a complementary test-excluded scholarships strategy helped the institution recruit and retain URM students.

After the application of a descriptive statistical analysis to answer the first research question about access of URM students, the findings confirmed positive change after policy implementation for some of the factors but not for all. Even though the numbers of applicants, admitted and enrolled students, particularly URM students, resulted in increases year-over-year,

there was no significant uptick for post-policy implementation cohorts. Moreover, enrollment rates resulted in an overall flat performance for the study period, with only a slight increase that was more notable for URM students. Female URM students had higher representation numbers as compared to their male peers, however their enrolled rates fell behind their male counterparts throughout the study period.

In the same vein, when the analysis turned to determining the significance of the admit or acceptance rates change for URM students after policy implementation, the independent two-sample *t*-test confirmed significant and positive change ($p < 0.05$) in the admit rates of underprivileged students after the adoption of the test-optional policy. Results from the same *t*-test also supported a statistically significant change in their acceptance rates for White and Asian students.

Conversely, results from the independent two-sample *t*-test comparing enrollment rates between pre- and post-policy implementation did not confirm a significant change for Asian and White students. And while the *t*-test resulted on a significant change for the enrolled rates of URM students, at declining rates it confirmed the opposite effect when compared to the intent of the policy.

For the second research question, which sought to determine a positive impact in the recruitment and retention of URM students after policy implementation, the analysis included factors of performance, financial need, financial aid, and retention. The analysis of factors of performance overall did not support a notable change after the adoption of a test-optional admissions policy and a test-excluded complementary strategy. When factors of financial need were considered in the analysis, the results were not conclusive of positive impact for URM students either, except for the Pell Recipient factor, which showed a slight increase after policy

implementation, particularly for URM students. Finally, while the independent two-sample *t*-test comparing the Retention rates to Year 2 of URM did not result in significant change, the same *t*-test conducted for the Scholarship Recipient rates of enrolled students, resulted in a statistically significant and positive change for students of all ethnicities. The findings for the second research question do confirm some positive results in the recruitment and retention of students from URM backgrounds, mainly related to scholarship recipient rates.

From the institutional perspective, this study confirms the power of complementary strategies. Although good things could be achieved by adopting sole initiatives, policies, or programs, finding points of positive confluence where the benefit or potential impact could be multiplied is certainly a better strategy when addressing questions of access and retention. Even though the findings of the study were not absolutely positive in their support of URM students, MPFU should build on these partial benefits as they could be considered the starting point for broader access and improve retention. The analysis resulted in no significant statistical change in the retention to year 2 after policy implementation, however the retention rates remained flat which could be construed as a good result since at least the rates did not decline for MPFU.

Overall, the partial positive findings supporting access and retention for URM students do still confirm the benefit of the adoption of a test-optional admissions policy and a complementary test-excluded strategy at MPFU. Institutionally MPFU should leverage these findings and further explore the next level of research to answer questions of access and retention. MPFU could expand the findings of the present study by conducting an additional quantitative inferential analysis and possibly a mixed-methods study, delving into qualitative methods such as surveys and personal interviews.

Finally, from a conceptual lens the present study can contribute to the increasing body of research related to the adoption of test-optional and related policies and strategies by institutions of higher education. Although the findings of this study have several limitations, the review and interpretation in the context of the Guided Pathways for Student Success framework could be beneficial for fellow practitioners and institutions comparable to the institution of analysis.

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Appendix A

IRB Approval

From: no-reply=kuali.co@mx3.kuali.co on behalf of [Kuali Notifications](#)
To: [Randall, Mercedes P](#)
Subject: IRB Protocol 20349 Approved
Date: Monday, October 2, 2023 10:57:55 AM

If you are not responsible for the IU Kuali Protocols submission for this protocol, this is for informational purposes only and no action is required.

The below protocol submission was approved on Monday, October 2nd 2023 by The Indiana University HRPP:

Protocol #: 20349

Protocol Title: Test-Optional Admissions and a Complementary Test-Optional Scholarship Strategy

PI: Randall, Mercedes

Type of Submission: Initial

Level of Review: Exempt

To access the submission in Kuali Protocols, go to:
iu.kuali.co/protocols/protocols/650c6176674aa1002a7b31cd.

Download your Approval Letter in Kuali Protocols by clicking on "Activity Log," scrolling to the bottom of the page, and clicking the "Correspondence Generated" link for the submission.

Curriculum Vitae

MERCEDES P. RANDALL

CAREER PROFILE

Analytical and performance driven higher education leader with 30 years of combined experience formulating and executing administrative, financial, and operational strategies. Dedicated, quality-focused, detail-oriented professional with proven skills in effectively managing resources while maintaining compliance with institutional policy and facilitating multiple tasks in a deadline-driven environment.

CORE COMPETENCIES

Financial Planning, Analysis & Reporting – Budget Management – Creative Problem Solving – Strategic Planning – Financial Systems – Efficiency Improvement – Regulatory Compliance – Human Resources – Team Leadership, Development & Mentorship – Student Services – Systems Administration & Tech Support – International Services

EDUCATION

Indiana University School of Education, Bloomington, IN

Ed.D., December 2024

- Major: Higher Education and Student Affairs, School of Education
- Minor: Strategic Management and Organization Theory, Kelley School of Business

Indiana University Kelley School of Business, Indianapolis, IN

MBA, December 1991

- Major: Marketing
- Courses included strategic management, finance, marketing, operations management, information systems, managerial and financial accounting, group behavior, leadership and international business.

Universidad de Lima, Lima, Peru

Licentiate in Administration, 1986

Bachelors in Administrative Sciences, 1982

RELEVANT EXPERIENCE

Indiana University Office of Enrollment Management, Bloomington, IN

July 2019— Present

Assistant Vice Provost and Executive Director of Administration

- Develop and direct fiscal and resource strategies, plans and policies for the Office of Enrollment Management (OEM), a complex Responsibility Center, which includes Admissions, Orientation, Admissions Research, Scholarships, Student Financial Assistance, Registrar, Student Central, Development, and Communications and Marketing.

- Focus on strategic processes consistent with the university's enrollment goals. Provide leadership in collaboration with RC directors for the successful planning of resources, processes, and technology to ensure effective operations that affect all potential and enrolled students as well as academic units.
- Provide consultation and advice to the Vice Provost, RC directors and campus leadership regarding enrollment management initiatives and strategies.

Achievements:

- Led the budget conferences and budget construction processes, providing strategic alignment with departmental and institutional goals and objectives.
- Coordinated with the VP and AVP group fiscal, administrative and policy strategies to address the challenges brought up by the triple pandemic of 2020 (public health, social, economic)
- Continued with the implementation of the administrative and fiscal centralization to gain efficiencies across the RC while still maintaining best practices.

Indiana University Office of Enrollment Management, Bloomington, IN

October 2010—June 2019

Director of Administration and Fiscal Affairs

- Provide fiscal and administrative leadership for the Responsibility Center which includes the Offices of Admissions, Student Financial Assistance, Registrar, First Year Experience Programs, Scholarships, Strategic Planning and Research, Strategic Communications & Marketing, and Student Central
- Oversee and perform fiscal and human resource policy duties, equipment lifecycle, purchasing, revenue processing, contracts, internal control management and compliance.
- Deliver direction and training to enable internal and collaborative communications with department fiscal and human resource officers to ensure resource planning policies, procedures, internal control guidelines and practices are consistent with federal, state, university, and IU Foundation guidelines.
- Direct RC administrative operations to include the development and implementation of the annual budget process with day-to-day management responsibility for the business, fiscal and human resource operations for RC administrative units.

Achievements:

- Led the budget conferences process, providing relevant alignment with bicentennial goals and objectives for the RC and the campus.
- Developed and implemented the strategic plan for the RC during a year-long process to align each units' objectives with the overarching mission and values at the RC and campus levels.
- Adjusted budget analysis process proactively in response to campus trends and fiscal initiatives such as all-funds budgeting.
- Maintained regular meetings with RC fiscal and HR officers to allocate and coordinate fiscal, administrative, and policy updates while ensuring consistency by promoting best practices.
- Implemented centralization of administrative and fiscal processes to gain efficiencies across the RC.

- Coordinated the development of Tableau reports to supplement the analysis of budgeted, actual, and anticipated expenditures as well as multi-year projections.
- Guided the administrative analysis of all IT positions in the RC leading to the adjustment of salary levels to ensure they were competitive with the market and equitable across the RC and the campus.
- Led large move of most of RC operations from Franklin Hall to the Student Services Building

Indiana University Office of the Registrar, Bloomington, IN

April 2008 — September 2010

Executive Director for Administration

- Developed and directed administrative strategies, plans, policies, internal controls and activities including budget, physical facilities, personnel and financial systems.
- Provided leadership for strategic planning and new initiatives.
- Coordinated and integrated activities of department division heads in the development and implementation of Indiana University policies and procedures
- Facilitated internal communications among department staff.
- Served as the financial and human resources advisor to the Registrar and senior management.

Achievements:

- Realigned resources to offset negative reserves.
- Implemented performance appraisal templates for professional and support positions.
- Piloted the Business Continuity Plan initiative.

Indiana University-Purdue University Office of Housing and Residence Life, Indianapolis, IN

February 2008 — April 2008

Assistant Director for Financial & Administrative Services

- Directed, planned and oversaw all financial operations for departments within the Housing auxiliary operation.
- Served as fiscal officer and account manager. Monitored the financial performance of all accounts. Oversaw all capital expenditures and construction projects as well as the planned uses of reserve funds.
- Advised the director on all financial and administrative operations, including the budget, financial commitments and projections, contracts, and other external agreements.
- Supervised human resources activities for the department.

Indiana University-Purdue University Office of Research and Grad Ed, Indianapolis, IN

November 1992 — February 2008

Director of Administration, Finance and Technology

- Afforded administrative direction on matters related to organizational and operational issues, personnel actions, fiscal and budgetary affairs, and information systems.
- Guided administrative and related fiscal affairs by serving as fiscal officer, account manager or supervisor as appropriate.
- Directed all aspects of the Research and Sponsored Programs information systems.

- Contributed to the strategic plan for the office, including the content summary for mission, goals, and objectives in the Annual Report.
- Represented the Vice Chancellor for Research and served as fiscal, administrative and information systems officer.

Achievements:

- Built the administrative team from 1 to 6 staff members (5 FT, 1 PT)
- Developed the systems and technology support area.
- Led the implementation of the budgeting, reporting and fiscal analysis processes in alignment with the inception of the RCM and FIS
- Supported the expansion of operations along with an increase in the number of employees from 12 to 80.

Indiana University-Purdue University, Fort Wayne, IN

May 1992 — October 1992

Counselor for Hispanic Support Services, Multicultural Services.

- Counseled and mentored Hispanic university students.
- Developed programs and activities involving Hispanic students (academic monitoring and retention), including middle and high school levels (recruitment)

Indiana University-Purdue University, Indianapolis, IN

Graduate Assistant/Prospective Student Counselor, Kelley School of Business MBA Office

September 1989 —December 1991

- Coordinated and conducted counseling sessions with prospective MBA students; maintained information-mailing system.

Program Assistant, International Affairs Office

September 1988 —December 1991

- Prepared monthly budget reports and maintained budget control system.
- Developed information modules in international dimension campus wide.
- Created a budget control system based on Lotus 1-2-3 spreadsheets.

Exchange Visitor in Training, Human Resources Administration

May 1988 — August 1988

- Received human resources and intercultural training.

Universidad de Lima, Lima, Perú

Unit Coordinator, Office of Faculty Records and Evaluation

February 1985—April 1988

- Administered evaluation procedures for faculty credentials and promotions.
- Worked closely with the computer center in the delivery of an electronic system for evaluating all appointed faculty.
- Supervised 3 full-time positions and up to 50 part-time interns.

Adjunct Instructor, Schools of Administrative Sciences and Accounting

February 1985—April 1988

- Taught the following courses: Introduction to Management, Organization & Management, Planning, and PERT-CPM; appointment included academic counseling.

Assistant to the Director, Office of Personnel

July 1984 —February 1985

- Maintained and controlled faculty/staff records and payroll systems. Generated reports for academic and administrative purposes

Administrative Assistant, Office of Teaching Evaluation

January 1984 —July 1984

- Developed procedures manual.

OTHER SKILLS

SYSTEMS/COMPUTERS Word Processor: Microsoft Word
 Data Management: DBase Plus III, Paradox, and Access
 Analysis: Excel, SPSS
 Presentations: PowerPoint, Publisher
 Software Suite: Microsoft Office 2020
 Internet: Internet Explorer, Mozilla Firefox, Chrome
 Data Visualization/BI: Tableau

PROFESSIONAL

DEVELOPMENT

Numerous conferences, workshops, seminars, and training sessions dealing with administrative, fiscal, financial, systems, computers and personnel issues attended over the years.
 Completion of the Fiscal Officers Development Series 2003-04, Indiana University

LANGUAGES

Fluent in English and Spanish

INTERESTS

Traveling – Reading – Physical Fitness – World Cultures – Languages – Community Involvement

REFERENCES

Available upon request

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