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# The Role of Cultural Capital in Improving Advanced Placement Outcomes

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# THE ROLE OF CULTURAL CAPITAL IN IMPROVING ADVANCED PLACEMENT OUTCOMES

by

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## Abstract

# THE ROLE OF CULTURAL CAPITAL IN IMPROVING ADVANCED PLACEMENT OUTCOMES

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This work delves into the potential benefits and criticism of Advanced Placement (AP) courses, with a specific focus on the necessity of cultural capital to address disparities in access and success. The researcher argues that the broad content coverage in AP courses often leads to conventional lecture-based instruction that does not value cultural capital and limits student engagement and outcomes. To rectify this, recommendations are made to incorporate pedagogical approaches like culturally relevant teaching and providing teacher feedback and support that allows for the successful implementation of these practices. Numerous studies indicate that participation in AP courses predicts success in college retention, GPA, and other areas, with the strongest links being for students who earn qualified exam scores of 3 or higher. However, historically marginalized populations, including Black, Hispanic, and low-income students, are less likely to participate in AP courses and less likely to earn qualifying exam scores. By focusing on the development of cultural and social capital among historically marginalized students through teacher behaviors and pedagogy, their chances of earning qualifying exam scores can be improved. This research emphasizes the potential of AP courses to support historically excluded populations in their pursuit of academic and career success, ultimately leading to an enhanced quality of life. This study aimed to address this shift by investigating the relationship between teacher support and feedback, the college-going environment, enrollment, and the percentage of students from low socioeconomic households in 20 comprehensive high schools through multiple regression and Lasso regression techniques. The results highlight that teacher feedback and support exhibited the strongest relationship among the variables considered; however, contrary to existing literature, this correlation was associated with lower qualified AP exam scores. These findings indicate the need for further research to better understand the specific nature of teacher feedback and support that may correlate with an increase in qualified AP exam scores.

*Keywords: Advanced Placement, cultural capital, college readiness, culturally relevant pedagogy, student outcomes, teacher support*

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# Chapter 1

## Introduction

Advanced Placement (AP) courses are offered in high schools across the United States to allow students to experience the pacing and rigor of university coursework and earn university credit. The College Board began offering AP courses in the 1950s to enhance the standard secondary curriculum, with ongoing backing from the United States government. First, government-sponsored financial support came with the National Defense Education Act of 1958, intending to advance science, math, and languages in elementary and secondary schools (Schneider, 2009). As part of the American Competitiveness Initiative in 2006, the United States government increased its support of AP and the work of the College Board (The White House, 2006). Following the development of the AP curriculum, College Board implemented initiatives to increase access to AP courses (College Board, 2019; The White House, 2006). Additionally, the College Board instituted exam fee waivers for students eligible for or enrolled in the National School Lunch Program to ease the financial burden of exams for low-income students and support widened course access (College Board, n.d.a.). By providing funding for teacher development and through the support of research-based curricula, the College Board solidified AP as a premier program for advancing education in the U.S. (The White House, 2006).

While AP has emerged as a significant way for students to attain college credits and resume enhancements, success in an AP course can be interpreted in a few ways. A score of three or higher on AP exams is considered a qualifying score, meaning that students can earn college credit; a score of two or higher is considered college-ready (College Board, 2021). It is up to individual universities to determine the exact exam scores for which they will grant credit, and some universities require a score of a four or a five to receive credit. However, in Texas, a

2015 law mandates that all universities are required to award credit for a minimum exam score of three (Selby, 2018; Watkins, 2015), although the wording in the law does allow some university discretion regarding credit awards concerning prerequisite courses. While colleges and universities use AP to award credit, qualifying exam scores also are a measure of success for state accountability in Texas public high schools College, Career, and Military Readiness (CCMR) category of the Texas Academic Performance Report (TAPR) providing yet another reason that schools would want to offer the program.

The AP program offers more than 37 courses, and domestic and international universities recognize subsequent exam scores making AP a top option for students looking to deepen their learning beyond the typical high school curriculum and prepare themselves for university coursework. Multiple studies found that students with AP credits tend to outperform students without credits (Chatterji et al., 2021; Hansen et al., 2006; Mo et al., 2011; Scott et al., 2010). For instance, research by Scott et al. (2010) and Ackerman et al. (2013) found that students with AP credit had higher GPAs and graduation rates. Further, AP can be worthwhile and beneficial even for those who do not earn college credit for the course through qualifying exam scores (Mattern et al., 2009). While a 2006 study found that students with qualifying exam scores were more likely to graduate college in five years than those with scores of one and two, this second group still graduated at a higher rate than the “no AP” group (Dougherty et al., 2006 as cited in Mattern et al., 2009).

As of 2016, more than 70 percent of U.S. public high schools offer AP courses, and 90 percent of high school students attend a school with at least one AP course (Malkus, 2016). However, it is not uncommon for students to enter these courses ill-prepared to manage the rigorous course work and succeed on the standardized assessment required to receive university

credit (Chatterji et al., 2021). This is especially true for students from minority races or historically marginalized populations (Patrick et al., 2022). In an analysis of the U.S. Department of Education's Civil Rights Data Collection from 2015-16, Chatterji et al. (2021) found that Black and Indigenous students had less access to AP courses than their peers. The researchers also noted in their analysis that even in schools offering 18 or more AP courses, there were significant disparities in the rates at which Black, Latino/a/x, and Indigenous students enrolled in AP, took the exams, and earned passing scores compared to white and Asian students. The disparities are also evident in Science-Technology-Engineering-Math (STEM) content, specifically as a 2022 report from EdTrust found that 2 in 5 Black and Latino/a/x students enjoy STEM courses and want to go to college. However, only three percent of students enroll in AP STEM courses (Patrick et al., 2022). Finally, College Board researchers in 2023 released data addressing racial and ethnic gaps in AP exam performance. Across all AP exams administered in 2022, average scores were lower among Black (average score 2.1) and Hispanic (average 2.4) students than for White (average 3.0) and Asian (average 3.4) students (Ewing & Wyatt, 2023).

**Factors Contributing to AP Discrepancies**

A review of the existing literature indicates several factors contributing to difficulties noted among students from minority races or historically marginalized populations in AP courses. For instance, empirical investigations have demonstrated that students from historically marginalized and excluded populations struggle in AP courses due to the culturally misaligned pedagogy often encountered in education (Kolluri, 2018). To be effective for instruction, the curriculum must focus on the "sociocultural realities of marginalized students" (Kolluri, 2018). This can be defined as cultural capital. Cultural capital is the widely shared attitudes, preferences, linguistic habits, and cognitive skills within a specific culture (Bourdieu, 1973;

Lamont & Lareau, 1988; Andersen & Hansen, 2012). However, as cultures differ, so does the capital handed down from parents and parental figures to children (Lareau, 1987; Lareau & Horvat, 1999; Lareau & Weininger, 2003). In a curriculum like AP, which was intended to separate white, upper-middle-class students from others, that is the culture valued and is reflected in the curriculum. Unfortunately, AP courses have been known to place value on cultural capital that does not align with that of students of color (Kolluri, 2018), meaning that Black, Latino/a/x, and other students are potentially starting the courses at a disadvantage.

Further compounding the issue is the organization and structure of AP courses. Specifically, AP courses are known for their "breadth and depth," and the large amount of rigorous content presented in a standard semester poses challenges for instructors and students (Parker et al., 2013). The accelerated pace of AP courses often leaves teachers ignoring high-impact and culturally relevant teaching practices proven to benefit students from historically excluded backgrounds (Kolluri, 2018). As early as 2002, the National Research Council recommended that AP revise courses to reduce the amount of accelerated content to better allow for reflection over topics as students develop skills of inquiry, analysis, and problem-solving (Parker et al., 2013). Slowing the course pacing down can allow for time to introduce cooperative learning and dialogue, enhancing culturally relevant practices that will benefit students in understanding complex concepts.

However, slowing the pace is not enough, and teachers require support to sustain the implementation of high-impact and culturally relevant practices in their AP classrooms. As noted in the literature, teachers who participate in ongoing professional learning are more likely to use high-impact teaching practices incorporating elements of culturally relevant pedagogy, which translates into higher student achievement (Johnson, 2011; Johnson & Fargo, 2010, as cited in

Pagán, 2022). For instance, a study by Saavedra et al. (2021) demonstrated teachers who received job-embedded professional learning combined with a supportive peer group saw positive student outcomes in their project-based learning (PBL) classrooms; PBL draws on culturally relevant pedagogy as part of its methodology.

Although access to AP courses has rapidly expanded, research has not kept pace with program growth (Parker et al., 2013). As such, there is a clear need for additional investigations exploring how pedagogical, cultural, and broader institutional influence AP outcomes, especially within urban school environments (College Board, 2019). Exploring the levels of support reported by teachers in relation to AP outcomes is a starting point to examine how pedagogical shifts can influence these student outcomes.

**Purpose of the Study**

Although there are many ways in which students can participate in advanced coursework, this study focuses on Advanced Placement as it is the most comprehensive program across the U.S. that students use to complete advanced courses (Kolluri, 2018). Empirical investigations focused on AP show that courses are not designed to value the cultural capital of Black and Latino/a/x cultures, which contributes to underperformance among these learners. Sunrise Independent School District (pseudonym) is a minority-majority district with Hispanic students making up 71 percent of the population and African American students at 20.3 percent, with the remaining 8 percent comprised of white, Asian/Hawaiian/Pacific Islander, Multiple, and American Indian/Alaska Native. Further, 85.1 percent of students identified as economically disadvantaged, 64.2 percent identified as at-risk, and 48.4 percent identified as Limited English Proficient (LEP or emergent bilingual). The demographic makeup of the student population means Sunrise ISD serves a majority of students who are known to have disparate outcomes in

AP courses when compared to white, middle, and upper-class peers. Thus, it is critical to evaluate the factors influencing AP outcomes within this population to ensure all students have the opportunity to be involved and succeed in advanced coursework shown to contribute to short- and long-term academic benefits. Literature suggests that the use of high-impact teaching approaches incorporating culturally relevant elements and exposure to supportive learning environments can help students overcome deficits in social and cultural capital, thereby contributing to students' success in AP courses (Bourdieu, 1973; Conley, 2008; Hurtado, 2020; Kolluri, 2018). Thus, this study examines aspects of the school culture and the availability of ongoing teacher support that influences AP exam outcomes.

**Theory of Change**

Indicators of college readiness, forms of capital, and the developing Academic and Cultural Demands-Resources (ACD-R) Framework were the basis for this study. A valuable resource for extending the research base on academic outcomes is the emerging ACD-R Framework, which offers conceptual guidance in linking cultural components with academic outcomes (Martin & Collie, 2022). This framework establishes connections among educational, personal, and cultural demands and resources and their impact on motivation and academic performance (Martin & Collie, 2022; Martin et al., 2021; OECD, 2006). Accepting that culturally and ethnically diverse students face unique demands distinct from those of the dominant culture is a starting point for research and schools to explore ways to address the demands and positively impact student achievement (Martin & Collie, 2022). By using the ACD-R Framework for guidance, this study will link social theories, like cultural capital and college-readiness indicators, with buffering and boosting effects that can be influenced by schools to improve student outcomes.

Bourdieu's 1973 theory on forms of capital is the underlying theoretical framework for this study, and it closely aligns with college readiness indicators. Capital is the resources, material and nonmaterial, that people possess. It allows them to interact with the world and exchange that capital for goods and services or other forms of capital. Nonmaterial forms of capital, like social and cultural capital, are primarily passed to children by those who raise them and are later influenced by friends and teachers (Johnstonbaugh, 2018). Critically, Bourdieu's theory suggests that cultural capital is critical to academic success as it allows for improved communication between teachers and students and helps students find connections and understanding when facing unfamiliar content. As long as educational programming, like AP, is based in the historically white, middle- to upper-class culture, anyone outside of that is at a disadvantage as those not versed in the dominant culture tend to view the learning environment as threatening (Bourdieu, 1984, 1986, 1996, as cited in Andersen & Hansen, 2012). Thus, the investment in time, money, and effort to build cultural capital across demographics is the key to successful outcomes.

Additionally, this study was inspired by Conley's (2008) work on post-secondary success. Conley's (2008) definition of college readiness is broad and includes cognitive strategies, content knowledge, self-management skills, and knowledge about post-secondary processes like admissions steps and navigating financial aid applications. He notes that lacking in even one area can be detrimental to groups of students from racial backgrounds with historical underrepresentation, immigrants, and those who are the first in their families to attend college. Work from Hurtado et al. (2020) also shaped the framework for college readiness by including educational endowments, family expectations, college-going socialization, and social network development as influential factors, especially in Latino/a/x populations. This is a notable

connection with the research site as most students attending Sunrise ISD schools are from Latino/a/x backgrounds, other racial/ethnic groups with historical underrepresentation, and are from low-income households. While GPA and standardized test scores are academic indicators of college readiness, the more uncontrollable non-cognitive indicators emerge as an area needing strengthening for many students seeking post-secondary credentials. Conley (2008) and Hurtado (2020) also stress the importance of placing students in an environment aimed at going to college, which AP classes provide, to boost their readiness levels. By participating in AP classes, students increase their proximity to a college environment by beginning to interact with non-cognitive processes like admissions requirements, contacting counselors, and submitting required documents. But importantly, students exposed to learning environments that stress the importance of preparing students for college success are more likely to participate and succeed in AP programming (Conley, 2008; Hurtado et al., 2020).

Overall, elements of cultural capital (e.g., aspirations, societal knowledge, access to educational technology/resources) are crucial to success within K-12 and post-secondary learning environments. Unfortunately, members of historically marginalized groups have lower levels of cultural capital which contributes to negative academic outcomes – including patterns of underperformance in AP courses noted in the literature. Critically, teachers and learning environments play a role in the transmission of cultural capital and in helping students overcome culturally bound barriers to success. Specifically, while students from an excluded culture might have deep knowledge of what is familiar to them, interactions with teachers and exposure to broader institutional supports are the primary ways they receive and build a broader range of capital (Johnstonbaugh, 2018). That is to say that schools and the teachers of AP courses can have a strong influence on the attainment of capital needed to enhance students' cultural capital.

The district's focus on assessing college-level expectations and educator support allows researchers the unique opportunity to investigate how elements of the educational environment that have been historically difficult to study on AP performance outcomes.

**Research Hypothesis**

This research intends to answer the question: How do perceptions of teacher feedback and support and a college-supporting learning environment influence qualified Advanced Placement exam scores at comprehensive high schools*?* The literature suggests that exposure to high-impact and culturally relevant teaching practices (which are more commonly implemented when adequate institutional support is provided) and positive learning environments positively influence students from historically marginalized populations. Therefore, it is hypothesized:

> *Hypothesis: Higher percentages of positive responses on campus climate survey items assessing college-going culture and teacher feedback will correlate with higher percentages of qualified AP exams.*

**Research Plan**

To conduct this study, the researcher first identified the problem that comprehensive high schools in Sunrise ISD have average AP exam scores below the accepted qualification level of three or higher. Advanced Placement was determined to be a relevant area for research, as the other most-utilized option for earning college credit in this district, dual credit, is mainly provided to students in early college high schools. Advanced Placement remains the predominant option for students in Sunrise ISD's comprehensive high schools who wish to earn college credits. Sunrise ISD predominately consists of students from minority races and from low socioeconomic households, which are groups known to have disparities in educational outcomes. The subsequent literature review on AP and student outcomes revealed that many non-cognitive

factors might positively affect student outcomes in advanced courses. The review included theories on the role of cultural, social, and economic capital and societal advancement and how educational environments contribute to increasing forms of capital and buffering students from maladaptive outcomes. This study used public datasets from Sunrise ISD regarding campus enrollment, AP course enrollment, percentage of qualified AP exam scores, and demographic information. Sunrise ISD publishes the percentage of positive responses to campus climate and parent surveys for each campus. The researcher connected survey items to non-cognitive factors related to forms of cultural capital and college-readiness indicators, including the campuses' college-going environment and ongoing feedback to teachers and support focused on helping educators improve instructional quality and address student needs. A correlational research design using multiple regression analysis and Lasso regression was selected to examine the relationship between those factors and AP outcomes.

**Significance of the Study**

The present study has significant implications for implementing AP courses in comprehensive public high schools. This study contributes to work by Kolluri, whose comprehensive literature review in 2018 found many areas for improvement in the research on AP outcomes. Advanced Placement has grown to serve more students who have historically been excluded from the program, but students continue to fail the corresponding exams. Kolluri's findings indicate that research in urban classrooms needing the most support with AP is limited. This study's focus on the comprehensive high schools in Sunrise ISD adds to the research base regarding urban schools and AP outcomes. By focusing on elements of the learning environment and instructional supports, this study intends to deepen the understanding of how to improve AP outcomes among those from historically marginalized backgrounds.

**Assumptions**

This research assumes that the survey administered by Sunrise ISD's outside vendor was a valid instrument and that the data was correctly aggregated and analyzed to compile the results. It is also assumed that the staff respondents provided truthful responses, as well as the sample representing most of those to whom it was administered. The survey was not required to be completed by any potential respondents. As such, it is assumed that enough responses were collected for the data to be a fair representation of the percentage of campus staff.

**Limitations**

This study was limited by the researcher's access to data and reliance on only public datasets and survey information. The survey administration was handled by an outside entity meaning that the researcher did not have access to information about the validity and reliability of the instrument. Additionally, due to the use of public data sets, the researcher was unable to access response rates of the campus climate survey for all included sites which raises questions about the representativeness of the sample. Another hinderance was the small sample size of 20 comprehensive high schools. Low sample sizes often pose challenges in multiple regression that lead to decreased power and higher error rates. This limitation was addressed using the Lasso regression technique. The correlational research design also was a limitation in that the researcher could not manipulate the variables. This could mean there is variable bias due to the omission of independent variables that could potentially correlate with the dependent variable or one or more independent variables. The results are also limited in the nature that correlational analysis makes it impossible to determine if the non-cognitive factors cause the outcomes or are simply correlated to the outcomes.

# Chapter 2

## Literature Review

For many students, obtaining a college degree is the pinnacle of academic achievement. Obtaining a post-secondary credential is associated with many positive outcomes. For example, those with college degrees have increased earning potential compared to those without degrees. On average, those with a bachelor's degree earn a median pay of $1,334 per week, which equates to $27,000 more per year than those without a post-secondary degree (U.S. Bureau of Labor Statistics, 2022). Those with master's degrees saw a salary increase of almost $40,000 more yearly than those without a degree. Data from the U.S. Bureau of Labor Statistics also shows that those with a college degree also experience greater job stability than those without, with 3.5% of workers with bachelor's degrees facing unemployment and 6.2% of those with a high school diploma experiencing unemployment (U.S. Bureau of Labor Statistics, 2021). Additionally, earning a college degree has been shown to impact job satisfaction. As noted in the Lumina Foundation's 2022 State of Higher Education Report found that 61% of students currently pursuing higher education degrees were doing so to find a more fulfilling job (Lumina Foundation, 2022). Finally, empirical investigations have suggested that those who earn a post-secondary credential have longer lifespans than their counterparts without a college degree (U.S. Bureau of Labor Statistics, 2022; U.S. Bureau of Labor Statistics, 2021; Warters, 2021).

Schools across the nation routinely implement educational curricula and programming to prepare students for college acceptance and success, given the benefits of post-secondary education. Some programs that are intended to increase post-secondary success include AVID, which intends to close opportunity gaps in a diverse population with an elective course, campus-wide curriculum, and teacher development to prepare students for post-secondary success

(AVID, 2023). However, the most desirable programs are those that provide students the opportunity to earn college credits which include early college high schools, International Baccalaureate (IB), and Advanced Placement (AP). Early college high schools pair high school coursework with dual credit/enrollment courses to allow graduates to leave high school with up to 60 hours of college credit (Educate Texas, n.d.; Hutchins et al., 2019) and are often more popular because students can prepare for college and leave high school with credits already earned. In preparing and granting high school students college credit, early college high schools, and dual-credit programs are one of the most straightforward ways for students seeking post-secondary credentials. From the 2002-03 to 2011-12 academic years, dual-enrollment participation increased by 80 percent, with 1.2 million students taking courses in a dual-enrollment program (National Center for Education Statistics, n.d., as cited in Fazlul et al., 2021).

The IB program is designed for students who are seeking an internationally-minded advanced curriculum and preparation for post-secondary education. The program is exclusively available at IB-certified schools, including public and private schools. As of June 2023, more than 7,900 IB programs were offered in 159 countries (International Baccalaureate®, 2023). In the United States, IB currently offers its diploma program in 944 schools (International Baccalaureate®, n.d.). Notably, students can earn university credits as part of the diploma program if certain performance benchmarks or academic milestones are obtained. For instance, some universities award course credit for those who earn an IB diploma, while others award credits if students perform well on end-of-course exams.

While there are multiple programs that offer opportunities for post-secondary academic success, the College Board's Advanced Placement (AP) courses are widely recognized and

popular, with over 2.6 million students taking exams during the 2015-16 academic year (Xu et al., 2021; Schneider, 2009). Through participation in Advanced Placement courses, students are exposed to college-level coursework while maintaining the support from the high school environment to ensure they are both academically and mentally prepared to attend four-year universities. Students who enroll in AP courses complete the class during the regular school day for either a semester or the entire year, depending on the content. The course culminates with exams administered over a two-week period in the spring. For students to be eligible for college credit, they must receive a qualifying score of 3 or higher (the exams are scored on a 1-5 scale).

Numerous empirical investigations have demonstrated that success in AP courses is associated with positive short and long-term academic outcomes – even after controlling for the effects of prior academic performance. For instance, Mattern et al. (2009) found that students who earn a 3 or higher on AP exams outperformed students who did not take AP exams in areas of first-year college GPA, retention to the second year, and the selectivity of the institution. The study also found that students who attempted AP exams and did not receive a "passing score" attended more selective universities and were more likely to return for a second year of college than those who did not participate in AP (Mattern et al., 2009). In Warne's 2017 work evaluating the state of AP research, he found many indications in the literature that participating in an AP course has positive benefits for high school students regardless of exam performance. Research also found that students benefit from rigorous coursework regardless of race and socioeconomic status (Alexander & Pallas, 1984, as cited by McKillip & Rawls, 2013).

With this in mind, finding ways to increase student access and success in AP courses may be directly linked to their post-secondary success and quality of life. Yet students from historically excluded populations are less likely to have access to rigorous coursework, including

AP courses (Adelman, 2006; Lee et al., 1997, as cited by McKillip & Rawls, 2013). In 2013, the College Board reported that Black students represented only 9% of test takers, although they accounted for 15% of the 2013 graduating class (Xu et al., 2021). Research by Scafidi et al. (2015) corroborated the College Board's findings that Black, Hispanic, and students from low-income backgrounds are half as likely to be enrolled in rigorous courses, like advanced math and science courses, as other students. Algebra was found to be a gateway for future success in advanced mathematics and college, but many schools divert low-income students to low-track math courses, limiting their opportunities (Oakes, 1990, as cited in Valadez, 2002). For many of the upper-level AP math courses in high school, it is imperative for students to take algebra early in their high school career to create room in their schedule. To improve academic outcomes for students of minority races or economically disadvantaged status, access and sustaining academic success in advanced high school coursework is an important area of focus. The purpose of this literature review is to discuss the disparities in AP course taking, including historical, social, and academic factors. This review will also discuss the possible solutions to overcoming these disparities that might improve AP outcomes for marginalized students.

**The College Board, Advanced Placement, and Disparities in Higher Education Access**

The College Board, best known for managing the Scholastic Aptitude Test (SAT) for college admissions, started the Advanced Placement (AP) program in 1955 to challenge the highest-achieving students in elite United States high schools (Kolluri, 2018; Schneider, 2009). After World War II, schools focused on tracking students with intentions to direct the highest-ability students through college and into military leadership positions in anticipation of a cold war where intelligence would be critical. Advanced Placement became a way to sort students and separate those deemed high achieving from those who were not (Schneider, 2009). As the

political tensions grew, so did the appeal of AP. The National Defense Education Act of 1958 funded advancing science, math, and language in elementary and secondary schools. This act influenced the adoption of AP due to the perception that it gave U.S. students an advantage over those in the Soviet Union (Kolluri, 2018; Schneider, 2009). Soon concern shifted to enrollment in prestigious universities, and AP became a way to gain a competitive edge to admission to many Ivy League schools (Schneider, 2009). In the 1960s, pedagogical concerns arose regarding perceived stress levels and the workloads of academically gifted students and those who taught them (Schneider, 2009). Despite these concerns, AP emerged and remained one of the most used measures for post-secondary readiness and earning college credit during high school.

In the present day, AP allows secondary students, those in U.S. grades 9-12, to complete college-level coursework taught by high school teachers at their respective schools. College Board's AP program offers more than 40 courses in various content areas, and domestic and international universities recognize these courses for potential college credit and readiness. At the conclusion of each AP course, students can earn credit for an equivalent college-level course if a score of 3 or higher - on a 1-5 scale - is achieved on a criterion-based summative assessment. Every exam has two sections comprised of multiple choice (MC) and free-response questions (FRQs). The ratio varies by exam, with some content areas relying more heavily on the MC portion and others weighting MC and FRQs almost equally (Kolluri, 2018). Although a score of a 3 or higher is a commonly used benchmark to determine who should receive college credits, the target score is up to the individual school's discretion and local legislation. For instance, some colleges and universities require students to obtain a 4 or 5 on AP examinations to earn college-level credit. Interestingly, some of the top universities in the U.S., like Dartmouth,

Brown, and California Institute of Technology, do not grant credit for AP exams but use the qualifying scores to assist in placing students in higher-level classes (Weinstein, 2016).

In 1969 only 14% of high schools offered AP courses and exams (Schneider, 2009), and after the growth it has achieved in the last 50 years, the program is now ubiquitous. For instance, Malkus (2016) found that more than 70 percent of U.S. public high schools offer AP courses, and 90 percent of all high school students attend a school where at least one AP course is offered. As of 2022, College Board serves 7 million students through AP, SAT, and BigFuture (College Board, n.d.). Almost 1.2 million class of 2021 students took at least one AP exam, and 2.5 million students across high school grades took at least one AP exam (College Board, 2021).

As alluded to above, involvement in AP coursework is associated with various positive outcomes for high school students. Most of the literature about the benefits and efficacy of AP comes from College Board-sponsored research. For instance, in an analysis of AP data provided by College Board, students who take AP are more likely to enroll in a four-year college than academically similar students who did not participate in AP; regardless of exam score, the data remains the same (College Board, 2021). College Board studies have also found that students in AP classes tend to have higher scores on standardized tests than non-AP students (Ewing et al., 2006; Mattern et al., 2009; McKillip & Rawls, 2013; Warne, 2017). Students in AP courses also earn higher grades in college (Keng & Dodd, 2008; Morgan & Klaric, 2011; Murphy & Dodd, 2009; Patterson et al., 2011; Shaw et al., 2013; Warne, 2017), and are less likely to drop out of college (Mattern et al., 2009; Wyatt & Mattern, 2011; Warne, 2017).

Empirical investigations conducted by individuals not affiliated with College Board have come to similar conclusions regarding the outcomes of AP coursework. For instance, a sizable body of empirical literature has demonstrated that AP students have higher college grade point

averages (Ackerman et al., 2013; Warne, 2017), higher measures of college-level writing ability (Hansen et al., 2006; Warne, 2017), college graduation rates (Ackerman et al., 2013; Klopfenstein, 2010; Tai et al., 2010; Warne, 2017), and obtain advanced degrees at higher rates (Bleske-Rechek et al., 2004; Flowers, 2008; Warne, 2017) than non-AP students. However, the results from most of the research surrounding academic outcomes and AP courses consist of descriptive statistics and lack control variables that reflect varying student demographics, such as race, ethnicity, and economic status, which might account for variance in the outcomes. Despite the evident need for expansion in the research, the few studies that have controlled for confounding variables found weaker though significant effects (Warne, 2017), suggesting that AP may have academic benefits for many groups of students.

Although involvement in AP courses is associated with numerous positive outcomes, the available literature suggests there are concerning disparities in participation across the United States. Returning to the early years of AP, in 1958, disparities in enrollment became evident when the then-director of the program, David Dudley, said: “Not all students are created equal…” (Schneider, 2009, p. 817). The inequities were acknowledged in the ’60s when a Phillips Exeter faculty member issued a warning alongside his praise of AP. He recognized a “dangerous tendency to regard Advanced Placement teachers and students as an elite worthy of special praise” (Bragdon, 1960, as cited in Schneider, 2009).

As AP took over the nation as a way for students to prepare for a university course load and earn college credit early, students who were not considered to be gifted, which typically includes minority race and low socioeconomic status students, began losing ground in their pursuit toward higher education. For instance, students in poverty take fewer AP exams than non-impoverished students (College Board, 2014; Plucker & Peters, 2016; Ricciardi & Winsler, 2021). Similar

disproportionality has been observed for Black students. As noted by Scafidi et al. (2015), Black students represent 15% of the U.S. high school population yet account for only 6.7% of all AP exams. Additionally, students who perform about average in their courses are often excluded from campus-level conversations about achievement as most attention is focused on moving underperforming students to the top (Flores & Gomez, 2011). Students in the academic middle miss out on potential educational benefits by being excluded from advanced coursework and the opportunity to challenge themselves with a more rigorous curriculum (Flores & Gomez, 2011).

**Advanced Placement by the Numbers**

In the 2017-18 academic year, the U.S. Department of Education reported 3,030,991 students enrolled in at least one AP course across all 50 states, the District of Columbia, and Puerto Rico (Office for Civil Rights, 2018) and total high school enrollment was 17.1 million students (Bauman & Cranney, 2020). Among those taking AP, 11.2% were Asian, 23.3% were Hispanic or Latino of any race, 9.3% were Black, and 52.4% were White. In 2019, 38.9 percent of public high school graduates took at least one AP exam, which was an increase of more than 50 percent over the past ten years (Fazlul et al., 2021). Given this exam-taking increase and recent demographic information, equitable enrollment in AP courses remains a focus area.

During the 2017-18 academic year in Texas, 384,870 students enrolled in at least one AP course. The demographic distribution was: 10.1% Asian, 46.5% Hispanic or Latino of any race, 9% Black, and 31.7% white. To give context to these numbers and how they have changed, EdTrust analyzed 2020 data to provide an understanding of equitable enrollment. As of 2020, there were only 75 Black students enrolled for every 100 and 88 for every 100 Latino students needed to reach fair representation in AP enrollment in Texas (EdTrust, 2020). Texas is

approaching fair representation in AP enrollment, but schools must continue focusing on equitable enrollment in tandem with improving student outcomes.

Another student population to consider is those identified as Emergent Bilingual (EB). The National Center for Education Statistics (NCES, 2021 as cited in Fazlul et al., 2021) identified 5 million students identified as EB as of 2018. Emergent bilingual students are those whose first language, or primary language spoken at home, is not English. Institutional and structural barriers for EB students in AP courses are a phenomenon that College Board itself acknowledges (Kanno & Kangas, 2014; Mavrogordato & Harris, 2017; Starr, 2017). Another obstacle is that EB students may not be skilled in self-advocacy and are interacting with teachers who can lack training with this population (Russell & Kuriscak, 2015; Russell, 2016; Watkins, 2022).

According to reporting from Bauer-Wolf (2022) and verified by this author's examination of the College Board website, the College Board no longer publishes AP exam results by ethnicity and state, which further complicates the situation for schools working to resolve issues of equity surrounding enrollment and achievement in these courses. The website states that this information can be requested but is no longer public, and no information was provided as to why the data publication changed. However, in 2023, the College Board did publish data shedding light on average AP exam scores based on racial and ethnic backgrounds (Wyatt & Ewing, 2023). The findings revealed that in 2022, Black and Hispanic students obtained lower average scores (2.1 and 2.4, respectively) compared to White (average 3.0) and Asian (average 3.4) students (Wyatt & Ewing, 2023). Without regular and publicly and easily accessible demographic data from College Board, it will be more complicated for public school

districts' advanced academic offices to create and lessens the transparency of an organization with a tight grip on the college admissions and course credit field.

Continuing to address AP course access for historically excluded populations is essential because AP remains the most comprehensive program for U.S. schools to provide advanced coursework to students while still in high school (Barnard-Brak et al., 2011; Kolluri, 2018; Xu et al., 2021). Black, Latino/a/x, Indigenous, and economically disadvantaged students have been behind from the inception of AP programming, yet its persistence in college readiness, admissions, and credit makes it one of the strongest tools that these students can use for self-advancement.

## Factors Influencing Student Achievement in Advanced Placement

### *Academic and Cultural Demands-Resources Framework*

Addressing concerns related specifically to students from minority races, immigrants, and low-socioeconomic households is the basis for many of the studies on student achievement in AP classes, and the Academic and Cultural Demands-Resources (ACD-R) Framework provides conceptual guidance for researchers (Martin & Collie, 2022). The development of this framework links educational, personal, and cultural demands and resources with motivation and academic performance (Martin & Collie, 2022; Martin et al., 2021; OECD, 2006).

By first acknowledging that culturally and ethnically diverse students have different demands than those of the dominant culture, researchers and practitioners can begin to find ways to address the demands for a positive impact on student achievement (Martin & Collie, 2022). According to the ACD-R Framework, demands are those challenges requiring psychological or physical exertion to overcome, and resources are the aspects of culture that help in the attainment of educational goals and are connected with positive psychological outcomes (Martin & Collie,

2022). Cultural demands include language proficiency and stereotypes; cultural resources include cultural identity and pride, and these factors are influenced by the available educational resources. Examples of educational resources available to students are quality instruction and a positive learning climate (Martin & Collie, 2022). To counteract opposing demands, students need buffering or boosting effects from other areas. For example, a high-quality learning environment may buffer the adverse effects of cultural discrimination, and a strong sense of cultural identity may boost academic outcomes despite poor teacher-student relationships (Martin & Collie, 2022). Ideally, research aligned with this framework explores which factors can boost positive effects and buffer negative effects for culturally diverse students and, ultimately, academic outcomes.

This conceptual framework provides guidelines for connecting academic outcomes in AP with non-cognitive factors identified in the literature. The emerging understanding of the ACD-R Framework has the potential to support the academic outcomes of students from culturally/ethnically diverse populations.

### *College Readiness*

In terms of college readiness, the word readiness suggests that students are equipped to manage the demands of higher education settings but defining "success" can be quite different for many groups of students and those interpreting the readiness indicators. College readiness tends to be defined by how students meet specific outcomes like campus-based measures of enrollment in college-level coursework in high school, first-year university grades, degree completion, and college admissions criteria. The Common Core State Standards (CCSS), although not adopted by all states, define college readiness as "readiness to take college-level classes" (Klasik & Strayhorn, 2018). For most states, the interpretation of college readiness is

noted by students not needing to take remedial college courses (Klasik & Strayhorn, 2018). High school GPA and course enrollment are among the strongest predictors of the need for (or not) developmental content (Porter & Polikoff, 2011). However, this general definition is not always helpful as it does not define the quality of courses nor the type of institution where these college-level courses are taken, and oftentimes, it has not accounted for students' race and ethnicity and the type of college selected (Porter & Polikoff, 2011; Klasik & Strayhorn, 2018).

The empirical literature is filled with alternative conceptualizations of college readiness that might provide more utility to educators and administrators attempting to promote student success. For instance, David T. Conley (2008) defines college readiness as a comprehensive concept encompassing cognitive strategies, content knowledge, self-management skills, and knowledge about post-secondary education. Conley notes that students who are the first in their families to attend college, immigrants, those from racial and ethnic groups that are historically underrepresented in college, and students who are from low-income families are easily thrown off track if they are lacking in even one area of the four dimensions (Conley, 2008). To address the complexity of Conley's model of college readiness, are four principles around which high schools should center. A college-going culture, aligning the academic program with college readiness standards, teaching essential self-management skills, and preparing students for the complexity of applying to college are the principles that must be accounted for in this plan. These measures, while helpful, are cumbersome and difficult for schools to navigate among the numerous data points and other improvement issues facing campuses and districts.

Hurtado et al.'s (2020) work further explains college-readiness indicators. This work includes educational endowments, family expectations, college-going socialization, financial/material resources, and network development as factors that influence college

readiness, specifically in the Latino/a/x population Where Conley (2008) uses content knowledge as an indicator of readiness, Hurtado et al. consider that to be educational endowments, which include GPA, standardized testing opportunities, and advanced coursework (2020). This is described in research through findings that GPA, standardized test scores, AP classes, and the highest level of math completed at the high school level are the strongest predictors of post-secondary institution attendance (Adelman, 2006; Contreras, 2005; Deil-Amen & Tevis, 2009; Garcia & Bayer, 2005; Hurtado et al., 2020). Like Conley (2008), Hurtado et al.'s research also finds that historically marginalized students can be derailed on the path to post-secondary achievement when lacking skills in even one noncognitive area (college-going culture, alignment to academic standards, self-management skills, and knowledge of the application process).
An additional point raised by Conley (2008) and Hurtado et al. (2020) is that placing students in an environment aimed at going to college contributes positively to improving readiness through other indicators. Advanced Placement classes are also vital to this component. By participating in these courses, students are exposed to the college preparation and admissions process. Students must create accounts with College Board for course study materials, but also to have exam reports sent to colleges, and to register for the SAT. Students involved in AP classes interact with the College Board more frequently and can have conversations about this process with teachers.

Advanced Placement's course design, emphasis on discipline-specific inquiry, reasoning, and communication skills over memorization (College Board, 2017) all align with college-readiness indicators noted in the literature. Combined with the increase in AP access, its use as a measure of state accountability, and the potential for subsidized costs, this program is perfectly positioned to be one that supports the greatest student outcomes on the path to college. These

indicators are directly impacted by AP teachers because they enhance the college-going environment and the four domains cited by Conley (2008) and reinforced through Hurtado et al.'s 2020 work.

### *Forms of Capital*

Economic, social, and cultural capital are relevant to education and student success as these factors influence the experience, knowledge, and resources students bring to the school environment. The educational literature is replete with various conceptualizations of economic, social, and cultural capital, but Pierre Bourdieu's (1973, 1986) work surrounding forms of capital provides an enduring theoretical framework upon which researchers can build their equity work. According to Bourdieu's 1986 work, capital is defined as the resources and traits that a person possesses (Johnstonbaugh, 2018). These resources encompass material and nonmaterial traits, including language and traditions, and these forms of capital can be traded for goods and services or other types of capital. Capital in all forms is passed to students from their parents or those who raised them, and later they obtain some forms of capital from their teachers and friends as they progress through school-age years (Johnstonbaugh, 2018; Lehmann, 2013; Lin, 1982). This makes teachers the key element in expanding cultural capital stores for students from historically excluded populations. Embodied, social, cultural, and economic capital, as proposed by Bourdieu and supported through the years in other research, are critical to student success in and beyond academic settings.

**Cultural Capital.** According to Bourdieu, successfully navigating and thriving within educational environments requires a considerable amount of cultural capital (1973). Defined by Bourdieu (1984, 1986, 1996, as cited in Andersen & Hansen, 2012), cultural capital is the "culture of the most powerful classes serves as a 'legitimate' culture that can be mastered to

varying extents" (p. 2). For instance, those who have been instilled with the dominant form of culture tend to have the most cultural capital and the greatest probability of academic success (Bourdieu, 1984, 1986, 1996, as cited in Andersen & Hansen, 2012). In Bourdieu's 1973 work, he asserts that cultural capital, or the accumulation of knowledge, is used to reinforce class differences. This is in line with the origins of College Board and AP, which sought to separate the working class from what was considered the academic class. In an educational environment, this link is critical because research also shows that students lacking the dominant cultural capital "experience school as a hostile environment" and are more likely to stay away from higher education than those with that cultural capital (de Graaf et al., 2000, p. 93, as cited in Wildhagen, 2009). Cultural capital is what allows those from all backgrounds to interact across cultures, and those who are a part of the dominant culture are at an advantage. In the case of AP, the dominant culture, although slowly shifting, remains white, upper- to middle-class, making it imperative that marginalized student populations learn to navigate this culture to succeed in the coursework.

In research contemporary with Bourdieu (1984, 1986), Lamont and Lareau (1988) define cultural capital as the cultural signals, such as behaviors, attitudes, and preferences that are used for social and cultural exclusion, in alignment with Bourdieu's (1973) writing about cultural capital and class differences. When one lacks the norms of the majority, they face being excluded from society. Lareau and Weininger (2003) further explain the concept of cultural capital to include general linguistic skills, habits, knowledge, and cognitive skills, which diverges from Bourdieu's early definition that considered only access to "high-brow" items (Andersen & Hansen, 2012). Like what was theorized by Bourdieu (1973), this type of cultural capital is passed from parents to their children through more general parenting events like talking and reasoning with children, helping with homework, and general stimulation (Lareau, 1987;

Lareau & Horvat, 1999; Lareau & Weininger, 2003). Cultural capital can be embodied in the form of knowledge gained over time through education and real-world experiences, or it can be objectified. Objectified cultural capital is the materials, or objects, that one has access to in relation to knowledge building, such as books and technology, that can signal an individual's economic class (Cole, 2019).

Scholarly arguments on cultural capital's academic benefits are primarily based on the assumption that having cultural capital creates better communication between students and teachers, which ultimately influences teachers' perceptions of students (Wildhagen, 2009). While it is primarily passed to students in familial relationships as parents or caregivers relay expertise in work and education to their children (Johnstonbaugh, 2018; Bourdieu, 1979), students who are from a non-dominant culture have to acquire other forms of cultural capital from school environments (Johnstonbaugh, 2018). Students from families that are of low socioeconomic status can and do have high cultural capital – meaning their families know of academic programs and extracurricular options – but their experiences are markedly different from students from high socioeconomic status whose families can pay for their students' participation in activities that further cultural capital (Johnstonbaugh, 2018; Morris, 2015; Duncan & Murnane, 2011). Findings indicate that highly educated parents/caregivers pass college expectations to their children, and familial knowledge also influences knowledge about the college application process, while those from marginalized populations must attain this from outside entities (Engberg & Wolniak, 2009; Hurtado et al., 2020; Perna & Titus, 2005). As research continues, exploring and understanding cultural capital's exact role in Advanced Placement outcomes is critical, and including this information in improvement work centered on academic outcomes is a key consideration.

In the context of disproportionality in Advanced Placement participation, students identified as economically-disadvantaged and Hispanic students have less cultural capital than middle-to-upper-class white students due to the historical nature of AP curriculum origins (Andersen & Hansen, 2012; Schneider, 2009). When considering that cultural capital includes the material resources available, low-income households have limited tangible resources relating to societal and educational development (Andersen & Hansen, 2012; Cole, 2019; Schneider, 2009). Referencing the cultural capital that is needed to succeed in AP courses, Kolluri (2018) gives Bourdieu's work a refreshed meaning by describing cultural capital as "elite cultural competence that comes only after the investment of money and effort" (p. 701). Students from non-white and economically-disadvantaged backgrounds possess cultural capital but not the capital historically valued in AP coursework, thus placing them at a disadvantage when they take those courses. Thus, campuses cannot afford to overlook the aspects of capital when they invest money and effort into providing AP programming, particularly in regard to professional development for teachers, who are the primary transmitters of cultural capital for many students. The intention behind AP was to deepen class divisions, so to overcome the historical inequity, schools must focus on cultivating the capital of students from marginalized populations to equip them with the necessary foundation for success in AP and beyond. The role of the school environment and that of teachers is essential in developing forms of capital.

**Social Capital.** Social capital is defined as the networks we create (Johnstonbaugh, 2018), or in other words, one's membership in various groups and the connections built from those groups. Social capital is gained most through the networks of our parents or caregivers, and this is an area where students who come from higher socioeconomic status are at an advantage, as the types of jobs and social activities afforded to higher economic status come with strong

social connections (Johnstonbaugh, 2018; Lareau & Weininger, 2008). One of the important aspects of social capital is the information network that is built through a robust social network (Coleman, 1988). Connections with others can provide key academic, career, and other satisfaction of life opportunities (Coleman, 1988). Research by sociologist James Coleman involved academic outcomes in low-socioeconomic areas, resulting in his views that social capital can increase capacity in underserved or historically excluded populations (Westphaln et al., 2020). While Bourdieu viewed social capital as a tool for social domination and examined its adverse effects on marginalized populations, Coleman's work viewed it as a positive resource (Westphaln et al., 2020). Again, Hurtado et al. (2020) illustrate the connection of the forms of capital to college readiness through the network development and college socialization that Latino/a/x students require on their path to post-secondary credentials. College socialization can include the work done on the part of the school to have conversations about college, assistance in the financial aid process, and working with a counselor throughout the entire college application and admissions process (Hurtado et al., 2020). Similarly, developing a social network is important for students as they can learn valuable information from their peers and feel a sense of belonging to a group with similar goals (Hurtado et al., 2020).

**Economic Capital.** Economic capital, the most straightforward form of capital, directly affects social and cultural positioning and how other forms of capital are attained (Bourdieu, 1986). Students benefit from having family members with higher levels of economic capital as they can easily exchange their capital for things beyond the basic needs of food and clothing and pay for extracurriculars like club sports teams, music lessons, and private tutors (Johnstonbaugh, 2018; Moore, 2004). With access to these types of activities, students are also able to further

expand their cultural capital as they have varied experiences with people who share their own cultural and social capital.

### *Culturally Relevant Pedagogy*

Access to courses alone will not remedy issues of cultural, social, and economic capital noted among historically excluded populations of students; the instruction they receive at all stages of the K-12 process is critical. The role of teachers and schools in building forms of capital is directly linked with their teaching practices and behaviors (Pagán, 2022; Kolluri, 2018). Culturally relevant pedagogy is the beliefs and practices that are intended to serve culturally diverse students (Ladson-Billings, 1995). Culturally relevant teaching places students at the center of instruction by emphasizing high expectations, cultural competence, and critical consciousness (Byrd, 2016). This pedagogy focuses not just on centering racially and culturally conscious attitudes but ensuring they are promoted positively in classrooms (Banks, 1995; Gay, 2000; Ladson-Billings, 1995, 2014; Nieto, 2000; Pagán, 2022; Steele & Cohn-Vargas, 2013). The experiences that students carry with them serve as the basis for educational materials through this approach (Piazza et al., 2015) bringing students' cultural and social capital into the educational environment in a way that benefits the student. Culturally relevant teaching uses language and dialogue in cooperative learning situations for students to learn in a community with each other as they build upon and connect their own experiences to the course content (Piazza et al., 2015). However, this practice does not occur by accident; intentional teacher behaviors and ongoing feedback from campus administrators are essential to ensure this practice is sustained on a campus.

Those from minority races may struggle in AP courses due to culturally misaligned pedagogy throughout their education (Pagán, 2022; Kolluri, 2018). In particular, schools serving

a population comprised primarily of minority races must pay close attention to pedagogy and support teachers in culturally relevant practices. Following a pedagogy that draws on students' capital stores and connects content to students' lived experiences, and maintains the student-centered experiential learning environment is critical to academic success for culturally and ethnically diverse students (Pagán, 2022). Advanced Placement classes are known to cover content broadly and deeply, students can feel intimidated by approaching the content, and teachers can be overwhelmed by the vastness of the course (Parker et al., 2013). Culturally relevant pedagogy is an intentional way of addressing inequities in course content and making sense of broad and deep content (Ladson-Billings, 1995; Pagán, 2022; Parker et al., 2013).

One example of culturally relevant pedagogy in practice comes from Saavedra et al.'s (2021) research on project-based learning theory (PBL) in an AP classroom. While this literature review does not seek to define and understand PBL, it is one example of a learning theory known to include tenets of culturally relevant pedagogy. This study found that students from marginalized populations tended to benefit from engaging in content in ways beyond the traditional lecture method. Project-based learning is one way of having students engage in content that includes oral presentations, team-based discussions, extended writing, and collaboration – all practices considered to be necessary for culturally relevant teaching (Piazza et al., 2015; Saavedra et al., 2021). In the study, teachers in the experimental group who used project-based learning were able to engage all students in the content, and an increase in performance was observed by all students in the group using PBL regardless of economic status and racial demographics (Saavedra et al., 2021).

### *Teacher Behaviors*

In schools, teachers are the most influential force in student development and have the greatest potential to stop the perpetuation of cultural and racial inequities (Pagán, 2022). Teachers must develop their own cultural consciousness before attempting to facilitate culturally relevant teaching for students (Byrd, 2016). Cultural competence and relevancy require teachers to understand their students' communities and cultural norms and work to embed the culture into instruction (Byrd, 2016; Pagán, 2022). To engage in this practice, teachers must have sociopolitical awareness of their own culture, which comes with reflecting on their own beliefs and identities (Dover, 2013; Pagán, 2022; Villegas & Lucas, 2002). Through curriculum changes, such as the representation of many cultural identities, connections to lived experiences, and collaborative conversations, teachers can create student-centered classrooms (Ensign, 2003; Fulton, 2009; Pagán, 2022). After self-reflection and consideration of the curriculum, teachers must employ constructivist pedagogy to build knowledge together in the classroom, where the teachers and students share the responsibility for learning (Morrison et al., 2008; Pagán, 2022). The importance of constructivist principles is acknowledged by College Board as well, in a report from 2005, the College Board emphasizes that these teaching methods are ideal (Paek et al., 2005).

To support sustained change in teacher behaviors, ongoing coaching and support is required. In Saavedra et al.'s 2021 study, the teachers in the experimental group that used PBL received job-embedded professional learning and had access to a supportive peer group that propelled positive changes in teaching behaviors. While PBL specifically is a shift in pedagogy, culturally relevant principles can be as well, and the same types of support should be given. For PBL specifically, PBLWorks and College Board have partnered in professional learning

opportunities (Saavedra et al., 2021). When teachers were part of a long-term, cultural relevance professional development program in science instruction, they were able to enhance their teaching practice resulting in higher student achievement (Johnson, 2011; Johnson & Fargo, 2010, as cited in Pagán, 2022). Additionally, for those teaching AP in a non-PBL setting, College Board provides a variety of continuing professional learning for teachers. Campuses can invest in weeklong summer institutes for AP teachers, online workshops throughout the academic year, the aforementioned PBL series for AP Environmental Science and AP U.S. Government and Politics teachers, mentor groups, equity workshops, and resources for campus- and district-level AP coordinators (College Board, n.d.b).

**Course Design and Content**

On the College Board's information page about AP courses, the program is touted as helping students "stand out to colleges, earn college credit and placement, and boost your GPA." (College Board, n.d.), which suggests that the course content, while meant to mirror college-level work, is not necessarily the primary focus. The implication is that AP provides a way for students to show colleges that they want to enroll and succeed in post-secondary academics rather than contributing to college readiness (Kolluri, 2018).

Most criticism of the course content is focused on the breadth of the content across course offerings (Kolluri, 2018). Recommendations for revising AP curriculum began in 2002 by the National Research Council, and in 2011 Parker et al. suggested that the expansive content remained a problem and resulted in teachers relying on lectures as an instructional method. Project-based learning can emphasize the depth of understanding and is a supportive practice in culturally relevant teaching (Kolluri, 2018; Parker et al., 2011). College Board revised Biology,

Latin, Spanish Literature and Culture, Chemistry, Spanish Language and Culture, and United States History between 2012 and 2015 (Kolluri, 2018).

There is also evidence to suggest that AP science courses can lower students' confidence in their ability to succeed in college-level courses (Conger et al., 2021). While Conger et al.'s 2021 research found that AP science courses reported higher rigor by both teachers and students, increases in skill, and higher interest in pursuing a STEM degree, AP course takers reported lower estimations of their ability than general education students. These same participants were also more than twice as likely to report that their AP course had negative effects on their physical or mental health (Conger et al., 2021). In school environments, students' self-efficacy, sometimes referred to as self-confidence, is a known predictor of academic success (Usher et al., 2019). Social cognitive theory posits that self-efficacy is related to self-regulation and managing stress in students (Usher et al., 2019). For example, students with lower self-efficacy can tend to procrastinate on their assignments, which often leads to poor academic performance Klassen et al., 2008, as cited in Usher et al., 2019). This information means that schools with AP programs must consider non-cognitive factors that can play a role in student achievement.

**Policy**

District policies regarding AP can vary greatly, but a commonly implemented local policy subsidizes AP exam taking for students meeting certain criteria. Exam fees can be as expensive as $97 in the U.S. and $145 for exams for AP Capstone programs like AP Seminar and Research (College Board, n.d.a). College Board offers a fee reduction of $35 per exam for students with financial need (College Board, n.d.a); however, the cost may still prove a barrier for students taking multiple exams. Many districts and states have picked up these costs, primarily for students who qualify for schools' Community Eligibility Provision (CEP), which is

income-based and provides students with free or reduced-cost school meals (College Board, n.d.a; Fazlul et al., 2021). In Texas, funding for exam fee subsidies has been available since 1993 (Texas Education Agency, 2021). These subsidy programs increase AP exam taking for students who qualify for free and reduced lunch (Fazlul et al., 2021). However, not all students in AP courses take the AP exam, an emerging policy research area (Fazlul et al., 2021).

**Systems' Role in Equitable Access**

Systems are perfectly designed to get the results they get. This statement has been attributed to W. Edwards Deming, Paul Bataldan, Don Berwick, and Arthur Jones (MacDavey, 2018) and contextualizes the issues that keep specific student populations out of advanced coursework. To change outcomes for historically excluded student populations, the enrollment systems for AP courses must be examined from the middle school level onward. For example, students of color in middle school often have a strong interest in attending college and taking advanced courses but are excluded from these courses as early as their 6th through 8th-grade years (Patrick et al., 2020). Teacher recommendations are a standard tool used in determining which students are placed in advanced courses, but with any human-made determination, conscious or subconscious biases can prevent historically excluded populations from getting seats in these courses (Patrick et al., 2020). In a 2020 EdTrust report, educator bias was found to be one of the biggest barriers to equitable enrollment for Latino and Black students. Many schools were identified as relying too heavily on teacher and counselor recommendations (Patrick et al., 2020). This educator bias is linked to deficit thinking held by many teachers and their lack of belief that culturally and ethnically diverse students can succeed in gifted and advanced academics (Ford & Grantham, 2003). In shifting deficit thinking to something more

dynamic, or positive, about students, culturally relevant teaching and shifting teacher behaviors must take place (Ford & Grantham, 2003; Kolluri, 2018).

A final systemic issue is that occasionally, schools have course sequences that are intended to support students identified as Emergent Bilingual, but those tracks can unintentionally limit those students from learning about and enrolling in advanced courses (Kanno & Kangas, 2014). The course selections in their research also were influenced by teacher guidance as well as the guidance counselors' desire to maintain academic track consistency. Participants were found to navigate emergent bilingual students away from advanced courses under the impression that they were protecting the students (Kanno & Kangas, 2014). The assumption from participants is that students would not be able to handle more advanced coursework simply because the students were not working in their first language. Another major issue from this study was that the lack of differentiated instruction in advanced courses did not lend itself to non-native English speakers. Some of these issues could be addressed through culturally relevant pedagogy and work on teacher behaviors to ensure that the environment is appropriate for all students, not only those who speak English as a primary language.

**Obstacles in Research**

A concern in research on AP programs is that most research on the academic benefits continues to be done in-house by the College Board (Warne, 2017). When most research on AP stems from in-house sponsored studies, the potential for bias is high. When College Board profits from its status in education and access to higher education, it benefits the organization to report positive findings and minimize any negative results. While this is not always a problem, it is vital for researchers and practitioners to keep potential biases in mind when reviewing and creating studies and implementation policies.

An issue in early studies was the lack of consideration for confounding variables, like those that describe the differences in types of AP students, and research has now begun to address this. The first critical study of AP's efficacy came from Lichten in 2000, following work in the 1990s that was primarily descriptive. Historically, AP students tend to be white, from higher economic status and have higher forms of capital than traditional education students (Warne, 2017), which was largely ignored until new research began considering the demographic differences of modern students and their increased interest and enrollment in AP. More recent, independent studies have begun to control for these confounding variables providing more insightful and relevant findings, especially for schools serving primarily minority demographic populations. Many studies (Klopfenstein & Thomas, 2010; McKillip & Rawls, 2013; Sadler & Sonnert, 2010; Warne et al., 2015) found that when controlling for factors like race, socioeconomic status, and forms of capital, the effects of AP programs on student achievement have a reduced, although still significant, impact (Warne, 2017). In what Warne (2017) cites as the "first non-College Board study that examined the academic impact of AP program participation," Geiser and Santelices (2004) found that AP course participation and exam scores had no predictive power specifically for student's GPA and college persistence when controlling for demographic and other variables. In the expansion of research and studies conducted on AP, specific examination of outcomes with the inclusion of confounding variables is vital to gaining a clear picture of the impacts of participation in the course.

**Summary**

Criticism of AP courses centers around the breadth of content, which results in teachers resorting to lectures as the primary instructional method (Kolluri, 2018). Recommendations regarding revising the curriculum and incorporating culturally relevant pedagogy and theories

like PBL. Advanced Placement, through its focus on college-level content, has the potential for instructors to embrace culturally relevant teaching practices and work on shifting the imbalance in forms of capital. However, the usefulness of AP as an indicator of college readiness continues to be unclear. As Klopfenstein (2010) found, the benefits of AP courses tend to be signaling effects on student ability and motivation. While other researchers have found the course to be a predictor of success in second-year college retention, college GPA, and other areas (Coughran, 2012; Bui & Fagan, 2013; Byrd, 2016; Hill, 2012; Hubert, 2013; Kolluri, 2018; Pagán, 2022; Rodriguez et al., 2004). As schools continue to offer AP courses, exploring and ensuring the campus' role in non-cognitive factors influencing exam taking remains a key variable in student success.

Although AP benefits can vary, it still emerges as a predictor of success in higher education. It can potentially support historically marginalized populations in pursuing improved quality of life through academics and careers (Kolluri, 2018). There is a significant disparity in access to AP courses for historically excluded populations. Black, Hispanic, and low-income students are less likely to have access to rigorous coursework, including AP courses. Research indicates that bridging the gap in AP course participation among marginalized students is crucial for improving their academic outcomes and overall quality of life. American society views AP as a symbol of academic preparedness, which makes success in the coursework advantageous to not only academic pursuits but also cultural and social capital. However, individuals who have internalized the prevailing cultural norms (e.g., middle- to upper-class white Americans) are more likely to possess a higher degree of cultural capital, increasing their chances of achieving success in AP coursework and examinations. The use of culturally relevant pedagogy is a tool linked to many positive outcomes for historically marginalized students, including increased

engagement and connection to the content, feelings of belonging, better relationships with teachers, and higher test scores (Coughran, 2012; Bui & Fagan, 2013; Byrd, 2016; Hill, 2012; Hubert, 2013; Pagán, 2022; Rodriguez et al., 2004). For students who do not possess the dominant forms of capital (e.g., Black, Latino/a/x, and those from low-socioeconomic households), teachers' pedagogical philosophies and behaviors have the potential to bridge existing social capital with the cultural values of the course. Regardless, to address the disparities in AP success, we must first address the lack of cultural knowledge necessary for success in the content. By focusing on the development of historically marginalized students' forms of capital through teacher behaviors and pedagogy, their participation in AP classes can potentially improve their chances of earning qualifying exam scores.

The present study focuses on the AP program, which is widely used by students to engage in advanced coursework. Given the demographic makeup of the Sunrise Independent School District, which serves most students who experience disparities in AP outcomes, it is crucial to evaluate the factors that influence AP exam scores, including culturally relevant pedagogy and social and cultural capital. The study aims to examine these factors and their potential impact on AP outcomes by answering the research question: How do perceptions of teacher feedback and support and a college-supporting learning environment influence qualified Advanced Placement exam scores at comprehensive high schools?

# Chapter 3

## Methodology

Advanced Placement is an important program, particularly in comprehensive high schools, as enrollment and exam taking are linked with positive post-secondary outcomes, including a higher likelihood of enrolling in a four-year college (Alexander & Pallas, 1984 as cited in McKillip & Rawls, 2013; College Board, 2021; Mattern et al., 2009; Parker et al., 2013). An important factor that predicts AP success among students from historically marginalized populations is the levels of capital, experience, knowledge, and resources that students bring to the learning environment and how schools build upon the students' existing knowledge (Andersen & Hansen, 2012; Johnstonbaugh, 2018; Kolluri, 2018; Schneider, 2009). The Academic and Cultural Demands-Resources (ACD-R) Framework (Martin & Collie, 2022) provides further conceptual guidance on the importance of cultural capital in relation to academic demands. For students with high cultural capital stores, tangible and non-tangible aspects of culture can increase the impact of positive factors in academics. For instance, researchers have suggested that having a strong sense of cultural pride can boost the effects of a high-quality curriculum (Martin & Collie, 2022). Likewise, cultural capital plays a role in buffering (reducing) the negative effects of education, and high-quality, supportive instruction may buffer the effects of racism (although it still must be addressed systemically) (Martin & Collie, 2022). Without the bolstering of cultural capital, students' ability to boost or buffer academic effects can be limited. For students from low-income households or minority races, their families' capital regarding the process of attending college tends not to be enough to guide students to post-secondary success (Andersen & Hansen, 2010; Lareau, 1987; Lareau & Horvat, 1999; Lareau & Weininger, 2003). Schools play a crucial role in helping students overcome

these barriers while still maintaining student enrollment in AP classes (Starr, 2017). Students lacking in the dominant culture's capital are most likely and most able to develop that through interactions with teachers and intentional actions related to campus climate (Johnstonbaugh, 2018; Lehmann, 2013; Lin, 1982). Therefore, this study aims to answer the research question: How do perceptions of teacher feedback and support and a college-supporting learning environment influence qualified Advanced Placement exam scores at comprehensive high schools?

**Research Design**

The research question will be explored through correlational design using multiple regression. Correlational design is commonly used to investigate relationships between variables without manipulation by the researcher. One of the key strengths of this design is that it provides insights into the associations between variables, helping researchers to identify patterns or trends (Mertler, 2022). This design also allows researchers to look for predictive relationships. This design is limited by the fact that correlation does imply causation, which is often misrepresented in media reports on correlational research. If relationships between variables exist, it does not necessarily indicate a cause-and-effect relationship. Because this typically relies on existing data, without control from the researchers, it may lead to omitted variable bias (Wilms et al., 2021). Variable bias happens when essential variables that influence the relationship with the dependent variable are left out of the analysis, potentially distorting the results, and leading to inaccurate conclusions about the relationship between the variables.

**Participants**

This research uses aggregate student performance data in Sunrise ISD's comprehensive high schools. A comprehensive high school is a traditional school option where students who

live in a specific attendance zone enroll at their local campus. Specifically, we selected data related to the performance of students who enrolled in AP courses in 20 comprehensive high schools in Sunrise ISD. The students may range from 9th to 12th grade and attend schools in various regions of the district. This research excluded the district's schools of choice (i.e., magnet schools, in-district charter schools, PTECH programs, etc.).

Sunrise ISD comprises primarily Hispanic students (N = 99,884), and students identified as economically disadvantaged are 85% of the district enrollment (N = 119,693). The demographic characteristics of the district are presented in Table 1.

**Table 1**

*Demographic Characteristics of Sunrise ISD*

| | ***N*** | **%** |
|---|---|---|
| **Total District Enrollment** | 140,720 | |
| **Ethnicity** | | |
| White | 7,594 | 5.4 |
| African American | 28,506 | 20.3 |
| Hispanic | 99,884 | 71.0 |
| American Indian/Alaska Native | 293 | 0.2 |
| Multiple | 2,691 | 1.9 |
| Asian/Hawaiian/Pacific Islander | 1,656 | 1.2 |
| **Other Identifiers** | | |
| Limited English Proficient (LEP) | 68,064 | 48.4 |
| At-Risk | 90,320 | 64.2 |
| Special Education | 15,381 | 10.9 |
| Talented and Gifted (TAG) | 26,821 | 19.1 |
| Economically Disadvantaged | 119,693 | 85.1 |

The total enrollment for the 2021-22 academic year of the schools selected for this sample was 33,038. The demographics of enrolled students mirror that of the district, with most

campuses predominately Hispanic; four were majority African American. Detailed demographic information is presented in Table 2 and Table 3.

**Table 2**

*Racial/Ethnic Characteristics of Sunrise ISD Comprehensive High Schools*

| | ***Enrollment*** | **% Hispanic** | **% African American** | **% White** | **% Other** |
|---|---|---|---|---|---|
| School 1 | 2199 | 82 | 10 | 5 | 3 |
| School 2 | 1480 | 95 | 2 | 2 | 1 |
| School 3 | 1110 | 32 | 65 | 1 | 1 |
| School 4 | 1294 | 64 | 21 | 1 | 13 |
| School 5 | 1636 | 70 | 16 | 10 | 4 |
| School 6 | 1426 | 95 | 3 | 1 | 1 |
| School 7 | 1261 | 72 | 26 | 1 | 1 |
| School 8 | 409 | 39 | 59 | 0 | 2 |
| School 9 | 2114 | 95 | 4 | 1 | 0 |
| School 10 | 1173 | 71 | 23 | 2 | 4 |
| School 11 | 1304 | 75 | 23 | 1 | 1 |
| School 12 | 1825 | 85 | 11 | 1 | 1 |
| School 13 | 1687 | 77 | 15 | 5 | 2 |
| School 14 | 4145 | 77 | 20 | 1 | 2 |
| School 15 | 1381 | 33 | 64 | 0 | 3 |
| School 16 | 1580 | 80 | 17 | 1 | 1 |
| School 17 | 2121 | 96 | 2 | 1 | 1 |
| School 18 | 2040 | 81 | 12 | 4 | 3 |
| School 19 | 980 | 47 | 51 | 1 | 1 |
| School 20 | 1867 | 60 | 7 | 29 | 4 |

**Table 3**

*Demographic Characteristics of Sunrise ISD Comprehensive High Schools*

| | ***Enrollment*** | **% EB** | **% At-Risk** | **% Sped** | **% TAG** | **% Low SES** |
|---|---|---|---|---|---|---|
| School 1 | 2199 | 53.1 | 73 | 8.9 | 15.6 | 82.4 |
| School 2 | 1480 | 61.6 | 81.7 | 7.9 | 14.3 | 95.5 |
| School 3 | 1110 | 21.8 | 73 | 8.9 | 14.6 | 82.4 |
| School 4 | 1294 | 65 | 77.5 | 8.2 | 9.5 | 90.2 |
| School 5 | 1636 | 47.3 | 66.9 | 8 | 16.8 | 69.7 |
| School 6 | 1426 | 74.5 | 81.2 | 7.7 | 11.8 | 89.6 |
| School 7 | 1261 | 50.9 | 82.3 | 10.7 | 9.3 | 88.2 |
| School 8 | 409 | 31.5 | 72.9 | 9.9 | 6.8 | 95.1 |
| School 9 | 2114 | 48.4 | 73.2 | 9.7 | 11.4 | 88.7 |
| School 10 | 1173 | 43.5 | 72.4 | 11.8 | 15.4 | 85.6 |
| School 11 | 1304 | 44 | 81.1 | 13.9 | 13.8 | 92.5 |
| School 12 | 1825 | 58.6 | 82.9 | 12.5 | 10.8 | 92.5 |
| School 13 | 1687 | 51.1 | 82.6 | 12.5 | 10.3 | 87.8 |
| School 14 | 4151 | 42.7 | 70.4 | 8 | 17.7 | 74.6 |
| School 15 | 1381 | 25.4 | 72.9 | 13.4 | 9.8 | 95.3 |
| School 16 | 1580 | 58.1 | 85.8 | 12.7 | 11.1 | 92.7 |
| School 17 | 2121 | 47.8 | 77.9 | 8.8 | 13.7 | 82 |
| School 18 | 2040 | 54 | 73.9 | 7.9 | 12.9 | 73.8 |
| School 19 | 980 | 32 | 75.1 | 12.1 | 9.4 | 95.3 |
| School 20 | 1867 | 28.1 | 56.1 | 10.4 | 19.4 | 52.9 |

The average AP exam score across campuses was 1.51; a score of 3 or higher is considered a qualified score meaning that the student is eligible for college or university credit. The average percent enrolled in AP courses for the sample was 37.55; the average percentage of students who took exams was 22.95; and the average percent of qualified exam scores was 5.05. Detailed AP exam information is presented in Table 4.

**Table 4**

*Advanced Placement Data for Sunrise ISD Comprehensive High Schools*

| | ***Enrollment*** | **Average AP Exam Score** | **% Enrolled in AP** | **% Tested** | **% of Qualified Exam Scores** |
|---|---|---|---|---|---|
| School 1 | 2199 | 1.59 | 47 | 36 | 9 |
| School 2 | 1480 | 1.61 | 37 | 26 | 6 |
| School 3 | 1110 | 1.13 | 22 | 6 | 6 |
| School 4 | 1294 | 1.47 | 31 | 22 | 5 |
| School 5 | 1636 | 1.77 | 32 | 20 | 5 |
| School 6 | 1426 | 1.35 | 57 | 35 | 6 |
| School 7 | 1261 | 1.25 | 30 | 13 | 1 |
| School 8 | 409 | 1.02 | 73 | 44 | 1 |
| School 9 | 2114 | 1.86 | 30 | 19 | 7 |
| School 10 | 1173 | 1.48 | 42 | 27 | 4 |
| School 11 | 1304 | 1.22 | 51 | 29 | 2 |
| School 12 | 1825 | 1.39 | 16 | 10 | 1 |
| School 13 | 1687 | 1.93 | 28 | 22 | 6 |
| School 14 | 4151 | 1.65 | 33 | 24 | 5 |
| School 15 | 1381 | 1.1 | 37 | 21 | 1 |
| School 16 | 1580 | 1.21 | 38 | 17 | 2 |

| | *Enrollment* | Average AP Exam Score | % Enrolled in AP | % Tested | % of Qualified Exam Scores |
|---|---|---|---|---|---|
| School 17 | 2121 | 1.77 | 27 | 15 | 5 |
| School 18 | 2040 | 1.55 | 44 | 27 | 7 |
| School 19 | 980 | 1.18 | 30 | 7 | 0 |
| School 20 | 1867 | 2.82 | 46 | 40 | 22 |

## Data Sources

### *Advanced Placement Performance*

Information about AP course-taking and exam performance was accessed through publicly available data provided by Sunrise ISD. Specifically, the researcher examined Sunrise ISD-compiled school profiles that included 2021-22 academic year enrollment, demographics, and AP exam information, including the percentage of students enrolled, percent tested, and percent of qualified exams. The researcher also used Texas Academic Performance Reports (TAPR), which TEA compiles. The TAPR documents include similar categories as the school profiles, and the documents were compared to ensure accuracy across the distinct data sources.

### *Teacher Climate Survey*

Information about factors that could influence AP performance and exam-taking rates was accessed from publicly available reports describing the results of annual climate surveys. Specifically, Sunrise ISD administers surveys to campus staff to better understand educators' perceptions of the school environment and learning quality. The surveys are administered anonymously by a third party, and the survey items are the same across all district surveys.

The teacher and staff version of the campus climate survey items assesses six areas of a given campus. The survey items relate to six categories: Beliefs & Priorities, Feedback &

Support; Culture & Environment; College-Going-Culture; Teacher to Teacher Trust; and Teacher to Principal Trust. The percentage of positive responses (i.e., strongly agree & agree) from the categories Feedback & Support and College-Going Culture were used in the analytical procedure for this research. The questions are administered using a Likert-type scale. The anchors range from 1 to 5, representing the following response options in ascending order: "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." Survey questions for these categories from the 2022 survey are presented in Table 5 and the percentages of positive responses by campus are presented in Table 6.

**Table 5**

*Faculty and Staff Climate Survey*

| Survey categories and questions |
|---|
| **Culture of Feedback and Support** |
| My campus leadership helps me improve the quality of my instruction. |
| The instructional feedback I get helps me improve the quality of my instruction. |
| I have sufficient opportunities and encouragement to develop my leadership potential. |
| The PD sessions at my school this year helped me improve instruction. |
| My team experiences with colleagues this year helped me improve instruction. |
| My school has an effective instructional leadership team. |
| **College-Going Culture** |
| Teachers expect most students in this school to go to college. |
| Instruction in this school is focused on helping students get ready for college. |
| Teachers in this school feel that it is a part of their job to prepare students to succeed in college. |

**College-Going Culture**

Teachers at this school accept nothing less from students than their full effort.

Teachers at this school do not let students give up when their class work becomes challenging.

Teachers at this school give students feedback to help them understand how to improve.

**Table 6**

*Percentages of Positive Responses to Campus Climate Survey*

| | ***Feedback and Support*** | **College-Going Culture** |
|---|---|---|
| School 1 | 47 | 57 |
| School 2 | 72 | 75 |
| School 3 | | |
| School 4 | 69 | 75 |
| School 5 | 78 | 75 |
| School 6 | 47 | 55 |
| School 7 | 56 | 59 |
| School 8 | 71 | 79 |
| School 9 | 46 | 51 |
| School 10 | 69 | 69 |
| School 11 | 75 | 69 |
| School 12 | 61 | 54 |
| School 13 | 59 | 56 |
| School 14 | 59 | 63 |
| School 15 | 66 | 71 |
| School 16 | 60 | 52 |

| | *Feedback and Support* | **College-Going Culture** |
|---|---|---|
| School 17 | 58 | 72 |
| School 18 | 43 | 48 |
| School 19 | 72 | 75 |
| School 20 | 32 | 57 |

# Chapter 4

## Results

The purpose of this study was to understand the relationship between teacher-reported perceptions of the campus' college-going environment and feedback/support and qualified AP exam scores. The study selected 20 comprehensive high schools in Sunrise ISD. Survey items assessing categories of "College-Going Environment" and "Teacher Feedback and Support" were selected from an annual climate survey for their connection to research on non-cognitive factors, like cultural capital, teaching practices, and college-readiness indicators, that influence student outcomes in AP courses. The study also included the control variables of total enrollment and percentage of low-socioeconomic status (SES) students, which is modeled after existing literature on AP exam outcomes (Hallett & Venegas, 2011; Ricciardi & Winsler, 2021; Scafidi et al., 2015). Qualified exam scores are those scores of three, four, or five, which allow the student to earn college credits. Assumption checks were conducted prior to running a multiple regression analysis and applying the LASSO technique on the dataset to answer the stated research question.

*RQ1: How do perceptions of teacher feedback and support and a college-supporting learning environment influence qualified Advanced Placement exam scores at comprehensive high schools?*

## Statistical Techniques

### Descriptive Statistics

Descriptive statistics of the variables provide important context for the results of the multiple regression and Lasso regression technique. The sample included 20 comprehensive high schools with a mean enrollment of 1,651 ($SD$ = 735.81). The mean of the percentage of qualified

AP exam scores in the sample was 5.05 (*SD* = 4.72). The mean for the percentage of low-SES students was 85.72 (*SD* = 10.77). For the survey categories of Teacher Feedback and Support, the mean was 60.00 (*SD* = 12.44), and for College-Going Environment, the mean was 63.78 (*SD* = 10.02). The descriptive statistics also are presented in Table 7.

**Table 7**

*Descriptive Statistics for Variables Used in Multiple Regression*

| Variable | Mean | Standard Deviation |
|---|---|---|
| Total Enrollment | 1651.90 | 735.81 |
| Percent of Qualified AP Exam Scores | 5.05 | 4.72 |
| Percentage of Low-SES | 85.72 | 10.77 |
| Percentage of Positive Responses for Teacher Feedback and Support | 60.00 | 12.44 |
| Percentage of Positive Responses for College-Going Environment | 63.78 | 10.02 |

**Correlation Analysis**

Correlation analysis was conducted on the variables to determine whether there is an association between them. The correlation analysis was conducted using the Pearson correlation coefficient (*r*) to quantify the strength and direction of the relationship. Pearson's r was selected because the variables are all quantitative, normally distributed, and approximate a linear relationship with no outliers.

Teacher Feedback and Support had a strong, negative correlation with the percentage of qualified exam scores, r = - .70, $p < .001$. College-Going Environment had a strong, positive correlation with Teacher Feedback and Support, r = .77, $p < .001$. The percentage of low-SES students had a statistically significant relationship with a majority of the variables. It had a moderately negative correlation with total enrollment (r = - .47, $p = .03$) but had a strong negative correlation with the percentage of qualified exams (r = - .79, $p < .001$). The percentage of low-SES students had a moderately positive correlation with Teacher Feedback and Support (r = .54, $p = .01$). These correlation coefficients are presented in Table 8.

**Table 8**

*Correlations for Study Variables*

| Variable | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Total Enrollment | — | | | | |
| 2. Percentage of Qualified AP Exams | .28 | — | | | |
| 3. Teacher Feedback and Support | - .38 | - .70** | — | | |
| 4. College-Going Environment | - .38 | - .31 | .77* | — | |
| 5. Percentage of Low-SES Students | - .47* | - .79** | .54* | .25 | — |

*Note.* *$p < .05$. **$p < .01$.

**Multiple Linear Regression**

Using multiple regression, this research examined the relationship between perceptions of College-Going Environment and Teacher Feedback and Support and qualified AP exam scores.

Multiple regression is a parametric statistical technique that is used to investigate predictive relationships between two or more independent variables and a single dependent variable. More specifically, the technique researchers to determine if a set of independent variables share a statistically significant relationship with a dependent variable and the strength and direction of those relationships. The dependent variables in this study are the qualified AP exam scores of students in Sunrise ISD. The independent variables are the percentage of positive responses to selected survey items.

**Lasso Regression Technique**

Research has suggested that when standard linear models, like multiple regression, are applied to small sample sizes, it can result in inflated standard errors causing reduced power and increased likelihood of researchers incorrectly determining that independent variables are (un)related to the outcomes of interest (Finch & Finch, 2016). Thus, I also analyzed the data using Least Absolute Shrinkage and Selection Operator (Lasso) Regression. This technique is a regularization method that can be used to determine the nature and strength of relationships between variables. Like multiple regression, LASSO regression generates a line of best fit that minimizes squared residual values (i.e., difference between raw scores and predicted scores). The characteristics of the line of best fit (e.g., slope & intercept) can be used to generate a linear equation that summarizes how variables are related. Further, LASSO regression introduces a penalty term into the regression equation that shrinks the size of the regression coefficients. By assigning a penalty, Lasso regression eliminates those that do not contribute to the dependent variable and retains only those with influence on the outcome (Finch & Finch, 2016). Lasso tends to have a smaller variance than other methods and can provide more accurate predictions with small samples (Tibshirani, 1996, as cited in Finch & Finch, 2016). Specifically,

investigations have demonstrated that Lasso regression has higher power and lower Type I and Type II error rates when applied to small samples than standard multiple regression (Finch & Finch, 2016).

**Assumptions of Multiple Regression**

An assumption of multiple regression is that the variables share a linear relationship. The linearity assumption was met because there was no evidence of a non-linear relationship in the partial plots which depict the relationships between each possible pair of independent variables. Additionally, the residuals must not be correlated to use this procedure. This assumption, the independence of residuals, was met by evaluating the Durbin-Watson statistic (2.069), and it was within the acceptable range of 1.5 to 2.6, indicating that there is no correlation in the residuals. Multiple regression also assumes that the distribution of residual values approximates a normal distribution. I checked that this assumption was met through the examination of a Q-Q plot of standardized residuals, and the data were approximately normal. Multicollinearity, when two or more independent variables are highly correlated with each other, causes issues in regression models. Thus, multicollinearity was tested. The tolerance for Feedback and Support, College-Going Environment, percentage of low-socioeconomic (SES) students, and total enrollment were all greater than .10 (.262, .323, .530, and .697), and the VIF values were less than 10 (3.814, 3.095, 1.888, and 1.434) suggesting that multicollinearity is not an issue. Multiple regression also assumes that there is no presence of heteroscedasticity. This assumption checks that the variability in the dependent variable is consistent across all levels of the independent variable (Astivia & Zumbo, 2019). The assumption of homoscedasticity was violated because the residuals vs. predicted plot did not approximate a horizontal band near the middle of the data indicating inconsistent variability among variables. Violations of this assumption can affect the

calculation of p-values but do not influence regression coefficients or $R^2$ values (Astivia & Zumbo, 2019). Typically, the issues with homoscedasticity must be severe to see any issues in the analysis, and because of this and the other statistical assumption checks meeting acceptable criteria, multiple linear regression was still applied.

**Multiple Regression Results**

Multiple linear regression was conducted to investigate the relationship among the sample's Teacher Feedback and Support, College-Going Environment, total enrollment, and the percentage of low-SES students on qualified AP exam scores. The results of the analysis indicated that the independent variables accounted for a statistically significant amount of variance in qualified AP exam scores, $F(4, 14) = 14.17$, $p < .001$, $R^2 = .80$. A review of standardized regression coefficients indicated that perceptions of Teacher Feedback and Support were negatively associated with qualified AP exam scores ($\beta = -.68$, $p = .011$). Additionally, the results indicated that the percentage of low-SES students was negatively associated with qualified AP exam scores ($\beta = -.56$, $p = .004$). Finally, the results of the multiple regression indicated that perceptions of College-Going Culture ($\beta = .31$, $p = .157$) and total school enrollment ($\beta = -.10$, $p = .464$) did not share a statistically significant relationship with qualified AP exam scores. Regression coefficients are presented in Table 9.

**Table 9**

*Regression Coefficients of Campus Culture Items, Total Enrollment, and Percentage of Low-SES students on Qualified AP Exam Scores*

| Variable | B | $\beta$ | SE | $p$ |
|---|---|---|---|---|
| Constant/Intercept | 33.75 | | 7.88 | < .001 |
| Teacher Feedback and Support | - .26 | - .68 | .09 | .011 |
| College-Going Culture | .15 | .31 | .10 | .157 |
| Percentage of Low-SES Students | - .24 | - .56 | .07 | .004 |
| Total Enrollment | - 6985 | - .10 | 9283 | .464 |
| $R^2$ | .80 | | | < .001 |

**LASSO Results**

The LASSO results show that Teacher Feedback and Support, College-Going Environment, Total Enrollment, and percentage of Low-SES students shared a meaningful relationship with qualified AP Exam scores. It is noted that LASSO included variables that were not statistically significant in the multiple regression. The "penalty" applied by LASSO eliminates from the model any independent variables that do not contribute to explaining

variance in the dependent variable. Thus, the findings suggest that all four variables influence qualified AP exam scores. Finally, it is important to note that the beta weights obtained from the LASSO regression all approximated those in the multiple regression instilling confidence in the estimates of the nature and strength of relationships between the variables. The comparisons are detailed in Table 10.

**Table 10**

*Comparison of LASSO and Multiple Regression Results on Qualified AP Exam Scores*

| Variable | $\beta$ Multiple Linear Regression | $\beta$ Lasso |
|---|---|---|
| Teacher Feedback and Support | - .68 | - .66 |
| College-Going Culture | .31 | .29 |
| Percentage of Low-SES Students | - .56 | - .56 |
| Total Enrollment | - .10 | - .10 |

# Chapter 5

## Discussion

Students have a myriad of options for continuing education beyond high school, and many choose to enroll in college in the hopes of earning a degree. Obtaining a post-secondary credential is linked with increased earning potential, higher levels of job satisfaction, and longer lifespans (U.S. Bureau of Labor Statistics, 2022a; U.S. Bureau of Labor Statistics, 2022b; Warters, 2021). The role of high school in post-secondary achievement cannot be ignored as it has a major role in the process through course offerings that prepare students for college-level coursework and enable them to earn college credits before high school graduation. One of the most common options is the College Board's Advanced Placement courses (Xu et al., 2021; Schneider, 2009).

The current study sought to explore the nature of the relationship between key non-cognitive factors identified in the literature with the number of qualified AP exam scores at 20 comprehensive high schools in a major metropolitan school district. Most studies on the topic indicate that students who earn qualifying AP exam scores of 3 or higher are more likely to have positive post-secondary outcomes (Alexander & Pallas, 1984, as cited in McKillip & Rawls, 2013; Hallett & Venegas, 2011; Mattern et al., 2009; Parker et al., 2013). Researchers agree that students from culturally and ethnically diverse backgrounds and those from low-socioeconomic households underperform in AP classes (Conley, 2008; Hurtado et al., 2020; Kolluri, 2018) and with open-enrollment policies widening access to the courses, consideration for improving student outcomes must be considered. The disparities in qualified exam scores were clarified in a College Board report that in 2022, Black and Hispanic students earned lower average scores (2.1 and 2.4) compared to White and Asian students (3.0 and 3.4) (Ewing & Wyatt, 2023).

Literature on AP finds that a critical factor in education for students who are from historically marginalized populations, like African Americans, Hispanic students, and those from low-income households, is the levels of capital, the experience, knowledge, and resources that students bring to the learning environment and how schools build upon the students' existing knowledge. Students can develop their cultural capital through school environments and teachers who focus on implementing culturally relevant pedagogy and college-going environments. For teachers to employ these practices, they must be supported and receive feedback, making teacher professional learning another factor that may be linked to student outcomes in AP exams.

For these reasons, this study sought answers to the following research question: Does the percentage of positive responses on a climate survey assessing college-going culture and teacher feedback and support account for a significant amount of variation in qualified AP exam scores?

**Study Findings**

The descriptive statistics show that the percentage of qualified exam scores in the sample (M = 5.05, *SD* = 4.72) is extremely low. This corroborates other findings in the literature that students culturally and ethnically diverse students and those from low-SES households perform worse on AP exams (Ewing & Wyatt, 2023; College Board, 2014; Plucker & Peters, 2016; Ricciardi & Winsler, 2021). The general results revealed that "Teacher Feedback and Support," "College-Going Environment," total school enrollment, and the percentage of low-SES students share a meaningful relationship with qualified AP exam scores. Specifically, the results demonstrated that "Teacher Feedback and Support" was the strongest predictor of qualified AP exam scores and had a negative relationship with student scores. Additionally, the results indicated that total enrollment and the percentage of students from low-SES households also had

a negative relationship with exam scores. Finally, "College-Going Culture" was positively related to exam scores.

### *Total Enrollment and Percentage of Low-SES Students*

In terms of understanding what influences AP exam scores, total enrollment, and the percentage of students from low-SES households are not within a campus's control; however, they are linked through the literature with a variety of student outcomes. This study found that both variables have a negative relationship with AP exam scores which was in line with empirical research. Results showed that when the number of students enrolled in a comprehensive high school increase, the number of qualified exam scores decreases. Further, when the number of students identified as being from a low-SES household increased, qualified exam scores decreased. This pattern of results is consistent with other published reports like that of Hallett and Venegas (2011), who explored the impact of socioeconomic status in a sample with similar demographics. Through their mixed-methods study, the researchers demonstrated that students from low-SES households had low AP exam passing rates and received lower scores on those exams in comparison with their grades in the coursework (Hallett & Venegas, 2011).

A potential explanation for the negative relationship between SES and AP performance is the role different forms of capital plays in student success. For instance, the literature that shows students from low-socioeconomic households can lack the cultural capital that is considered innate to middle- to upper-class homes, and that makes success in AP classes more likely (Johnstonbaugh, 2018). For students from low-income households or from minority races, their families' capital regarding the process of attending college tends not to be enough to guide students to post-secondary success requiring an outside influence to develop it, in this instance

from a school environment (Andersen & Hansen, 20120; Lareau, 1987; Lareau & Horvat, 1999; Lareau & Weininger, 2003). Another link to the literature is that those in low-SES households often lack the economic capital to have their students participate in extracurricular experiences that further develop cultural and social capital (Duncan & Murnane, 2011; Johnstonbaugh, 2018; Morris, 2015). Students from low-SES households tend to attend low-SES campuses, often identified as Title I campuses, which present barriers to student success like teacher turnover and lack of resources to fully implement programs with the potential to support short and long-term academic success (Hallett & Venegas, 2011).

### *College-Going Culture*

This study found that higher percentages of positive survey responses in "College-Going Culture" were associated with higher percentages of qualified AP exam scores. These findings are in line with Conley's (2008) and Hurtado et al.'s (2020) discussions surrounding the importance of a college-going culture to academic success. A major component of college readiness is the college-going environment that helps students develop cognitive strategies, content knowledge, self-management skills, and knowledge about post-secondary education (Conley, 2008). Culturally and ethnically diverse students and those from low-SES households are at risk of derailment on their path to college if they lack proficiency in any of these areas (Conley, 2008; Hurtado et al., 2020). Conley (2008) reports that a college-going environment can help students develop cognitive strategies and self-management skills alongside the content knowledge they need to succeed. The positive correlation in these findings may be influenced by the fact that the campus environment better-supported students in their development of those academic behaviors identified by Conley (2008). Interacting in a college-focused environment puts self-management capabilities, like time management, persistence, and study skills, into the

content as students are forced to develop these skills if they want to succeed in their courses (Conley, 2008). The conversations about college processes are vital (Conley, 2008; Hallett & Venegas, 2011; Hurtado et al., 2020), but to achieve higher exam scores, it is the focus on developing skills through the coursework that is most strongly connected with the findings of this study.

It is also critical to note that the AP classroom setting can be an opportunity for the students to develop academic and cultural resources as they navigate college-focused content and processes. The Academic and Cultural Demands-Resources (ACD-R) Framework (Martin & Collie, 2022) provides conceptual guidance on the link between academic and cultural resources (like forms of capital and high-quality curriculum) with the demands put on academic performance. According to this framework, academic and cultural resources can boost positive effects and buffer the adverse effects of public school environments. For example, educational resources, like quality instruction and a positive learning climate, can buffer the negative effects of things like micro-aggressions and socioeconomic status (Martin & Collie, 2022). The findings of the present study support the assertion of the ACD-R Framework that school factors, like culture, can have a positive influence on students.

Sustaining the college-going environment means that in AP and campus-wide, students also will have more knowledge of college processes, and students in these schools are more likely to be accepted and enroll in four-year universities (Roderick et al., 2011). Advanced Placement, by nature, mimics a college setting, but it is up to the teachers to maintain the college focus and further develop that environment through content-focused and cultural conversations (Conley, 2008; Hallett & Venegas, 2011; Hurtado et al., 2020). Students in AP classes are more

likely to talk about the college admissions process and be encouraged to apply to college by their teachers (Venezia & Kirst, 2005).

### *Teacher Feedback and Support*

This study resulted in the unexpected finding of a negative relationship between teacher feedback and support and AP exam scores. Specifically, the results indicated that higher perceived teacher support was associated with reduced qualified exam scores. This finding is inconsistent with most of the literature surrounding AP and advanced courses in general.

Teaching AP courses requires a robust support system as the content of the courses is known to be broad and deep. Part of that system includes a commitment to culturally relevant pedagogy, which is marked by high expectations, cultural competence, and critical consciousness from the teacher (Byrd, 2016). These behaviors and beliefs are not always innate, and teachers who are supported are more likely to develop these qualities (Byrd, 2016; Dover, 2013; Pagan, 2022; Villegas & Lucas, 2002). Because teachers have such a significant influence on student development, their potential to limit cultural and racial disparities in AP must be addressed intentionally (Pagán, 2022). The support system for teachers must include ongoing coaching to sustain any behavioral and pedagogical changes. Studies show that teachers who engage in job-embedded professional learning and have a supportive peer group experience positive transformation in teaching behaviors (Saavedra et al., 2021). Research also suggests that teachers can better internalize and employ culturally relevant pedagogy through participation in long-term culturally relevant professional development (Johnson, 2011; Johnson & Fargo, 2010; Pagán, 2022). College Board has acknowledged and addressed this issue by partnering with project-based learning organizations for training, providing weeklong summer institutes for each AP content area, online workshops throughout the year, equity workshops for teachers and district

leaders, and mentorship cohorts (College Board, n.d.b.). In Sunrise ISD, the district has a stated commitment to instructional equity, which includes culturally relevant teaching practices and the training to accomplish this goal.

The negative relationship indicates that teacher feedback and support provided by Sunrise ISD might not be limited by district and campus constraints. In reviewing the district's website, a variety of professional learning opportunities are available, but the highlighted sessions and instructional tools are all aimed at alignment with STAAR subjects, and there is no apparent mention of AP. Exploration of the website leads to the department for advanced courses and gifted and talented programs, which do have summer learning opportunities for teachers. These opportunities include topics like the social and emotional needs of gifted students, differentiated instruction, and engaging students through depth and complexity, which are topics that align with the research (Byrd, 2016; Johnson, 2011; Pagán, 2022; Saavedra et al., 2021). However, these are all considered optional training for AP teachers, and not all teachers are willing or able to participate in summer professional learning. Campus-based professional learning options during the school year are also limited by time constraints related to planning periods and after-school responsibilities. Oftentimes on dedicated professional learning days, campus administration pre-determines what sessions or activities teachers will participate in despite what is available from the district, further limiting AP teachers from participating in potentially beneficial training. This leads the researchers to conclude that leading the provided options may not be accessible to the AP teachers who could benefit from them, or those who do participate may face barriers to implementation.

Another potential explanation for the expected finding is related to the role of teacher motivation in successful implementation. Research suggests one of the barriers to the successful

implementation of professional learning in teacher influence in AP exams is a potential lack of motivated and prepared teachers. In a 2011 study, Hallett & Venegas reported findings that teachers were learning the content alongside students, displayed a lack of preparedness and motivation to teach the content, and that the prominence of this behavior was heightened in low-SES urban schools. This suggests that even if teachers do receive feedback, their personal motivations are preventing efficacy in instruction. Teacher burnout has long been an issue in the field with negative associations with motivation and efficacy (Westphal et al., 2022). Since the pandemic, burnout has increased for a variety of reasons, including a lack of experience in online instruction and stress management (Westphal et al., 2022). Prolonged exposure to these stressors makes burnout more likely, and the pandemic merely added stressors to an already growing problem. Despite feeling supported, factors like burnout can cause teachers to lack the motivation to implement what they learn or know is impactful for students (Hellebaut et al., 2023).

Finally, the issue of fidelity in implementation arises in relation to these findings. One of the benefits of teaching an AP course is that there is no prescribed curriculum, and teachers retain autonomy in creating course syllabi. College Board provides sample syllabi, course resources, instructional videos, and practice exams, among many other instructional resources, but the onus falls to the teacher on how to incorporate these resources into the course (College Board, n.d.c.). This autonomy can be beneficial, but it can also create questions surrounding the fidelity of the implementation of AP content and practices from professional learning. Some issues with fidelity may be related to the collective efficacy of teachers. Research suggests that teachers who collaborate in effective professional learning communities (PLC) are more likely to achieve positive student outcomes, and participation in these learning communities can predict

greater collective efficacy (Voelker & Chrispeels, 2017). Sunrise ISD has PLCs on all high school campuses, but typically they center around general education content. There is only one comprehensive campus known to have a dedicated PLC for AP teachers. Teachers may feel supported, but AP teachers, specifically, may not be implementing instructional practices with fidelity due to PLC issues. To mitigate barriers to implementing the practices learned through all this professional development, collaboration with teachers through professional learning communities may serve to create a sense of collectivity among AP teachers resulting in fidelity across instructional practices (Voelker & Chrispeels, 2017).

**Limitations**

This study faced several limitations worth addressing. First, the study was conducted based on data that was publicly available and unable to be manipulated by the researcher. This leads to some unknown factors in how the datasets provided by Sunrise ISD were compiled and limited the study to the variables the district deemed important. There is no reliability and validity information available about the survey instrument, and it is assumed that because it was administered by a third-party that, instrument validity has been tested. Most importantly, the use of public data sets also prevented the researcher from accessing the response rates of the campus climate survey for all the sites included in the sample. This means that it is unknown to the researcher what percentage of the teachers are represented in the survey results. Low participation rates raise concerns about the representativeness of the sample. Meaning it is unknown how many AP teachers responded to the survey and if the results honestly represent the feelings of AP teachers and educators in general on the categories used in the regression analysis.

Another limitation is that correlational research can only give insights into the relationships between variables, but it cannot predict cause-and-effect relationships. Therefore, it

is possible teacher feedback/support, college-going culture, and the percentage of low SES students might not exert a causal influence on AP exam performance. Finally, the study was limited by the small sample size (20 comprehensive high school campuses). Multiple regression does not always work well with low sample sizes. Specifically, parametric procedures – such as multiple regression – often have lower power and higher error rates when applied to small samples and can result in researchers misidentifying the variables that relate to the outcome (Mertler, 2022). However, this limitation was addressed by applying the Lasso technique – a method shown to work well in small sample situations - in combination with multiple regression to instill confidence in the results.

Finally, the study was limited by Sunrise ISD policies and procedures that severely limited the researcher's ability to work within the district. As a student researcher, the policies and procedures of Sunrise ISD limited the researcher from engaging in academic research that aligned with university expectations. With a more straightforward process through the research and review board, the design of this study could have been improved by the ability to gather qualitative data and additional quantitative measures allowing for more specificity in the results.

**Directions for Future Research**

In expanding the research base of College Board's AP program, future studies should address additional non-cognitive factors influencing exam scores. With initiatives by local and federal governments and demographic changes in the U.S., access to AP courses is expanding to Black, Hispanic, and students from low-SES backgrounds who were not originally intended to take these classes. It is imperative that we continue to explore how to help the culturally and ethnically diverse students in these classes achieve qualifying exam scores. The results of this study indicate that studying the effects of teacher professional learning on AP exam scores is

especially important. This includes understanding what types of support teachers find beneficial and the specific nature of professional learning available to teachers in Sunrise ISD. Because teachers reported being in a supportive environment, more research is needed into why that support did not translate into higher student outcomes despite its apparent link through present research.

With this specific sample from Sunrise ISD, the researcher should first address the limitations of the survey instrument. As noted above, one limitation of the survey instrument is that it provides a general estimate of perceived support for each campus. However, the nature of the data did not allow for an examination of perceived support among those responsible for teaching AP courses. Thus, future work with this sample should seek to administer or gather survey results specific to AP teachers to ensure the results represent the group under examination. Additionally, to understand the nature of the feedback and support, research in Sunrise ISD could use the campus with an AP PLC as an experimental group to be compared against a similar campus with a general or no PLC to understand the influence of that type of learning community. This type of study could allow the researcher to exercise more control on the support, feedback, and professional learning, gaining greater insight into correlations with AP exam scores.

Moving beyond this sample to the broad scope of AP programs, understanding the exact nature of the feedback and support is critical to make improvements that yield positive relationships with AP exam scores. Many studies find that job-embedded, ongoing coaching with supportive peer groups and a culturally relevant focus result in positive student outcomes (Johnson, 2011; Johnson & Fargo, 2010, as cited in, Pagán, 2022; Saavedra et al., 2021). To understand the divergence of the results from the literature, one needs a complete picture of the

teacher feedback and environmental support that influenced the survey results. In the current study, it is unclear if the professional learning mirrored that of what is discussed in the empirical literature as being effective. Therefore, future studies could examine the AP exam scores of students whose teachers participated in various College Board training and yearlong cohort opportunities. It may also include the role of teacher agency in implementing the learning from professional development. Lockton and Fargason (2019) suggest that teachers tend to highly value social cohesion, which can be an obstacle in pursuing cultural and institutional changes, making this an alternative area of exploration in the role of feedback and support on exam scores. The role of social cohesion in implementing instructional reform is important, as cited by Lockton and Fargason (2019) in their findings that teachers felt they could not sustain the changes without the support of a like-minded group. The study also reported that teachers feared risking collegial relationships and thus hesitated to push for instructional changes (Lockton & Fargason, 2019).

This study found that low-SES status was the second-largest predictor of qualified AP exam scores, and while schools cannot control the economic status of the students they serve, some of the negative effects can be mediated through other factors. Research indicates that student engagement is a mediating factor in student outcomes (Tomaszewski et al., 2020). Through a series of multiple regressions, Tomaszewski et al. (2020) found that increasing engagement in students from low-SES households correlated with higher achievement. Student engagement can be directly influenced by schools and teachers through curriculum selection and teaching practices. Empirical investigations demonstrated that curriculum and approaches emphasizing projects, collaborative discussion, and students' cultural identities lead to increased

student engagement (Parker et al., 2013; Saavedra et al., 2021; Tomaszewski et al., 2020). This further highlights the importance of using teaching practices like culturally relevant pedagogy.

To further mitigate the negative impacts of being from a low-SES household on AP exam scores, schools must invest in areas beyond the AP classroom and influence the entire campus (Fitzpatrick, 2020; Hallett & Venegas, 2011). This means improving teacher quality in AP courses and ensuring that teachers are motivated and equipped to teach a high-rigor curriculum (Hallet & Venegas, 2011). It also means focusing on bolstering other campus activities with a college focus in mind. This both furthers the college-going environment and accounts for disparities in cultural and social capital known to exist in this student demographic. One area, suggested in findings from Fitzpatrick (2020), is reducing counselor loads where possible, ensuring that counselors engage in activities (i.e., assisting students with financial aid applications), and having college-focused conversations with students who have parents without bachelor's degrees can have positive effects on college readiness.

**Conclusions**

Research demonstrates that students from culturally and ethnically diverse backgrounds and from low-SES households have worse performance on AP exams than their White and middle- to upper-class peers (Conley, 2008; Ewing & Wyatt, 2023; Hurtado et al., 2020; Kolluri, 2018). Historically, research has focused on access to AP classes, but as more states approximate fair enrollment (EdTrust, 2020), there has been a shift in examining the factors influencing qualifying exam scores for these historically excluded populations. Cultural capital, college-readiness indicators, and teacher pedagogy have emerged as important non-cognitive factors in student achievement (Bourdieu, 1973; Conley, 2008; Hurtado et al., 2020; Kolluri, 2018). The current study attempted to address this shift by exploring the relationship between teacher

support and feedback, college-going environment, enrollment, and the percentage of students from low-SES households in 20 comprehensive high schools. The results of this study highlight that teacher feedback and support had the strongest relationship of the included variables, but in contrast with the literature, it correlated with lower qualified AP exam scores. The results indicate that further research is needed to understand the specific nature of teacher feedback and support that may correlate with an increase in qualified AP exam scores.

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## Biosketch

Kolbe Ricks was born. She went to school. She wrote a dissertation. She graduated.