

Quantitative Analysis of Minority Students' College Preparedness and Matriculation Through Advanced Placement Test Scores

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Abstract

This study evaluated Advanced Placement test scores of high school students in local Maryland school systems to determine college preparedness and educational success of minority groups. The research utilized data provided by the Maryland State Department of Education to conduct a quantitative study that analyzed the percent of passing scores in relation to the ratio of minority students in local school counties. Analogous to that of the Critical Race Theory, it was hypothesized that minorities are not well prepared for college matriculation because of the epistemological perspective of social constructivism which has created educational gaps. Among the 24 local school systems in Maryland, Charles County, Howard County, and Prince George's County were used for the study. The classifications used when choosing the counties to evaluate were based on the rating of college preparedness. The counties selected were either (a) top-ranking, (b) average-ranking, or (c) low-ranking. Using ranking measures, the study closely evaluated each county to determine the relation between Advanced Placement test scores and the ratio of minorities within the school systems. The findings of the study suggested that Advanced Placement test scores were lower in counties with a higher percentage of minority students and higher in counties with a lower percentage of minority students. Therefore, the results confirmed that counties with high minorities population are ill-prepared for college matriculation.

Keywords

College Preparedness, College Matriculation, College Enrollment, College Readiness, Minority Students, Underrepresented, Advanced Placement test, Success Predictors

1. Introduction

College enrollment throughout the United States has increased substantially in the past years as the demand for post-secondary degrees has become a mandatory requirement for most job positions. Although the overall enrollment rate has increased, the level of minority matriculation, specifically African American and Latino/Latina students, is still at a lower percentile. To understand if the steadily low college-enrollment rate among minorities is due to the lack of preparedness for matriculation, this study examined high school Advanced Placement test scores to predict whether the educational curricula of high schools are preparing minority students (African Americans and Latino/Latina) for college enrollment.

Addressing the topic of college-preparedness among minorities, this study looked at Advanced Placement test scores of three different counties in Maryland with different rankings to determine the relationship between test scores and the ratio of minority students in the county. Using the results of the Advanced Placement test scores, the study analyzed college preparedness and matriculation into college of minority students. The rigorous college-level courses offered in the high school educational system helps to show students' ability to comprehend and handle the demanding and complex subjects covered in college level courses.

The study utilized a comparative, quantitative approach to analyze Advanced Placement test scores provided by the Maryland State Department of Education of (a) Howard County, (b) Charles County, and (c) Prince George's County to determine if there is a relationship between test scores and the number of minority students in each county. The counties chosen were in accordance to their ranking in the Advance Placement test scores, either performing as (a) top-ranking, (b) average-ranking, or (c) low-ranking.

Through the analytic lens of Critical Race Theory, within the prism of Social Constructivism Theory, educational gaps that occur in institutional systems are explained through social constraints that affects the minority population. Understanding the constraints, this study examined if high school institutions are preparing minority students for college matriculation. Some of the major questions to be answered through the study are: has there been a difference in test scores between minority groups and non-minority groups? Is the educational system working to change the

educational gap within minority groups? Is the educational system taking effective steps to close the educational gaps in minority groups compared to non-minority groups that has been caused because of social constraints? For this study, data of Advanced Placement test scores was examined for the six consecutive years from 2011-2016. The study analyzed whether the scores and number of minorities have been in relation to the success rate. This study is important because the results will be significant to high school educational institutions to understand the effectiveness of their institution's curriculum and help to determine if actions must take to ensure the preparation of minority students for college matriculation.

2. Literature Review

There is an under-representation of minority population in various professions, and among the social and political constraints regarding the issue, major impacts are the deficiency of college matriculation, retention and completion rate among minority population. Looking at locations with a higher minority demographic, there is a lack of proper college preparation that accommodates to the educational gap that exist among underrepresented population compared to other demographic groups. A college degree is a critical predictor towards a higher profession, and a better wage, and the lack thereof can also be a negative predictor. The following reviews discuss research findings regarding minorities college matriculations and retention in chronological order of the year they were published.

"Can College Outreach Programs Improve College Readiness? The Case of the College Bound, St. Louis Program" (2015) by collaborative investigators of the Research in Higher Education, the study looked at the College Bound program at St. Louis to see the impact it has on minority population matriculating into college. Through the Social Capital theory framework, the research acknowledges that there are various barrier and lack of resources that inhibit college participation among "low-income, minority and first-generation college students." The result of the study showed that the students that participated in the College Bound program had a positive performance achievement on examination, course grade paralleled to their comparison groups.

"Coloring the College Pathway: A More Culturally Responsive Approach to College Readiness and Access for Students of Color in Secondary Schools" (2013) by Anjalé Welton and Melissa Martinez conducted a qualitative study to look at college choice and opportunity network that connects students' of color to college resources. The study revealed that one model does not provide a comprehensive explanation of researches that failed to explain the college access and readiness as it is necessary to incorporate cultural and social roots that impact pathway to college.

"Rethinking Advanced High School Coursework: Tackling the Depth/Breadth Tension in the AP US Government and Politics Course" (2011) by writers of the Journal of Curriculum Studies discusses design experiments that aim to balance of college-preparation courses and the financial coverage for the courses. The study found that a "semi-repetitive content-rich project cycles can lead to same or higher scores on the AP exam along with deeper conceptual learning." But the study also indicates that there need to be changes in the way the curriculums are thought to students.

"Involving Low-Income Parents and Parents of Color in College Readiness Activities: An Exploratory Study" (2010) by Cheryl Holcomb-McCoy looked at high school counselors' belief and views about the involvement of parents in their children's college application process. The result of the study confirmed that it is critical to provide knowledge on college application process for parents for "the future postsecondary success of low-income students and students of color who will likely be first-generation college students."

"Moving Beyond High School Expectation: Examining Stakeholders' Responsibility for increasing Latina/o Students' College Readiness" (2010) by Erica Yamamura, Melissa Martinez and Victor Saenz examined the significance of college readiness among stakeholders in the South Texas border region. Stakeholders held for the research includes "teachers, counselors, parents, students and superintendents." The study revealed that it is necessary to have a collective responsibility in students' college readiness among every stakeholder.

"Privilege, equity, and the Advanced Placement Program: tug of war" (2009) by Jack Schneider discusses about the college level courses, Advanced Placement course, provided in high school. The Advanced Placement test is critical to help build students with high academia, and this paper examined the history of how it expanded and combat inequality in regards to accessibility for every student. The research indicates that while over time the courses became available to every student, there is still a problem regarding equity. The Advanced Placement courses are given to students who are thriving in their classes, and that places underserved population at a disproportion. The program "fail[s] to level the playing field."

"College Readiness and Academic Preparation for Postsecondary Education" (2008) by Jeanne Reid and James Moore conducted a qualitative study to examine how minorities students who performed exceptionally in high school perform in college. The study relied on the "student's perception and attitudes of their preparation for postsecondary education." The study found that it is necessary to have resources for minority population to help prepare for college and learn skills necessary for success while in college.

“Preparing Underprepared Students for College: Remedial Education and Early Assessment Programs” (2008) by William Tierney and Lisa Garcia looked at “remedial education at the postsecondary level” to determine if the courses are effective to help students successfully complete their postsecondary education. The research found that there is a low enrollment number of students within the underrepresented and low-income demographics in postsecondary schools, which already makes it difficult to help with graduation rate. Early programs at high school levels is essential to have an effective improvement in the enrollment and attainment of underrepresented groups in college.

“Public High School Graduation and College Readiness Rates in the United States” (2003) by Jay Greene and Greg Forster looked at the statistics of high school graduation and the freshmen college matriculation rate within minority groups using the Greene Method for data count. The low percent of college enrollment set an evidential platform that underrepresented groups are not well-prepared through the public high school system on skills that are necessary for college matriculation. The study found that there is a disproportion in high school graduation and college matriculation among minority population.

“Defining College Readiness from the Inside Out: First-Generation College Student Perspectives” by Kathleen Byrd and Ginger MacDonald stated that access to college is problematic “due to the issues of academic, social, and economic readiness.” The research collected feedbacks from first-generation college students through qualitative phenomenological interview methodology. The result of the study had emerging themes relating to background factors that influence a student’s success, self-concept on their abilities to excel in college and the skills needed for college as an important aspect to college readiness.

3. Theoretical Framework and Research Methodology

The structure of the research is a hybrid of the Critical Race Theory and the Social Constructivism Theory to provide an understanding on the established founding factors that have created educational gaps among minorities and the effect they have on college matriculation if not dealt with in secondary educational systems. The Critical Race Theory deals with the “relationship among race, racism and power” (Delgado & Stefancic, 2012). It explains the existence of racism in the United States and the ineffectuality of the system for equality in regards to the treatment of people of color. There is “less incentive to eradicate” the issue of racism as it directly benefits the privileged and elite group which has a direct reflect on race. The philosophy of racism is also visible in the educational institution through varying factors that advance only the interests of the elite class while ignoring the damage it may have on the deprived minorities. In addition, the epistemological Social Constructivism Theory further explains the importance of social interaction for the fundamental development of knowledge. This is an important topic that allows classroom instructions to be student-centered, catering to each “individual’s production of knowledge, value, beliefs and opinions” to better enhance the students’ learning experience (Kompf & Denicolo, 2013).

The two theories provide an acknowledgement and an evaluation on the pre-existing factors that are challenging minority groups, and they allow the analysis of this study to determine the effects of pre-existing factors on college preparedness among minorities. They also identify if high school educational systems are catering to the needs of their students, specifically minority students, to excel in school. Comparing Advanced Placement test scores of different counties, this study evaluates the passing test scores in relation to the number of minority student population in the county. The study helps to determine if high school educational systems meet the needs of minority students for college matriculation.

The research utilizes comparative, Quantitative approach to data provided by the Maryland Department of Education on the Advanced Placement test scores and designed a One Group Post-test Only design to analyze the relationship between the percent of passing scores and the ratio of minority students in the counties. One Group Post-test design allows researchers to observe a selected target groups with control of the measurements. The operational variable of the study are the test scores of students in the different counties and the minority students. The measurement used for the study is a row count of the actual numbers of students in each county. For this research, it was hypothesized that minorities are not well prepared for college matriculation because of the epistemological perspective of social constructivism which has created educational gaps. Minorities that are the focus of the study includes African Americans and Latino/Latina groups. The analytic level of the study is at a micro-level. The study analyzed three counties, (1) Howard County, (2) Charles County and (3) Prince Georges’ County in the state of Maryland. The data provided by the Maryland Department of Education was analyzed through the archival technique. The counties selected to examine were through methods of convenience sample as they were in accordance to their ranking in the Advance Placement test scores, either performing as (a) top-ranking, (b) average-ranking, or (c) low-ranking.

4. Data Analysis

The study evaluated the relationship between Advanced Placement test's passing rate of high school students and the number of minority students in three counties: Charles County, Howard County and Prince George's County through the data collected from the Maryland State Department of Education website starting from the year 2011 to 2016.

4.1. Comparing the population

Viewing the population of each county, (see Figure 1) Charles County had the lowest minority population of high school students while Prince George's County had the highest number of high school student population. Focusing on minority students, (see Figure 2) Howard County had the lowest minority student population and Prince George's County had the highest minority student population.

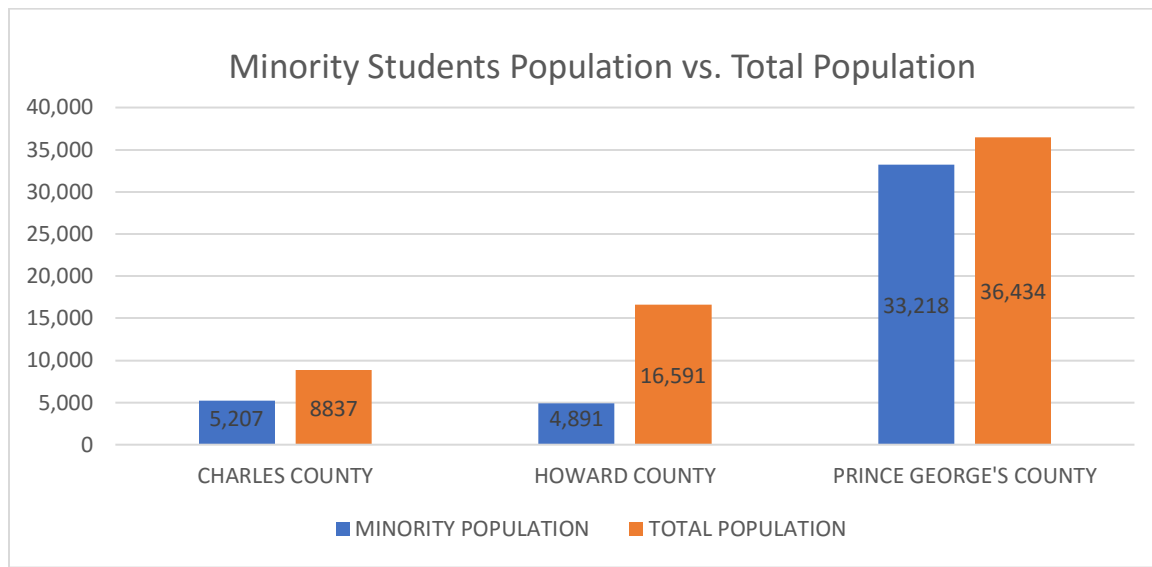


Figure 1: The average high school population of minority students in Charles, Howard and Prince George's County compared to the total high school student population

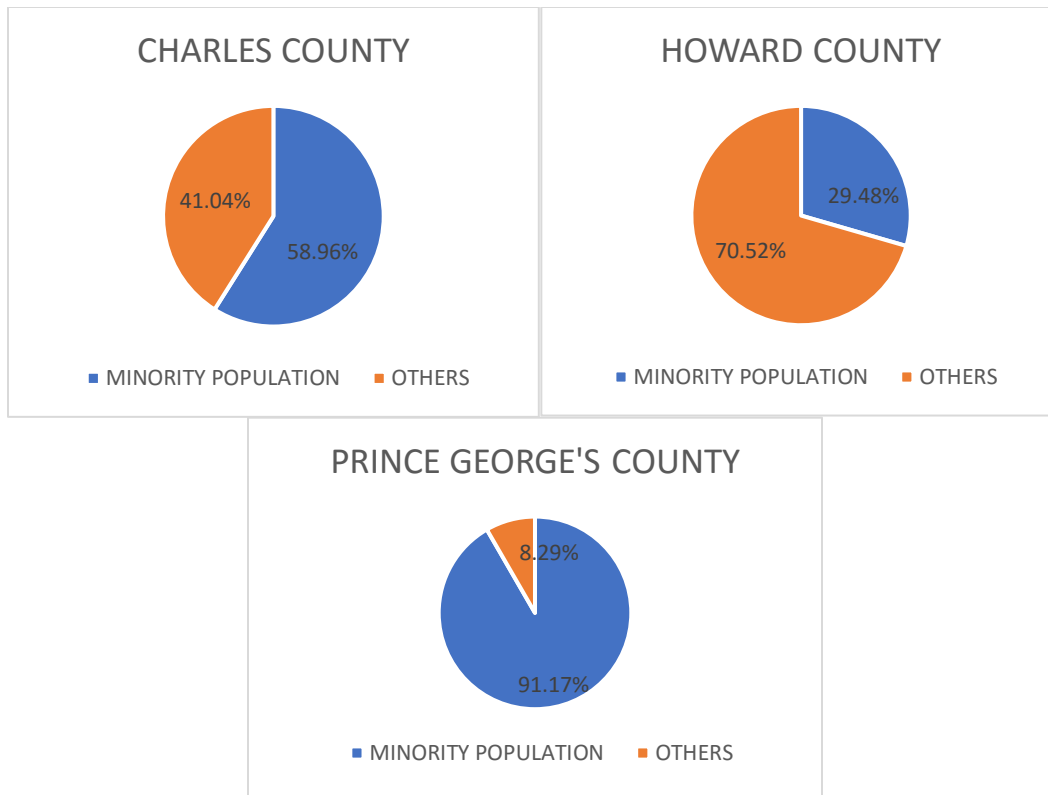


Figure 2: The average population of minority students (African American and Hispanic Latino/a) compared to other student population in Charles County, Howard County, and Prince George's County

4.2. Comparing Advanced Placement test passing scores

The difference of passing scores for the advanced placement (Figure 3) in the three counties: Charles, Howard and Prince George's county implicates whether the curriculums provided in high schools of each county prepares students for college level courses. Based on the data (Figure 3), Prince George's County scored the lowest in the Advanced Placement test while Howard County scored the highest in the Advanced Placement test scores.

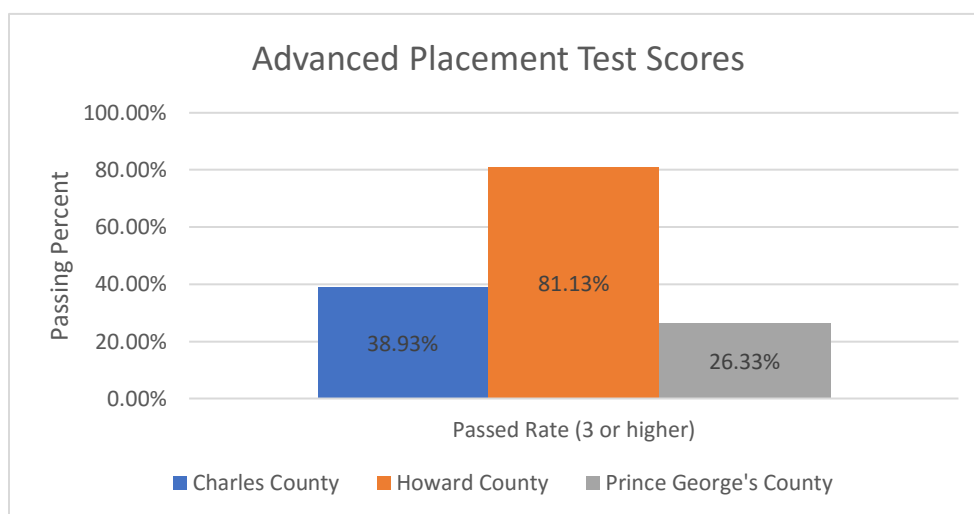


Figure 3: The total percent of high school students passing scores of the Advanced placement test in Charles, Howard and Prince George's County

4.3. Mean differences to obtain correlation

The Advance Placement test scores in Charles relating to the percent of Minority in Charles (Figure 4) shows a significance of 0.01. The Advance Placement test scores in Howard relating to the percent of Minority in Howard (Figure 4) shows a significance of 0.05. The Advance Placement test scores in Prince George's relating to the percent of Minority in Prince George's (Figure 4) does not show a significance.

Correlation								
Significance at 0.01		Percent Minority Charles	*Significance at 0.05		Percent Minority Howard	Not Significance*		Percent Minority PG'
AP Scores Charles	Pearson Correlation	0.943**	AP Scores Howard	Pearson Correlation	-0.839*	AP Scores PG's	Pearson Correlation	-0.592***
	Sig. (2-tailed)	0.005		Sig. (2-tailed)	0.037		Sig. (2-tailed)	0.216

Figure 4: The significance of Advance Placement test scores and the minority population percent in each county.

4.4. Advanced Placement Test Score Mean difference of two set for significance of a 2-tailed hypothesis

The paired sampling statistics provides a mean average of the Advanced Placement test scores of two sets of County. Figure 5 provides the pair counties mean. The correlation of the tests scores at the pair sampling (Figure 6) shows that Advanced Placement Test scores of Charles County and Howard County have a negative correlation with a significance (2-tailed) of 0.0001. The correlation shows that Advanced Placement test score of Charles and Prince George's county have a positive correlation with a significance (2-tailed) of 0.001. The correlation shows that Advanced Placement test score of Howard and Prince George's county have a negative correlation with a significance (2-tailed) of 0.0001.

Paired Sample Statistics				
		Mean	Standard Deviation	Standard Error Mean
Pair 1	AP Charles	38.9333	4.83308	1.97310
	AP Howard	81.1333	0.83825	0.34222
Pair 2	AP Charles	38.9333	4.83308	1.97310
	AP PG	26.3333	0.95847	0.39129
Pair 3	AP Howard	81.1333	0.83825	0.34222
	AP PG	26.3333	0.95847	0.39129

Figure 5: Mean sample and Standard deviation of Advanced Placement Scores at two sets of county

Paired Samples Correlation											
		Correlation	Significance	Mean	Standard Deviation	Std. Error Mean	95% Confidence Lower	95% Confidence Upper	t	df	Sig. (2-tailed)
Pair 1	AP Charles and Howard	-0.844	0.035	-42.200	5.556	2.269	-48.034	-36.366	-18.596	5	0.0001
Pair 2	AP Charles and PG's	0.291	0.576	12.500	4.64543	1.896	7.725	17.475	6.644	5	0.001
Pair 3	AP Howard and PG's	-0.114	0.830	54.800	1.34313	0.548	53.390	56.210	99.940	5	0.0001

Figure 6: Sampling of Advanced Placement test scores of two sets of county to obtain correlation and Significance

4.5. Advanced Placement Test Score Mean difference of two set for significance of a 2-tailed hypothesis

The paired sampling statistics provides a mean average of the Minority Population of two sets of County. Figure 7 provides the paired means of counties. The correlation of the minority population at the pair sampling (Figure 8) shows that percent minority population of Charles County and Howard County have a positive correlation with a significance (2-tailed) of 0.0001. The correlation of percent minority population of Charles and Prince George's county have a negative correlation with a significance (2-tailed) of 0.0001. The correlation of percent minority population of Howard and Prince George's county have a negative correlation with a significance (2-tailed) of 0.0001.

Paired Samples Statistics				
		Mean	Standard Deviation	Standard Error Mean
Pair 1	% Minority Charles	58.9617	1.68968	0.68981
	% Minority Howard	29.4833	1.84289	0.75235
Pair 2	% Minority Charles	58.9617	1.68968	0.68981
	% Minority PG	91.1683	0.17128	0.06992
Pair 3	% Minority Howard	29.4833	1.84289	0.75235
	% Minority PG	91.1683	0.17128	0.06992

Figure 7: Mean sample and Standard deviation of the percent minority population at two sets of county

		Correlation	Significance	Mean	Standard Deviation	Std. Error Mean	95% Confidence Lower	95% Confidence Upper	t	df	Sig. (2-tailed)
Pair 1	% Minority Charles	0.948	0.004	29.478	0.590	0.241	28.859	30.097	122.427	5	0.0001

	and Howard										
Pair 2	% Minority Charles and PG	-0.373	0.466	-32.207	1.761	0.719	-34.055	-30.359	-44.804	5	0.0001
Pair 3	% Minority Howard and PG	-0.630	0.180	-61.685	1.955	0.798	-63.737	-59.633	-77.272	5	0.0001

Figure 8: Sampling of percent minority population of two sets of county to obtain correlation and Significance

5. Conclusion

The data obtained provides proof that the Advanced Placement test scores were decreasing in counties with high percent of minority population students. In the other hand, there was an increase in Advanced Placement test scores in Counties with less percent of minority population students. This helps to confirm that locations with a higher minority population does not prepare minority students for college matriculation.

This study helps to surface the question on whether educational systems are working to change the educational gap that exists in the minority group. The results can help provide evidence to create initiatives to change high school curriculum that is catering to minority students. This research did not have the AP scores specifically for minorities to prove the correlation between the lower minority student population and a higher Advanced Placement test score percentile. Future researches can refine the study and obtain the specific percent of minority students that are taking the Advanced Placement test and their passing percent in different counties.

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