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Influence of African American Engineering Student Perceptions of Campus Climate on Graduation Rates

Many complex systemic problems impact negatively on the production of minority engineers. We show from Engineering Workforce Commission (EWC) national data on engineering enrollments and graduates that the African American engineering graduation rate is the lowest of any underrepresented minority group and substantially lower than the rate for other U.S. students.

The systemic causes of low African American graduation rates are well understood. However, little is known about the perceptions of individual students and what influence students' internal responses to their external environment may play in their success or lack thereof. The present study examined African American undergraduate engineering student perceptions of institutional and personal/social campus climate factors to determine how these perceptions influence academic performance and institutional graduation rates.

Data collection was accomplished through use of a quantitative and qualitative survey instrument administered to a national sample of subjects enrolled at a representative cross-section of institutions. Summated subscale correlation analysis was employed to study student perceptions of eight climate variables. Six of the eight subscales were adaptations of subscales devised by previous researchers, while two were essentially new. Reliability and validity were established from previous research and from pilot testing of the present instrument.

Institutional graduation rates were computed through an algorithm applied to the EWC institutional enrollment and graduation data set. A number of statistical tools, including ANOVA and ANCOVA, were used to examine relationships among demographic, perceptual and institutional variables.

Analysis of the data revealed that student perceptions of campus climate were largely positive even though the overall academic performance of students in the sample was mediocre. Perceptions on the racism and discrimination subscale were found to be not as positive, particularly among students with lower grades.

The research discovered wide variation in individual institutional African American graduation rates and differences in rates among groups of institutions categorized by their academic selectivity or by their designation as a Historically Black College and University (HBCU). In the academic selectivity categories, students enrolled at institutions in the higher selectivity categories had higher graduation rates. However, students enrolled in the HBCU category had more favorable perceptions of their college experiences and had higher grades than students attending other institutions. Qualitative data in the form of students' comments were aligned with the trends found in the quantitative analyses of subscale results.

After controlling for institutional category, higher institutional graduation rates were associated

with students' lower perceptions of racism and discrimination and with students' greater institutional commitment. This result points toward an institutional climate effect, as opposed to an effect observed for individual subjects across institutions. However, additional research is needed to validate the causality effect of climate hypothesis.

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