

## **First Year Experience of Minority Male and Female Engineering Students**

During the last three decades, there has been a growing public consensus that preparing a qualified engineering workforce will generate a profound impact on the nation's economy and prosperity<sup>1</sup>. However, many students who enter college with a STEM major are likely to switch within the first one or two years; this is true more so of minority students in STEM than a typical Caucasian male<sup>2</sup>. Due to both limited numbers of minority students entering STEM fields as freshmen and attrition of the students during the transition period, females and racial minorities are significantly underrepresented in the STEM workforce<sup>3</sup>.

Racial minority students are at a higher risk for attrition for several reasons. Research has found that there is a lack of academic preparation for minority students entering a university setting<sup>4</sup>. There is also the risk of stereotype threats and racial discrimination that only "certain types" of people should (or are able to) pursue math and science. Racial minorities tend to face significant social disadvantages in university environments because they are less likely to interact with peers and faculty of their racial/ethnic background who share similar social/cultural experiences<sup>5</sup>. Therefore, the additional support from the institution is pivotal to the academic success of racial minority students in engineering<sup>6</sup>.

Our qualitative research examined the experiences and perceptions of 24 minority students enrolled in introductory engineering classes at a large, urban university in the Southeast. Utilizing an in-depth interview about their prior schooling, peer/social relationships, and the experience of being a racial minority in the program, the analysis explored the experiences of a marginalized group that often remain invisible and silent. Specifically, their social adaptation, awareness of minority underrepresentation, and prior school experiences that contributed to their college academic success were closely examined in this study.

The qualitative analysis generated three major findings: a) Academic challenges are mainly due to a lack of prior exposure to a rigorous high school math/science curriculum, b) Minority students' awareness of underrepresentation and pervasive stereotype threat, and c) Significant gender differences in social adjustment of minority students. Minority females in this study were most affected by their status as being a double minority. They experienced multiple challenges including a lack of peer support, financial hardship, and family-related responsibilities. However, minority female students also expressed a strong sense of pride and joy responding to the concept of societal contribution. While most engineering students tended to view the goodness of the engineering field from the perspective of their career/job, minority female students were more likely to take the idea of societal contribution to heart and listed it as the best part of their introductory engineering class.

This qualitative study provides valuable insight into the transition experiences of minority engineering students. In particular, our research highlights unique challenges faced by minority females during the transition period, and reveals their strong desire to serve society through the engineering profession.

## References

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