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Poster: Institutional Barriers to Black and Latino Male Collegians' Success in Engineering and Related STEM Fields

Leroy L. Long III
Embry-Riddle Aeronautical University, longl2@erau.edu

Trevion S. Henderson

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EMBRY-RIDDLE Aeronautical University
COLLEGE OF ENGINEERING
Engineering Fundamentals

BACKGROUND

- For Blacks and Latinos who are accepted into engineering and related STEM fields, they face a number of barriers to their success which lead to low retention and graduation rates
- Black and Latino men have remained underrepresented at the student and faculty ranks
- Negative statistics and cultural stereotypes regarding Black and Latino men inaccurately suggest that men of color are inherently less likely to succeed in academically rigorous fields such as engineering

PURPOSE

- The purpose of this story was to categorize and critically examine the educational experiences of Black and Latino males in engineering and related STEM fields
- Particular attention was given to the "institutional barriers" that prevent Black and Latino men from maximizing their potential for success in engineering and related STEM fields

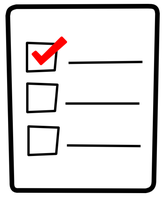
PARTICIPANTS

- 27 Black and 22 Latino male collegians majoring in engineering and related STEM fields, whose ages ranged from 18 to 24 years

FOUR MAJOR FINDINGS

- Inadequate academic advising

- Poor quality teaching
- Limited course offerings



- Insufficient Financial Aid

STUDENT EXCERPTS

Finding 1: Inadequate academic advising

A Black male and senior electrical engineering major named Derrick said, "Going through courses **one [challenge] was just [getting] advice because there are certain times for, you weren't sure whether to drop a class** and basically the professor will tell you 'you're not really good at this' so the question is how do I deal with major challenges?"

Finding 2: Limited course offerings

A Black male and senior aerospace engineering major named Charles said, "I would just say the whole major itself is pretty challenging but I would say junior year was the most challenging because the aero engineering there is only four or five professors and **they only offer that class that quarter or that semester, so if [you] don't take it then or if you drop it, you have to wait an entire year to take that class over again**…"

Finding 3: Poor quality teaching

Carlos, a Latino male and senior math major said, "We just go lecture, lecture, lecture, work, lecture, and that's it. Back in [the Caribbean country where I was born and raised] we had practice classes, but that is not the style here....We have like from Monday to Wednesday we have lectures, and Thursday and Friday we just go to the class, and with the same class we with a TA and we solve exercises…**There is a difference just going, giving lectures, and giving you theory, there is a difference between that and actually applying that theory to solve problems**"

Finding 4: Insufficient financial aid

A Latino male and recent microbiology graduate named Miguel said, "[I took] about three to four class every quarter. It's a pretty big load pretty standard every single quarter, I was here for five years –actually about four and a half because last quarter I think I only took one class because I was out of my scholarship so I had to pay for it out of pocket."

RECOMMENDATIONS

Finding 1: To address inadequate academic advising

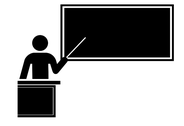
- Use targeted hiring practices to recruit more: a) Black and Latino academic advisors who can form positive relationships with men of color due to shared cultural experiences, as well as b) senior and graduate student academic advisors who can provide detailed curricular guidance after having taken engineering and related STEM courses
- Pair Black and Latino male students with mentors who are recent alumni of engineering and related STEM programs so alumni can also provide academic advising

Finding 2: To address limited course offerings

- Consider offering more transparent and diverse options for students to transfer credit hours from other institutions like community colleges or online programs
- Provide financial incentives as well as new metrics to the promotion and tenure process to reward faculty who teach courses during the summer semester

Finding 3: To address poor quality teaching

- Change engineering and STEM graduate programs so they have mandatory education classes involving pedagogy and experience teaching with a faculty member who has a record of high quality teaching
- On at least an annual basis, provide financial incentives and course releases so faculty members can use evidence-based strategies such as culturally relevant pedagogy to update curriculum in engineering and related STEM fields



Finding 4: To address insufficient financial aid

- Provide financial incentives for more students to work with faculty on research projects, curriculum updates, and outreach projects in engineering and related STEM fields
- Create endowments and scholarships for students from historically underrepresented racial/ethnic groups who have unmet financial needs

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National Science Foundation
WHERE DISCOVERIES BEGIN