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POINT OF VIEW

Minority Students and Research Universities : How to Overcome the "Mismatch"

By RICHARD A. TAPIA

A controversial theory much in the news lately claims that affirmative action is often unfair to the very students it is intended to help. Called the "mismatch" theory, it suggests that underrepresented minority students are more likely to leave science, math, and engineering when, because of affirmative action, they attend colleges for which they are unprepared.

The theory contrasts that outcome with the success that minority students experience at less-rigorous colleges, especially minority-serving institutions, and suggests that those students would be better served by less-competitive institutions, where they can be more successful.

But the mismatch theory is terribly flawed — in fact, it could set underrepresented minorities back 40 years in science participation and achievements. I say that based on my own experience as a minority scholar and my many years working with minority students at Rice University .

I have been a mathematician at Rice since 1970. I received a B.A. in mathematics from the University of California at Los Angeles in 1961 and a Ph.D. in mathematics from UCLA in 1967. I have received numerous awards for my accomplishments as a mathematician: I was elected to the National Academy of Engineering and appointed to the National Science Board by President Bill Clinton, and at Rice I have been promoted to the position of university professor, of which there have been only six named in the history of the institution. Yet at many junctures, my life could have taken a different path.

I was born in Los Angeles to parents who emigrated from Mexico . I attended a below-average high school in Los Angeles , and because my teachers and counselors did not

encourage me to go to college, even though I had demonstrated strong mathematical talent, I started to work after graduation. When a co-worker insisted that I go to college, I began at community college.

When it came time to transfer, two of my math professors strongly directed me away from less-selective four-year colleges and toward UCLA. Little did I know how crucial to my career that advice would be. As an undergraduate there, I saw other students with less mathematical talent going to graduate school, so I went to graduate school. Then, after receiving my Ph.D, I was guided by David Sanchez, the only underrepresented-minority faculty member in the mathematics department, to faculty positions at the University of Wisconsin at Madison, Stanford University, and, finally, Rice. Today I can easily say that I owe my success to my education at a top research university.

While at Rice, I have served as dissertation director or co-director for many successful minority doctoral recipients in science, technology, engineering, and mathematics (the STEM fields). I have also taught many minority undergraduates. In both cases, some of those students, perhaps most, would fit the pattern of the mismatch theory, entering Rice less prepared than most of their fellow students were.

Some scholars believe that steering such minority students to less-challenging institutions, where they can be more successful, is better for them and for the nation because doing so would increase the numbers of those receiving degrees in science and engineering. Rice and other selective research universities recruit some of the nation's most capable minority students, who enter intending to pursue careers in science, math, or engineering, and then we lose disproportionate numbers of them to other disciplines.

But numbers of degrees alone are not a good measure of success. Underrepresented minorities must be competitive with the overall population. Students at minority-serving institutions, for example, speak warmly of how confident and supported they feel in their experiences, and research universities should learn from those colleges and universities how to nurture that kind of confidence. But Ph.D.'s produced at minority-serving institutions will not become faculty members at top-tier research universities, which choose their professors from those educated at other top-tier research universities. Steering capable students to less-selective institutions puts a cap on their potential achievements and serves only to perpetuate the stereotype that they are less able than other students to succeed in STEM fields.

Consider three systems that prepare minority students: elementary and secondary schools, minority-serving colleges and universities, and research institutions. For different reasons, none of them adequately promote equitable representation in science, math, and engineering. But solving the problems of the first two systems would require transforming urban schools that educate the vast majority of underrepresented students, and bringing minority-serving institutions up to the academic excellence of research institutions — both overwhelming tasks.

The most viable solution is to focus on the third system: to admit underrepresented minority students in larger numbers to science and engineering programs at the nation's leading research institutions and then support them in whatever they need to be successful. To do that, we who work at those institutions must evaluate our admissions criteria to determine whether they are excluding people with the ability to succeed. The traditional use of standardized-test scores, guided by the belief in the predictive power of scores at the upper level of the scale, is one of the worst enemies of underrepresented minority students. I have seen many of those students, especially Hispanic women, who entered with modest SAT scores (albeit the best scores in their high schools), graduate from Rice with honors.

My experience has been that the high end of the test-score scale has little or no predictive value. For example, there is essentially no benefit in favoring a student with a combined SAT score of 1500 over one with a combined score of, say, 1300. The same can be said for a graduate student whose GRE score is in the 95th percentile versus one whose score is only in the 85th percentile. But I have never seen an undergraduate student at Rice succeed in math, science, or engineering with a combined SAT score below 900. That is, I have found much more predictive information at the low end of the scale than at the high end.

Thus, at Rice, in both graduate and undergraduate admissions, we have successfully adopted a threshold approach toward standardized-test scores. We pick a threshold score, determined from years of experience in working with all students, at which students will be successful. We deem those students with scores significantly above the threshold to be equivalent, as far as the test score goes, and the score is dismissed and admission decisions are guided by other factors. We look at students with scores near the threshold value with extra care. And we don't accept students with scores significantly below the threshold.

To retain underrepresented-minority students, we have developed a program, supported by the National Science Foundation, that builds a strong community among them and faculty members. Key components of it include:

- Senior administrators, especially science and engineering deans, actively endorse and support the program to promote faculty buy-in.
- Respected faculty members in the STEM fields act as mentors, advisers, role models, and advocates.
- High standards and expectations encourage all students to perform at their best.

Following those guidelines, we have produced probably the country's largest number of underrepresented minority doctoral recipients in science, math, and engineering. The National Science Foundation informed Rice in 1986 that in 1985 and 1986, eight underrepresented minority Ph.D.'s in mathematics were produced in the country, and

Rice had produced four — or half the total. That statistic was bittersweet; sweet because we were number one in the country, but bitter because the number was so incredibly small. And the situation since then has not improved nearly enough.

The mathematics departments at Arizona State University , Cornell University , and the University of Iowa also produce minority Ph.D.'s at a high rate. Again, each student's success comes from a champion in the faculty, strong commitment, and aggressive support. At the undergraduate level, because of the Texas "Top 10 Percent" rule, the mathematics department at the University of Texas at Austin has the highest proportion of underrepresented-minority mathematics majors — slightly more than 26 percent — of any top-tier research university. With innovative support programs, it retains minority students through graduation at a rate above the majority-student rate.

Three other exemplary programs are at Harvard University , for faculty searches; the University of California at Berkeley , for undergraduate support; and the Georgia Institute of Technology, for promotion and tenure. More leading research institutions should learn from those models and strongly encourage underrepresented minority students to enter STEM fields.

A two-tiered society is certainly not healthful for America . With support and caring, underrepresented minorities can succeed at the best universities in the country. Indeed, many of us have. And more of us can.

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