

A Voice and A Vision of Your Own

Introduction

Thank you. It is a great honor to be here and to welcome you to UC Merced.

I would like to start by dedicating this speech to my parents, Carmen and Camilo Meza, who immigrated to the United States in 1955. Their courage in leaving their native home of Mexico and their dreams of a better life for their children have brought me here today.

And if there are other immigrants or children of immigrants in the audience, I would like to acknowledge you as well. In these times I think it's especially appropriate to recognize people who have taken such great risks and who have worked so hard to make their dreams come true. Because whatever anybody says, we are a nation of immigrants and if we forget who we are, we will surely have lost our way.

Many reports today, for example the National Academies' *Rising Above the Gathering Storm* report, highlight the need for more graduates from STEM (Science, Technology, Engineering and Mathematics) fields. The President's Council of Advisors on Science and Technology (PCAST) said, "... projections point to a need for approximately 1 million more STEM professionals than the U.S. will produce at the current rate over the next decade if the country is to retain its historical preeminence in science and technology."¹

How did we get to this point in time? And what can we do about it?

One possible solution is provided by the PCAST report that speaks about the "*underrepresented majority*" referring to "women and members of minority groups who now constitute approximately 70 percent of college students while being underrepresented among students who receive undergraduate STEM degrees (approximately 45 percent)."

Belonging and Creative Entitlement

To answer these questions, let me start with a story. In 1986, the United States produced six US-born Latino Ph.D.s in Mathematics. I was one of them. As it turns out, one of the other six also came from the same small graduating class in the same university. So one third of the Latino Math Ph.D.s in that year came from one school. What set that school apart was an exceptional Mexican American faculty member who had made it his mission to improve the number of underrepresented minorities in mathematics. His name is Richard Tapia. He was and still is one of the most inspirational role models I have ever known.

¹ *Engage to excel: producing one million additional college graduates with degrees in science, technology, engineering, and mathematics* (Executive Office of the President of the United States, 2012)

The numbers have improved since then and overall we have more underrepresented minorities in the academy every year.

Yet there are many days when I hear about a student who says that they feel like they don't belong. Isn't it funny that in a state that has such a large number of minorities we still believe that we don't belong? We also have a large percentage of first generation students at UC Merced so maybe that's part of why I hear this so often, but I think there are deeper reasons many people feel this way.

In the book *Big Magic*, the author Elizabeth Gilbert speaks about a certain attitude you need to live a creative life, but I think it also applies here. She says, "... in order to live this way – free to create, free to explore – you must possess a fierce sense of personal entitlement".

By *personal or creative entitlement*, she means, "believing that you are allowed to be here".

To quote Gilbert, "*Creative entitlement doesn't mean behaving like a princess, or acting as though the world owes you anything whatsoever. No, creative entitlement simply means believing that you are allowed to be here, and believing that — merely by being here, merely by existing — you are allowed to have **a voice and a vision of your own.***"

So why is it that we feel like we don't belong, especially on a campus like Merced where over 50 percent of the students are underrepresented minorities?

Today I would like us to consider two possibilities: the lack of faculty role models, and the belief that only certain people can be "scientists".

Let's look at the second point first.

There are many who believe that it takes a certain kind of person to be a mathematician, biologist, or take your favorite discipline. Just last year in a case considering affirmative action, Supreme Court Chief Justice Roberts asked, "***What unique perspective does a minority student bring to a physics class?***" While the question was specific to physics, I presume he would ask a similar question about any one of a number of the sciences.

As I thought about this, I was reminded of a book that I read in college titled *Flatland: A Romance of Many Dimensions*, written by Edwin Abbott in 1884. If you haven't read this delightful little book I encourage you to read it for its many subtle observations. The book tells the story of a character by the name of A. Square who lives in a two-dimensional world. One day, he is visited by a three-dimensional sphere named (you guessed it) A. Sphere who takes him on a journey to Spaceland. A. Square has an incredibly hard time understanding this new world because of his two-dimensional upbringing and his previously limited worldview.

In some respects, I came to think that Chief Justice Roberts was guilty of two-dimensional thinking in posing his question. Might he believe that scientists are two-dimensional beings,

whose only real purpose is to present formulas and facts to students, who in turn must memorize them to proceed to the next level of memorization?

Sadly, this may be the case in some classrooms and perhaps Roberts had the misfortune to be a student in one of those classes.

But if that's not the case, what do scientists do? I would argue that one of the main activities for practicing scientists is to look for interesting and unsolved problems to work on. As an applied mathematician I like problems that have real-world applications as well, but others choose to engage in fundamental research.

Most importantly, I would argue that to explore and to discover is at the heart of all scientific endeavors. But what does that mean? And how does one go about the exploration of interesting problems?

In my experience, one looks for interesting problems partly by learning what is already known in the field from colleagues, mentors, and other resources. However, a large part of it is also based on individual interests that are unique to each person, and to a large extent, based on past experiences – in other words our own life stories. It is that distinct perspective that *all* people, including minority students, bring to the table.

And from this perspective, the world that most minority students live in is quite different than the world Roberts grew up in and currently occupies. Some might say the students' perspectives are not unique, but I would respond that they are likely to be *uniquely different* from those that Roberts or another white student would have.

The American Physical Society had a wonderful response to Chief Justice Roberts, pointing out that it was one particular physicist in the last century from a minority group that was systematically ostracized at the time and whose unique perspective went on to radically change the world. To quote from their statement, "Einstein deplored racial inequality, and writing on the subject he said, 'The more I feel an American, the more [it] pains me. I can escape the feeling of complicity in it only by speaking out.'"

The consequences of restricting access to science positions was a lesson Germany and the rest of the world learned the hard way. Apparently, it is a lesson we are still learning today with respect to women and underrepresented minorities in science and technology.

Thinking that minority students do not bring a unique perspective is to think like A. Square. He just can't perceive other dimensions because he's living in Flatland – he really does not have any way to know anything outside his worldview. A. Square literally had to step outside his world to experience those extra dimensions.

Because the people asking the questions drive the research being done, having diversity in a field is critical.

I don't know where science will be in the next hundred years, but I am sure that it will be richer, more vibrant, and will advance further the more diversity we have. History has shown us that the more inclusive a field is, the more likely it is to advance and to thrive.

Let's stop living in Flatland!

The Importance of Faculty Role Models

To the first point – the lack of faculty role models – it pains me to see such low numbers of women and underrepresented minorities in the academy, particularly in STEM disciplines.

Let's consider the state of California. Today 38.8 percent of its population is Latino/a, another 6.5 percent is African American and overall underrepresented minorities constitute 47 percent of the population in California.²

Within the UC system, four of the 10 campuses are now Hispanic Serving Institutions, UC Merced being one of them, and another two soon will be. And yet, if one looks at faculty diversity, and especially in STEM fields, the numbers aren't pretty.

While I've focused on STEM disciplines so far, let me broaden the scope here to all fields. The number of underrepresented minority professors varies across the UC system and by discipline, but as of 2015 it averaged about 9 percent. In social sciences and psychology, it was 12.9 percent; in mathematics it was 0.8 percent³.

Those numbers are typical for many research universities, so I'm not just singling out the University of California. But in a state like California with such a diverse population and on campuses with majority minorities one has to ask – ***why is this?***

I suspect part of the problem is the same as before – a sense of not belonging, which I daresay is just as prevalent among minority faculty as it is within the student population. I must confess to you that on some days, I also feel that sense of not belonging. If that feeling is as shared as it seems to be, it likely leads to many quite talented individuals choosing careers outside the academy.

And what of those who decide to stay in the academy? Faculty from underrepresented minority groups play an especially important role. For many students from these groups, minority faculty members represent what I call "existence proofs". To these students, seeing a faculty member

² <https://www.census.gov/quickfacts/table/RHI125215/06>

³ <https://www.universityofcalifornia.edu/infocenter/diversity-ucs-faculty-and-academic-appointees>

from their own ethnic group at a university – often for the first time – offers proof that they belong and hopefully encourages them that one day they might also achieve that status.

As I mentioned earlier, this sense of belonging is crucial to many underrepresented minorities and first-generation students, who in many cases, are already unsure as to whether higher education is the right path for them.

Faculty from underrepresented groups also play an important role in listening to issues that these students are unlikely to bring up to faculty with whom they don't identify. Here, a level of trust is almost always a part of the issue. Rightfully or not, students usually make implicit assumptions that someone from a similar background understands the issues that they are facing. Thus, they feel safer raising sensitive topics related to academic issues and doing so at earlier stages, which, research indicates, often leads to better retention rates and overall student success.

Clearly, we need to seriously consider and address the demographics of our faculty body to better reflect the diversity of the student body.

From my own perspective, the mentor I mentioned earlier, Professor Richard Tapia was the first to instill the idea that I might be good enough to go to graduate school.

He encouraged me to apply to graduate school. He guided me through graduate school and he advised me to stay in graduate school when I wanted to quit. He's been a lifelong advisor and champion throughout my career. Next to my parents, I would say he had the greatest influence in my being here today.

But let me add that I was not the only one he helped in this way. Dr. Tapia has helped hundreds of others. In 2011, President Obama awarded Dr. Tapia the National Medal of Science. At the ceremony, Obama said, *"All seven of you have performed excellent research, but Richard Tapia has given to the nation in the critically important areas of improving ethnic representation and gender equity. I wish the other six of you would emulate his success."*

For these and many more reasons, I now encourage you to consider graduate school and a career in higher education. The academy needs you.

But more importantly we need each other.

Conclusion

I want to reaffirm one message: You **do** belong here. Not only can you bring a unique perspective, but you add an extra dimension, one that is deeply rooted in your rich cultural experiences.

What advice can I give you? First, be ready for your fair share of hard work. It is still true that you are likely to have to work twice as hard as others just to be perceived as being equal to them. On the sunnier side, a lot of what we do we do because it's fun.

Second, you will need a bit of good luck. We all get some luck – you just need to recognize the opportunity when it arrives and not be afraid to take risks – a lesson I learned from my parents.

And finally, nobody makes it on their own. I had a lot of help to get to where I am. Likewise, I have tried to return the favor and help others where I can. I encourage you to find a mentor who can advise you and champion your career. And whenever you can, consider serving as a mentor for others when they ask for your help.

Earlier I mentioned that Elizabeth Gilbert spoke about developing a sense of creative entitlement because it allows you *“to have **a voice and a vision of your own.**”*

Imagine a world where research teams are made up of a diverse group of people from all walks of life. Imagine a world where it's the conviction of your ideas and your passion to help others that matters. And imagine a world where higher education is equally accessible to all who are curious enough to want to pursue it.

That's my vision, I encourage you to create a vision of your own.

Let me leave you with a final thought. In President Obama's 2009 inaugural address he said, “We'll restore science to its rightful place, and wield technology's wonders to raise health care's quality and lower its cost. We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. All this we will do.”

Can science take its rightful place in society?

It can if we – and that includes all of you in the audience – add our voices and visions.

Good luck and thank you again for the invitation to speak here.