Scholar-Practitioners of Color Challenge Normative STEM-M Practices Through Cultural Intuition and Student Narratives/Voices

Maria Reyes  
*Phoenix College*

Janet Rocha  
*Northwestern University*

Tamara Coronella  
*Arizona State University*

Lindsay Romasanta  
*Portland State University*, lindsay.romasanta@pdx.edu

Follow this and additional works at: [https://pdxscholar.library.pdx.edu/president_diversity_pubs](https://pdxscholar.library.pdx.edu/president_diversity_pubs)

Part of the Education Commons, and the Social Justice Commons

Let us know how access to this document benefits you.

**Citation Details**

Reyes, Maria; Rocha, Janet; Coronella, Tamara; and Romasanta, Lindsay, "Scholar-Practitioners of Color Challenge Normative STEM-M Practices Through Cultural Intuition and Student Narratives/Voices" (2020). *Global Diversity and Inclusion Publications and Presentations*. 23.  
[https://pdxscholar.library.pdx.edu/president_diversity_pubs/23](https://pdxscholar.library.pdx.edu/president_diversity_pubs/23)

This Presentation is brought to you for free and open access. It has been accepted for inclusion in Global Diversity and Inclusion Publications and Presentations by an authorized administrator of PDXScholar. Please contact us if we can make this document more accessible: pdxscholar@pdx.edu.
Scholar-Practitioners of Color Challenge Normative STEM-M Practices Through Cultural Intuition and Student Narratives/Voices

ASHE 45th Annual Virtual Conference 2020

Friday, November 20, 2020
W. E. B. Du Bois Room
3:30 to 4:45pm CST

This session will be audio recorded for internal purposes. Please send us a message in the chat if you have questions.
Maria A. Reyes, MSE, MPA  
Dean, Industry & Public Service -  
Phoenix College

Janet Rocha, Ph.D.  
Research Assistant Professor, Internal Medicine -  
Feinberg School of Medicine, Northwestern University

Tamara Coronella, Ed.D.  
Director, Student Success and Engagement -  
Ira A. Fulton Schools of Engineering, Arizona State University

Lindsay Romasanta, Ed.D.  
Director, Student Success Programs  
Student Retention and Success, University of California San Diego
Session Objectives

- Challenge systemic barriers in diverse educational settings, such as deficit-frameworks and their associated normative practices.
- Promote asset-based approaches and frameworks to achieve better equity, access, and opportunity for students of color in STEM-M pathways in K-16 settings.
- Facilitate discussion with the audience on how they can replicate a similar approach of change at their respective institution.
Introduction

This symposium features four scholar-practitioners of color working across the STEM-Medicine (STEM-M) pipeline who are actively engaging their cultural intuition (Delgado Bernal, 1998) to create access to higher education by challenging dominant pathways, practices, and cultures related to college readiness/preparedness, success, persistence, and the workforce transition.
STEM–M Statistics

● **STEM-M Major Attrition: URM students vs. White Students** (Riegle-Crumb, King, Irizarry 2019)
  ○ 37% of Latinx students and 40% of black students switched majors vs. 29% of the white students
  ○ 20% of Latinx and 26% of black STEM majors left their institutions without earning a degree, vs. 13 percent of white STEM majors dropped out.

● **STEM-M Workforce**
  ○ The majority of STEM workers in the U.S. are white (69%), followed by Asians (13%), Blacks (9%) and Hispanics (7%) - Pew Research Center
  ○ 56% of active physicians are white, followed by Asians (17%), Hispanics (6%), Blacks (5%) - Association of American Medical Colleges
Campus Climate defined: environment of college within and outside of the classroom (Yosso et al., 2009)

- Most often cited reason for student departure
- Hostile, unsupportive, exclusionary climate of STEM (Yosso et al., 2009)
- Stereotype threat
  
  “the threat that others’ judgments or their own actions will negatively stereotype them in the domain” (Steel, 1997, p. 613)

Perceive they can succeed, they belong, they have the resources, and they will be accepted until...they begin to fear they will confirm stereotypes or begin to internalize those stereotypes

They begin to disidentify with STEM
Literature Review
Asset-based Approaches

- Working definition of assets: an innate capacity when activated serves as a powerful course of strength

- Key assumption regarding students then is that they have a multitude of strengths

- Most frequently discussed are social and cultural capital
  - Insufficient explanation because access to those capitals has been historically limited
  - Growing consideration of Community Cultural Wealth (Denton et al., 2020) in STEM-M context

(Yosso, 2005)
Deficit Thinking Model

Student failure is attributable to internal deficiencies (Valencia, 2010)
- Responsibility of the “family” to build social and cultural knowledge (Valencia, 2010, 2012; Yosso, 2005)
- *Blame the Victim* (Valencia, 2010)
- Concept of *educatability*
  - Perceived institutional responsibility to fill in gaps
- Outcomes: maintain subordination; reinforce dominant views of success
Critical Race Theory (CRT)

Critical Race Theory

- “identify, analyze, and transform those structural and cultural aspects of education that maintain subordinate and dominant racial positions” (Solórzano & Yosso, 2002, p. 5)

- 5 tenets: Centrality of race and racism (intersectionality), challenge to dominant ideology, commitment to social justice, centrality of lived experiences, historical context
Testimonios

- Centrality of voice, stories, histories
  - Our own
  - Our students
- Methodology to inform understanding of educational experiences through recognition and validation of historically marginalized voices and stories (Pérez Huber, 2009)
- The process of testimonio, is a form of validation
  - ‘allows the individual to transform past experience and personal identity, creating a new present and enhancing the future’ (Cienfuegos & Monelli, 1983, 46 as cited in Pérez Huber, 2009, p. 643)
Cultural Intuition (Delgado Bernal, 1998)


- Draws on Chicana Feminist Epistemology as the underlying theoretical framework

- Extends on what Strauss and Corbin (1990) called "'theoretical sensitivity' - a personal quality of the researcher based on the attribute of having the ability to give meaning to data" (p. 563)
Cultural Intuition (Delgado Bernal, 1998)

Comes from four distinct areas:
(1) personal experience (which are influenced by ancestral wisdom, community memory, and intuition);
(2) existing literature (on and about Communities of Color);
(3) professional experience;
(4) the analytical research process

Cultural Intuition or “a sense of knowing”:
1. “Extends one's personal experience to include collective experience and community memory” (p. 563)
2. "A complex process that is experiential, intuitive, historical, personal, collective, and dynamic" (pp. 567-568)
Documents Reviewed 2010-2020
Total of 26 references
- 16 graduate theses/dissertations
- 10 peer-reviewed journals
  - Research context focus
    - Positionality
  - None are within a scholar-practitioner context
  - Bridging theory into practice

In what ways have four scholar-practitioners of color engaged with their cultural intuition (Delgado Bernal, 1998) across the STEM-Medicine (STEM-M) pipeline?
In what ways have four scholar-practitioners of color engaged with their cultural intuition (Delgado Bernal, 1998) across the STEM-Medicine (STEM-M) pipeline?
The stories we are told

Kasabihan

Dichos

Sayings

Collect, Collect & then Select

Charting our paths, grounded by our roots, to help us determine what forks in the road to take.
Self-Reflection

What is one saying that you remember that has stuck with you to this day?

What was the root of the saying?

How has it helped you in your path today?
Take note of key words and your own feelings as you listen.

Four Testimonios
An Engineer – A Practitioner – A Developing or Imposter Scholar – Maria A. Reyes, MSE, MPA

Post-conference responses at 93% and 91% respectively

More than 6000 participants in 15 years

Pre-Conference
“I know what an engineer or scientist does” (35%)

“I CAN be an engineer or scientist” (51%)

Latinas comprise ~ 2% of those employed in STEM (NSF/NCSES, 2015)

Yet they comprise > 16% of the female population (United States Census Bureau, 2016)

Pre-Conference
I would like to obtain a college education
There are situations that could stop me from reaching a college education
I have information on how I can overcome these situations
I know how to prepare for college, Classes to take during my high school years and who to go to for guidance.
I know what an engineer/scientist does
The career option of being an engineer or scientist is available to me.
I can be an engineer/scientist

Before/After
(circle one)

Before Conference

After Conference

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Solana, 2006
Harvard University

“I know what an
engineer or scientist
does” (35%)

“I CAN be an engineer
or scientist” (51%)

Pre-Conference

Post-conference

More than
6000 participants
in 15 years

Before Conference

After Conference

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
This program was designed with other Latina engineers with a foundation in our cultural intuition. The familial recognition of those that came before us, as Hermanas, was a nod to our collective efforts as practitioners and outreach to those that follow us.
MCCCD Is Committed to Expanding Our IT Workforce

by Mike Hunter

“Principal Investigator, Maria Reyes expressed her excitement for this opportunity by saying, ‘We are eager to design this high-impact model that will build capacity to engage and retain Hispanic students throughout their higher education experience, as well as prepare them for STEM related positions in the workforce’.”
Utilizing My Scholar-Practitioner Identity to Heal a Still-Painful Wound: Making the Invisible, Visible – Janet Rocha, Ph.D.

“Si Se Puede”/"Yes, we can"

About Dr. Rocha:

Personal Background:
- Mexican-American/Chicana
- Child of immigrant Mexican parents
- Grand Daughter of a Bracero
- First-generation college graduate
- Low-income/limited resources
- Blessed with mentorship & guidance

Academic Background:
- Education/Training at Research I Institutions
- Research on URMs in various fields

Professional Background:
- Theory in Practice
- Design, Implement, and Assess Programs in Student Affairs and Academic Affairs

Dr. Rocha’s Cultural Intuition:

Incorporate my cultural intuition in research, practice, and teaching

Centralize student experiences and voices


Seek diverse collaborators to facilitate student empowerment
Students’ Subjective Experiences with HSTEP:

“Being able to have a mentor, I think, allows me to see into the future and see that I can succeed, and what it takes to succeed. And like having people that look like me, that people who look like me have succeeded, and that it will take a lot of hard work, but it is possible.”
--Rising senior, Black male, 2016

“The program definitely gave me more confidence and that helped me academically. You can see that in my G.P.A at school. I feel that [HSTEP] gave me more of a purpose.”
--Rising senior, Latina, 2018

Program Objectives:

- Expose Youth to Health, Medicine, and Science Careers
- Promote a “Culture of College”
- Facilitate Mentorship Opportunities
- Provide Professional and Leadership Development

Student Outcomes:

- Ignite STEM-Medicine Curiosity and Identities
- Achieve Personal, Academic and Professional Development
- Foster a Sense of Community and Support
- Facilitate Transformative Beliefs, Attitudes and Behaviors

My Role - Enhance the student experience through a culturally sustaining curriculum, high-impact practices, and evidence-based research.

HSTEP Participants:
- 92% are Black or Latinx students
- 81% are first-generation college students
- 66% are female students

HSTEP - Strategic Alliance Partnership:
Academic Hospital, Medical School, & High School

Scholar-Practitioner - Health Science Teaching Excellence Program
An authentic approach to academic advising informed by cultural intuition – Tamara Coronella, Ed.D.

About me:
- Mother to 2 boys
- 3rd generation Arizonan
- First-generation parents from mining community, career educators
- Career educator - 20 years at Arizona State University
- Completed doctorate recently

Central force in my research:
Testimonios from my mother and my colleague (later my participants)
An authentic approach to academic advising informed by cultural intuition

Validating Advising Practices Defined: supportive, affirming, and empowering approach where students reflect upon and enlist their strengths and assets through advising interactions with a validating agent

- **Support** – state they believe in student, connect to resources, develop strengths (Barnett, 2006; Rendón & Muñoz, 2011)
- **Empower** – “active participatory process of gaining resources, competencies, and key forms of power necessary for gaining control over one’s life and accomplishing one’s goals” (Stanton-Salazar, 2011, p. 1090)
- **Affirm** – leveraging their strengths, assets, and lived experiences (Rendón & Muñoz, 2011) (see Yosso, 2005)

Qualitative, action research study

Critically raced-gendered epistemology

Three FSE advisors – first-generation - Audrey, Jennifer, and Elena (all pseudonyms)

From those three, recruited 10 students (3, 3, and 4)

Narrative interviews, focus groups, reflections

Three-phase data analysis process *adapted* (Pérez Huber, 2009)
An authentic approach to academic advising informed by cultural intuition

- “I think especially with some engineering, especially computer science there might be guys that you see who have been doing it since they were little kids. And, so they know so much that it might seem like, ‘Wow, they’re on the same level. How am I ever going to catch up to them?’” (Emily, when analyzing data which discussed feeling out of place in engineering)

- “Looking back on it, I don't know if that was a good decision or not [to ask Emily about DACA]...maybe my other students that are in that position have tiptoed around it, but they haven’t said this, because I think sometimes, they're afraid to” (Jennifer, advisor)

- “When you’re meeting more than once and you’re getting to know your advisor and you’re getting that relationship with them, you feel more inclined to say, "Okay, these are my concerns. I don’t think I can do this."...It’s just nice as like a person to just have that” (Mona, describing her advisor, Elena)

Validating Advising Practices Defined: supportive, affirming, and empowering approach where students reflect upon and enlist their strengths and assets through advising interactions with a validating agent (see Stanton Salazar, 2011)
Photo-Testimonios which illuminate (missed) opportunities for student success - Lindsay Romasanta, Ed.D.

About Me

- First-Generation, Low-Income College Grad
- Immigrant Family
- Single Parent Household
- 10+ years experience in student services and retention of underserved student populations
- Asset-based Scholar Practitioner

Cultural Intuition as a revelation to challenging the dominant narrative

Personal Experience | Professional Experience

Literature | Analytical Research Experience

Photo Testimonios

(Romasanta & Liou, 2018)

Resilience
(Werner, 1993; Morales 2008).

Protective Factors
(Kitano and Lewis, 2005)

Risk Factors
(Morales & Trolman, 2004).

Resilient Resistance
(Yosso, 2000).

Community Cultural Wealth
(Yosso, 2005).

Hidden Curricula
(Jackson, 1968; Margolis 2001).

Resilient Resistance: Surviving/Succeeding through the educational pipeline as a strategic response (Yosso, 2000).
When it gets tough, I think about my parents, especially my dad. My dad worked so hard throughout his life since he was four, being a slave to the ranch life, to now, he busts his back working outside in the blazing sun. I've never heard my dad complain. I know that what I am going through would never compare to what my dad has been through.

If we can support each other, and show each other that “No. All these other people did it. We’re doing this. You can do it, too.”

On a micro level, it’s going to start by helping ourselves and our community which will eventually become something bigger at a macro level. Not just helping our university, but expanding to different states, and universities, and countries.

That’s why I think it starts with us.
Centering Student Voices and Visions in Student Success Efforts

**Familial Capital**

This is a blanket I have on my bed. It reminds me of my family and that I am never alone.

Hummingbirds represent my family in Mexico, my heritage, and my drive to have a better life and to give them a better life. This keeps me going.

**Acknowledgement of college opportunity**

While this is a blessing it helps me to remember how privileged I am and how I cannot give up on my dreams. Dreams that I never thought would come true.

I am motivated by knowing I was lucky enough to make it to ‘El Norte’ and to make it back home to ‘Merica.
Reflection and Discussion

Breakout rooms overview

What major themes emerged?

What connections do you see within your own story?

Using a "sticky note" (on the left-hand side menu), write your reflection.

Sticky Note
Discussion

Examination - how do our roles as scholar-practitioners influence student empowerment in our respective settings and how do we value students’ narratives/voices for social change at all educational levels and settings?

1. What are the major challenges we encounter in our work when challenging normative STEM-M practices at our respective institutions, and how are we navigating such experiences?

2. What are other potential strategies higher education can promote to achieve transformative experiences among marginalized students in STEM-M pathways?
Closing Comments/Conclusion

Charles Lu, Ph.D.
Director, Office of Academic Support & Instructional Services - UC San Diego
Questions

Maria Reyes - maria.reyes@phoenixcollege.edu

Janet Rocha - janet.rocha@northwestern.edu

Tamara Coronella - tami.coronella@asu.edu

Lindsay Romasanta - lromasa2@pdx.edu