

Plenary Presentations:2018.02.23.0100

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Talk Title:

Inherently Political: Making Progress in the Mathematics Community

Date:	02/23/2018	Time:	1:00 - 2:30	pm
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Materials:

- Implicit Bias Test <https://implicit.harvard.edu/implicit/>
- Detailed notes from note taker (pdf)

List 6-12 key words for the talk:

Rehumanizing mathematics education, equity, action, teaching, Project NeXT

Please summarize the lecture in 5 or fewer sentences:

Dr. Suman Pendakur and Dr. Dave Kung provide an interactive joint presentation about rehumanizing mathematics, discussing three topics: why teaching matters, how we help teachers change, and how we change institutions. In discussing this they each shared specific aspects of their personal work including work done with the MAA Project NExT and bringing this change into instructional leadership.

This is going to build off what we've already seen presented here including rehumanizing mathematics, moving away from deficit model, and more. This is going to resonate well with those talks. We also want to acknowledge the tension of revolutionary goals and the methods that necessarily need to meet people where they are.

What we're going to discuss:

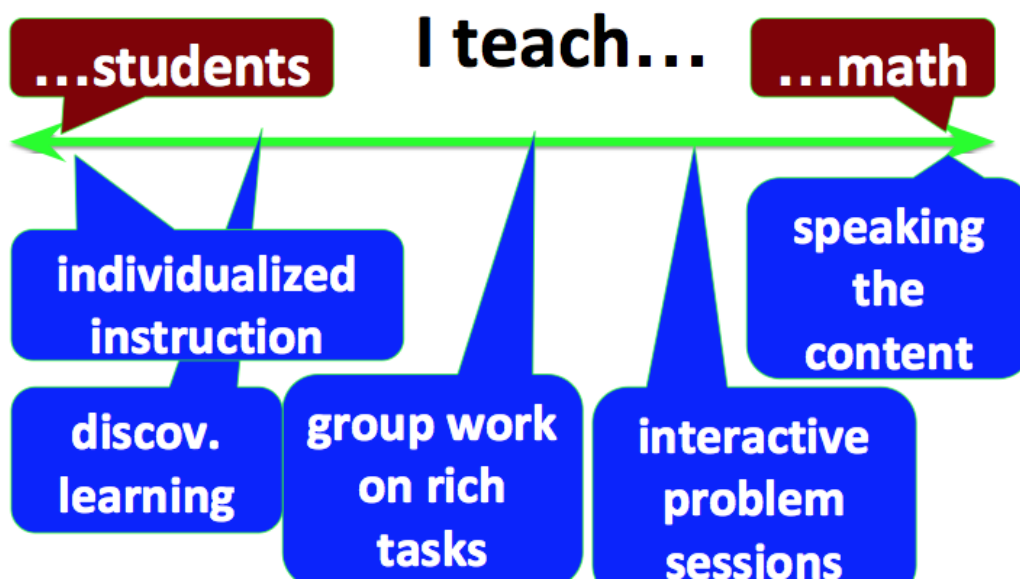
1. Why Teaching Matters
2. How We Help Teachers Change
3. How We Change Institutions

We'll be discussing existing research and our own experiences.

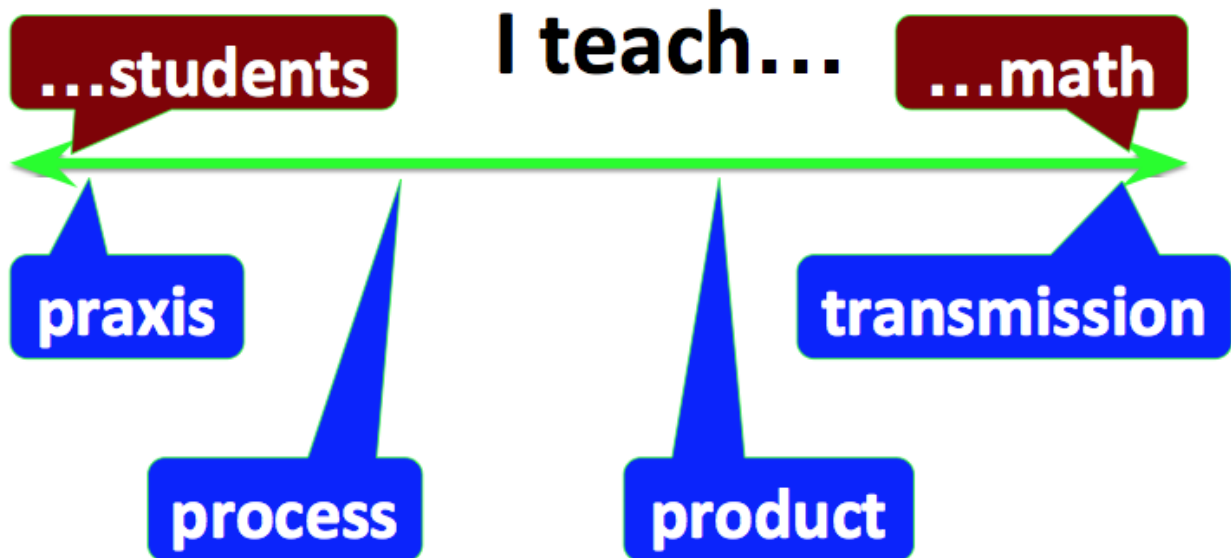
Part I: Why Teaching Matters

When you talk with new faculty - set the framework for the faculty we work with. Think about the question you get asked on an airplane, what do you do? I've started to think there is a different answer there, a a continuum from "I teach students" to "I teach mathematics".

You can see this in the classroom, is the focus on the mathematics or the students?



- Focus on Mathematics - speaking the content (transmission)
- Interactive problem sessions (product)
- Group work on rich tasks - low floor and high ceiling (Jo Boaler- rich tasks, talking about thinking/reasoning)
- Discovery learning (process)
- Students - individualized instruction (Praxis) one on one instruction where what gets talked is decided in a mutual permission giving discussion.



From a research perspective we can talk about this with praxis -> transmission.
 Not so much based in research but a framework we can start to use for a discussion.

Transformational change - together we're working on the content. One on one instruction where what gets talked about is a mutual understanding and content is all part of the system.

For example:

Professor Brandon Leonard. Taking the derivative by definition.
<https://www.youtube.com/watch?v=962ILfW-8Jo&list=PLF797E961509B4EB5&index=9>
 He stops and asks the students if they understand.

He is on the right side, near a product. He is not just speaking the content, he's attentive to students and he's asking them for interaction.

Eric Hsu - graph of the height of the flag over the time.
 Showed video.
 He's more on the left side, near process. He is doing group work on rich tasks, talking about their thinking.

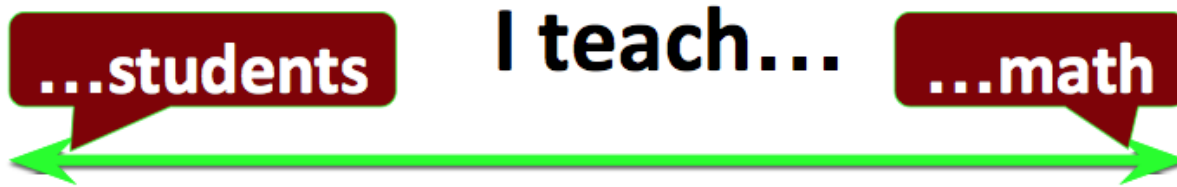
Question for you: Where are you? Where is your department?

When faculty go and teach Calculus they teach one way and then go back to their office and teach graduate students in a different way. What does that mean for your department? If you met your colleagues in the hallway and they said "I just taught Calculus" then what does it mean in your context. Think about this and talk with the people near you.

Small Group Discussion

Discussion: Raise your hand when we get to the place that teaching is in your department. There was a pretty even distribution in the room.

In meeting people where you are, the message of Project NeXT is that you should move toward the left - wherever you are, as you move towards the left great things happen. There is a lot of great evidence that the more interaction is there is and more learning.



more interaction ←
more learning ←

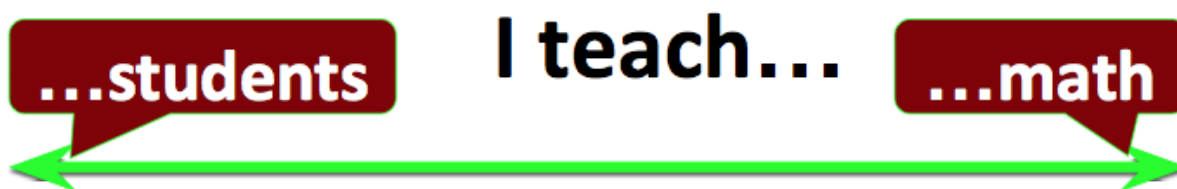
“Worst Way to Teach” (Bressoud)
Physics Ed. (Mazur, Hestenes)
National Academy (Freeman Report)

- Worst Way to Teach (Bressoud, <http://launchings.blogspot.com/2011/07/the-worst-way-to-teach.html>)
- Physics Ed. ([Mazur](#), [Hestenes](#))
- National Academy (Freeman Report, <http://www.pnas.org/content/111/23/8410>)

Freeman Report (<http://www.pnas.org/content/111/23/8410>): This study looked at active learning in the US. Passive lecture have a 55% D/F fail rate. The summary was that if this was a medical study we would ethically have to cut the study short and provide the treatment to the control group. This is what we know from the National Academy of Sciences and we know in the US around 70% of STEM classrooms are passive lecture, while we pride ourselves on being logical and evidence based.

To add on to this: There was a meta analysis of 272 active learning studies, measured anything that wasn't passive lecture learning, they showed the same distinction (drop/fair rate) and the disproportion bump for students of color when you shift to active learning.

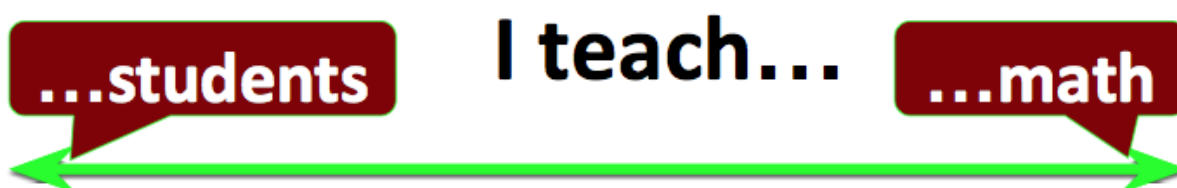
Great equity - interaction closes gaps



greater equity
Interaction closes gaps!

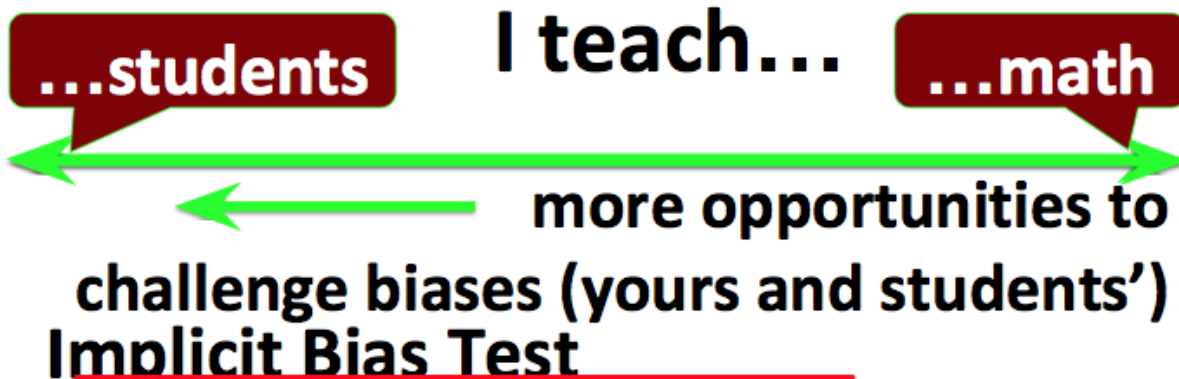
- **Emerging Scholars (Treisman)**
- **Physics Ed (Mazur)**
- **Inquiry-Based Learning (Laursen)**

- Inquiry-based learning (Laursen, [http://128.192.17.191/EMAT7050/articles/LaursenEtAl\(2014\).pdf](http://128.192.17.191/EMAT7050/articles/LaursenEtAl(2014).pdf))



more rehumanizing
more inclusion
work/struggle visible

As you work towards more interaction the struggle of the students are public, you are asking them to take risks and put your work out there (work/struggle visible). The benefits are incredible - adjust your thinking. Integrate your thinking. We have to take those same risks when it comes to our teaching - we need to make our teaching public. Teaching/Work in our classroom have been historically very private. The same benefits that our students see will benefit us. Making our teaching public is incredibly leveraging.



Your Result
Your data suggest a strong automatic preference for Light Skin compared to Dark Skin.

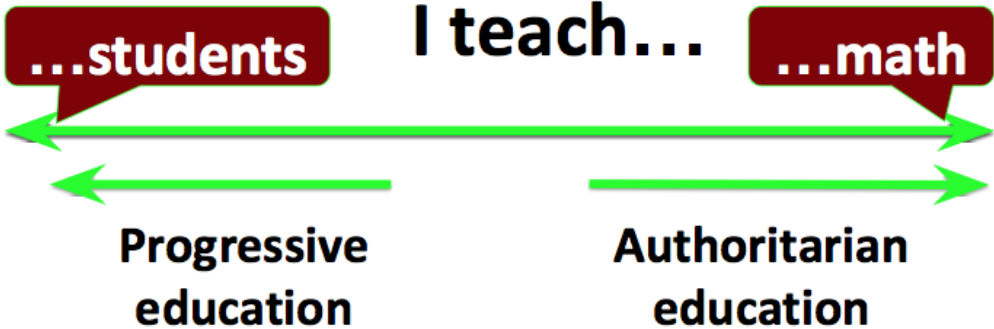
Your Result
Your data suggest a strong association of Male with Science and Female with Liberal Arts compared to Female with Science and Male with Liberal Arts.

Your Result
Your data suggest little to no automatic preference between Straight People and Gay People.

More opportunities to challenge biases (Yours and your students'). There is more of an opportunity to challenge biases if we put them out there.

Implicit Bias test (<https://implicit.harvard.edu/implicit/>) show people and talk about your own biases. Above we see the bias test provided by the speaker. It's mortifying but it shouldn't be surprising, in the whitest congressional district in the country. Everything I knew about Black people came from my television. My parents both worked in a STEM building on campus and I saw that a majority of the people were male. And my family had gay and lesbian friends long ago. None of these biases should be surprising. **Bias are not my fault but they are my responsibility.** We need to interrogate these to make sure we do not act on the biases that we hold.

Thinking about moving towards the left. We call it progressive education as we move towards to the left. If you think about what we're doing when we speak the content we are reinforcing authoritarian view of education.



It's all political!

After the election, Dan Meyer asked, “**What is the mathematics communities role in getting people to believe fewer lies?**” When we collectively teach on the right we’re setting people up to believe that knowledge is whatever the authority in front of you tells you. Only under those circumstances can someone legitimately say, yes there were more people at Trump’s inauguration. It’s frustrating to people on the left that hear that and say, “it’s not true”. The question, what does it mean for something to be true. What it means to be mathematically true if you get a good grade (the authority tells you) rather than the facts tell you are true. If we move to the left then people start looking for the reasons why something is true.

Sumun- I’ve been talking with my mathematician friends about worries about K-12 education as 5 year old son gets ready for school. They said, that is why the Common Core is good, it teaches why is something the way it is. How do we know these things?

Dave - this is why people went crazy with the Common Core, it encourages people to think. It is all political! If we think of math as a political and pedagogical moment then we need to question the authoritarian view of knowledge? How did you get that? What did everyone else get? What is your reasoning etc. This will transition to a more progressive view of knowledge and the world.

Part II: How do we change how we teach?

We’re both approaching this from different angles, suggesting models for change that are progressive justice oriented change

- **Bottom-up (MAA Project NExT - Dave)**
 - Professional development for new(ish) math faculty.
 - Infiltration (with external support). Equip with tools and cohort to make change within, give each other support to make change.
- **Top-down (Harvey Mudd/USC - Sumun)-** change the culture from within, faculty searches, award distribution, etc. Institutional leaders to transition in learning and doing.

Cultivate the pond, the microenvironment that you are in. Who is responsible for cultivating the pond so that all fish will thrive (faculty, 1st generation students, staff)- an ecosystem of support and thriving for the communities for whom the environment was made for in the first place (white, cis-gender, male, middle class - naming the structures that we need to thinking about). Blending theory and politics with strategic and implementable tools.

Challenging Scenarios - decide what you would do (silently), discuss with neighbors what you'd do, report best ideas to the whole group. Be aware of discussion guidelines.

Challenging Scenario #1

Your Calc students work in groups of 3. Tori's an outgoing – and very good – student, but one day she's in a group with two guys. You notice that she isn't as active as usual. She later tells you they kept interrupting her & ignoring her ideas, so she just worked by herself. What do you do?

Dave: You have to talk with Tori and deal with her exclusion. But that's not all. If you just talk with Tori you're only addressing part of the problem, her exclusion. This scenario actually comes from Physics research - with 3 student groups for the entire quarter. Statistically groups of 2 men and 1 woman the woman was statistically doing worse in the quarter and not persist the next quarter. Their solution was to make sure they never have these types of groups which only solves part of the problem. So Dave talks to them about this when he setups group.

You want rich group work, that is where kinship is developed, where skills are developed, and where some of the same hierarchies are reinforced. Look at when you reproblemize Tori, that reinforces as opposed to naming the situation.

Using this example with STEM faculty at UC Irvine. Asked, What does it look like to teach students to engage in group work. What methods or skills do we bring to our teaching, telling them key things that I see happen - teach skills so people to learn to step back and others empowered step forward - learning and unlearning process for multiple parties. A political act.

When we have interactive classrooms - our students' biases is not our fault but they are our responsibilities. That is a hard problem to wrap your head around and deal with.

Challenging Scenario #2

A few minutes before class you're getting materials ready. Ashanti walks in wearing a #BlackLivesMatter shirt. Ben, a white student, is clearly annoyed. "Don't you mean All lives matter?" What do you do?

Acknowledge: Your own identity plays an enormous role in how you address this situation.

Call my gender studies ladies to find a YouTube Video to talk about stereotype threat in classroom and how that plays a role in mathematics.

Class may be derailed but class could be incredible.

That happened in my class - student wearing the shirt discussed a march that she was organizing. A male student said that we shouldn't be discussing that now. It wasn't class time. What I did: I appreciate that you are doing this. I am going to participate, I think this is a great thing to do. I acknowledge that you have thoughts about that. I also want to acknowledge we had a difficult day yesterday and some students may need the space to discuss it, we need to provide the space for this.

Use data in class - look at the statistics. Let's give them numbers.

Dave: We're teaching a subject with a lot of tools - we can bring to bear including the logical fallacy between Black Lives Matter and All Lives Matter.

This reminds me of being desettled when I was talking to a group of faculty about this scenario. Many mathematicians just want to teach the math, they want to not address this and they just want to go on. One faculty member said, "*I'm hired to teach math, that's what we're doing and we should just do that*". An African American woman in the room asked him, "*How do you feel the Black students in your room feel?*". He said, "*I bet they are pretty upset, you're right I bet they are probably not ready to move on*". And then she said, "*So what you're saying is that you're ok with moving on as long as all the white people are with you*". When I think of the word desettled that moment was hard. We need to create these situations to pull this out of people. Someone earlier said when they think of white supremacy they think of guys marching with torches in Charlottesville vs the stuff that is internalized in all of us. We have to find ways of desettling them so that we can all move forward.

Sumun- What is it about our PhD programs that our students are trained to become subject matter experts but are not trained to engage in conversation about bodies in the street and the trauma that provokes for all of us and how learning is marginalized when you're in a state of trauma. When we have communities of trauma but when your discipline don't prepare you to have these conversations then we're leaving our teachers/admin with deficit.

<http://www.thedemands.org/> - this was made by Black students in Fall 2015 that collected all the lists of demands from students at various campuses that were in the news. The thing that came up over and over again is, I need my faculty to understand my experiences better, to see me as a human, to counter micro- and macro- aggression in the classroom. There is not just research data but anecdotal nationwide data about what it means to be the one student where the teacher/professor never intervenes. That us colluding in power (because we're pressed for time and don't know how to handle it). It takes practice. **We need to build our response kits/tool kits to be able to react.**

The Pond - the other side

A 1/3 of the room is or will be an institutional leader. Leadership is not a future tense action, it's a constant progress that requires daily action.

Thinking about trainings/intervention. Last year I did a really good 50 hour training at a institution. They agreed that they were going to change their hearts and practices. They are now running two searches and it's not going great. **People can say they want to change. Speed is easier but speed increases bias and that maintains the norm.**

Many of us have looked at the reproduction of sameness that occurs. **The question is, how do we increase the tools that we have access to?** Bias reduction, equitable search, etc. We also need to ask, **who holds people accountable?**

Two points:

Deans, Chairs, Principals, & Superintendents should engage in guided introspection about their own deeply held values, particularly values based on concepts such as meritocracy and academic recognition. These often unspoken values can be barriers to equitable change and progress.

By show of hands, wow many of you have gone through where you learn notions around **merit - if you work hard enough then you will accomplish - important to look at where you are.**

Microaggression training - through office of diversity where we learned some tools around the tenure and promotion practices at the university. In doing that we took the implicit bias test and did some role playing. It was enlightening and challenging, as it should be.

Meritocracy is one of these key thing that we don't unpack enough. The idea that if you work hard enough you will accomplish, and we're on a level playing field. Exploding that, wherever you sit, K-12 classroom, community college, university.

Deans, Chairs, Principals, & Superintendents should be (or become) racially literate, with fluency and fluidity in their abilities to understand and explain the specific experiences of faculty experiencing minoritization and marginalization, as well as strategies to combat endemic academic silencing and sidelining. For example, Derald Wing Sue has excellent research available on the impact of microaggressions on faculty of color.

1/3 of room has done training on microaggressions in general.

Suggestion: Derald Wing Su (<http://www.tc.columbia.edu/faculty/dw2020/>) has a phenomenal body of work. He doesn't just talk about microaggressions and microinvalidations and how do they physiologically and physically impact targeted populations? He's expanded this to look at the experiences queer populations, the experiences of women, the experiences of faculty of color. It's useful literature to be able to explore.

Small group discussion - taking leadership wherever you sit and what kinds of questions that you can ask wherever you are. Three questions:

What does mentorship look like in your department? In mentorship informal and on the fly? Or are early career faculty mentored formally?

Do a "diversity audit" of your own department. Who serves in what roles? In the last 10 years of faculty hiring, what patterns emerge? Who has been retained, promoted, and tenured?

Examine the culture and cultural practices of the department or unit in question. What is the system and structure of rewards and recognition? Whose labor is valued and how (especially if it falls outside of the traditional domains for research, teaching, and service - narrowly defined)?

Don't have enough time to fully discuss but wherever you sit ask these questions. There are ways to ask questions (even without tenure) that promote change.

Part III: How do we change our institutions?

Example: search committee trainings - you are bringing people into the institution for 15-40 years. Who can we hire? Who is going to enhance the culture?

Takes practice - the workshops are important, the opportunity to practice skills is important, particularly within. These can be painful personal conversation. Think about this role as a gatekeeper.

We're going to discuss these questions:

How would you respond to these comments from colleagues?

- a) "We are interested in the most qualified applicants."
- b) "I understand we don't have much diversity in this pool, but we got what we got."
- c) "This applicant's degree is from a university from which we don't typically hire."
- d) "I don't know any of this person's references...I really respect this other person's recommenders."
- e) "We tried, but really couldn't find any qualified women or people of color for this position."
- f) "I'm just not sure how they would fit into our culture."

Think about how to be prepared for these hard conversations with some role play. Your goal, discuss as a group. If you heard this statement - what are people saying through coded and hidden language. How would you respond in that moment?

Worksheet: Six common statements that you can hear on a committee

What are people saying (the coded language covering white supremacy and sexism).
How would you respond?

(a) “We are interested in the most qualified applicants”	
Decoded	
Action	

(b) “I understand we don’t have much diversity in this pool, but we got what we got”	
Decoded	We’re ok - we don’t need to worry about it.
Action	

(c) “This applicant’s degree is from a university from which we don’t typically hire.”	
Decoded	
Action	

(d) “I don’t know any of this person’s references... I really respect this other person’s recommenders.”	
Decoded	
Action	

(e) “We tried, but really couldn’t find any qualified women or people of color for this position.”	
Decoded	
Action	

(f) “I’m just not sure how they would fit into our culture.”	
Decoded	
Action	

These are coded ways that mask our language. Finding ways to practice responses is important. Some of us have had a lot of practice and yet in the academic context this needs to new practice. USC - practice with early career faculty for the first two year to practice these skills.

When you finally get people to campus and you want to get a sense of diversity, equity, social justice, **How do you go beyond “why do you value diversity”.** This question is terribly framed -it answers nothing, it doesn't tell you about their effort, skills, teaching.

Here are two sample questions used at Harvey Mudd to interrogate people's practices:

How do you improve the learning environment to better meet the needs of students who have been historically marginalized (such as Native Americans, African Americans, LatinXs, Southeast Asians, women in STEM, and students with disabilities)?

This is getting at what is your work, what have you done? Give them a chance to talk about concrete things beyond “I think diversity is nice”.

Jamilla, a sophomore student of color, had a cohesive study group with other students of color in her core mathematics courses, and she is excited to become a math major. When she enrolls in the gateway math course, however, she is the only person from her original study group in the class. Because of the loss of her study group, Jamilla loses interest in becoming a math major. As the professor of the course, you overhear her saying that after this course, she is planning to switch her major to another field. This is the third time you've noticed such a situation arising in one of your courses. How would you mitigate the situation, both in the moment and in subsequent offerings of the course?

A great question, it's situational. What does this change in your articulation of teaching? Who gets to participate? How study groups stabilize the students.

These are trying to get at the heart of what we're getting at. If we're trying to bring people to our campus that move in a direction we need to measure for that.

We are getting close to the end but we want to recognize the people in the room want to change current practices.

How do we instigate / institutionalize more radical change on different levels?

- i. Admissions (undergrad & grad)
- ii. Curriculum
- iii. Pedagogy
- iv. Assessment practices
- v. Incentive/Rewards structures for faculty (esp. the hidden service load for women/minority faculty)

Frederick Douglass (1857) - "If there is no struggle, there is no progress. Power concedes nothing without a demand. It never did and it never will."

We want to destabilizing the norm of who we hold as having knowledge. We want to talk about these things in theory but the how and where we do it are going to be different. The skills to do this are gain over a lifetime and are part of constantly asking ourselves how do we instigate / institutionalize more radical change on different levels?

We need to think about who is at the table. Whose work is represented? Whose work is recognized.

Frederick Douglass (1857) - “If there is no struggle, there is no progress. Power concedes nothing without a demand. It never did and it never will.” Saying something is important. Doing something is also important. You have to engage in the act of change making in a way that is relevant to you to make that change.

If you are engaged in change agency. **Be ready for the pushback, questing and backlash.**

Read through Rochelle Gutiérrez’s December paper discussing the backlash against her: Why Mathematics (Education) was late to the Backlash Party: The need for a revolution. View it here:

<http://ed-osprey.gsu.edu/ojs/index.php/JUME/article/view/347/224>

Be ready to be questioned. When you start to push against the normative ways you come up against the same resistance.

Closing thought: We want cultural change. So, so hard. So, so slow. Focus on progress, process. We are all impatient. We have to see it as a process, take joy in small victories/ small desettling moments. Take joy to move us all forward.

As Asian model minorities, is this our fight?

Dave - When I was a senior as undergrad at UW, recruited for Treisman Emerging Scholars, It was eye opening for me. 40 students (African American, Latinx, Native American, from small towns). Seeing how the students who had historically not done well at UW thrived, that changed my perspective and I wanted to bring that to others.

It is fascinating that there is a lot of Asian Americans talking about diversity issues. Even when we talk about civil rights movement is in racist way. First movies about civil rights movement is about white people registering to vote. It's also true about diversity in math. Listening to males about gender, they are likely to hear from men. Asian Americans can also see this from a new angle. As model minority in the mathematics community we can see a lot seeing microaggressions that a lot of white people don't. It's not coincidental that they are leading in this.

Sumun - positionality as a model minority that is weaponized against black and Latinx. It's been that way since the framework was presented, to talk about good vs bad minorities. Positioning from the start has been to position as a wedge. It's harmful here. I grew up in the midwest, and learned first pieces of race consciousness vs ethnicity consciousness. Brown Asian woman in a context where it was all black and white. Not black and not white - not just not something- but then what am I and what does that stand for? It's also about owning identity, I'm steeped and immersed in that. It's also a way of being highlighted and made invisible in the larged discussion of race and racism. Vertical and horizontal oppression. When we think in binary ways we lose nuanced ways.

Grad student - Mathjobs.org. We receive all this great training and then there is 600 applicants for one position. People look to make sure you don't miss out. What do you think of that?

- I learned from last school president- give a damn meter, representation of students meter. The interview process is a standardized test. Be intentional about looking for representation. If we do status quo then we get status quo.
- You have to think about dividing the load. Have a process that you speak about BEFORE the situation. The intent that you put into the application - what examples you're looking for in the teaching statement. What you're looking for in the research statement. Agree on with a rubric ahead of time - highlight details of what you are trying to look for. They all have to be looked at.
- AMS - It is so easy for people who don't care about your job to apply for it. It is plus because it's easy for those people who think you wouldn't give them a second look to also apply. To look at pile of applications- ask for a diversity statement or something else. Give the person a chance to say what they will do for your campus. By asking for something beyond the usual then people can't just click the button.
- We asked that in cover letter to address something specifically and then make it searchable.
- You have to

- From hiring side with diversity statements - the folks that had the hardest time writing diversity statements had the least experience on the job market. Don't want to disadvantage recent PhDs which gives you an opportunity to develop the skills.
- There is something to bringing folks in and introducing them to our folks. That said I push back that there are PhD students who they have the chance to do the work. Could be in different ways.

How important is it that you talk to people who really know how to do politics. There may be a lot of things in political world that we may want to consider. There may be things we could get blindsided.

Dave - I think it's already being played and we're losing. If you want to win then you have to play the game. there is a flip side of that then you can leverage their politics to push the change.

Sumun - how to teach the skills to engage in the political games - politics at large and then in our institution. Taking a stance is a choice based act in our institution. What is the pedagogy in our training programs - what have we learned beyond content mastery. There is a rich opportunity there.

Two quotes from Tacoma

- Politics is the art of satisfying the irritated without irritating the satisfied.
- I want to do politics but I don't want to irritate my principles, I don't have principles.

On the job training -

Grad student finishing up and just hired, been on PhD. Diversity statement - some schools have sample diversity statement. CTL statements and how to build a diversity statement for you. Socioeconomic. We're having a lot of training in grad school and we're in a great position to respond but there is a pressure we hear that we need to apply for 100 jobs because there is a pressure to get there. Don't know what i'm qualified for - where do I fit? Wanted a small liberal arts college (SLACs).

One school had a job and denaded response to their mission statement - in the last paragraph we don't go in for so called "social justice". AAHH!

Mathematics summer program - transitioning from pre calc to calc. Found grad students care, deeply care and ran off grad student volunteer labor.

That said, the economics is because we need the jobs. Adjuncts - 70% of teaching load is being done by. How to talk about reforming the system when you have no ability to do.

S- Calls in the trend of faculty at large with no job security and no health security, beyond job security. Destabilizes the ability - deeply harmful. How to push against that is a deep questions.

D- what does it say that grad students still care and acknowledge that it's going to be

beaten out of them. These are hard questions - what are the incentive structures. How do we tend the pond? Revamping of the ecosystem.

Assistant professors still care :)