

# Inclusive Teaching: What does that mean in STEM?

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Christus

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*The Task of the Modern Educator is not to cut down jungles but irrigate Deserts.*

C.S. Lewis

*Inclusive excellence is the philosophy that excellence should be pursued and that everyone should have the opportunity to do so...*

Unknown

# Have you ever said this??

- It must be because they are not exerting effort!
- Why aren't they seeking MY help? I just don't think they are motivated...
- Students work too many hours! They don't prepare for classes!
- So unengaged!!!

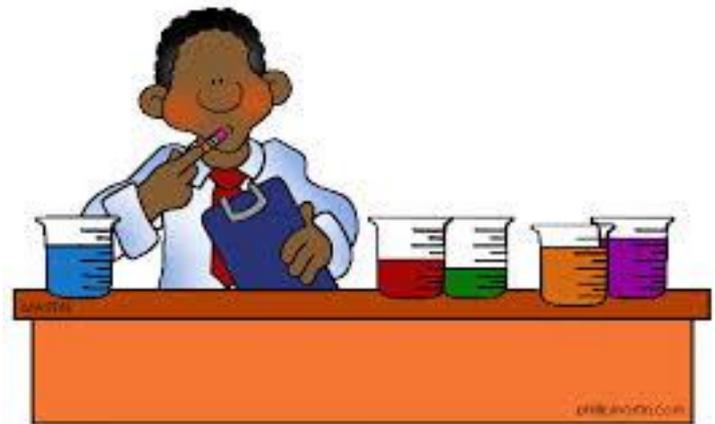
# Have you ever felt?

- Isolated
- Alone
- Confused
- Sad
- Depressed
- Outcasted
- Frustrated
- Different



# Teaching in STEM Doesn't Give Us a Pass.....

- We can still be inclusive despite teaching “facts”, “theories”, or “laws”
- Creating an environment in our classes, departments, colleges, and universities
- What does IE really mean? How do we create this environment?



# Defining *Inclusive Excellence*

- AAC&U defines Inclusive Excellence as
  - Integration of diversity, equity, and educational quality efforts into the missions and institutional operations at an institution
  - AAC&U calls for higher education to address diversity, inclusion, and equity as critical to the wellbeing of democratic culture.
  - An active process through which institutions achieve excellence in learning, teaching, student development, institutional functioning, and engagement in local and global communities.

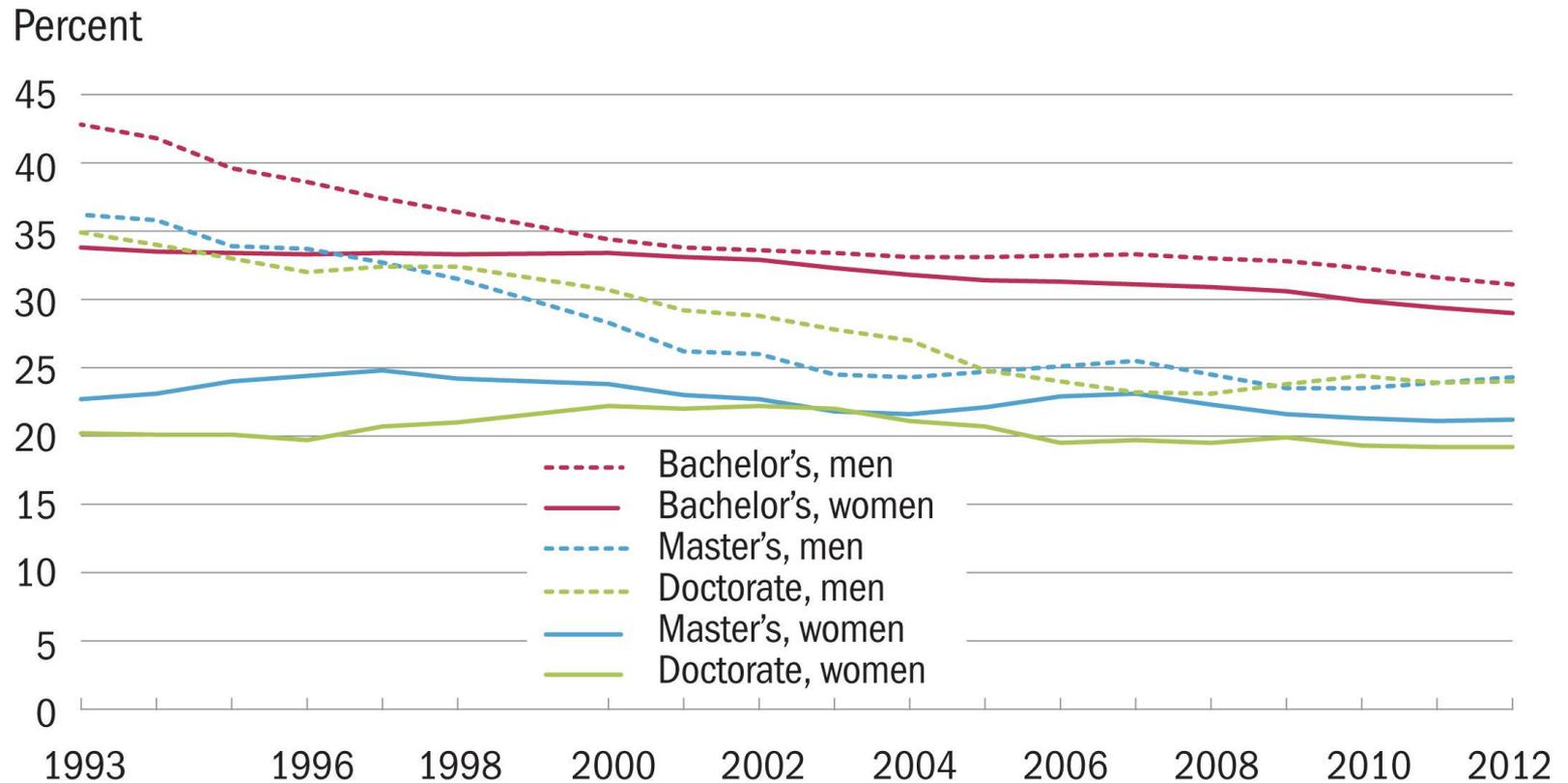
# Diversity, Inclusion, and Equity: Core Principles

- Develop “equity-minded practitioners,” who are willing to engage in the necessary, and sometimes difficult, conversations and decision-making that can lead to transformational change for student learning and achievement.
- **Diversity**
  - Individual differences (e.g., personality, learning styles, and life experiences)
  - group/social differences (e.g., race/ethnicity, class, gender, sexual orientation, country of origin, and ability as well as cultural, political, religious, or other affiliations).
- **Inclusion**
  - The active, intentional, and ongoing engagement with diversity—in the curriculum, in the co-curriculum, and in communities (intellectual, social, cultural, geographical) with which individuals might connect—in ways that increase awareness, content knowledge, cognitive sophistication, and empathic understanding of the complex ways individuals interact within systems and institutions.
- **Equity**
  - The creation of opportunities for historically UR populations to have equal access to and participate in educational programs that are capable of closing the achievement gaps in student success and completion.
- **Equity-mindedness**
  - A demonstrated awareness of and willingness to address equity issues among institutional leaders and staff (Center for Urban Education, University of Southern California).

# Why does teaching inclusively matter?

- Wide body of literature shows that inclusive teaching benefits students and positively impacts student learning, retention, and professional development.
- UGRs are still largely underrepresented.
  - Examples –
    - 2012- 0.015% of engineering doctorate degrees were awarded to Hispanic females
    - 2013 – 0 doctoral degrees were awarded to African Americans in the fields of astronomy, oceanography, applied physics and nuclear engineering

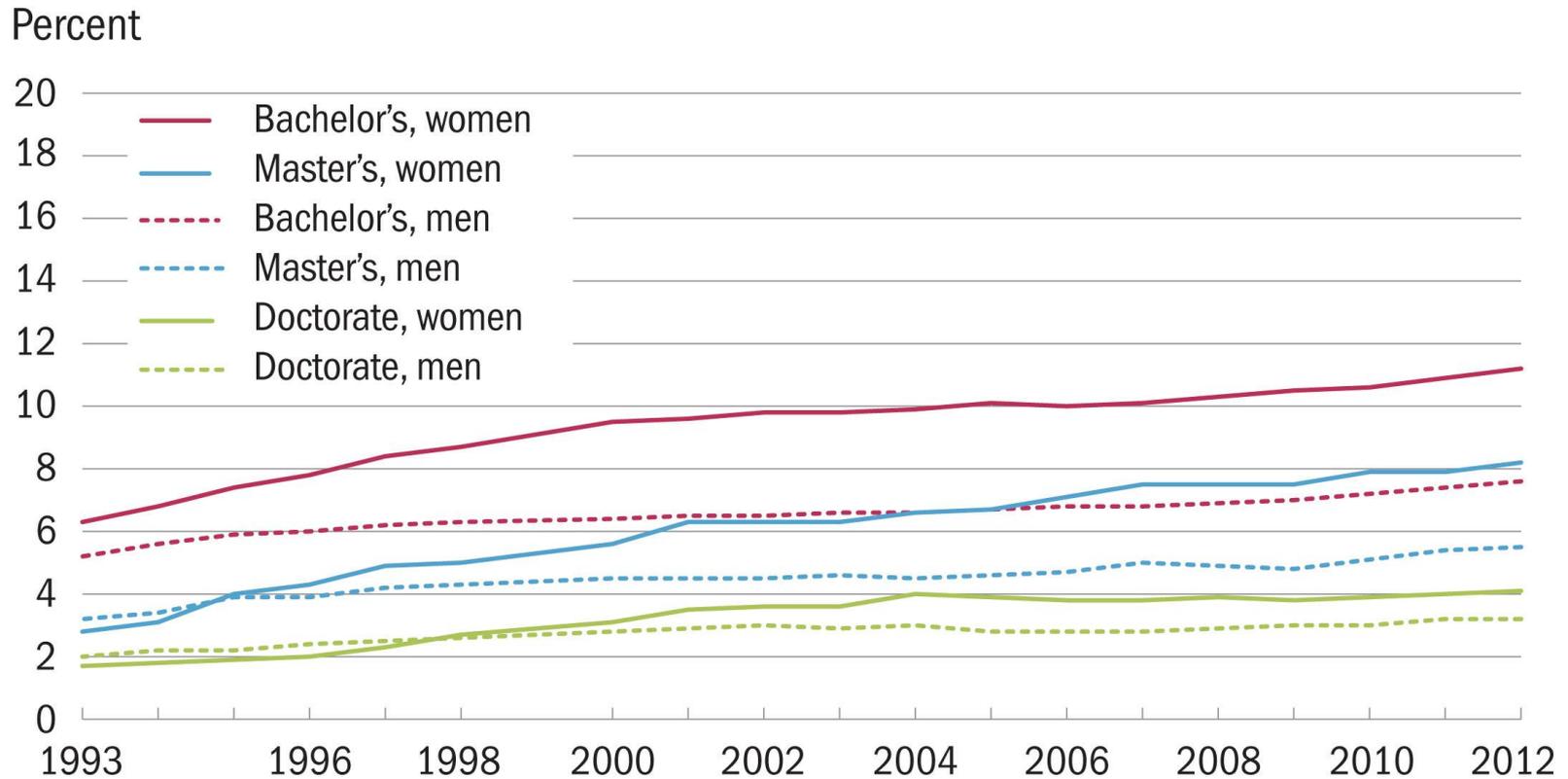
## Science and engineering degrees earned by white women and men: 1993–2012



NOTE: Data not available for 1999.



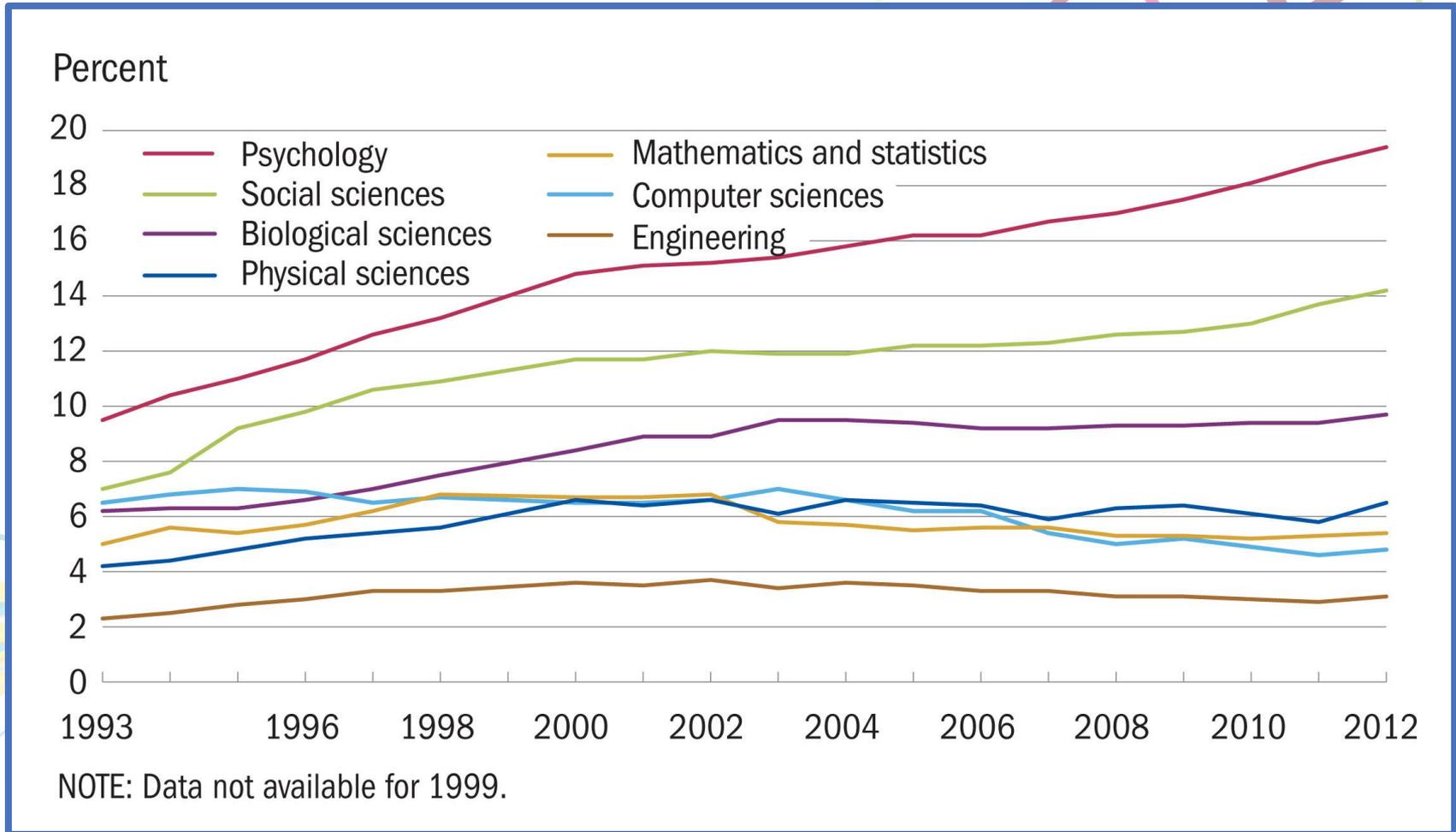
# Science and engineering degrees earned by underrepresented minority women and men: 1993–2012



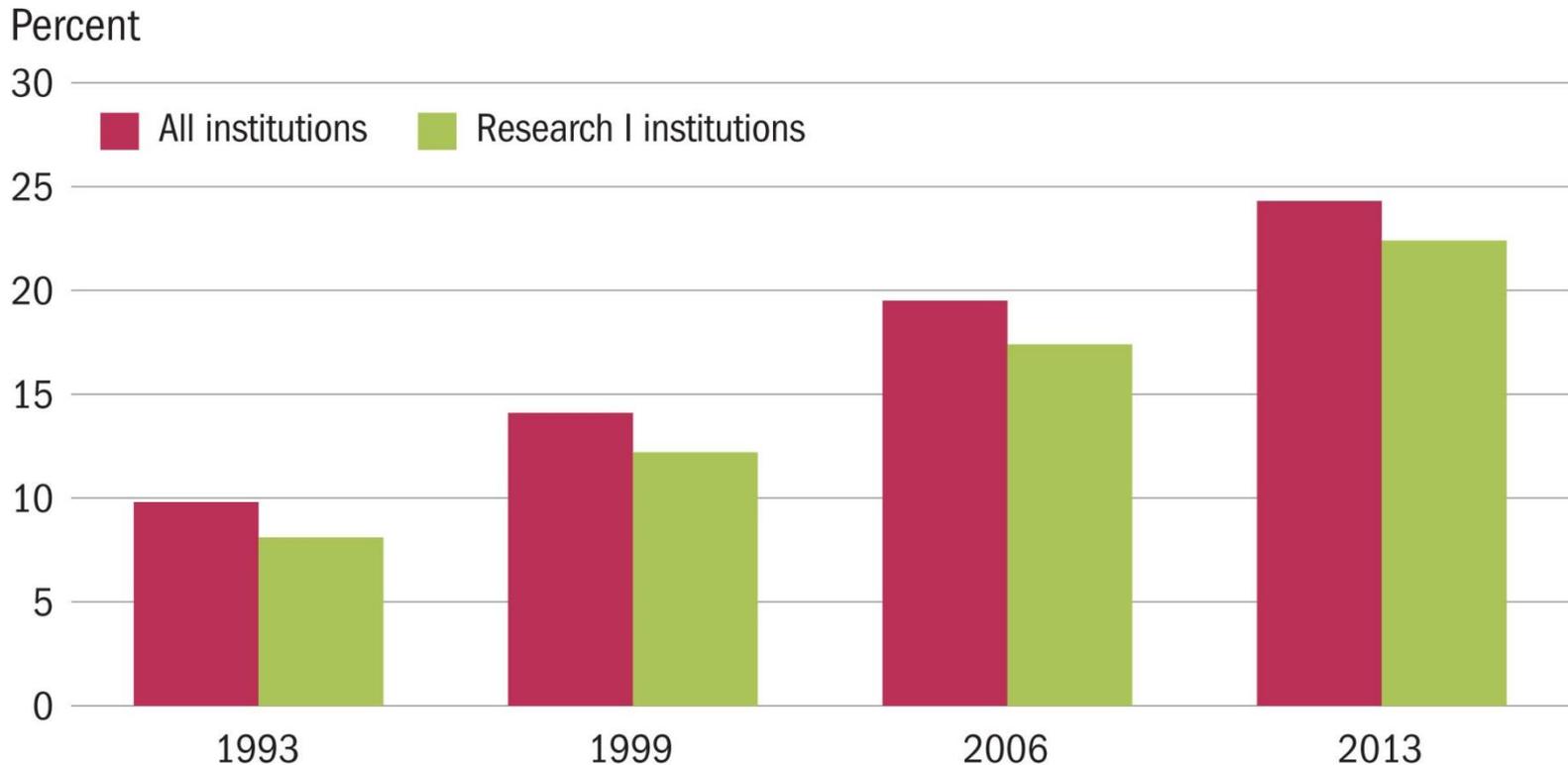
NOTE: Data not available for 1999.



# Science and engineering bachelor's degrees earned by underrepresented minority women, by field: 1993–2012



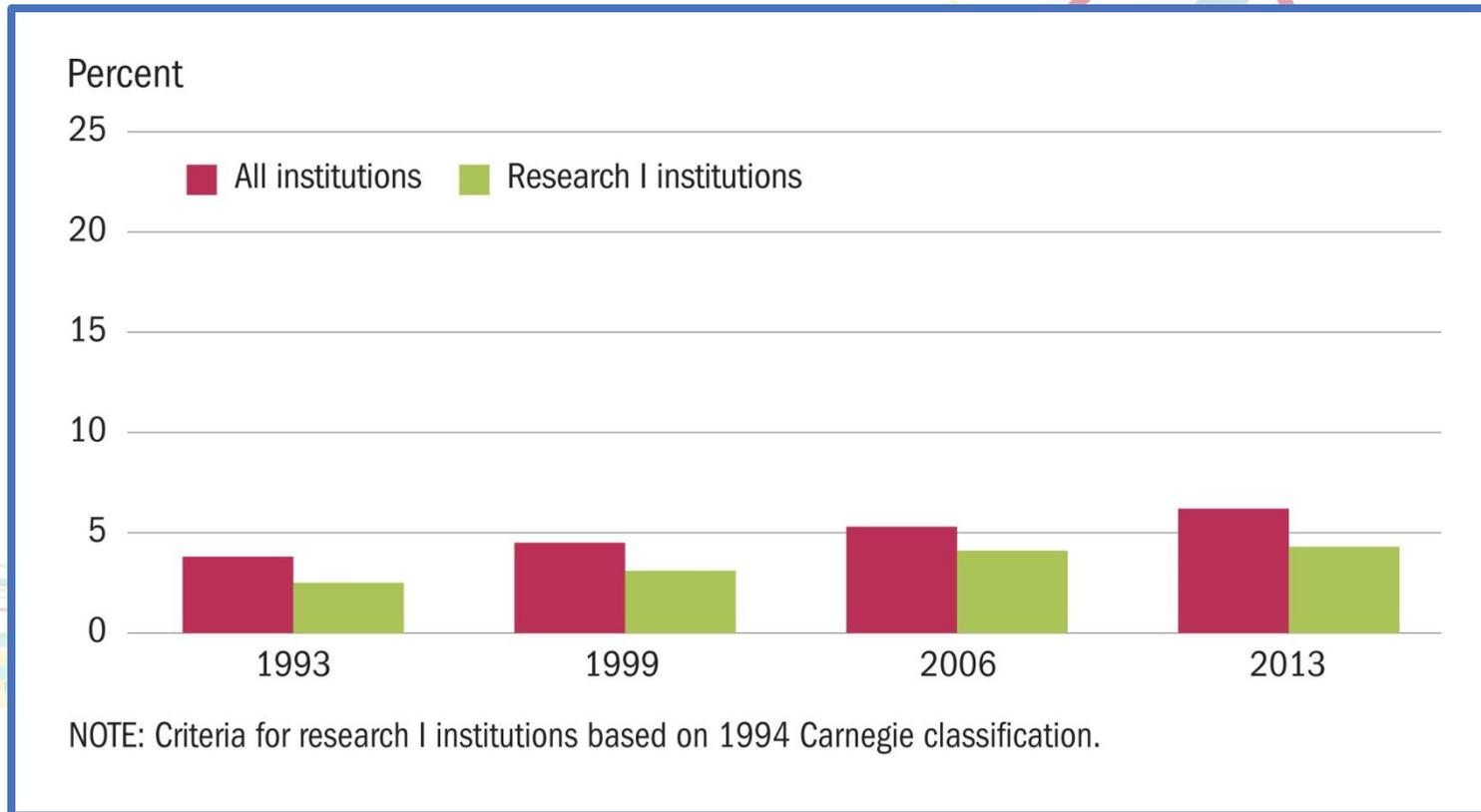
# Women as a percentage of full-time, full professors with science, engineering, and health doctorates, by employing institution: 1993–2013



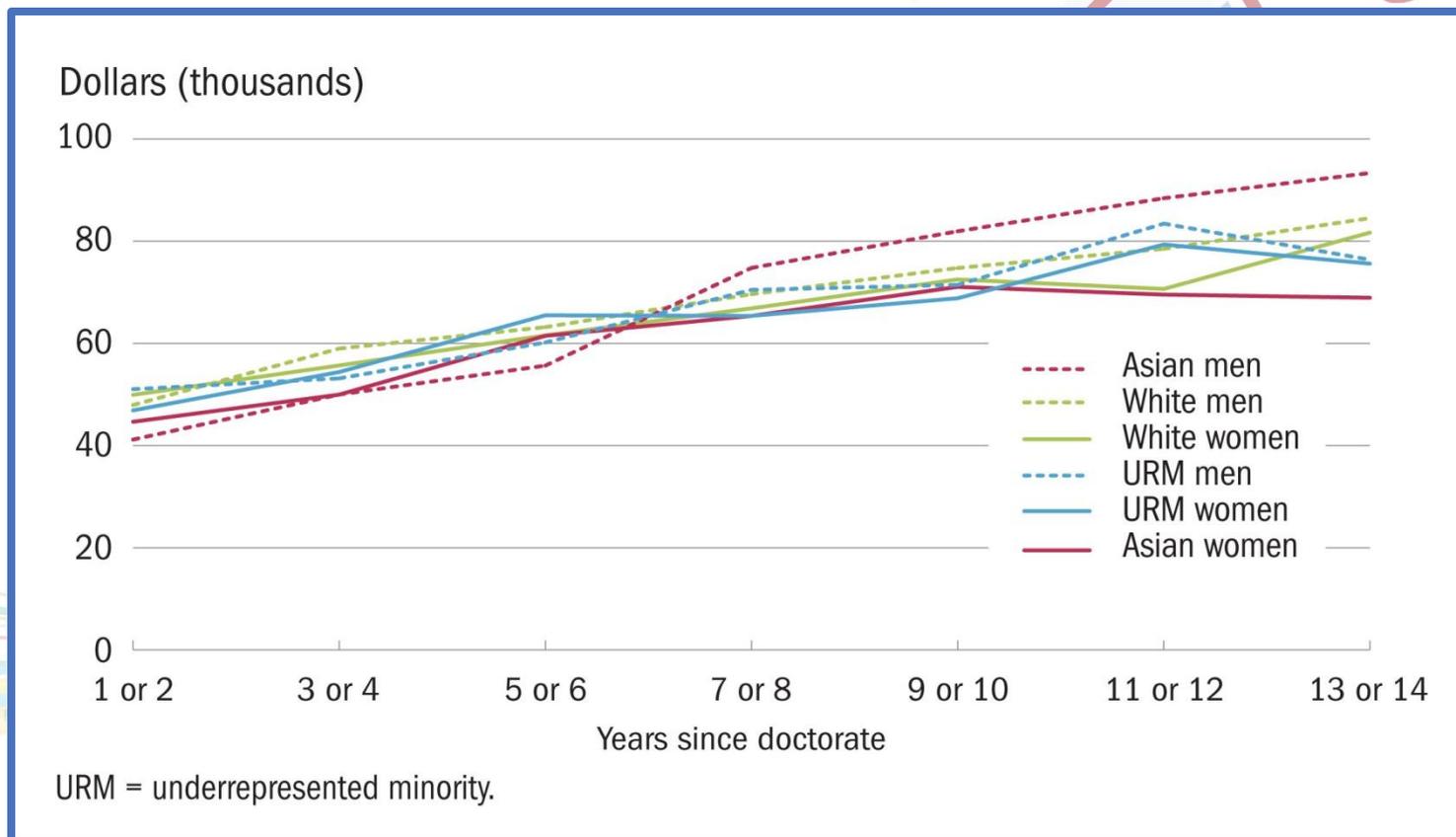
NOTE: Criteria for research I institutions based on 1994 Carnegie classification.



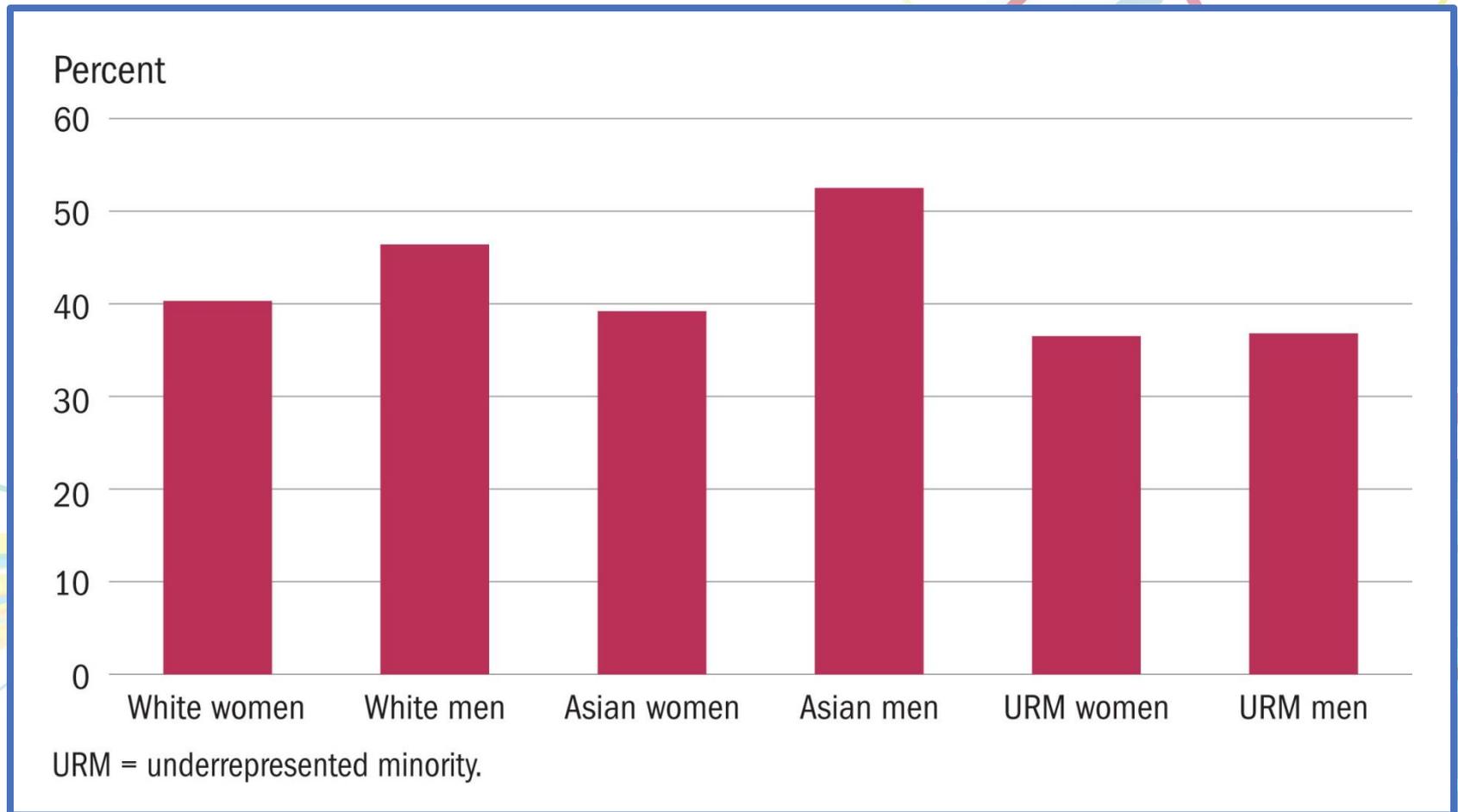
# Underrepresented minorities as a percentage of full-time, full professors with science, engineering, and health doctorates, by employing institution: 1993–2013



# Median salaries of doctoral scientists and engineers employed full time in 4-year institutions, by years since doctorate: 2013



# Full-time faculty in 4-year institutions who have science, engineering, and health doctorates and receive federal support: 2013



# Time, time, time...

- In science there tends to be a resistance to change.
- Most common reasons cited –
  - The lack of an inclusive mindset, lack of knowledge about pedagogy, high teaching loads, and lack of time for instructional development.

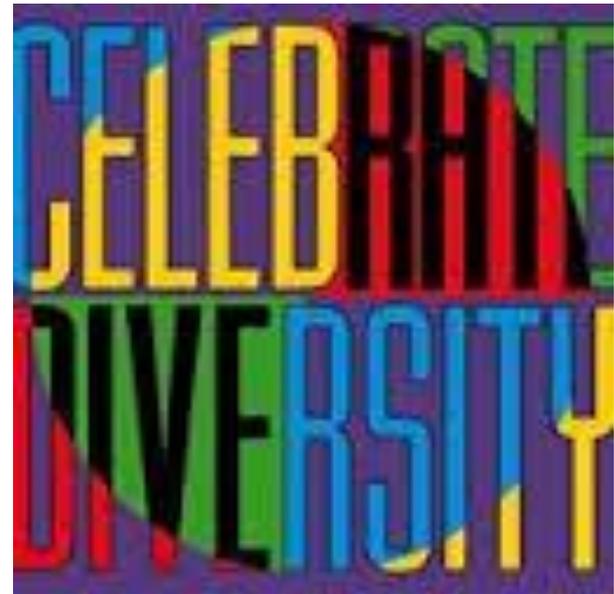


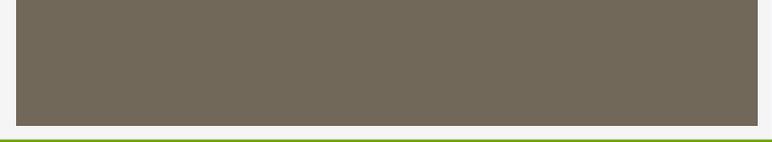
# Inclusive Teaching

- Can be effective without being inclusive!
- Inclusive teaching adds to effective teaching a framework for understanding why teaching is effective, which in turn helps solve problems, extends effective practices to other contexts, and facilitates adapting to change.
- Example –
  - A faculty member may teach a course effectively without consciously considering inclusiveness, but by defining the problem well, this faculty member has created a learning environment which effectively welcomes and includes all students.
- However, being effective in one course does not guarantee being effective in a different course, at a different level, or with a different group of students.
- Inclusive teaching encourages faculty to be explicit in their decision-making about teaching – beyond “doing what worked last time.”

# Many different inclusions to consider:

- Race
- Ethnicity
- Culture
- Income
- First generation
- Gender Identity
- Sexual orientation
- Disabilities
- Age
- Etc.





Who are we teaching?

# Demographics

The report provides projections for 45 states. **Wisconsin** is one of 17 states that will see a “slowing production of high school graduates, **losing between 5 and 15 percent**” of high school graduates.

## **National High School Graduation Rates by Ethnicity; 2013/2014 through 2027/2028:**

- ❖ American Indian/Alaska Native – 18% increase
- ❖ Asian/Pacific Islander – 42% increase
- ❖ Black non-Hispanic – 3% increase
- ❖ Hispanic – 31% increase
- ❖ White non-Hispanic - -10% decrease

# Demographics

## **MIDWEST High School Graduation Rate Projections 2013/2014 through 2027/2028**

- ❖ American Indian/Alaska Native – 1.8% increase
- ❖ Asian/Pacific Islander – 43.7% increase
- ❖ Black non-Hispanic – 1.7% increase
- ❖ Hispanic – 29.9% increase
- ❖ White non-Hispanic - -13% decrease

# UW System

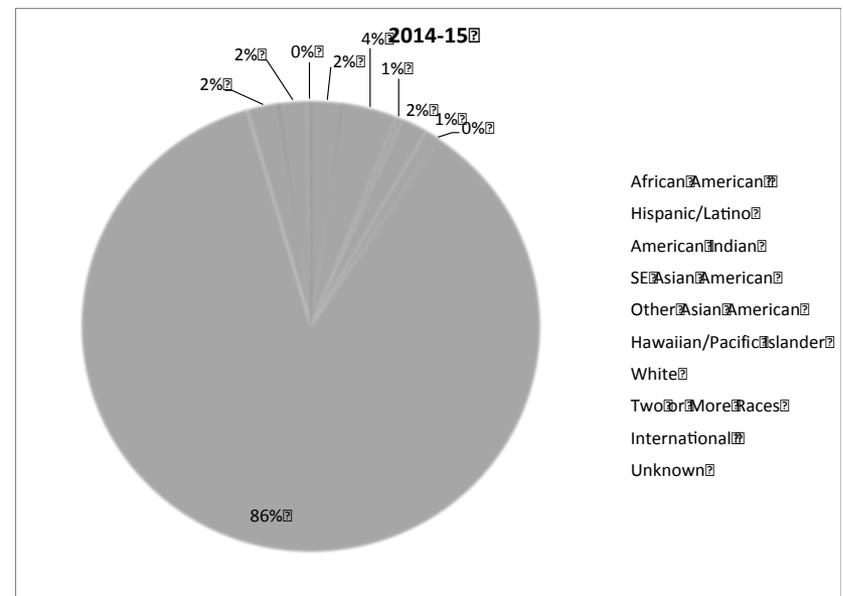
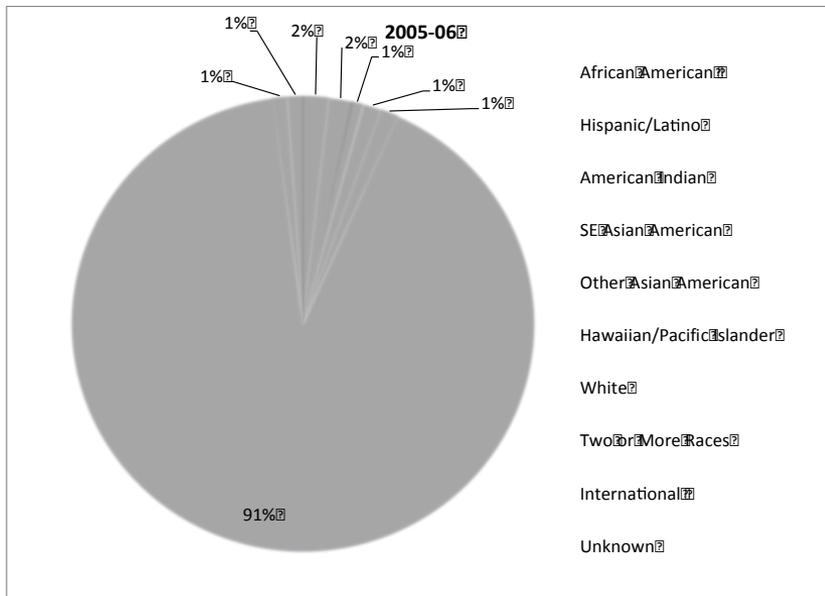
- 103,028 students in 2014-2015
  - Comprehensives and Colleges

Group	2005-06		Percentage	
	Comps.	Colleges	Comps.	Colleges
African American	1492	153	1.88%	1.21%
Hispanic/Latino	1221	256	1.54%	2.03%
American Indian	660	99	0.83%	0.79%
SE Asian American	1005	148	1.27%	1.17%
Other Asian American	947	197	1.19%	1.56%
Hawaiian/Pacific Islander	0	0	0.00%	0.00%
White	72214	11512	91.11%	91.39%
Two or More Races	0	0	0.00%	0.00%
International	900	46	1.14%	0.37%
Unknown	822	186	1.04%	1.48%
<b>Total</b>	<b>79261</b>	<b>12597</b>	<b>100.00%</b>	<b>100.00%</b>

# UW System

Group	2014-15		Percentage	
	Comps.	Colleges	Comps.	Colleges
African American	1909	356	2.15%	2.51%
Hispanic/Latino	3174	806	3.57%	5.69%
American Indian	411	67	0.46%	0.47%
SE Asian American	1531	377	1.72%	2.66%
Other Asian American	836	174	0.94%	1.23%
Hawaiian/Pacific Islander	73	15	0.08%	0.11%
White	76688	11974	86.31%	84.49%
Two or More Races	2020	296	2.27%	2.09%
International	1945	52	2.19%	0.37%
Unknown	269	55	0.30%	0.39%
<b>Total</b>	<b>88856</b>	<b>14172</b>	<b>100.00%</b>	<b>100.00%</b>

# Comparison



# But...

- Access
  - Enrollment, financial aid and major areas of study
- Retention
  - Persistence and academic success
- Excellence
  - Achievement and academic opportunities
- Institutional Receptivity
  - Openness to diversity of faculty, staff and campus climate

# What Can We Do?

- We can change!
- Need to think about each particular course we are teaching
- Methods cannot be more time consuming!
- Develop a plan and be conscious about what you are teaching from a student's point of view to achieve optimal learning outcomes

# What do we need to do?

- Know who our students are and who they will be!
- Have frank, hard dialogues about the climate for underserved students with the goal of effecting a paradigm shift in language and actions
- Invest in culturally competent practices that lead to success of underserved (and all!!) students
- Set and monitor equity-minded goals
  - Included allocating resources to achieve them!

# Implications for Teaching

## **Faculty will need to work on:**

- Creating a diversity of learning experiences in the classroom
- Create an experiential, interactive and authentic learning environment
- Elimination of delays (millennials like immediate feedback)
- Create an opportunity for students to staying connected
- Expand their opportunities on and off campus by providing internships emphasizing social services projects
- Revising the curriculum taking into account the millennial learning styles and their differences

*Beatriz Rivera, Maribel Huertas*

# How do Minnennials differ from Generation X:

Generation X	Millennials
Born late 60s-early 80s 51 Million	Born early 80s-early 2000s 75 Million
Accepts Diversity Pragmatic/Practical Self-reliant/individualistic Rejects rules Mistrust institutions Use Technology Multitask Latch-key kids Friend-not family	Celebrates Diversity Optimistic/Realistic Self-inventive/individualistic Rewrite the rules Irrelevance of institutions Assume technology Multitask fast Nurtured Friends = Family

"Engaging Multiple Generations among Your Workforce" by Devon Scheef and Diane Thielfoldt

# The Five R's of Engaging Millennial Students

- **Research-based methods:**
  - Active learning methods
    - Less lecture, use of multimedia, collaborating with peers;
- **Relevance:**
  - The professor's role is shifting from disseminating information to helping students apply the information.
    - Connect course content to the current culture and make learning outcomes and activities relevant
- **Rationale**
  - More likely to comply with course policies when teachers provide them with a rationale for specific policies and assignments
- **Relaxed**
  - Prefer a less formal learning environment in which they can informally interact with the professor and one another
- **Rapport**
  - Extremely relational
  - used to having the adults in their lives show great interest in them.
  - Appreciate professors showing interest
    - More willing to pursue learning outcomes when instructors connect with them on a personal level.

○ Mary Bart

# What do we need to do?

- Action plan –
  - Develop an actively pursue a clear vision and goals for achieving the high-quality learning necessary for earning a degree
  - Monitor data to ensure ELOs are reached and equitable participation and achievement are accomplished by underserved (and all!) students
  - Provide support to help students achieve ELOs
  - Identify high impact practices that you can implement and proactively ensure equitable student participation
  - Making student achievement VISIBLE and VALUABLE!

# Clarify Your Expectations!

- *Clearly define your goals and expectations. Provide rationales, appropriate design, and principles of implementation*
  - What is important for students to be able to do in the course? Have you specified that? Do you tell them why it is important or just assume they know?
  - Tell students the ways in which people in your discipline are successful. How do they work? How do they study? How do they achieve success?
  - Eliminate inconsistency among learning goals, content, activities, and evaluation
    - Better syllabus? Schedule of events?
  - Get to know your students – What is their prior knowledge and skill set coming into a course? Are your expectations in line with their abilities?
    - Identify resources for filling in gaps in knowledge and skills that are identified.

# The Iterative Process

- *Recognize that an effective system is designed to monitor and respond to feedback, adapt to changing conditions, and provide alternate strategies when systems do not function or other obstacles are encountered.*
- Assess the students.
  - Quick feedback has been shown to improve student retention for URGs.
  - If you assess, you have to respond!
- Design learning experiences based on the learning goals not based just on how you've previously taught or learned the material.
- Provide support somehow. People need multiple ways to practice.
  - Examples – Student peer support, extra worksheets, online homework, written homework, clickers, tutorial videos, online tutorials, case studies, etc.

# Practice, Practice, Practice

- Remind your students that your activities are designed to support effective learning for all students.
  - Meaning = Remind them they matter to you!
- Provide students with feedback that is task specific and not a general confirmation of ability
  - Student X demonstrates a clear understanding of a given concept rather than responding with general statements like “good”.

# External Factors Do Matter

- *Anticipate and minimize or compensate for ways in which teaching and learning processes and outcomes are influenced by environmental factors and other external constraints.*
- Examples –
  - Use online homework? Do all of your students have internet access?
  - Do your students work? Do they honestly have enough time to commit to their coursework?
  - Do your students have families? Parents or kids they are taking care of?

# The Real World

- Do your students see people like themselves majoring in your discipline?
- How do we fight back against our statistics and encourage them to go into a position where they are an “URG”?
- Help students explore the ethical and social relevance of course content to the professional or scientific community. Let them connect to the “issues”.
- Expose the students!
  - Invite women and scholars of color as guest lecturers.
  - Highlight current ongoing research by an URG person.
  - Use historical discoveries to show the diverse community of professionals and scholars that have contributed

# Questions?

