



Transforming Engineering Culture to Advance Inclusion and Diversity (TECAID): An Evidence-Based Approach & Model

February 22, 2018 (12:30-1:30pm ET)




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Webinar Overview


- **Why** engage in DEI-focused engineering department culture change?
- **How** does one go about DEI-focused engineering department culture change?
- **Who** has engaged in this change process?
- **What** are resources useful for the department culture change process?




WHY Engage in DEI-Focused Department Change? ASME Perspective




Thomas Perry, P.E. (TECAID Co-PI)
Director, Engineering Education (ret., 2017)
American Society of Mechanical Engineers (ASME)



Aisha Kenya Lawrey, M.P.A. (TECAID Co-PI)
Director, Engineering Education
American Society of Mechanical Engineers (ASME)



Tom's Personal Context



The Digital Mechanical Engineer


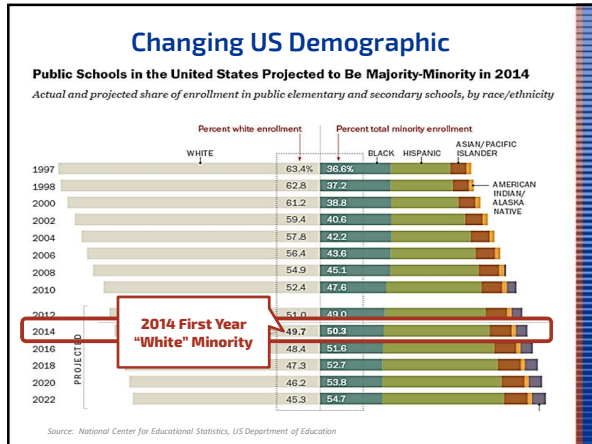


Image Source: Google - ASME Mechanical Engineering (January 2018)

The Changing Student-Talent Supply-Chain



Image Source: Google - NBC News.com



Innovation

“Diversity drives innovation. When we limit who can contribute, we in turn limit what problems we can solve.”

Telle Whitney
 CEO & Co-Founder
 Anita Borg Institute for Women in Technology

Image Source: Google: The CUBE-Grace Hopper Celebration 2016

Aisha's Personal Context

Richer and more extensive practice-based engineering experience for students

Greater cultivation of collaborative inclusion, diversity, creativity, and innovation among students and faculty

Increased flexibility in ME Programs

New balance of faculty research/ industry practice skills in ME programs

Development of students' professional, and communication skills to higher standards

Google: ASME Vision 2030 Project

ASME Engineering Education: Strategies


- Convene & Collaborate
- Communicate
- Advocate

ASME Engineering Education: Specifics

- Degree Program Quality Standards**
 - ABET Accreditation
 - ~400 ME/MET Degree Programs Globally
- Leadership Development**
 - ASME Department Heads Community & Leadership Summits/Workshops
- Research, Best Practices & Advocacy**
 - Vision 2030 Advocacy
 - Collaborative Research/Programs
 - Awards, Fellowships

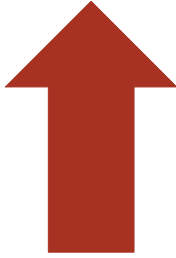
ABET Principles: Diversity & Inclusion
 Approved by Board of Directors (June 12, 2017):

- 1) Our global professions require creativity and innovation, which are best achieved when persons with varied perspectives, experiences, and talents work toward a common goal.
- 2) Understanding and experiencing diversity and inclusion in higher education are critical to competitiveness, innovation, and our social and economic futures.
- 3) Further, we expect our accredited programs to support this vision.




ASME Engineering Education

Undergraduate ME Enrollment: 8 Years




62% Overall
 55% Men
 119% Women

ASEE Data, 2008-2016, US & Canada




Equality




The assumption is that everyone benefits from the same supports. This is equal treatment.

Equity




Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

Justice

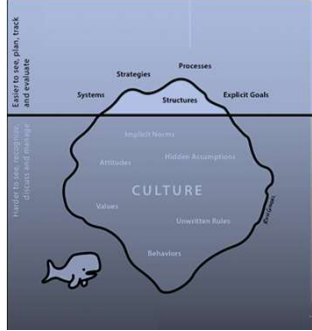


All 3 can see the game without supports or accommodations because the cause(s) of the inequity was addressed. The systemic barrier has been removed.

Image Source Google: Pinterest-Laura Thomas on Equality, Equity, & Justice




Culture

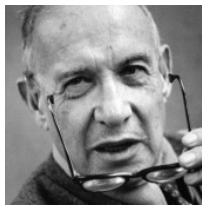


A department's biggest challenges....
 Lie below the waterline.....

Image Source Google: Dangerous Kitchen Rich Godel (March 25, 2015)




Culture is Paramount



"Culture Eats Strategy for Breakfast."


Peter F. Drucker
 Clarke Professor of Social Science & Management,
 Claremont Graduate University, 1971-2005

Image Source Google: AZ Quotes



ASME Engineering Education Key "Take-Away(s)"

- **Diverse perspectives are critical** for addressing the multidisciplinary, global problems that we face.
- **ME is the largest U/G engineering discipline**
- **Women's enrollment is growing** at a faster rate than men's (although women are still only 13% undergrads)
- **Capitalize on women's enrollment growth**
- **Focus on culture change strategies** to recruit and retain women and role model faculty
- **Strive for the 30% "tipping point"**
- Culture change strategies used to support women's engagement will be **beneficial to all URMs.**



WHY Engage in DEI-Focused Department Change? WEPAN Perspective



Amy Freeman, Ph.D. (TECAID Co-PI)
President, Women In Engineering ProActive Network (WEPAN)
Chief Diversity Officer and Associate Provost,
Tufts University



"What girl wouldn't want to do this?"



One's lived experience informs perception...



"You think you're over it- and then you get a letter..."



Why the TECAID Model?

It is possible to raise consciousness,
and change behaviors in a way that will
encourage
the growth of a diverse and inclusive
scholarly community.



Working to Achieve Gender Equity through Culture Transformation



WEPAN
Women in Engineering ProActive Network

- Welcoming Environments



Working to Achieve Gender Equity through Culture Transformation




WEPAN
Women in Engineering ProActive Network

- Welcoming Environments
- Student Participation




Working to Achieve Gender Equity through Culture Transformation




WEPAN
Women in Engineering ProActive Network

- Welcoming Environments
- Student Participation
- Research-based strategies




Working to Achieve Gender Equity through Culture Transformation





WEPAN
Women in Engineering ProActive Network

- Welcoming Environments
- Student Participation
- Research-based strategies
- Systems-level improvements



TECAID Changes the Culture




TECAID Changes the Culture




Women in Engineering ProActive Network (WEPAN) Key "Take-Away(s)"


- We change the culture when we **change the daily individual experience where perceptions are formed.**
- The TECAID Model provides **practical, research-based solutions that engage all members** of a department in long-term, systemic cultural change.


HOW to Effect DEI-Focused Department Change?



Gretal Leibnitz, Ph.D. (TECAID PI)
Research & Grants Consultant
Women in Engineering ProActive Network (WEPAN)



Diana Kardia, Ph.D.
(TECAID Organizational Change Consultant)
Founder and Partner, Kardia Group, LLC



Resources: Website



TECAID Wins 2017 NSF Video Showcase



Evidence Based TECAID Outcomes

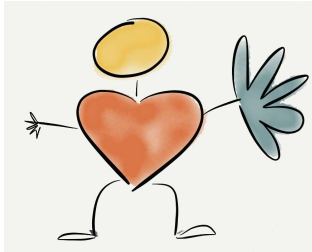



Image Created by J.R. Briggs

- ↑ Knowledge and Use of Diversity, Equity and Inclusion (DEI) Concepts
- ↑ Confidence in Leadership Skills
- ↑ DEI Action


http://www.wepan.org/mpage/TECAID_Outcomes



Example: Increased Knowledge of Diversity Concepts

"Micro-Inequities" Awareness


BEFORE	↑	AFTER
59%		96%



Example: Increased Knowledge of Diversity Concepts

"Micro-Inequities" Awareness Informs Interactions

BEFORE	↑	AFTER
36%		69%



Example: Increased Confidence

AFTER
>90%




- How to engage in productive change processes
- Leadership skills
- How to create organizational change




Example: DEI Action Taken

Within Last 6 Months
100%


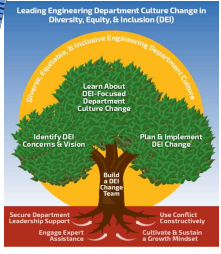



- DEI action taken (Participants taking no action dropped from 37% to 0%)

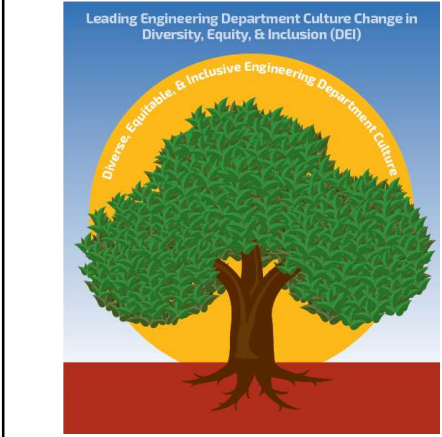



Resources:

[TECAID Model & Graphic](#)

Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

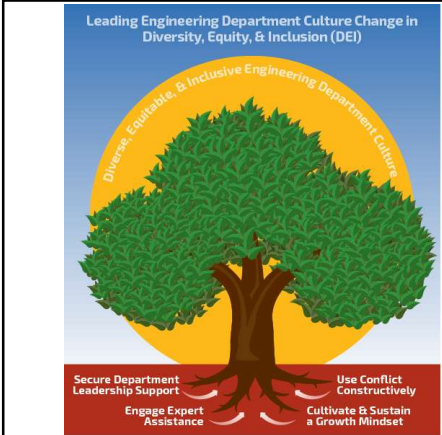




Chat: What's Your Vision?

- Why does having a diverse, equitable, and inclusive engineering department culture matter to **you**?



Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

TECAD Case Studies

Case Study 3
Navigating Conflict while Engaging in DEI Change Efforts

Diversity efforts through the experience of differences – and differences in bridge conflict. Conflict is an inevitable part of the experience of change. Conflict is typically considered problematic in a negative way. However, conflict is typically considered addressed in a positive way – that is, something in fact or in the resolution of resolution.

This case study documents the Thomas Kilbourn Conflict Mode Instrument. This tool describes how two people deal with conflict:

- **Attribution:** Making an attempt to resolve the conflict.
- **Competition:** Pushing the other party to have their way.
- **Collaboration:** Both parties working together to find a solution which will meet the objectives of both parties.
- **Compromise:** Both parties working together to find a solution which will meet the objectives of both parties.
- **Withdrawal:** One party withdrawing or not showing up in order to avoid the conflict.

Through this case study we have learned (in case) how and where to place where there was an effort to create a positive departmental climate – and, conversely, where effort to create a more positive departmental climate.

Through this case study, which demonstrates faculty working through many types of conflict situations you will see:

- Differences between productive and unproductive conflict behaviors.

Resources:
[Case Studies](#)

Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

Diverse, Equitable, & Inclusive Engineering Department Culture

Build a DEI Change Team

Secure Department Leadership Support Use Conflict Constructively

Engage Expert Assistance Cultivate & Sustain a Growth Mindset

TECAD Case Studies

Case Study 1
Working as a Team on DEI Issues: The Challenges and Benefits

Most change efforts involve multiple individuals working together in a coordinated manner. However, in academia, most faculty work independently in the majority of their collaborative efforts outside of their specific research interests. This is a major challenge faced by faculty engaging in change efforts in the process of effectively building and sustaining a change team.

This case study documents how a team-building experience, like the one presented through TECAD, helps a diverse collection of individuals become a cohesive unit.

In Case Study 1, you will see how several faculty members:

- Created a shared vision for a common goal.
- Progressed from a collection of individual problems.
- Made positive use of different members' points of view.
- Over time, recognized and addressed interpersonal issues and academic issues in order to maintain and continue developing good teamwork.

The Case Study

Like the other teams, Team PNC came into the TECAD process mostly about the possibility for creating a multi-departmental and interdisciplinary in their department. A primary concern was their department's ability in terms of maintaining a critical mass of female faculty members.

The team had followed some track and leader diversity:

- Low: A multi-faceted multi-departmental chair and full professor.
- High: A female assistant professor.
- High: A female assistant professor.

The team also represented a variety of DEI-related issues and concerns. A question that affected several team members was how to work through their own differences to be an effective team.

During one of the TECAD workshops, participants were asked to reflect upon and share their social identities (such as race, gender, and sexual orientation) and their experiences and feelings regarding discrimination and prejudice. For many participants, this was an uncharted and edgy – and often a very uncomfortable – experience. For many participants, this was a very successful experience. These kinds of issues are addressed in the workshop.

Resources:
[Case Studies](#)

Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

Diverse, Equitable, & Inclusive Engineering Department Culture

Identify DEI Concerns & Vision

Build a DEI Change Team

Secure Department Leadership Support Use Conflict Constructively

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Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

Diverse, Equitable, & Inclusive Engineering Department Culture

Learn About DEI-Focused Department Culture Change

Identify DEI Concerns & Vision

Build a DEI Change Team

Secure Department Leadership Support Use Conflict Constructively

Engage Expert Assistance Cultivate & Sustain a Growth Mindset

Leading Engineering Department Culture Change in Diversity, Equity, & Inclusion (DEI)

Diverse, Equitable, & Inclusive Engineering Department Culture

Learn About DEI-Focused Department Culture Change

Identify DEI Concerns & Vision

Plan & Implement DEI Change

Build a DEI Change Team

Secure Department Leadership Support Use Conflict Constructively

Engage Expert Assistance Cultivate & Sustain a Growth Mindset

TECAID Case Studies

Case Study 2

Gathering Strategic Information for Planned DEI Change

Many change efforts experience a sense of urgency, having motivated by a response to an acute crisis or a need for change. However, effective action is predicated on an understanding of the problem we are trying to solve. Do we understand what is needed to solve the problem? Do we understand the underlying culture, and can we distinguish symptoms from causes? Do we understand the kind of change? The first challenge facing change efforts is the data dilemma of gathering strategic information.

This case study demonstrates a productive approach to strategic intelligence gathering – specifically in a case related to diversity, equity, and inclusion (DEI) change. The approach includes:

- Thoughtful and effective data collection in response to an acute problem
- Tracking and making productive use of differences in how individuals perceive the problem
- Analyzing the readiness for making change.

Note: In this case study, the term Underrepresented Minority (URM) can encompass students with identities that are not dominantly represented in their Mechanical Engineering department. This term can include, but is not limited to, Hispanic/Latino, American Indian, Alaska Natives, and people of color. People of color (of interethnic) have dominant identities that are not of color – as those who have dominant and non-dominant identities, like a white, transgender man.

The Case Study

Recently, several undergraduate URM students approached their faculty advisor with concerns about their experience in the department. In some classes, they had been asked to leave the lab space. They had also experienced certain issues with their advisor and brought this to the Chair.

This was not good news for the department. These faculty feared the possibility that such concerns could lead to competent students underperforming and perhaps even leaving the department – thereby making it even more difficult to recruit diverse students in the future. They were also concerned about the lack of professional support resources of the Chair.

The Chair decided to create a Task Force focused on two issues: identifying and addressing the concerns of their department and future students, and providing a forum for discussion about diversity and inclusion.

Resources:
Case Studies

TECAID WEAPAN ASME PURDUE

Transforming Engineering Culture
To Advance Inclusion and Diversity

Force Field Analysis Worksheet for Planning Change

Forces Pushing for Change Reasons (+)	Forces Pushing Against Change Barriers (-)
	Individual
	Team
	Department
	Larger Environment

Resources:
Force Field Analysis & Worksheet

TECAID

TECAID WEAPAN ASME PURDUE

Transforming Engineering Culture
To Advance Inclusion and Diversity

Toolkit

Diversity, Equity, & Inclusion (DEI) Department Culture Change
TECAID Model Graphic

Resources:
Toolkit & Worksheet

TECAID

"What does TECAID Mean for YOUR Work?"
Key "Take Away(s)"

Teams & Time
Education & Engagement
Commitment & Customization
Adaptation & Assessment
Iterative & Inimitable
Dynamic & Daring

TECAID

Who has Engaged in this change process?



William (Bill) Predebon, (TECAID Participant)
Department Chair & Professor, Mechanical Engineering-Engineering Mechanics
Michigan Technological University

TECAID

Bill's Personal Context

The Boston Globe

New Black Panthers seek to unite neighborhood

By Megan Smith

After the police shooting in a residential building in the South End neighborhood of Boston, a group of young men and women gathered in a community room to discuss the incident and to plan for the future. The group, known as the New Black Panther Party, is a community-based organization that seeks to address the needs of the neighborhood's young people.



Image Source Google: Boston Chapter of New Black Panther Party
Image Source Google: Think.Create.Change.org

TECAID

What did TECAID work mean to your department and Faculty?



Image Source Google: Huffington Post



Image Source Google: The Odyssey Online



Teaming Learning Outcomes in ME at Michigan Tech

Implementing in the ME Practice Courses and the Sr. Capstone Design sequence:

1. Full engagement in the team
2. Team roles
3. Productive conflict
4. Analyze evidence
5. Identify each students strengths



Key "Take-Away(s)"

- **Start at the top** – has to be important to the chair for change to happen.
- Get a **critical mass of stakeholders** who believe in the effort
- Faculty are busy: **Indirectly educate faculty** by developing the tools for faculty to teach the students inclusive approaches
- **Implement in stages**
- **It is a long term endeavor** – keep at it and don't give up



Who has Engaged in this change process?



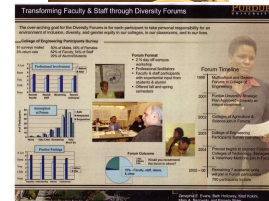
Klod Kokini, (Co-PI)
 Professor, Mechanical Engineering
 (Formerly Associate Dean, College of Engineering)
 Purdue University



Klod's Personal Context



How can the office of a Dean be leveraged in support of Department DEI Culture Change?



Purdue Departmental DEI Change



Key "Take-Away(s)"

- Culture is traditionally defined by majority. **Education of all**, including the majority **on DEI is critical** for real change
- Institutional **support**, through **Provost, Dean, Head is key to change**
- It is important to **build a community for change (inclusion) AND to increase underrepresented group members (diversity)**
- **It is a journey**, not a destination: persistence is key



Questions? Comments?

www.wepan.org/mpage/TECAID

- Gretal Leibnitz, Leibnitz@wepan.org (General TECAID Questions)
 Amy Freeman, Amy.Freeman@tufts.edu (WEPAN Questions)
 Aisha Lawrey, LawreyA@asme.org (ASME Education Questions)
 Bill Predebon, wwwpredeb@mtu.edu (TECAID "Dept. Chair" Questions)
 Klod Kokini, kokini@purdue.edu (TECAID "Dean/faculty" Questions)
 Diana Kardia, diana@kardiagroup.com (TECAID DEI & Organizational Change Questions)



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<https://www.surveymonkey.com/r/TECAIDWebinar1>

Thank you!