

2018 CoNECD - The Collaborative Network for Engineering and Computing  
Diversity Conference: Crystal City, Virginia Apr 29

## **Successful Engineering Dean's Diversity Councils**

### **Ms. Sandra English, Cleveland State University**

Sandra L. English, Esq., is the Senior Manager for the Center for Engineering Experiential Learning (CEEL) Office at the Washkewicz College of Engineering, Cleveland State University. Ms. English promotes and presents concepts and best practices of cooperative education to students, faculty and employers. Ms. English assists and participates on the Dean of the CSU Washkewicz College of Engineering's Diversity Council to implement programs and initiatives that reflect the College's commitment to diversity. She is the advisor for the NSBE (National Society of Black Engineers) student chapter and SHPE (Society of Hispanic Professional Engineers) student chapter. Ms. English serves as the primary point of contact and liaison with internal and external constituencies.

Hannah Rosen, M.Ed., is the Coordinator of Engineering Student Programs and Recruitment for the Washkewicz College of Engineering at Cleveland State University. Originally, from Phoenix, AZ, Hannah earned her undergraduate degree in English and Creative Writing from the University of Arizona and her Masters of Education in Higher Education from Arizona State University. Hannah joined the Washkewicz College of Engineering in August, 2016, and has been working to organize high school visits, college fairs and a recruitment event for women. Hannah also oversees tutoring for the college and assists with activities for engineering student organizations.

Anette M. Karlsson is the Dean of the Washkewicz College of Engineering at Cleveland State University. Washkewicz College of Engineering was founded in 1923 as Fenn College and has since maintained its reputation for excellence in engineering educating and research.

Dr. Karlsson has been a strong proponent for equity and diversity. Her work related to diversity efforts at the University of Delaware was recognized by the E. A. Trabant Award of Women's Equity 2012. Moreover, the Engineering Deans Diversity Council received the Presidential Award for Diversity at CSU two years in a row: 2014 and 2015.

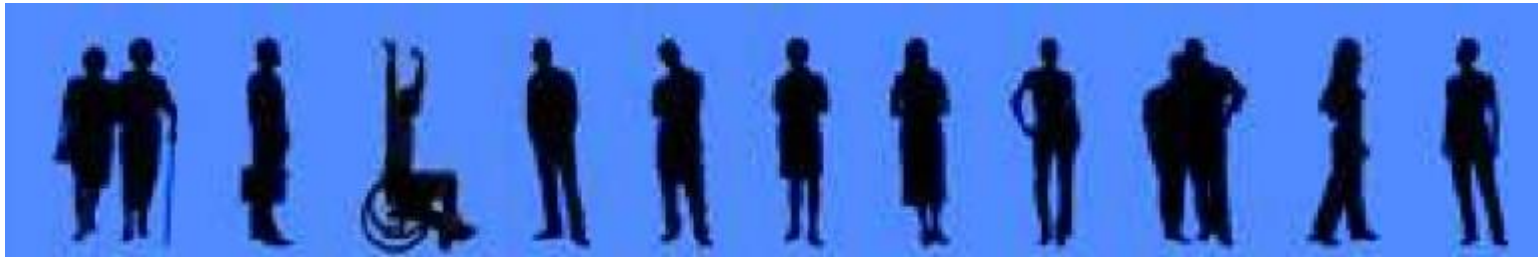
Dr. Karlsson is a Fellow of the American Society of Mechanical Engineering. She is the recipient of the 2004 ONR Young Investigator award and the Francis Alison Young Scholars Award for 2005. In 2012 she received the University of Delaware E. A. Trabant Award of Women's Equity.

### **Hannah Rosen, Cleveland State University**

Cleveland State University

### **Dr. Anette M Karlsson, Cleveland State University**

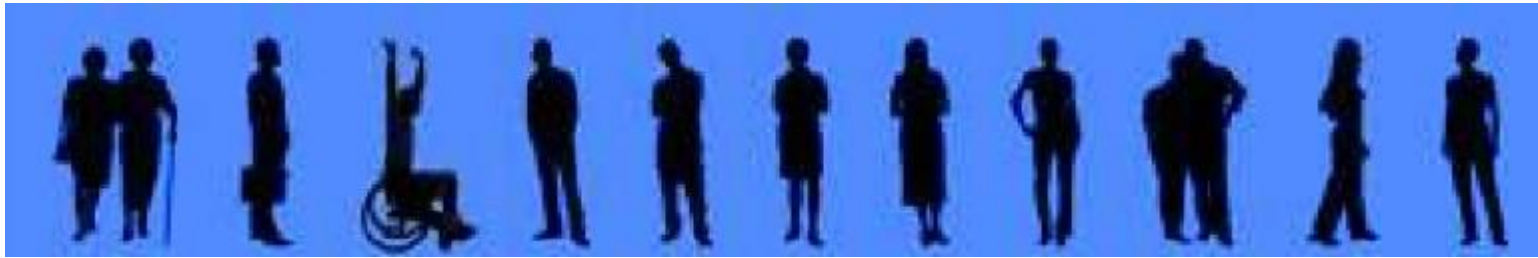
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# **Diversity Council Workshop Session**

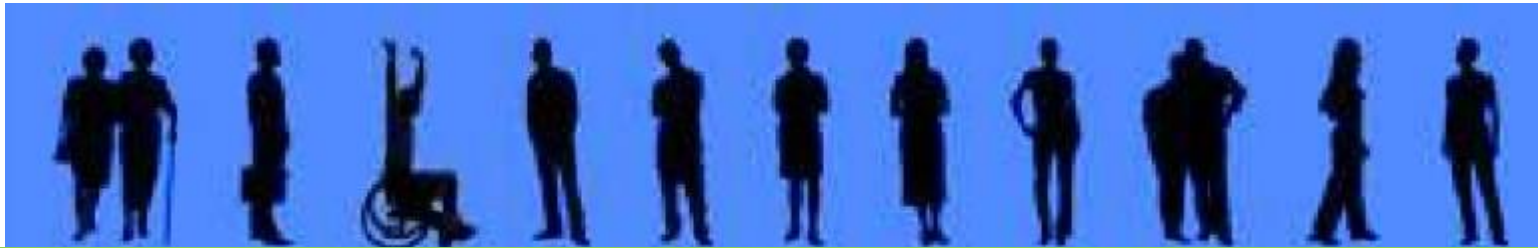
**Washkewicz College of  
Engineering  
Cleveland State University**





# Workshop Topics

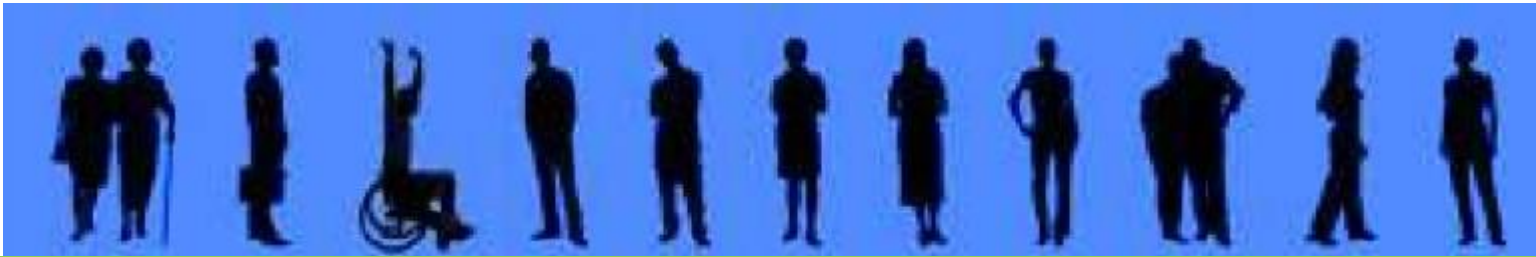
- Detailed Overview of CSU Engineering Diversity Council
- Approaches to Diversity in Engineering Workplace
- Working with Underrepresented Organizations
- Suggestions and Challenges with Alumni Mentoring Program
- CSU Strategies for Targeting Diverse Faculty
- Fenn Academy Program and Women in Engineering Initiatives



# Washkewicz College of Engineering

- ❑ **Our Mission is to provide a world class, engaged engineering education, and to graduate ready-to-go engineers who are prepared to solve real world engineering programs.**
- ❑ **Our Vision is to be the engineering school of choice for students of all backgrounds, and to empower sustainable urban living via engaged teaching and research.**
- ❑ **66 Faculty members in 5 departments**
- ❑ **1800 undergraduate students**
- ❑ **500 graduate students**
- ❑ **75 doctoral students**

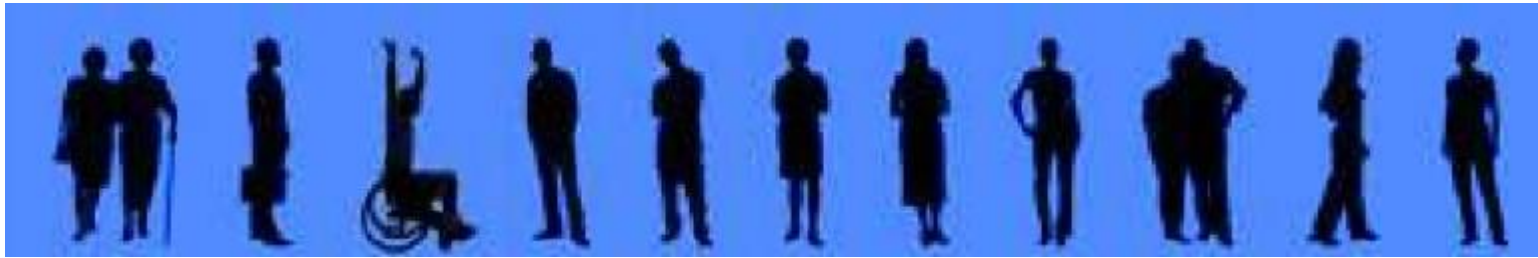




# Defining Diversity

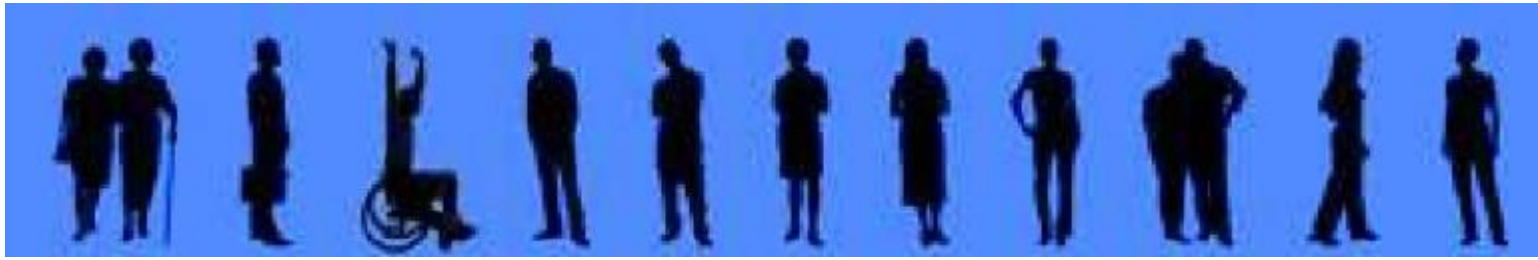
- ❑ Research shows that there are many ways to define diversity
- ❑ Age, Gender, Ethnicity, Nationality, Education and Work status are the common areas covered when discussing diversity
- ❑ Diversity can be defined as groups of two or more people referring to demographic differences of one sort or another among the group members [1]
- ❑ At CSU, here is how we are assessing diversity.

	Faculty	Staff	Management	Students	6yRetention	Cleveland	US
White	72.96%	67.29%	78.2%	61.4%	49%	33%	62%
Black	5.44%	23.74%	13.91%	16.4%	22.2%	53%	13%
Hispanic	2.36%	4.14%	2.63%	4.8%	38.7%	10%	17%
Asian	13.25%	3.15%	4.14%	3.4%	50%	2%	5%
Multiracial	0.73%	0.79%	0.75%	2.7%	28.1%	6%	3%
Nonresident Alien	5.08%	0.69%	0%	8.8%	81.8%		



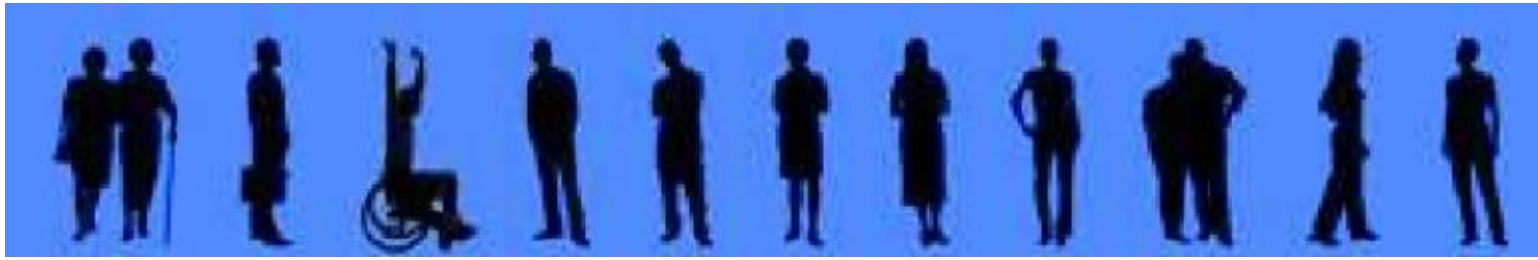
# Engineering DDC Overview

- History**
- Mission and Goals**
- Success Stories**
- Challenges**



## **DDC Mission Statement**

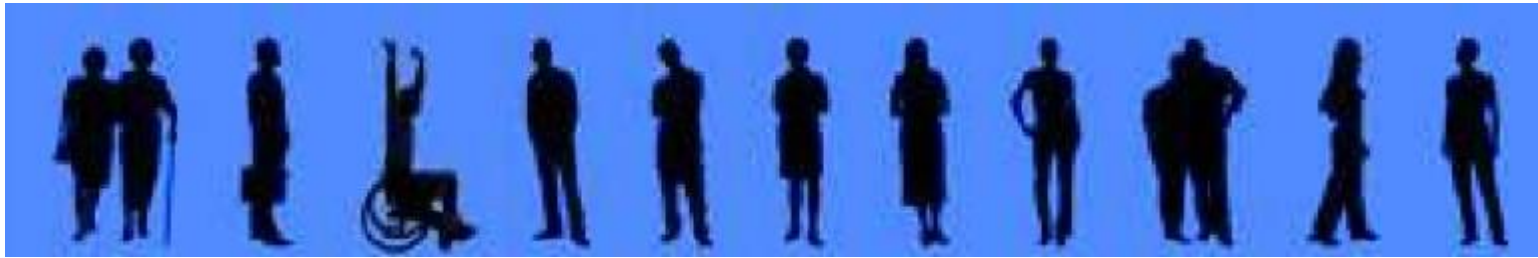
**To promote a culturally and intellectually rich environment for diversity and inclusion, support the education success and personal development of all members of the Washkewicz College of Engineering**



# DDC Goals

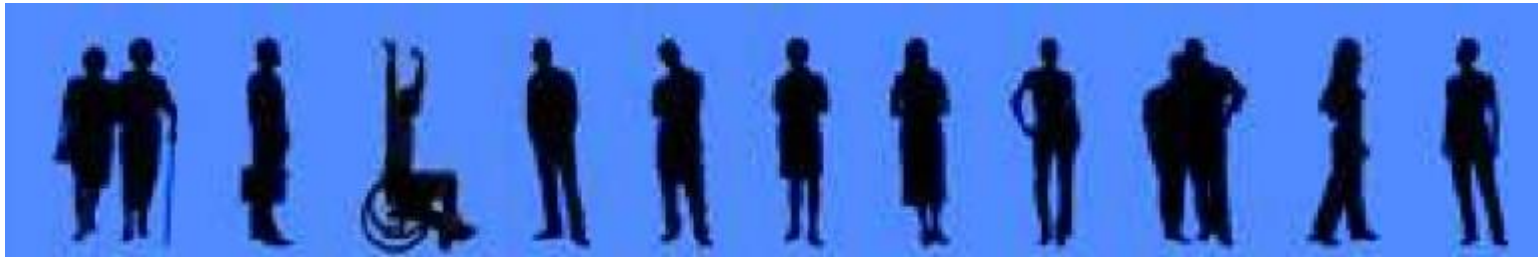
Goal No	Definition
1	Enrich the campus climate for diversity and inclusion
2	Strengthen Recruitment, Retention, Achievement and Graduation of Diverse Students
3	Strengthen and Promote Multicultural Programs





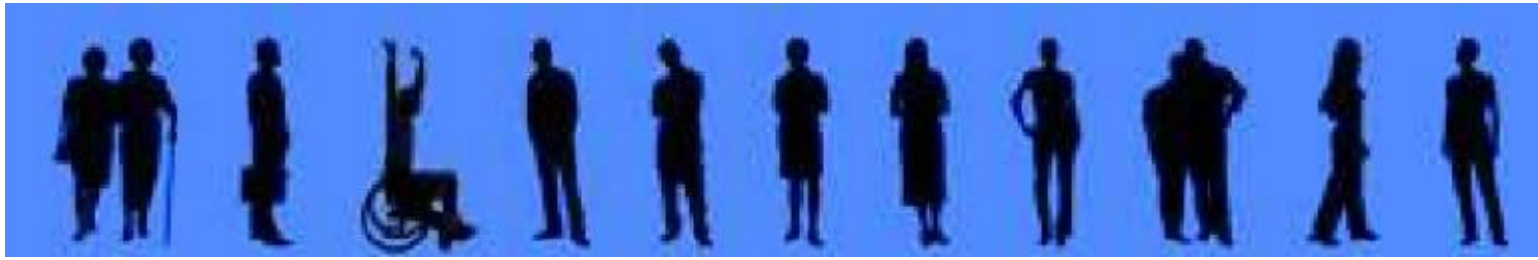
# DDC Success Stories

- ❑ **Structure (Diverse: Faculty, Staff, Students, Outside College and CSU Community)**
- ❑ **3-Years Commitment (Co-Chair, Chair, Past-Chair)**
- ❑ **Chair Rotation between Faculty & Staff**
- ❑ **Committee meetings 2 to 3 times/Semester**
- ❑ **Implicit Bias Workshops**



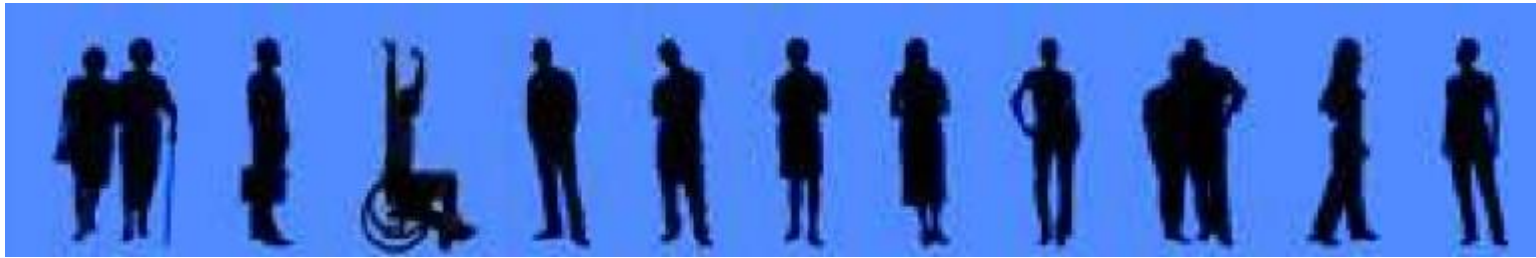
# DDC Challenges

- Faculty participation
- Keep all DDC members engaged
- People interested get overloaded
- Continuous Quality Improvement



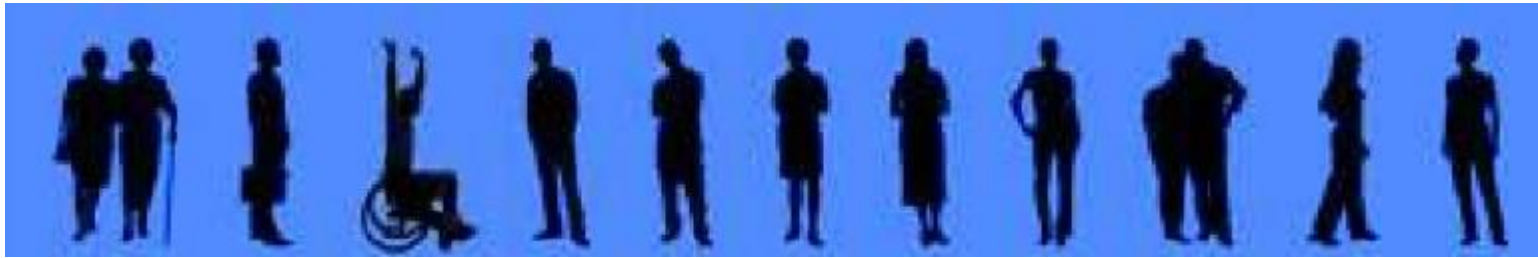
# Diversity in Engineering Workplace

- Developing Industry Partners**
- Campus Engagement**
- Experiential Education**



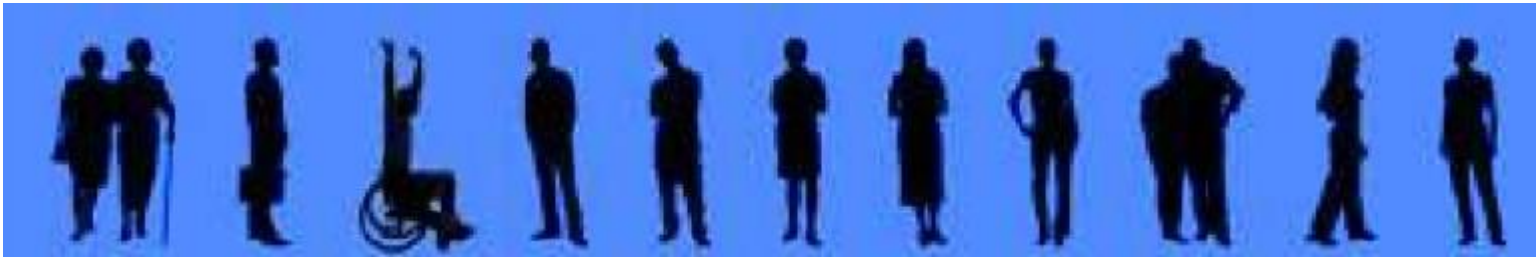
## Approaches to Diversity in Engineering Workplace

- ❑ **Developing Industry Partners**
  - ❑ **Utilized Industrial Advisory Boards, CSU Board of Trustees and Cooperative Education Program**
  - ❑ **Industry Partners with Diversity in the Workplace Seminars were:**
    - ❑ **NASA, Lincoln Electric, UTC Aerospace, FirstEnergy**
  - ❑ **Diversity in Engineering Networking Program**
    - ❑ **Year One: 8 companies with 20 underrepresented students in attendance**
    - ❑ **Year Two: 30 companies with 50 students in attendance**



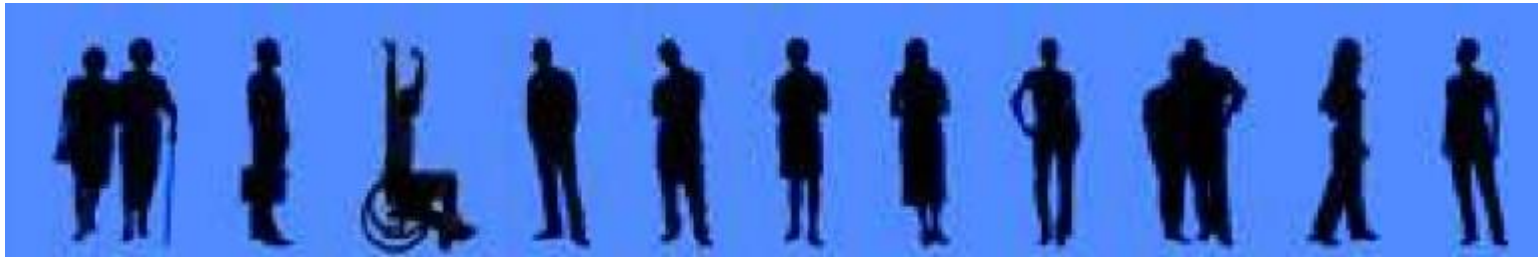
# Campus Engagement

- Often universities assess what institutional efforts are already underway
- Such factors look at areas of increased efforts in faculty recruitment, retention, student retention, outreach and programming [2]
- At CSU our campus engagement includes:
  - President's Diversity Council
  - College DDC Collaborations (College of Business, College of Science, and College of Law),
  - Engineering DDC (with outreach to members not on the council)



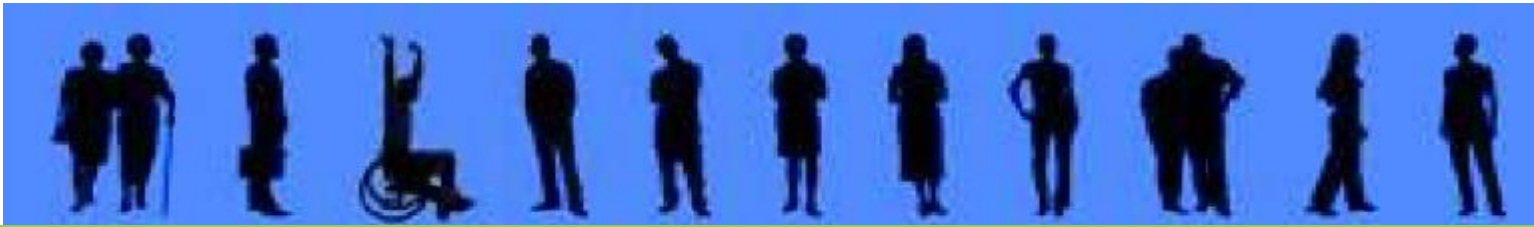
# Experiential Education

- ❑ **In College of Engineering, we have a Center for Engineering Experiential Learning which covers the following:**
  - ❑ **Cooperative Education (co-op)**
  - ❑ **Internships**
  - ❑ **Senior Design and Capstone Partnership**
  - ❑ **Industry Collaborative Initiatives**
  
- ❑ **Utilized Experiential Education via Center for Engineering Experiential Learning (CEEL) to enhance Diversity Initiatives.**
- ❑ **Experiential Education has served a great foundation to keep Industry Partners engaged in College wide Diversity Efforts**



# DDC Initiatives

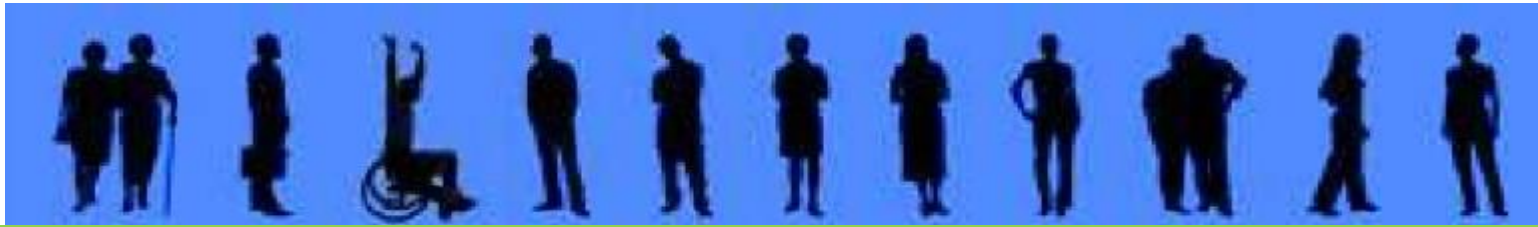
- Enhancing recruitment, retention and professional development with underrepresented organizations
- Success and challenges with sustainable engineering alumni mentoring programs
- Recruitment and Retention Workshop Strategies for targeting diverse faculty
- Fenn Academy middle school/high school recruitment program and women in engineering initiatives showcase



# Working with NSBE and SHPE

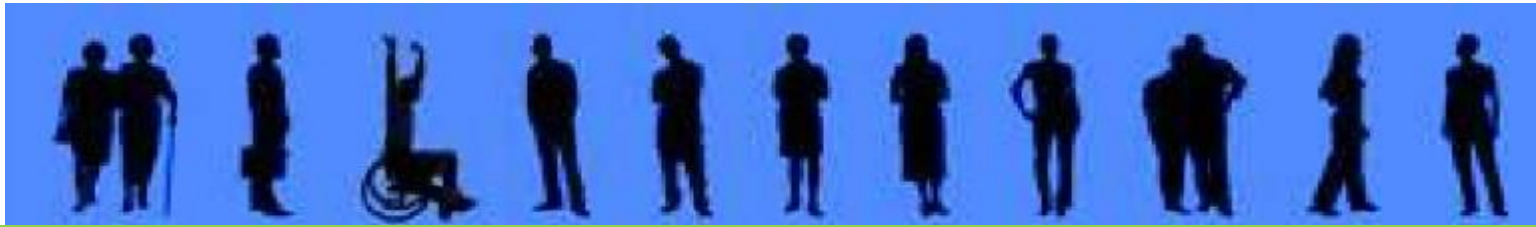
- ❑ **Recruitment:** Faculty/Staff advisor for NSBE and SHPE, student organization president and first year advising collaborate to identify candidates
- ❑ **Retention:** Advisors (First year and faculty) work with organizational advisor to disseminate resources to students which include one-on-one tutoring, academic seminars and college financial assistance
- ❑ **Professional Development:** Utilize CEEL Office to get students internships (freshman level and optional), Sophomore co-ops (mostly) and work one-on-one with students on resume drafting, interviewing skills and ethics/professionalism
- ❑ **Current Outcome**
  - ❑ 1. Recruitment: Successful in identifying students
  - ❑ 2. Retention: Needs more work, working to provide more resources timely and not reactionary
  - ❑ 3. Professional Development: Placement in Co-ops and Internships are successful and assist students but the retention factor even affects this outcome if not addressed timely.





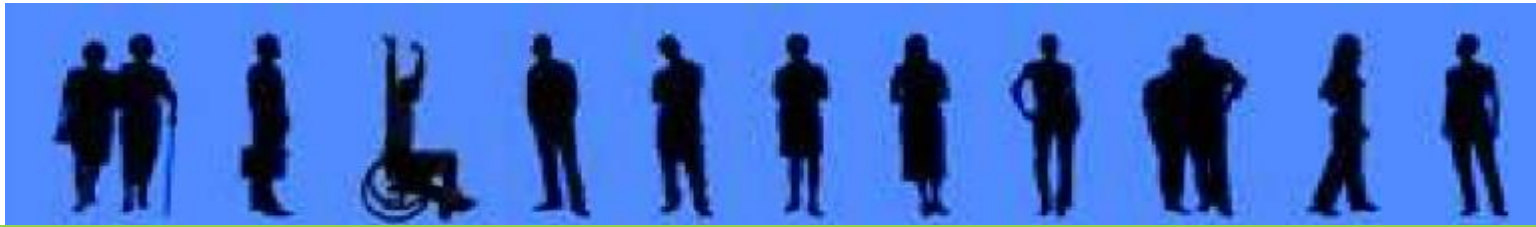
# Approach to Address Working with Underrepresented Organizations

- ❑ **The National Academies conducted a study on expanding underrepresented minority participation in America's science and technology talent and found that preparation, access, motivation, financial aid, academic support and social integration are issues that need attention. [3]**
- ❑ **At CSU, we thought we were addressing these areas and realized that our approach, while well intended, was fragmented and not coordinated.**
- ❑ **New approach to address these challenges**
  1. **Revise Introduction to Participants**
  2. **Orientate participants continually about resources**
  3. **Monitor every step of Implementation**
  4. **Carefully assess outcomes to determine what did and did not work and provide applicable solutions**



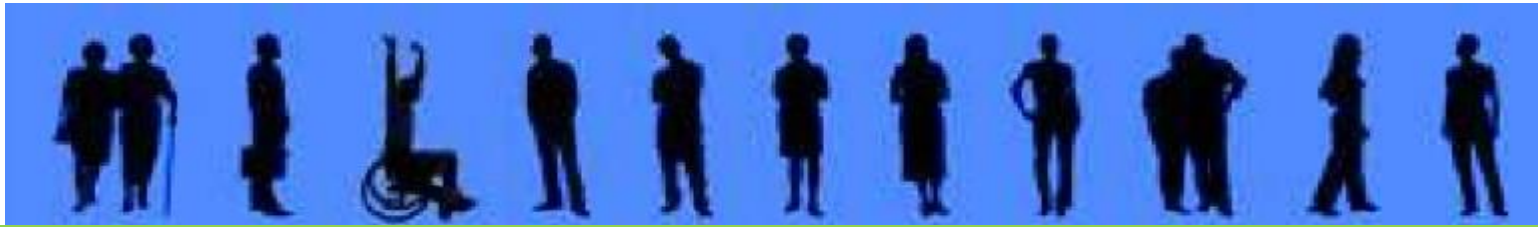
# **Approach to Address Working with Underrepresented Organizations Continued – Corporate Funding Model for a Bridge Program**

- ❑ Bridge Program for Students from Underrepresented Groups, securing their success earning a College Degree in Engineering**
  - ❑ The Bridge Program will support engineering and computer science students from low-income backgrounds and underserved high schools in navigating the transition to college-level engineering courses.**
  - ❑ The program will be designed to provide students who may not have the necessary network support to succeed in a rigorous college program.**
  - ❑ We will recruit the students via our Fenn Academy program, encouraging them to enroll in Engineering**



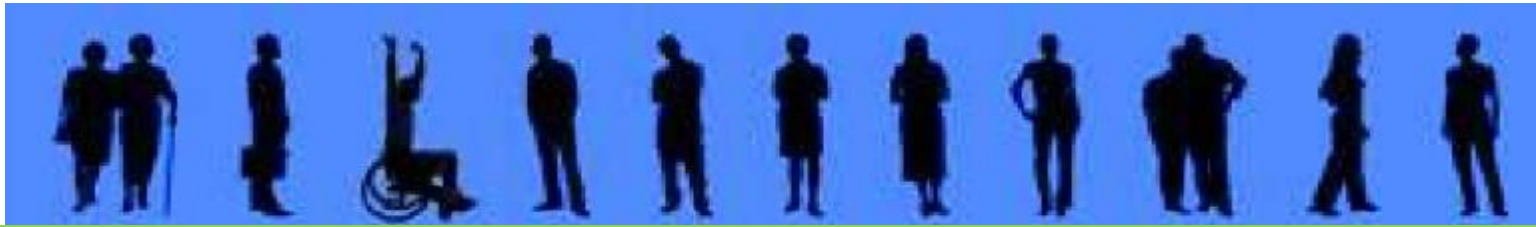
# **Approach to Address Working with Underrepresented Organizations Continued – Corporate Funding Model for a Bridge Program**

- The Program will be based on a cohort model, starting their first years, where students will be mentored by professional staff and by each other. It will include:**
  - Specialized and individualized first and second year curricula**
  - Comprehensive academic advising tailored to students' individual needs**
  - Tutoring and instructional support through the OpSTEM and other resources as needed**
  - Career Counseling and resources to help students secure internships in industry**
  - Mentoring and research opportunities with faculty**
  - A supportive community of peers, faculty and staff**
  - Scholarships**



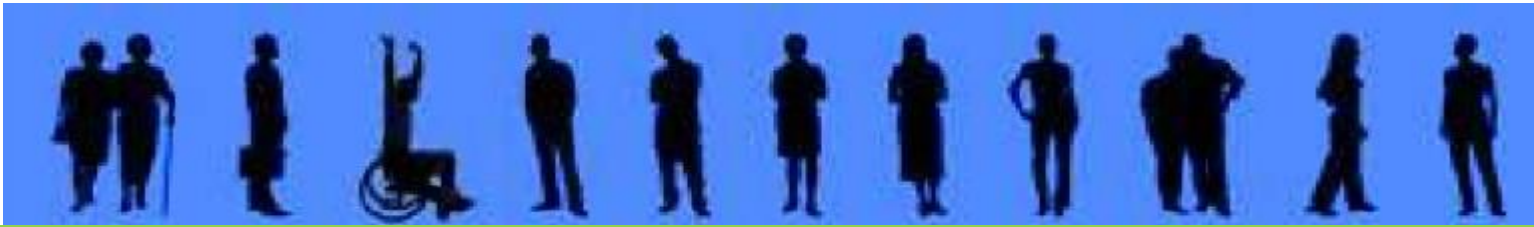
# **Approach to Address Working with Underrepresented Organizations Continued – Corporate Funding Model for a Bridge Program**

- This approach is based on “best practice” from STEM programs across the nation. The requested funds will be used for staff support and other program costs.**



# Alumni Mentoring Program

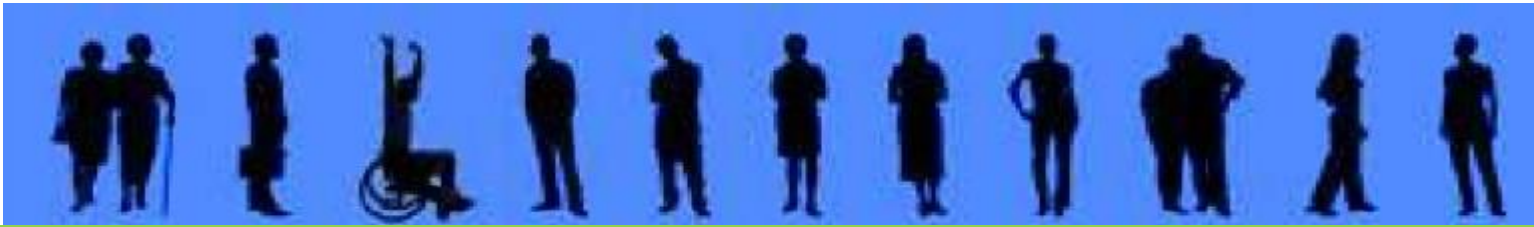
- Our DDC worked with local Cleveland Engineering Society and University Alumni office to identify potential Mentors
- We invited students to attend based on faculty/staff recommendation and sent out email invitation to all engineering students
- Program ran for 2 years with success reported by both the mentors and the mentees
- Challenges to Address
  - Needed assigned staff support for continuity and sustainability as modeled across campus in other mentoring programs
  - Provide funding to hire staff or funding to supplement current resources
  - For CSU, we will be able to address this need due to recent funding obtained for the bridge program. We will implement beginning Fall 2018.



## Alumni Mentoring Program Continued

### Recommendations for Developing a Sustainable Engineering Mentoring Program Using Alumni

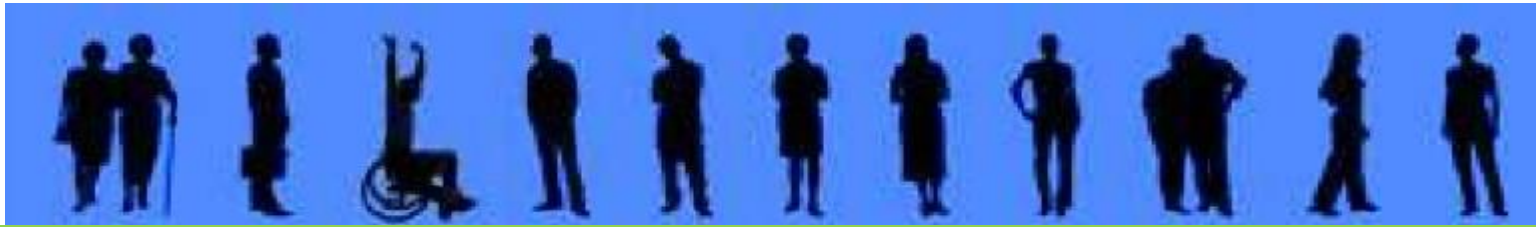
- Obtain resources to pay designated staff to lead initiative or designate staff to lead (even if a committee is working on endeavor there needs to be a lead person identified)
- Utilize University Alumni Office, College Alumni contacts, and local engineering organizations
  - For CSU, our local engineering organizations such as ASME, AICHE, etc. worked well for us
- Market the program to students as well as use faculty to target students that would be of benefit (Our CSU Program had many underrepresented students in the program as well as non underrepresented students)
- As previously stated, facilitate a program structure that includes providing student resources continually throughout the process
  - Match Mentor and Mentee based on common interests via application questions
  - Have initial orientation and mid-program check-ins and follow-ups
  - Have end of semester end of year closing program ( at CSU it was successful to work with students each semester which avoided burn out for both mentor and mentees with an option for each to sign up the following semester)



## **Facilitating Workshops to aid with Recruitment and Retention of Diverse Faculty**

### **Steps Taken at CSU Engineering College to Address this Goal**

- 1. Brought in outside workshop facilitators on Unconscious Bias to facilitate this workshop to faculty only**
- 2. Worked with University Human Resources and other college DDCs to invite representatives from both to attend a half-day workshop**
- 3. In Engineering, we worked with Human Resources to implement a requirement that all faculty that sit on hiring committees had to have attended the workshop on unconscious bias and the outcome was that the workshops had great attendance participation**
- 4. In Engineering College we put together a book club for faculty to discuss unconscious bias and invited each college to participate**
- 5. This proved to be successful due in part to each Dean suggested 2 people to attend and several colleges participated (Engineering, Health Sciences, and Business)**
- 6. If any one in attendance is interested in obtaining more information about workshop facilitators used at CSU as well as details on the book club and this initiative, please take a handout that details this endeavor.**

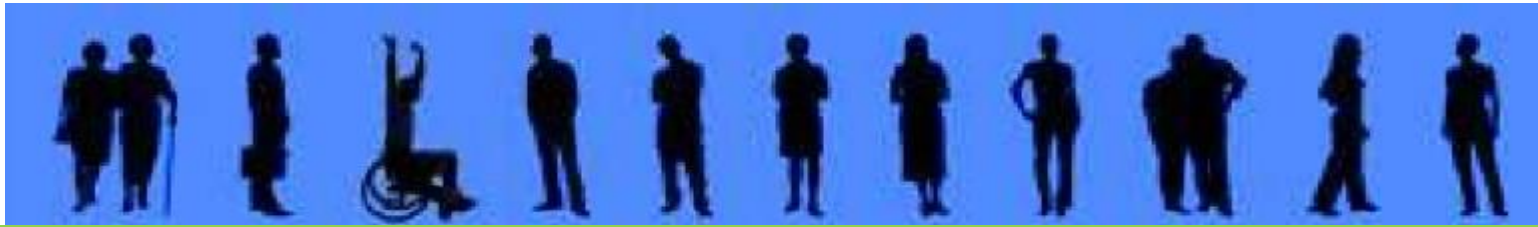


## Fenn Academy and Women in Engineering Initiatives

### Fenn Academy

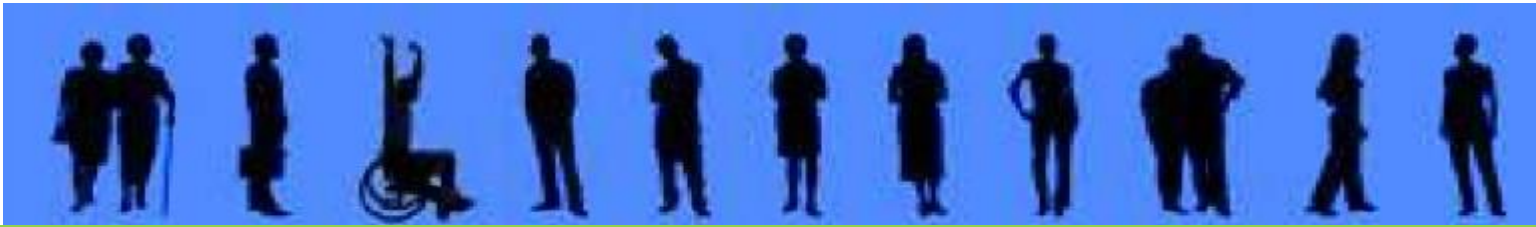
- Stimulate and encourage 8<sup>th</sup>-12<sup>th</sup> grade students to explore engineering fields
- Address the national shortage of students pursuing an engineering degree
- Increase the number of underrepresented students
- Assist teachers to enhance STEM lessons
- Provide information for parents and counselors
- Introduce students to college life and undergraduate engineering program





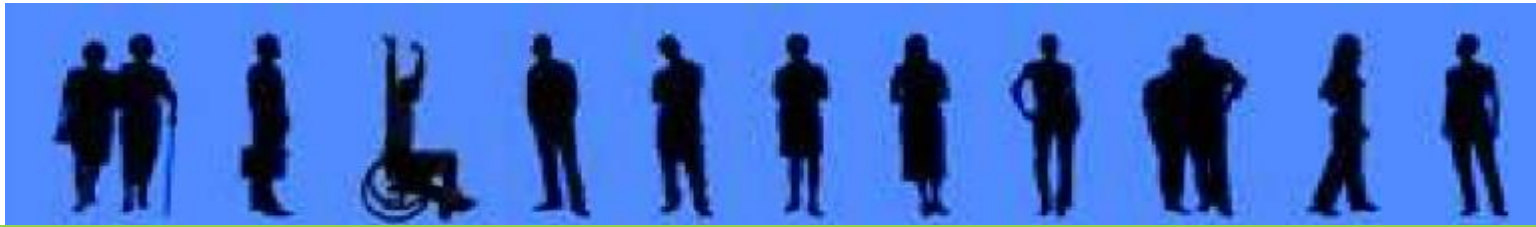
## **Benefits: For Middle School and High Schools**

- **Engineering Activity Day campus events**
- **Engineer for a Day job shadowing program**
- **Women Exploring Engineering program**
- **Summer camp activities**
- **Curriculum consultation**
- **Small grants to teachers for engineering competitions/projects**
- **Participation in career fairs and STEM Competitions**
- **Individual tours and advising**
- **Programs in collaborations with the Boy Scouts and Girl Scouts**



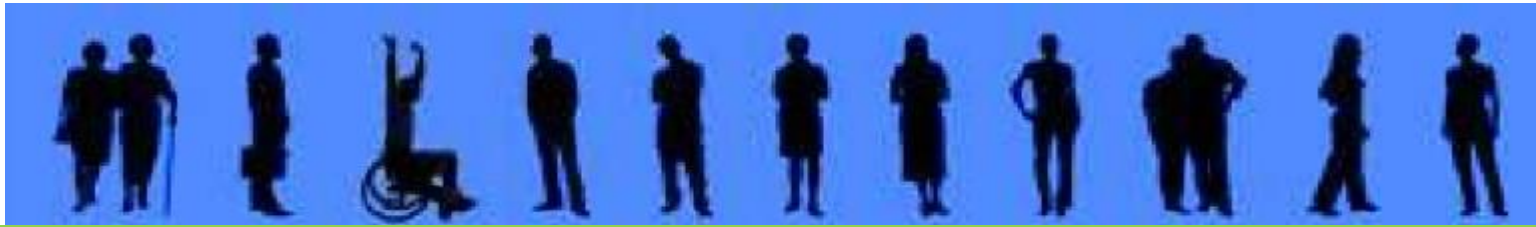
## Reaching Diverse Students

- **Current Active undergraduates = 2,200+**
- **From 2012-2016**
  1. **African American Student Enrollment has increased at least 8% per year**
  2. **Hispanic/Latino student enrollment has increased at least 3% each year**
  3. **Approximately 22% female enrollment**
- **Partnerships with Cleveland Metropolitan School District**
- **Inner Ring Suburban District Partners**
- **Targeted Girl Schools**



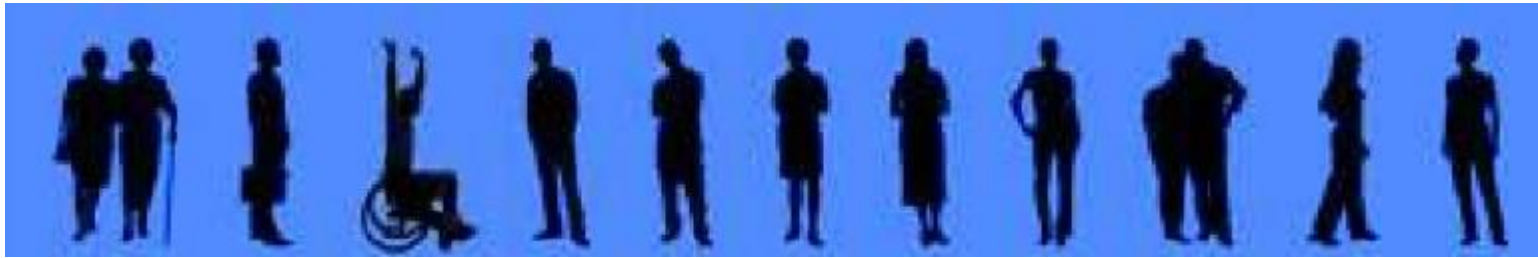
## 2016-2017 Results

- **3,000+ students that participated in Fenn Academy activity either on or off campus**
- **30 Engineering Activity days**
- **Specific work with CMSD schools including presentations with ACE and student assistants at Orchard STEM and New Tech East**
- **Engineer for a Day program provided job shadowing for 78 students at 22 companies**
- **Added 5 new high school partners**
- **\$3984 in small grants distributed to teachers including New Tech Easy**
- **Approximately 1/3 of admitted students for fall 2017 came from Fenn Academy Partner Schools**



## Reference List

- [1] A. Podsiadlowski, D. Groschke, M. Kogler, C. Springer and K. van der Zee, "Managing a culturally diverse workforce: Diversity perspectives in organizations," *International Journal of Intercultural Relations* [online]. Available [www.elsevier.com/locate/ijintrel](http://www.elsevier.com/locate/ijintrel). [Accessed Nov. 8, 2017]
- [2] J. Wilson, "Public Institution Governing Boards The Invisible Key actor in Diversity Planning Efforts in Higher Education," *Planning for Higher Education Journal*, V44N4 July-September 2016 [online]. Available [www.scup.org/phe](http://www.scup.org/phe). [Accessed Nov. 8, 2017]
- [3] The National Academies Press, "Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads," [online]. Available [http://nap.edu/catalog.php?record\\_id=12984](http://nap.edu/catalog.php?record_id=12984). [Accessed Nov. 8, 2017]



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