GLOBAL DIVERSITY & INCLUSION PRACTICES: KEY TO THE ADVANCEMENT OF MECHANICAL & AEROSPACE ENGINEERING

An NSF Center for the Study of Evolution in Action
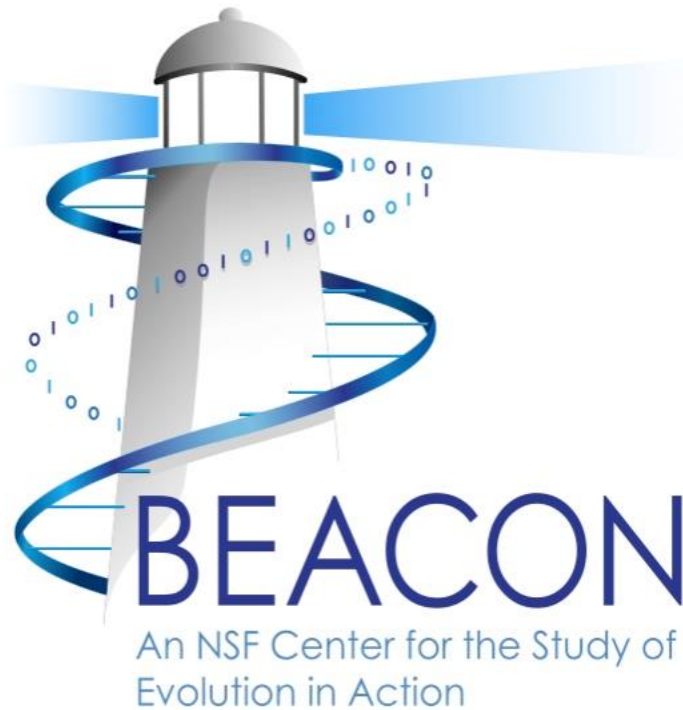
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BACKGROUND

I am a scientific strategist that functions at the intersection of STEM & Infrastructure

BEACON Center for the Study of Evolution in Action

- Illuminating & harnessing the power of evolution in action to advance science, technology & society.

- We have 800 members

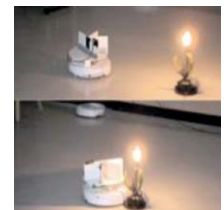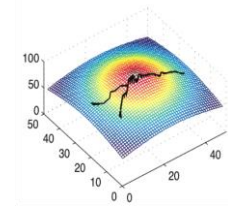- Create innovative solutions by leveraging existing systems and realities

Crosscutting Themes Include:

- **Biological Evolution**

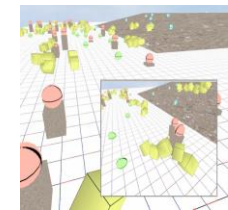- **Computational Evolution**

- **Evolutionary Applications**

Genomic
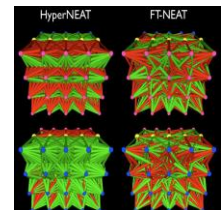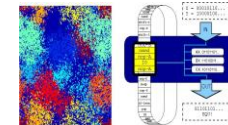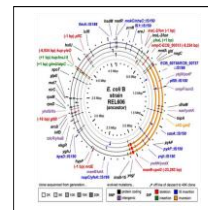
Individual Behavior

Group Behavior

DIVERSITY: THE VOICE'S BLIND AUDITION

- During the blind auditions, the decisions from the coaches are based solely on voice and not on looks. **(Implicit Bias)**

- The coaches hear the artists perform, but they don't get to see them - thanks to rotating chairs. If a coach is impressed by the artist's voice, he/she pushes a button to select the artist for his/her team. **(Recruitment)**

- At this point, the coach's chair will swivel so that he/she can face the artist he/she has selected. **(Unconscious Bias)**

- If more than one coach pushes his/her button, the power then shifts to the artists to choose which coach they want to work with. **(Retention)**

- If no coach pushes his/her button, the artist is eliminated from the competition. **(Equity & Fairness)**

THE EVOLUTION OF "WICKED PROBLEMS"

The globalization of business and research has created a sophisticated, complex, and competitive environment

- A diverse and inclusive workforce is necessary to drive innovation, foster creativity, and guide business strategies

Executive leadership no longer view diversity and inclusion efforts as separate from their other business practices

- There is a strong recognition that a diverse workforce can differentiate them from their competitors by attracting top talent and/or capturing new clients/collaborative partners

WHERE "STANDING OUT" BECOMES "OUTSTANDING"!

COMPETITIVE EDGE

In order to be successful, researchers/organizations need to continually create new knowledge, products, and services

The best way to ensure the development of new ideas is through a diverse and inclusive workforce

- **Multiple voices lead to new ideas, new services, and new products, and encourage non-traditional, out-of-the-box thinking**

- **Do not undervalue diversity of thought and adaptive solution from individuals with disabilities, who navigate daily barriers "real-time"…ex: blind CSE student**

DIVERSITY IS THE KEY TO ROBUSTNESS AND INNOVATION

Forbes Insight (2017) conducted a comprehensive survey and interviews of more than 300 senior executives and found:

- Diversity is a key driver of robustness and innovation and is a core component of being successful on a global scale

Senior executives are recognizing that a diverse set of experiences, perspectives, and backgrounds is crucial to innovation and the development of new ideas

- A diverse and inclusive workforce is crucial for companies that want to attract and retain top talent.

Competition for talent is fierce in today's global economy, so senior executives need to have plans in pace to recruit, develop, and retain a diverse workforce.

STRATEGIES BASED ON KEY CHANGE ELEMENTS

Catalyst research suggests that a well-designed strategy, not separate programs or specific people, makes all the difference.

The strategy cannot be must be:

- Business-based and founded on organizational goals and structure, as well as on assessment of strengths, issues, and opportunities

- Focused on the three or four priority areas that define the programs the organization develops

- Integrated into business strategy and human resources policies with effective planning and implementation

STRATEGIES BASED ON KEY CHANGE ELEMENTS

Driven by key change elements:

- **Solid Business Case - Assess and develop the case for an inclusive culture that supports talent and business goals**

- **Senior Leadership Support - Act as a role model/champion of diversity internally and externally, advocate and shape a culture of inclusion on a daily basis**

- **Effective Communication - Market the business case, approach and success in a consistent and clear message across the consortium**

- **Accountability and Metrics - Measure if practices support diversity efforts and reward "inclusive" behaviors and results**

YEAR-ROUND AND SUMMER RESEARCH OPPORTUNITIES

We blended, braided, and leveraged from multiple funding sources to create research opportunities

We found that many students were underprepared for the research experiences and therefore created a two-tiered program by funding:

- Research Experiences for Undergraduates (REUs) for students with strong lab/research backgrounds who were able to conduct their own research projects

- Undergraduate Research Apprenticeships (URAs) for student with limited lab/research background who conduct a limited portion of an existing research project

ESTABLISH STRUCTURES TO ENSURE PAYOFF OF INVESTMENT?

- Establish "buy-in" and ownership among the participants

- Get people "leaning in" versus "leaning back" on diversity, equity and inclusion

- Change the atmosphere by clarifying and operationalizing the core values

- Establish a compelling argument using a cost-benefit business perspective that frames the "high performance" advantages of a diverse organization

  - E.g., diverse perspectives facilitate innovation and creative solutions

KEY STRATEGIES TO SUCCESS – EVERYONE OWNS IT!

Diversity Committee consisted of "decision-maker" representatives that constantly monitor diversity progress with continuous and active feedback and improvement

Diversity Director worked "top down" with the Diversity Committee and faculty, and "bottom up" with graduate students and post-docs, using active involvement and advocacy

Many points of feedback with "gatekeepers" across the organization at every level; e.g., undergraduates, graduates, post-docs, faculty, staff … in the classrooms, labs and fields

Able to identify unmet needs and gaps problems quickly, problem solve, and share successes

MECHANICAL AND AEROSPACE ENGINEERING

NEW CHALLENGES:

1) Systems software (CSE) is on the rise, but must interface with hardware

2) Machine learning and artificial intelligence – collaboration with neuroscience and

3) Big data science and analytics/software carpentry

4) Talent banks, some Aerospace EGR programs are training differently than how industry is addressing "wicked" problems…need to facilitate "knowledge transfer" opportunities to collaborate on brilliant solutions

NEW SOLUTIONS:

Create huge inclusive pipelines and pathways for the *best and brightest* talent and curious innovators

QUESTIONS???