Type them into questions box!

“Why am I muted?”
Don’t worry. Everyone is muted except the presenter and host.
Thank you and enjoy the show.

Contact ACS Webinars ® at acswebinars@acs.org

@AmericanChemicalSociety

@AmerChemSociety

https://www.linkedin.com/company/american-chemical-society

Contact ACS Webinars ® at acswebinars@acs.org
Check out the ACS Webinar Library!
An ACS member exclusive benefit

Hundreds of presentations from the best and brightest minds that chemistry has to offer are available to you on-demand. The Library is divided into 6 different sections to help you more easily find what you are searching.

Professional Development
View the Collection
Learn how to write better abstracts, deliver more engaging presentations, and network to your next dream job. Brush up on your soft skills and set a new career path by mastering what can not be taught in the lab.

Technology & Innovation
View the Collection
From renewable fuels to creating the materials for the technology of tomorrow, chemistry plays a pivotal role in advancing our world. Meet the chemists that are building a better world and see how their science is making it happen.

Drug Design and Delivery
View the Collection
The Drug Design Delivery Series has built a collection of the top minds in the field to explain the mechanics of drug discovery. Discover the latest research, receive an overview on different fields of study, and gain insights on how to possibly overcome your own med chem roadblocks.

Culinary Chemistry
View the Collection
Why does food taste better when it is grilled or what molecular compounds make a great wine? Discover the delectable science of your favorite food and drink and don't forget to come back for a second helping.

Popular Chemistry
View the Collection
Feeling burdened by all that molecular weight? Listen to experts expound on the amazing side of current hot science topics. Discover the chemistry of rockets, how viruses have affected human history, or the molecular breakdown of a hangover.

Business & Entrepreneurship
View the Collection
How do ideas make it from the lab to the real world? Discover the ins and outs of the chemical industry whether you are looking to start a business or desire a priceless industry-wide perspective.

https://www.acs.org/content/acs/en/acs-webinars/videos.html

Learn from the best and brightest minds in chemistry! Hundreds of webinars on diverse topics presented by experts in the chemical sciences and enterprise.

Edited Recordings are an exclusive ACS member benefit and are made available once the recording has been edited and posted.

Live Broadcasts of ACS Webinars® continue to be available to the general public several times a week generally on Wednesdays and Thursdays from 2-3pm ET!

A collection of the best recordings from the ACS Webinars Library will occasionally be rebroadcast to highlight the value of the content.

www.acs.org/acswebinars
From ACS Industry Member Programs

♦ Industry Matters Newsletter
   ACS Member-only weekly newsletter with exclusive interviews with industry leaders and insights to advance your career.  
   Preview & Subscribe: acs.org/indnews

♦ ACS Innovation Hub
   Connect, collaborate, and stay informed about the trends leading chemical innovation
   Join: bit.ly/ACSinnovationhub

ACS Career Navigator:  
Your Home for Career Services

Whether you are just starting your journey, transitioning jobs, or looking to brush up or learn new skills, the ACS Career Navigator has the resources to point you in the right direction.

We have a collection of career resources to support you during this global pandemic:

Professional Education  
Virtual Career Consultants  
ACS Leadership Development System  
Career Navigator LIVE!

ChemIDP  
College to Career  
ACS Webinars  
Virtual Classrooms

Visit www.ACS.org/COVID19-Network to learn more!
ACS Department of Diversity Programs

Advancing ACS's Core Value of Diversity, Inclusion & Respect

We believe in the strength of diversity in all its forms, because inclusion of and respect for diverse people, experiences, and ideas lead to superior solutions to world challenges and advances chemistry as a global, multidisciplinary science.

Contact Us:
https://app.suggestionox.com/r/DI_R
Diversity@acs.org

@ACSDiversity

ACS Diversity
acsvoices.podbean.com/

www.acs.org/diversity

ACS Publications Journals, Books and News

An indispensable resource for educators

- Prepare lecture and lab curriculum
- Increase diversity in STEM education
- Support accessibility
- Teach by example
- Assign supplemental reading
- Build communication skills
- Connect concepts to current events
- Add historic context

https://connect.acspubs.org/getaccess
Please join the National Science Foundation Division of Chemistry for

A Listening session on Broadening Participation, Diversity, Inclusion, and Equity in Chemistry

Guest Hosts: Miguel Garcia-Garibay of UCLA
Rigoberto Hernandez of Johns Hopkins University
Kayunta Johnson-Winters of University of Texas at Arlington

will lead a community discussion on this important and timely topic.

Friday, March 5, 2021. 4 PM (Eastern). Register here
https://nsf.zoomgov.com/meeting/register/vJlsd-2urDgqGadHnmAsAs9W17CmfRo-45o

The Division of Chemistry (CHE) supports innovative research in chemical sciences, integrated with education, through strategic investment in developing a globally engaged U.S. chemistry workforce reflecting the diversity of America.

CHE invites our entire community to this listening session as we specifically invite those most affected by inequities in chemistry and related fields to add their voices to this conversation.

CHE is working to identify the areas of greatest concern where funding or other actions by the Division might have real, measurable, and sustainable impact in accelerating Broadening Participation, Diversity, Inclusion, and Equity in Chemistry.
www.acs.org/acswebinars
Creating an Inclusive and Resilient Future in Chemistry Education

Anthony DePass
Co-director, Understanding Interventions; Principal, Depass Academic Consulting; Professor of Biology, Long Island University

Lourdes Echegoyen
Research Assistant Professor Chemistry and Biochemistry and Director BUILDing SCHOLARS Center, University of Texas, El Paso

Michelle Claville
Assistant Dean and Professor of Chemistry, Hampton University and Program Director, NSF Undergraduate Programs

Zakiya Wilson-Kennedy
Assistant Dean, Diversity & Inclusion, College of Science and Associate Professor of Research, Chemistry Education, Louisiana State University

Presentation slides are available now! The edited recording will be made available as soon as possible.

www.acs.org/acswebinars

This ACS Webinar is organized by Leyte Winfield, Division Chair for Natural Science and Mathematics, Spelman College and co-produced with ACS Publications and ACS Education.

CALL FOR PAPERS

SPECIAL ISSUE:
Diversity, Equity, Inclusion, and Respect in Chemistry Education Research and Practice

Submissions due April 12, 2021.
The upcoming special issue for the Journal of Chemical Education (JCE) will focus on diversity, equity, inclusion, and respect. **Are you planning to submit a manuscript for the upcoming special issue of JCE?**

- Yes, I have a manuscript in development
- Maybe, I am thinking about it
- No, I am not planning on it
- I don’t know if my efforts would fit into the special issue

*If your answer differs greatly from the choices above tell us in the chat!*
Social Cognitive Career Theory
**Community Cultural Wealth** (Tara Yosso, 2005)

<table>
<thead>
<tr>
<th>Community Cultural Wealth</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirational</td>
<td>The ability to maintain hopes and dreams for the future, even in the face of real and perceived barriers.</td>
</tr>
<tr>
<td></td>
<td>- The power and culture of possibility.</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Intellectual and social skills attained through communication experiences in more than one language and/or style.</td>
</tr>
<tr>
<td></td>
<td>- Multiple languages and communication styles (e.g., world languages and racialized/cultural histories or communication).</td>
</tr>
<tr>
<td>Navigational</td>
<td>The skills of maneuvering through social institutions.</td>
</tr>
<tr>
<td></td>
<td>- Inner resources, social competencies, cultural strategies that permit survival, recovery, and thriving (self-serving).</td>
</tr>
<tr>
<td>Resistance</td>
<td>Knowledge and skills fostered through oppositional behavior that challenges inequality.</td>
</tr>
<tr>
<td></td>
<td>- Mindsets and behaviors employed to resist subordination (collectivist approach).</td>
</tr>
<tr>
<td>Familial</td>
<td>Cultural knowledge cultivated among family that carry community history, memory, and cultural intuition.</td>
</tr>
<tr>
<td></td>
<td>- Practices that demonstrate a commitment to community (kin) well-being.</td>
</tr>
<tr>
<td>Social</td>
<td>Networks of people and community resources.</td>
</tr>
<tr>
<td></td>
<td>- Utilizing communities to gain access to and insight on opportunities.</td>
</tr>
</tbody>
</table>

**Community Cultural Wealth Model**

![Community Cultural Wealth Model](image)

Is there a community of faculty in your institution that collaborates on DEIR (diversity, equity, inclusion, and respect) efforts?

- Yes, we have a well-formed group
- Yes, we have a loosely-formed group
- No, we don’t have faculty collaborating in this way
- I wish there were faculty collaborating in this way

*If your answer differs greatly from the choices above tell us in the chat!
How would you define student success?

&

How would you measure it?

Roadmap

• About the NIH BUILD initiative
  • General
  • DPC Hallmarks of success

• Perspective
  • About UTEP

• About UTEP BUILDing SCHOLARS Student Training
  • Persistence, Degree Completion, Competitiveness, & Graduate School Enrollment
  • Effect of academic year research on science/research self-efficacy and science identity
  • Qualitative study on what has impacted students the most
About the NIH BUILD Initiative

A core component of the NIGMS funded Diversity Program Consortium (DPC)

**BUILD** = Building Infrastructure Leading to Diversity (10 sites)
**NRMN** = National Research Mentoring Network (13 sites)
**CEC** = Coordination and Evaluation Center (1 site)

"to implement and evaluate effective approaches to training and mentoring undergraduate students with the goal of increasing the participation and persistence of individuals from diverse backgrounds in the biomedical research pipeline"

UTEP is one of ten BUILD sites across the US
All BUILD sites include activities for

- Institutional development
- Faculty development
- Student Development

Perspective: About UTEP

- ~25,000 students (21,000 UG)
- 80% Hispanic (83.3% at UG level)
- 51% 1st generation
- 60% Pell recipients
- 37% with family income under $20K/year
- 83% from El Paso County
- 74 Bachelor’s – 26 have BMRW* relevance
- 74 Master's – 25 have BMRW relevance
- 22 doctoral programs - 16 have BMRW relevance

Well-positioned to enhance the diversity of the biomedical research workforce

* BMRW = biomedical research work force
Perspective: About UTEP

ACCESS & EXCELLENCE MISSION

5th

1st

1st

R1

2014-15

2016

2012-15

2019

# of UG degrees Awarded to Hispanics¹

Hispanic Institution of Origin for STEM Doctoral Recipients²

Social Mobility (bottom 20% reaching top 20%)³

Carnegie Classification

1. Excellencia in Education, 2016
2. NSF, NCSES, 2016 Survey of Earned Doctorates

A Hispanic Serving Institution
“We serve students with intentionality”

UTESP BUILDing SCHOLARS Student Development Opportunities

Financial & Academic Assistance

- Accepted as FR, SO or JR
- Tuition scholarship – up to 60%
- Monthly stipend (12 months)
- Research Foundations & CUREs for Freshman
- Mentored academic year research
- Summer research at partner institutions
- Travel to present at conferences
- Personalized advising
  - Degree plan - course enrollment
  - Complete 30 credit-hours/year
  - Research mentor selection assistance

Professional development training

- Peer mentor training
- Responsible conduct of research
- How to travel to conferences
- Finding work-life balance
- Applying to graduate school
  - How to apply - requirements & timeline
  - GRE preparation
  - Grad school interview
- Writing intensive sessions
  - Abstract & poster preparation
  - Research report & thesis preparation
  - Crafting a personal statement
  - Resume/CV
- Multiple seminars

30
The DPC Hallmarks of Student Success

Basis for evaluating DPC member student activities

<table>
<thead>
<tr>
<th>STU-1</th>
<th>High academic self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>STU-2</td>
<td>High self-efficacy as a researcher</td>
</tr>
<tr>
<td>STU-3</td>
<td>High science identity</td>
</tr>
<tr>
<td>STU-4</td>
<td>Satisfaction with quality of mentorship</td>
</tr>
<tr>
<td>STU-5</td>
<td>Perceived sense of belonging within the university</td>
</tr>
<tr>
<td>STU-6</td>
<td>Perceived sense of belonging within the research community</td>
</tr>
<tr>
<td>STU-7</td>
<td>Intent to pursue a career in biomedical research</td>
</tr>
<tr>
<td>STU-8</td>
<td>Entry into an undergraduate biomedical degree program</td>
</tr>
<tr>
<td>STU-9</td>
<td>Persistence in biomedical degree or other formal research training program</td>
</tr>
<tr>
<td>STU-10</td>
<td>Frequent receipt of mentoring to enhance success in the biomedical pathway</td>
</tr>
<tr>
<td>STU-11</td>
<td>Participation in mentored or supervised biomedical research</td>
</tr>
<tr>
<td>STU-12</td>
<td>Evidence of competitiveness for transitioning into the next phase in the biomedical career pathway</td>
</tr>
<tr>
<td>STU-13</td>
<td>Participation in academic or professional organizations related to biomedical disciplines</td>
</tr>
<tr>
<td>STU-14</td>
<td>Evidence of excelling in biomedical research and scholarship</td>
</tr>
<tr>
<td>STU-15</td>
<td>Strong academic and professional networks</td>
</tr>
<tr>
<td>STU-16</td>
<td>Completion of biomedical degree or other formal training program</td>
</tr>
<tr>
<td>STU-17</td>
<td>Application and acceptance to a subsequent research training program in a biomedical discipline</td>
</tr>
<tr>
<td>STU-18</td>
<td>Entrance into a subsequent research training program in a biomedical discipline</td>
</tr>
</tbody>
</table>

Persistence (STU-9), Competitiveness (STU-12), Evidence of Excelling in Research & Scholarship (STU-14), Degree Completion (STU-16), & Graduate School Enrollment (STU-18)

<table>
<thead>
<tr>
<th>FTF (2013-2016) N</th>
<th>Persistence</th>
<th>Graduated</th>
<th>Cumulative GPA</th>
<th>Entered Advanced Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-year retention</td>
<td>2-year retention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 25%*</td>
<td>1,635</td>
<td>1,510 (92%)</td>
<td>1,395 (85%)</td>
<td>884 (54%)</td>
</tr>
<tr>
<td>BUILD</td>
<td>71</td>
<td>71 (100%)</td>
<td>68 (96%)</td>
<td>53 (75%)</td>
</tr>
</tbody>
</table>

*Comparison group: UTEP students who are
- Top 25% of cumulative GPA in 1st year
- First-time students in Fall 2013-2016
- From the following Colleges: Science – all majors; Engineering – all majors; Health Sciences – all majors & Liberal Arts - Psychology & Sociology only

‡ Data from UTEP’s Center for Institutional Evaluation Research & Planning (CIERP)

As of Feb 2020, 26 peer reviewed publications with UTEP BUILD students as co-authors.
What made the difference for the first two BUILDing SCHOLARS cohorts (2015 & 2016)?

Question on a **senior exit survey** (N=34):

“Please provide a summary of the different ways that BUILD impacted your life”

<table>
<thead>
<tr>
<th>Themes</th>
<th># responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding (tuition, stipend support)</td>
<td>11</td>
</tr>
<tr>
<td>Learning opportunities</td>
<td>13</td>
</tr>
<tr>
<td>Research opportunities (general)</td>
<td>12</td>
</tr>
<tr>
<td>External summer research opportunities</td>
<td>5</td>
</tr>
</tbody>
</table>

- “Participating in workshops... I developed”
- “Writing skills”
- “Working with a team”
- “Presenting my work”
- “Critical thinking”
- “Research ethics”
- “Handling impostor syndrome”

**BUILDing SCHOLARS Academic Year & Summer Research Experiences**

- Positively & significantly impacts the **science self-efficacy** of both
  - continuing & graduating students
    - (retrospective pre-post = 2.93 - 3.89; \( p = 0.002 \))
    - (retrospective pre-post = 3.17 - 3.78; \( p = 0.001 \))

- Positively & significantly impacts the **science identity** of graduating students
  - (retrospective pre-post = 3.94 - 4.48; \( p = 0.01 \))

- Positively but not significantly impacts the **science identity** of continuing students
  - (retrospective pre-post = 3.75 - 4.06; \( p = 0.19 \))

**Science self-efficacy may mediate, or be the first step in developing a science identity.**

Expanding on Verna Myers quote: “Diversity is being invited to the party; inclusion is being asked to dance”

My six-word memoir:

Inclusion requires dancing with different partners

Lourdes E. Echegoyen

NanoHU: A Boundary-Spanning Education Model for Maximizing Human and Intellectual Capital

**Human Capital**

“the collective skills, knowledge, or the other intangible assets of *individuals* that can be used to create economic value for the *individuals*, their *employers*, or their *community*,”

**Intellectual Capital**

*The value of the nation’s employee knowledge, skills, business training or proprietary information that provides the nation with a competitive advantage.*

**Convergence**

- the merging of life and physical sciences with engineering
- drives the latest industrial revolution
- demands that the world’s workforce become proficient in multiple STEM disciplines

*Fourth Industrial Revolution,*

“…is characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human.”

---

**Figure 1. NanoHU boundary-spanning design**

- Macroscopic: University
- Mesoscopic: Departments
- Microscopic: Students, Faculty

**Funded by NSF award HRD 1238838**
Figure 2. Key elements of the NanoHU Model.

**Human Capital**

- **Microscopic**
  - 82 students took new course, earned STEM degrees, earned nanoscience minor, engaged in research, and other professional development activities.
  - 23 faculty received startup funding, professional development.
- **Mesoscopic**
  - Nanoscience minor development via inter-departmental and inter-school collaboration.
- **Macroscopic**
  - University approved course and minor. Both are available to all students.
  - Nanoscience minor model for creating other minors (e.g. material science).
  - Enhanced infrastructure.

**Intellectual Capital**

- **Microscopic**
  - >12% of course participants (neither Scholars nor Fellows) elected to become Fellows.
  - 5% of course participants (not Scholars/Fellows) elected to earn minor.
- **Mesoscopic**
  - Most (85%) of minor courses were existing courses that were redesigned to accommodate nanoscience component.
  - Non-STEM units explore nanoscience.
- **Macroscopic**
  - First nanoscience minor at an HBCU.
  - Institutional recruitment tool.
  - Institutional administrative support in diverse non-academic units.
Nano-savvy Workers

Research

**HUMAN CAPITAL**

(Research)

- **Microscopic**
  - 23 faculty across 8 department performed nanoscience-related research and disseminated their results
  - Over 30 UG and 65 HS students in nanoscience research
  - Students co-authored publications and awards
- **Mesoscopic/Macroscopic**
  - Increased nanoscience research activity on HU campus, i.e. across department and schools
  - Enhanced research laboratories

**INTELLECTUAL CAPITAL**

(Research)

- **Microscopic**
  - 21 of 23 research projects have been sustained at HU
- **Mesoscopic**
  - Two of 23 projects resulted from collaborations between STEM/non-STEM
  - Inspired similar inter-departmental collaborations, i.e. STEM and non-STEM
  - 10 faculty peer-reviewed publications
- **Macroscopic**
  - Broader array of research projects
  - Newly established and re-purposed labs for nanoscience projects
  - Established relationships with PWI nano-labs (e.g. VT’s NanoEarth, Brandeis U, U of Nebraska’s Medical Center)

**HUMAN CAPITAL**

(Professional Development)

- **Microscopic**
  - Weekly meetings
  - Grantwriting workshops and seminars
  - Career workshops
  - Faculty and students
- **Mesoscopic**
  - 20 seminars annually
  - Impacted over 500 students
  - Collaborations between SOS, SET, and Graduate College to produce a Research Symposium
  - Interdisciplinary discussions about nanoscience (e.g. pre-law, journalism, education, business, and fine arts)
- **Macroscopic**
  - More visibility for HU
  - Continued inter-institutional collaborations for seminars and symposia

**INTELLECTUAL CAPITAL**

(Professional Development)

- **Microscopic**
  - 2 GRFP award applications
  - Research at notable institutions across the US and ind Israel
  - Faculty gained additional research funding
- **Mesoscopic/Macroscopic**
  - Faculty and students recognize and embrace benefits of scientific intersectionality
  - Interdepartmental collaboration yielded institutional research symposium the gained attention of external entities (e.g. Fox Media)
A successful broadening participation in STEM initiative requires

Broad participation (collaboration)

in order to be

Successful and mutually beneficial!
I am engaged in broadening participation or DEIR activities that encompass:
(select all that apply)

• Education and training
• Research
• Professional development
• Outreach and recruitment
• I am not yet engaged in any of these activities

* If your answer differs greatly from the choices above tell us in the chat!
The Journal of Chemical Education (JCE) is the official journal of the Division of Chemical Education of the American Chemical Society, co-published with the American Chemical Society Publications Division.

Launched in 1924, the JCE is the premier international journal for the teaching and learning of chemistry.

JCE considers and publishes chemistry education research, activities, laboratory experiments, instructional methods, and pedagogies.

Read and submit your research at pubs.acs.org/jce

Follow us on Twitter: @ACSDivCHED

www.pubs.acs.org/jce

ACS Webinars®

www.acs.org/acswebinars
Learn from the best and brightest minds in chemistry! Hundreds of webinars on diverse topics presented by experts in the chemical sciences and enterprise.

Edited Recordings are an exclusive ACS member benefit and are made available once the recording has been edited and posted.

Live Broadcasts of ACS Webinars® continue to be available to the general public several times a week generally on Wednesdays and Thursdays from 2-3pm ET!

A collection of the best recordings from the ACS Webinars Library will occasionally be rebroadcast to highlight the value of the content.

 ACS Webinars® does not endorse any products or services. The views expressed in this presentation are those of the presenter and do not necessarily reflect the views or policies of the American Chemical Society.