Please Join Me/Us/Them on My/Our/Their Journey to Justice in STEM

Rod D. Roscoe (rod.roscoe@asu.edu)
Society for Text and Discourse, August 2021
GIVE TALK? ME?
Imposter Syndrome

• **doubts** about ones abilities, skills, and achievements

  • see Clance *(1985)*; Clance & Imes *(1978)*
  
  • despite valid experience and credentials

  • fear of being “exposed” as a “fraud”

  • people may “talk themselves out of” opportunities (e.g., applying for jobs or accepting invitations)
“You Don’t Belong Here”

• contemporary research links imposter syndrome to marginalizing and minoritizing experiences related to race, gender, sexuality, neurodivergence, disability, and much more

  • lack of representation or role models
  • microaggressions, stereotype threat
  • impression management, emotional regulation
Imposter Syndrome is a Symptom

• imposter syndrome can be *internalized exclusion*

• related to **sense of belonging** (Strayhorn, 2018)

• myriad factors subtly and unsubtly **cause** underrepresentation (“unbelonging”) in STEM
  - people may be actively **pushed out** of STEM
  - hostile communities cause people to **avoid** or **flee** STEM
“I have spent my entire life proving that I belong in elite white spaces that weren’t built for Black people. I got a lot of clarity through what happened with the University of North Carolina and I decided that I didn’t want to do that anymore. … It’s not my job to heal the University of North Carolina. That’s the job of the people in power who created this situation in the first place.”
Where Am I Going with This?

- this talk (almost didn’t happen) asks the question: **How do we improve representation in STEM?**

  - topic of belonging was a model of this talk—reflection and research with relevance to (in)equity and (in)justice

  - **Part 1**: me/our/their and decentering

  - **Part 2**: journeys and the myth of meritocracy

  - **Part 3**: justice, activism, and coalitions
Part 1:
Disfluency, Discomfort, Decentering
The Title was Awkward on Purpose

• leveraging links between **disfluency** and...
  • ... attention (Faber et al., 2017)
  • ... comprehension (Ozuru et al., 2010)
  • ... deception (King et al, 2018)
  • ... reasoning (Hernandez & Preston, 2013)
stumbling is humbling
Makes You Stop, Think, and Question

- key **mindset** for critical thinking about “DEI” issues
- Question: “How do we improve representation in STEM?”
  - well... **what is** representation? **who? why?**
  - what are the **causes** and **consequences**?
- need to be open-minded and **embrace disfluency**
Decentering

- a shift in perspective from self and one’s internal world to other people and the external world
  - perspective taking (Cho et al., 2021; Wolgast et al., 2020)
  - mental health (Bernstein et al., 2015)
  - progression of “me” → “us” → “them” in the title
- humbling and uncomfortable to realize it’s not (only) about you, yet you should care just as much
natural for humans to think about the world from the perspective of Self
you are everywhere you go!
my feelings, my beliefs, my choices, my actions, my needs
“How does this affect me?”
also fairly natural to extend our perceptions to people close to us or similar to us
reflection of Self; tribe
our feelings, our beliefs, our choices, our actions, our needs
“How does this affect us?”
takes work and effort to think about their feelings, their beliefs, their choices, their actions, their needs
“How does this affect them?”
e.g., correspondence bias (Gilbert & Malone, 1995) and cognitive consistency (Gawronski & Brannon, 2019)
Decentering as “Far Transfer”

- difficult to appreciate how people are meaningfully variable while also sharing underlying connections, goals, or a common cause
- e.g., structure mapping and analogy (Gentner & Markman, 1997)
- relational reasoning (Alexander et al., 2015; Dumas et al., 2013)
Marginalization and Exclusion

- select identities are historically and habitually centered, which creates a culture of exclusion for some people instead of a culture of belonging
  - i.e., White, male, heterosexual, able-bodied, rich, etc. folks are concentrated in positions of power and prestige; implicitly treated as the cultural “default”

- WEIRD (Clancy & Davis, 2019; Henrich et al., 2010)
Improving Representation (Part 1)

• people go and stay where they are wanted, valued, supported

• must assess how current cultures communicate and enact exclusion (e.g., policies, leadership, language)
  • who is centered? who is marginalized—unseen and unheard?
  • what factors are preventing or undermining belonging?

• must learn the actions, events, and experiences that contribute to sense of belonging, and then do those things
Part 2:
Personal Journeys and the Myth of Meritocracy
Language of “Journeys”

• a variety of analogies describe how people move through STEM: “pipelines” and “pathways” (Lee, 2019; Lord et al., 2019)

• analogies are powerful but must be used cautiously
  • … activate knowledge and highlight features (Danielson, Sinatra, & Kendeou, 2016)
  • … constrained by prior knowledge (Braasch & Goldman, 2010)
  • … misconceptions, illusions of comprehension (Jaeger & Wiley, 2015)
“Pipelines”

- fixed, unidirectional, and predetermined by others
- valves ("weeding out") and reservoirs ("pools")
- things either "flow through" or "leak out"
- what happens if a person "leaks out" from the pipeline? splat?
“Pathways”

- many **different routes** to get from “A” to “B” to “Z”
- can diverge and converge
- paths are **personal**, organic
- often **nonlinear**: may backtrack, get lost, find a new path, blaze a new trail
Pathways and Participation @ ASU

Dr. Samantha Brunhaver
engineering career pathways and adaptability (NSF CAREER); how identity-based characteristics influence adaptability (learn more)

Dr. Dina Verdín
broadening participation, issues of access and persistence; asset-based for understanding minoritized student experiences (learn more)

Dr. Mayra Artiles Fonseca
underrepresented and minoritized doctoral student education and policy (learn more); Rising Doctoral Institute (learn more)
“Journeys”

• because **people** are walking those paths, with personal **goals** and **purpose**

• we struggle, encounter conflicts and obstacles

• we explore, make discoveries, adapt, improvise, and fail

• we often need help
Understanding Journeys

• crucial to **understand and respect peoples’ journeys**, histories, and legacies if we want to understand (or improve) “representation in STEM”

• how and why do **some** journeys lead people **to** STEM, **away from** STEM, **into** STEM, and/or **out of** STEM?
e.g., My STEM Journey

• I’m queer, BIPOC, able-bodied (ish)

• undergraduate degrees in neuroscience and psychology; graduate degrees in cognitive psychology; 1st generation PhD

• tenured associate professor in Human Systems Engineering in a world-class engineering college

• decent publication record

• PI and co-PI on several grants
e.g., My STEM Journey

- I **worked really hard** to **merit** those degrees, jobs, publications, grants, and tenure

- maybe I’m an **existence proof**. If someone like **me** can be successful in STEM, then so can **they**!

- ... right?
My STEM-Rich Childhood

my parents built a house. I “helped.”

my dad and I built a go-cart
My Parents had School Expertise

college-educated parents who were career educators in public schools

my mom wrote the teachers’ edition for a 5th grade science textbook
Education was Valued and Celebrated
Went to College...

• accepted into multiple schools

• but University of Pittsburgh offered a full-ride **Helen Faison Scholarship**
  • i.e., 4-year degree with **no debt**

• **Dr. Helen Faison**: a pioneer and champion for students; first woman and first Black Superintendent of Pittsburgh Public Schools ([learn more](link))
...and then Graduate School

• GRA in the lab of Dr. **Michelene Chi** (more)

• generous, accessible **mentors** (only a few fit on here)

Dr. Robert Hausmann (blog, book)
Dr. Marguerite Roy (more)
Dr. Randi A. Engle (more)
Dr. Agnieszka Kristensen (more)
Dr. Kirsten Butcher (more)
Dr. Scotty D. Craig (more)
One More Time: No Student Debt

- obtaining undergraduate and graduate degrees with zero debt is/was amazing in too many ways to count

- student debt is wrecking generations of learners

- debt is inequitably distributed by race, gender, etc. (Goldrick-Rab & Kelchen, 2016; Goldrick-Rab & Steinbaum, 2020)

- “underserved” and “under-resourced” students are more likely to need assistance, exit before graduating, encounter employment hurdles, and/or default on loans
Postdoctoral Research

- second postdoc at University of Memphis with Dr. Danielle McNamara (more)
  - incredible mentor for basically how all of academia works
- launched research on writing and NLP; Writing Pal
- another very supportive, collaborative, and inspiring lab and community (learn more)
Unwavering Family Support
So... Lessons from My Journey?

• be born to **awesome parents** who can explain and guide you through the processes and practices of school

• be **immersed in early and continuous STEM**-rich environments with lots of encouragement

• go to college and graduate school **without debt**

• join stimulating, **well-funded** labs with **generous mentors**
Meritocracy

• “I worked hard and earned my successes…”

• A meritocratic ideology argues that success is the result of talent, skills, knowledge, and effort... and thus apparent success is the most valid proof of talent, skills, knowledge, and effort

• Reputation and rewards are based on or evidence of objective merit rather than subjective bias or charity
papers

citations

credentials + tenure

government funding
Meritocracy

- meritocracy seems fair and equitable
  - the same for everyone (“We all have 24 hours in a day. How will you use them?”)
  - the opposite of unfairness and discrimination (“You get what you work for.”)
- and feels good to those with power, prestige
  - justifies positive attributions and self-concept

Dr. Erin A. Cech

cultural mechanisms of inequality; STEM education and workplace; gender, race, and LGBTQ+ issues (learn more) (The Trouble with Passion, upcoming book)
Myth of Meritocracy

• my journey demonstrates the range and depth of factors that powerfully enabled my work to matter throughout my life

• but... meritocratic structures and policies ignore the journeys
  • ignore variation in opportunity, support, and luck
  • ignore variation in pressures and obstacles
  • ignore variation in starting places and resources

• even when resources are equally provided, people vary in whether they can use those resources and opportunities
Improving Representation (Part 2)

• journeys enable and/or hinder success in ways separate from “hard work” or “talent”

• by ignoring the journeys, meritocratic ideologies reward privilege and power as much as (or more than) actual success within personal context—“the rich get richer”

• meritocracy contributes to underrepresentation in STEM by gatekeeping who “deserves” to be in STEM

• we need new ways to assess and anticipate success that involve meeting peoples’ needs prior to evaluation
Part 3:
Joining Together as ______-Activists
Get fired up!
Change the System

• underrepresentation in STEM is the predictable product (or symptom) of systemic inequity and injustice in STEM fields and culture
  • e.g., cultures of exclusion that are unwelcoming
  • e.g., meritocratic mismeasurement of success
  • e.g., ignoring our journeys and the impact of injustice

• therefore, improving representation in STEM requires attention to injustice and conscious acts of justice
Language of “Justice”

• “representation” is **demographic or compositional diversity** (who is present or not)

• “inclusion” and “belonging” encompass **more than being present**—truly feeling and being welcomed, integrated, and valued

• “justice” entails **removing or overcoming barriers** that hinder representation, inclusion, belonging
Justice as “Problem Solving”

• to **solve** a problem...
  
  • need to **map** the problem space; **(re)frame** the problem  
  (Svihla, 2021; Svihla & Reeve, 2020)

- or **(re)structure** the problem  
  (Ash & Wiley, 2006; Cushen & Wiley, 2012)  
  (Jonassen, 2000)

• we can **map out the inequitable** factors, events, actions, policies, ideologies, etc. that **produce, justify, and maintain problematic outcomes** within the system
“_____ - Activism”

• activism: **problem solving** to fix systemic inequities

• anyone can contribute as a **scholar-activist**, **teacher-activist**, **practitioner-activist**, **developer-activist**, or other roles
  
  • as a **focus** of our research, teaching, practice, service
  
  • as a **lens** for interpretation and communication
  
  • as a **commitment** in our methods and procedures

• next... **rapid-fire examples** from ASU, HFES, ISLS, and AIED
Madeleine Jennings
pursuing MS in HSE and PhD in engineering education; **asset-based approach** to neurodivergent and LGBTQ+ students *(more)*

Dr. Areej Mawasi
learning sciences, educational technology; **equity-oriented** engagement and **sociopolitical dimensions** of STEM *(more)*
Inclusive Language Analytics

- new Gates-funded project to investigate bias, inclusive applications, and inclusive method for language analytics; with The Learning Agency Lab

Postdoctoral Fellows

Dr. Maria Goldshtein
Dr. Amin Alhashim

Learning Agency Lab (Feedback Prize, Tools Competition)

Ulrich Boser
Aigner Picou
Perpetual Baffour
DII@FSE

Diversity and Inclusion Initiative at the Ira A. Fulton Schools of Engineering

In January 2019, the Ira A. Fulton Schools of Engineering launched a new initiative focusing on diversity and inclusion — core values to the Fulton Schools and ASU, as exemplified in the university charter. This initiative is called DII@FSE.

Our DII@FSE task force has articulated a vision to follow strategies and practices that support environments where individuals feel included, valued and respected and where different kinds of people can succeed.

The DII@FSE has submitted a proposal to the American Society for Engineering Education’s (ASEE) Diversity Recognition Program. That proposal was awarded bronze status (the highest entry status a university can be awarded). Next steps for the initiative will be working together to realize the plan’s goals.

Goals

1. Create and maintain a student body and workforce across the Fulton Schools that is diverse in multiple dimensions and inclusive for all.
2. Empower faculty, staff, students and academic associates at the Fulton Schools to embrace the core values and practice of diversity, equity and inclusion.
3. Be a global leader in diversity, equity and inclusion in engineering.
In spring 2020, we awarded our first round of DII@FSE funding for projects to increase diversity and inclusion in the Fulton Schools. Learn more about these projects below.

**ASU-ACCEL**

The Arizona Center for Comprehensive Education and Life Skills has collaborated with ASU allowing undergraduate students to develop or modify assistive devices.

[Read more about this program]
In spring 2020, we awarded our first round of DII@FSE funding for projects to increase diversity and inclusion in the Fulton Schools. Learn more about these projects below.

**Employment Assistance & Social Engagement (EASE)**

The Employment Assistance & Social Engagement (EASE) program provides peer mentoring for Fulton Schools students with an Autism Spectrum Disorder to assist with the transition to college life, and later, career readiness skills.

[Read more about this program](#)
Committee for Campus Inclusion

• promote inclusive, harmonious campus environment that celebrates individual and group diversity

• training, webinars, consulting

• Catalyst Awards

ASU’s Committee for Campus Inclusion honored with city of Tempe’s diversity award
Catalyst Award 2020 Recipients

Supriya
Catalyst Award
Staff category
Pondicherry University School of Global Studies
Supriya has worked to make the future of the Pondicherry University School of Global Studies more inclusive and build community, fostering an environment that is welcoming to all students. She has been a role model and mentor to others, and has created opportunities for students of all backgrounds to engage and contribute.

Melinda Borucki
Catalyst Award
Faculty category
Communication and Events Coordinator, Department of Business and Community Solutions
Melinda Borucki has led the Communication and Events Coordinator role at CCI for nearly five years. She has consistently demonstrated a commitment to excellence in her work, and has shown a strong ability to support and engage with faculty and staff to promote the goals of the department. Her leadership has been instrumental in the development of the department and in the growth of the university as a whole.

Mako Fitts Ward
Catalyst Award
Faculty category
Chair and Civil and Environmental Engineering
Mako Fitts Ward has been a driving force in the development of the Civil and Environmental Engineering program at the University of Southern California. Her leadership has been instrumental in the growth of the program and in the development of new courses and opportunities for students.

Sara Brownell
Catalyst Award
Faculty category
Assistant Professor, School of Life Sciences
Sara Brownell has established a laboratory that focuses on the development of new drugs for the treatment of neurodegenerative diseases. Her research has been recognized with numerous awards, and she has published extensively in the field of neurodegeneration. She has also been active in her community, serving on numerous committees and in various leadership roles.

Anyah Braveboy
Catalyst Award
Student category
Community Activist and Public Policy
Anyah Braveboy has achieved excellence in her work as a community activist and public policy advocate. She has used her platform to raise awareness about the importance of education and social change, and has worked to create opportunities for others to do the same.

Liam Gleason
Catalyst Award
Student category
Researcher and Social Change
Liam Gleason has been recognized for his outstanding work as a researcher and social change activist. He has been involved in numerous initiatives that aim to address issues such as climate change and social justice.

Healthy Lifestyles
Organization at ASU
Healthy Lifestyles is a student-run organization that focuses on promoting healthy lifestyles through education and engagement. The organization has been successful in raising awareness about the importance of a healthy lifestyle, and has provided opportunities for students to learn about and participate in healthy living.

Turning Points Magazine
Turning Points is a student-run magazine that focuses on issues related to mental health and well-being. The magazine has been recognized for its commitment to raising awareness about mental health issues and providing a safe space for students to share their experiences.

ASU Poly Sol
Catalyst Award
Organization category
University Technology Office (UTO)
ASU Poly Sol is a student organization that focuses on sustainability and environmental issues. The organization has been successful in raising awareness about the importance of sustainability, and has provided opportunities for students to engage in environmental projects.

TRiC Devils Poly
Catalyst Award
Organization category
TRiC Devils Poly is an organization that focuses on the development of student leaders and provides opportunities for students to engage in community service and leadership development. The organization has been successful in raising awareness about the importance of leadership and has provided opportunities for students to develop their leadership skills.
Advocating with and for women and girls of color in STEM

Welcome to the Center for Gender Equity in Science and Technology
CGEST Collaborators

- pending proposals: use systems mapping to explore systemic factors that affect women and girls of color in STEM; expanding COMPUGIRLS globally using VR

Dr. Kimberly Scott
social and academic development

Dr. Tara Nkrumah
culturally responsive science education

Dr. Brooke Coley
engineering education, VR, identity

Dr. Lois Brown
African American lit and culture

job opportunities
The Social Cohesion Dialogue series puts acclaimed authors and their powerful writing in conversation with ASU and Antenna audiences.

Engage with accomplished writers and each other as we grapple with pressing issues of race, class, environmental justice, civil rights, economic inequality and social justice facing our societies today.
Systems That Work
For Humans
Dr. Erin K. Chiou
trust in automation,
human-automation
teams, healthcare,

(more)

Dr. Abigail Wooldridge
health systems, patient
safety, healthcare

(more)
2020

Outstanding Academic Title by Choice

Advancing Diversity, Inclusion, and Social Justice Through Human Systems Engineering

ROD D. ROSCOE, ERIN K. CHIOU, ABIGAIL R. WOOLDRIDGE

Assessing Authentic Diversity in the Human Factors and Ergonomics Society: Part 1

By Erin K. Chiou & Rod D. Roscoe

FEATURE AT A GLANCE: This article is Part 1 of a two-part series exploring the meaning of authentic diversity within the Human Factors and Ergonomics Society (HFES) and how this concept is essential to advancing HFES organizational goals. HFES 2020: HFES is an international organization, although the central office and its founding history are largely U.S.-based. Therefore, these articles possess a U.S.-centric lens. Nonetheless, this series invites dialogue and action across the broad human factors and ergonomics (HF/E) community. Part 1 articulates a framework for authentic diversity, including benefits, supports, and potential threats. This article explores a 3x3 matrix for authentic diversity: three levels of awareness and three different perspectives. Part 2 examines recent collaboration and new ideas and recent scholarship within HFES: IFFS supports outcomes in diversity issues. Part 1 and 2 also offer ways that HFES might further pursue authentic diversity. These assessments focus on two concerns that are of particular importance to many in HFES: recruitment of new and diverse members and retention of existing members. Attending to authentic diversity speaks to both of these goals. Importantly, this assessment is not a call to action in the absence of action, nor is it a critique of valuable activities and progress to date. Rather, this is a contemporary look at what "HFES is" and how HFES can continue building toward a better future for all.

CONCEPTUALIZING AUTHENTIC DIVERSITY

Diversity refers to the range of different people and perspectives within a group or organization. Previous scholarship has articulated several types of diversity, including demographic, functional, experiential, cognitive, cultural, and ideological (Duchek et al., 2015; van Keijnsbergen et al., 2004; van Keijnsbergen & Schippers, 2007; Zhou et al., 2013). This incomplete list illustrates that diversity comes in many forms. Our fundamental theme in diversity scholarship is that broadening the representation of members within an organization, across multiple dimensions, is worthwhile (e.g., Bell et al., 2017; Duchek et al., 2020; Guillaume et al., 2017; Salazar et al., 2018; Stahl et al., 2019). When managed well, increased functional, cognitive, and ideological diversity leads to more robust and novel ways to conceptualize problems, solutions, and activities. Similarly, increasing demographic, cultural, and ideological diversity can enable a better understanding of an organization's impact on broader communities. Another core finding is that the mere presence of diverse people is no guarantee for achieving the benefits of diversity. Diversity must be authentic and accompanied by feelings of belonging, worth, agency, power, and participation. The experience of being a valued member in an organization is termed inclusion (Puritty et al., 2017; Robertson, 2006; Sherbin & Rashid, 2017; Shore et al., 2011; Tims, 2013). Because opportunities for inclusion are not often equal for all members, authentic diversity also requires attention to equity and ensuring that different needs are not barriers to inclusion. A number of threats to authentic diversity in an organization can arise. Lack of

Assessing Authentic Diversity in the Human Factors and Ergonomics Society: Part 2

By Erin K. Chiou & Rod D. Roscoe

FEATURE AT A GLANCE: This article is Part 2 of a two-part series exploring the meaning of authentic diversity within the Human Factors and Ergonomics Society (HFES). Part 1 discussed what it means to pursue authentic diversity and reported recent demographic characteristics of HFES. Part 2 discusses a brief history of relevant efforts in HFES and recent scholarship that suggests sustained interest in diversity issues within human factors and ergonomics. Part 2 concludes with a discussion about how human factors and ergonomics professionals can continue to lead the design and implementation of systemic change that benefits all by embracing human complexity.

POSSIBLE EFFECTS ON AUTHENTIC DIVERSITY IN HFES

HFES has documented its progress in gender parity via a series of profiles on its first woman member (Ruth Hoyt in 1958), fellow (Dore Sogberry McKewen in 1968), president (Gail L. Grace in 1978), and editor-in-chief (Nancy D. Cooke in 2005; see Dorn, 2014). Other efforts to address diversity within HFES include the establishment of the first HFES Diversity Task Force in 1994. The Diversity Task Force was terminated early due to lacking interest until 2015–2016, when diversity and inclusion were officially added to the HFES Strategic Plan. The Diversity Task Force transitioning to a more permanent standing committee by then HFES president William S. Marras. The inaugural Diversity Committee, led by Pascale Cayonne, formed a charter to support diversity and inclusion efforts within the society by...
The International Society of the Learning Sciences

An interdisciplinary society dedicated to the research of learning in all of its forms
ISLS Emerging Scholars Committee

Dr. Victor Lee
learning technology, computational thinking, data science education (more), as President of ISLS

Dr. Maxine McKinney de Royston
culture and learning, race and equity, political clarity (more)

Dr. Leema Berland
Epistemology and argumentation, equity and integration, STEM engagement (more)

Dr. Roberto de Roock
learning, technology, and justice (more)

Dr. Mmantsetsa Marope
education administration, economics, policy (more)

Dr. Dengting Boyanton
educational psychology, co-learning (more)

Request for Proposals:
due date: September 1st, 2021
Dr. Maxine McKinney de Royston

• importance and urgency of political clarity: scholars need to be socio-politically aware and engaged in their work and how it is applied

  • e.g., McKinney de Royston & Sengupta-Irving (2019) (special issue)

• STEM and the social good: Forwarding political and ethical perspectives in the learning sciences (Sengupta-Irving & McKinney de Royston (Eds.) (2020)
Dr. Sherice Clarke

• accountable talk, discourse, educational technology, design (Clarke, 2018, 2020)

• promoting equity for diverse and underserved learners (website) (more)

• need to see the full humanity of all learners, see learning as development, and see teaching as the fostering of that development

• these assumptions must also apply to minoritized children—not selectively
Mind the Gap: AIED for Equity and Inclusion

June 14 - 18 2021, ONLINE from Utrecht (Netherlands)

Resources stay online for participants
AIED and DEI: A Bidirectional Relationship

• invited panel for AIED 2021 conference, to discuss equity, inclusion, artificial intelligence, and education

Dr. Shima Salehi
problem solving, STEM inclusion and access, learning analytics

Dr. Chris Piech
computer science education, co-teaching, learning analytics

Dr. Nia Dowell
discourse analysis, group communication analysis, learning analytics

Dr. Rose Luckin
learner centered design, educational technology, ethics for AI

Dr. Marcelo Worsley
inclusive teaching and learning via tech, multimodal learning analytics
Dr. Shima Salehi

- problem solving, STEM learning
- inclusion, equity, and access in STEM learning communities
- barriers to equity (e.g., academic preparation, self-efficacy)
- Salehi et al. (2019a, 2019b, 2019c, 2020) (more)
Dr. Nia Dowell

- discourse processing, group interaction, learning analytics, collaboration (website)

- social processes, engagement, incorporating gender and race; promoting inclusion

- Dowell et al. (2019, 2020, 2021a, 2021b) (more)
Dr. Marcelo Worsley

- inclusive making, co-design, broadening participation
- multimodal tools and learning analytics for studying complex learning environments
- Worsley et al. (2018, 2020, 2021a, 2021b) (more)
- Technological Innovations for Inclusive Learning and Teaching (tiilt) Lab—centering marginalized people and communities
Future Panelist? Dr. Angela Stewart

- combines education, HCI, and AI to create **sociotechnical interventions** for more equitable and inclusive educational spaces
- collaboration and teams
- Stewart et al. (2019, 2020, 2021) (more)
Improving Representation (Part 3)

• must take action and build coalitions to solve the systemic problems that undermine the inclusive world you want

• it is possible and valuable to weave inclusion, equity, and justice themes into all kinds of work

• please contact the scholars noted here, or join an affinity group or book club, or partner with other organizations, or submit collaborative multi-institute grants—join forces

• tell ‘em Roscoe sent ya
The Question(s)
How do we improve representation in STEM?

How and why do some journeys lead people to STEM, away from STEM, into STEM, and/or out of STEM?
Five ThoughtProvoking Answers

entail **seeking justice** in STEM—recognizing, confronting, and dismantling the **inequitable systems** and **ideas** that **create** and **maintain** underrepresentation
(1) Build a Culture of Belonging

- assess how **your system communicates and enacts exclusion** (e.g., policies, leadership, what is tolerated)—sends people **away** and **out**

- implement **multiple ways to belong** as systemic principles that encourage discovering, **joining**, and **staying** in STEM
  - be proactive with sincere **invitations**
  - acknowledge and celebrate **people** and their **journeys**
  - promote and support diverse **role models** at all levels
  - cultivate communities of **generous mentorship** and **access**
  - solicit needs and be **accountable** for meeting them
(2) Decenter, and then Recenter

• must **challenge the “defaults”** in the system
  • what do they look like? where are they from?
  • silence and invisibility pushes people **away** and **out**

• must **promote** and celebrate the work of marginalized and minoritized scholars and practitioners
  • exciting **attention** that **pulls in** “newcomers” and “outsiders,” while **uplifting** current members—**welcoming them into the center**

• importantly, when we **focus on each other**, the result is a reciprocal and mutual system of support
(3) Adopt a Journeyocracy

• meritocracy is inequitable gatekeeping that only constrains **who can enter or stay** in the system

• must respect **crucial variations** in resources, luck, experience, and opportunities that powerfully affect how people journey through the system
  - must stop **reducing people** to publication counts, h-indexes, pedigrees, expenditures, award lists, etc.

• need new models for recruiting, hiring, tenure, awards that value **how we get** there, not **whether we got** there
Journeyocracy

• focusing on journeys prepares us to appreciate diverse backgrounds and intervene to support ongoing journeys

• identify where systems support or hinder people along their journeys—it is only equitable and valid to assess people after their needs have been met

• the journey continues after joining—cultures of belonging offer continuous support (e.g., mentors and safety nets)

  • instead of allowing people to “leak out” or “get lost,” provide what they need to stay and keep progressing
(4) Become an _____-Activist

• must embrace injustices as problems you have the tools and responsibility to address

• must invest in learning about the systemic factors that include or exclude people from STEM

• must act via research, teaching, service, administration, volunteering—get involved

• and do so with political clarity and awareness
(5) Build Coalitions

• there are many experts, committees, initiatives, organizations, work groups, projects, centers, etc.

• however, many folks are working in parallel but not together—forming coalitions and alliances helps us share resources, share strategies, and share wisdom

  • coalitions help us resist divisive tactics and rhetoric

  • coalitions can enact systemic change at larger scales
By Our Powers Combined...

- every organization contributes distinct expertise, methods, perspectives, and person-power

- we should promote interdisciplinary scholarship along with interdisciplinary activism

- “insiders” here may be “outsiders” there; but joining together makes us all insiders (a “bigger tent”)
So... please join me/us/them on my/our/their journey to justice in STEM!

Rod D. Roscoe (rod.roscoe@asu.edu)
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- disguise dog: photo by Braydon Anderson on Unsplash
- Nikole Hannah-Jones: photo by Marcus Ingram
- slip-and-fall sign: photo by Skitterphoto on Pexels
- monkey mirror: photo by Andre Mouton on Unsplash
- friends photo: photo by Duncan Shaffer on Unsplash
- protester hug: photo by Hannah Busing on Unsplash
- busy street: photo by mauro mora on Unsplash
- Google search: screenshot by R. D. Roscoe
- grocery list: photo by cottonbro from Pexels
- construction worker Rod: photo by Roscoe Family
- go-cart Rod: photo by Roscoe Family
- OSU Rod: photo by Roscoe Family
- textbook cover: photo by Scott, Foresman
- kindergarten graduate Rod: photo by Roscoe Family
- high school graduate Rod: photo by Roscoe Family
- Dr. Faison: photo by Pittsburgh Post-Gazette
- Roscoe family: photo by Roscoe Family
- easy cake: photo by congerdesign from Pexels
- trophy: photo by Giorgio Trovato on Unsplash
- burning money: photo by Jp Valery on Unsplash
- shredded paper: photo by Hans Braxmeier from Pixabay
- diploma: photo by Ekrulila from Pexels
- thumbs up: photo by Lukas from Pexels
- matches: photo by Comfreak from Pixabay
- concert hands: photo by Free-photos from Pexels
- megaphone: photo by Andrea Piacquadio from Pexels
- systemic racism: photo by UnratedStudio from Pixabay
- CCI award: photo by ASU Now, ASU
- HSE book (front, back): photo by R. D. Roscoe
- Sherice Clarke: photo by c.bay milin
- Journeycracy: screenshot by R. D. Roscoe
- team hands: photo by fauxels from Pexels: team hands
- holding child: photo by Ketut Subiyanto from Pexels: holding child
- garden maze: photo by Susanne Mumm from Pixabay garden maze
- protester: photo by Ehimetalor Akhere Unuabona on Unsplash
- build bridge: photo by Mason Kimbarovsky on Unsplash
- sword: photo by Ryszard Porzynski from Pixabay
- robot arms: photo by kalhh from Pixabay
- dragon: photo by JL G from Pixabay
- flames: photo by Cullan Smith on Unsplash
- all photos of academic and professional colleagues sourced from public-facing profiles; all images of webpages are screenshots of public-facing sites