Building Students Science Identity

Session goals:
• How might we help build our students abilities to perceive of themselves as future scientists?
• How might we provide diverse perspectives in our courses and programs?
• How might we infuse career information throughout the curriculum?

Rachel Beane and Stefany Sit

Building from the SAGE2YC Faculty as Agents of Change ‘Science Identity’ session.
Strategies to Support All Students

The ECC Trilogy

**Engagement**
Having an orientation to the sciences and/or quantitative disciplines that includes such qualities as awareness, interest and motivation.

**Capacity**
Possessing the acquired knowledge and skills needed to advance to increasingly rigorous content in the sciences and quantitative disciplines.

**Continuity**
Institutional and programmatic opportunities, material resources and guidance that support advancement to increasingly rigorous content in the sciences and quantitative disciplines.

from Jolly et al. 2004
What are your identities?
Picture an earth or environmental scientist
If students hold stereotypes that portray scientists as a different 'kind of person' than themselves, those students might conclude they are not 'science people.' This mismatch between a student's personal sense of identity and a science identity can hamper persistence in STEM.

SCIENTIST SPOTLIGHTS: WEEKLY METACOGNITIVE EXERCISES TO SHIFT STEREOTYPES AND ENHANCE SCIENCE IDENTITY

“Scientist spotlights” are weekly online homework assignments featuring diverse scientists related to upcoming course content, developed by Jeff Schinske, a Biology faculty member at DeAnza College

Goals:
• Introduce new course content using the stories of scientists
• Encourage students to reflect on their learning & confusions
• Enhance students’ science identity & sense of belonging

Scientist Spotlights: Weekly Metacognitive Exercises to Shift Stereotypes & Enhance Science Identity

Please spend approximately 40-60 minutes responding in writing to the following prompt.

We will soon be looking into the body's defenses and the microbes with which our bodies interact. This leads us to our next scientist. Lawrence David is a Filipino-American biologist currently working as a professor at Duke University and Harvard. His work focuses on the trillions of bacteria that live on and in the human body, and he is particularly interested in how bacteria contribute to health and disease in the developing world, including in Bangladesh and other non-western areas. He also helped start a website to showcase illustrated, science-related poetry (http://www.sciku.org/).

Please click here and listen to the story told by Lawrence David. A written transcript of this story is available here.

Next, click here to read a 2013 Nature article by Lawrence David reporting on some of the striking results of his work.

Write a 350 word or more reflection with your responses to what you heard. You might discuss:
1) What was most interesting or most confusing about the podcast and article?
2) What can you learn from the podcast/article about the relationships between our body and bacteria?
3) What does this podcast/article tell you about the types of people that do science?
4) What new questions do you have after hearing the story?
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Scientist Spotlight Resources

- Counter-stereotypical Geoscientist Career Profiles developed by Jan Hodder, Oregon Institute of Marine Biology, University of Oregon, for the SAGE 2YC project
- transverse RANGES: (tR) interview-format articles celebrating diversity of individual geoscientists
- Time Scavengers' *Meet the Scientists*: Stories of geoscientists, what type of data they use, why they enjoy science, and their advice for young future scientists.
- Kappel, E.S. (Ed) *Women in Oceanography - A decade later*. Oceanography 2014 Vol 27 no.4 supplement
- Secret Lives of Scientists and Engineers is an Emmy-nominated web series and site from PBS's NOVA.
- Black History Month: Making History in the Geosciences is a blog post about four extraordinary Black geoscientists.
GEOScientist Representations

In your course, please indicate how frequently you include photos and stories of individual geoscientists & their work? (n=2106)

- Never: 16%
- Once or twice: 23%
- Several times: 39%
- Weekly: 11%
- Nearly every class: 11%
What percentage of the geoscientists included are female? (n=1749)

- Less than 30%: 52
- 30% - 70%: 45
- More than 70%: 3
What percent of the geoscientists included are people of color? (n=1746)

- Less than 10%: 82
- 10 - 25%: 15
- More than 25%: 3
% Responding 'YES'

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<th>Category</th>
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<tr>
<td>Geo career info (Q22.1)</td>
<td>58</td>
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<tr>
<td>Connect workforce skills with assignments (Q22.8)</td>
<td>51</td>
</tr>
<tr>
<td>Highlight geo alumni (Q22.3)</td>
<td>44</td>
</tr>
<tr>
<td>Promote internship/research opportunities to all (Q22.5)</td>
<td>41</td>
</tr>
</tbody>
</table>
Career Pathways

- Communicate re preparing students for careers (Q35.3): 38
- Help with applications (Q22.7): 37
- Publicize job search/career resources (Q22.6): 25
- Assignment to explore geo careers (Q22.4): 9
Highlighting Career Pathways – Example

- Alumni Interviews on YouTube
- Career Awareness Poster/Postcard (English and Spanish)

Geoscience Careers | Air Toxics Specialist - Lionel Mojekwu
Highlighting Career Pathways – Example

• Resume Jigsaw Assignment

RÉSUMÉ JIGSAW ASSIGNMENT

Assignment - Students compete for different job openings by writing a winning résumé. Students choose the scholarship, internship, or job ad they want to apply for and create a résumé that will highlight their relevant experiences.

Gallery Walk - During the next class meeting, students will go through a gallery walk, where each ad and associated student résumés will be available. Students will evaluate the résumés and vote on their favorite. At the end of the gallery walk, students should have a discussion about what was successful about different resumes.

Optional - Students revise and edit their own resumes after the discussion and turn in the updated resumes for a grade.

Reach Out to Career Services - For this assignment, you may want to reach out to your Office of Career Services for help finding recent job ads and have them present to the class on resume writing.

For the full assignment:
Check out the UIC InTeGrate site
In this session we’ve discussed:

- Representations of earth and environmental scientists
- Scientist spotlights
- Career pathways information
Building Students Science Identity

Other suggestions include:
• Be explicit about the process of science (include failures not only successes)
• Include topics relevant to students’ lives
• Allow students to practice doing science (and let them know when they are doing what scientists do)

https://serc.carleton.edu/sage2yc/sci_id.html
YOUR TURN: GALLERY WALK

Count off 1-8, Start at your number and introduce yourselves.

1. What can we do in our class to bring diverse representations and perspectives to our students?

2. What can we do in our programs bring diverse representations and perspectives to students in our programs?

3. What can we do in our classes to develop an understanding of what an earth/environmental scientist does?

4. What can we do in our programs to develop an understanding of what an earth/environmental scientist does?
Review the responses to each question and choose one thing for each question that you would consider doing.

Put a dot by your choice.
Reflection

- What might you do to help your students build a science identity?
- What diverse perspectives might you bring to your next class?
- What might you do to infuse career information in your program’s curriculum?