Breaking Barriers: Dispelling Career Misconceptions

Time Frame 75 minutes

Essential Question(s)

How do you overcome career misconceptions in a virtual world?

Summary

One notable thing the events of recent years have taught us is that what we think we know might not be a holistic truth. This includes the ways in which we think our GEAR UP students perceive career paths. Contexts like culture, background, skills, and interests can have a profound effect on student career aspirations. In this interactive presentation, we will explore common misconceptions around careers and how these misconceptions can act as barriers that hinder students' aspirations for a wider range of career fields. Participants will discuss and explore virtual activities that will help reshape student beliefs and develop a plan that will forge a path to a more enlightened college and career awareness program.

Learning Goals

- Explore personal and professional career misconceptions.
- Design a virtual career exploration program that will break career stereotypes.
- Implement new career exploration strategies in your program or school that can help break down the barriers and misconceptions of career clusters.

Attachments

- Dispelling Career Misconceptions Action Plan—Breaking Barriers.docx
- Health Science Breakout Room Slides—Breaking Barriers.pptx
- Helpful Resources—Breaking Barriers.docx
- Information Technology Breakout Room Slides—Breaking Barriers.pptx
- Manufacturing Breakout Room Slides—Breaking Barriers.pptx
- Presentation Slides—Breaking Barriers.pptx
- Transportation Distribution and Logistics Breakout Room Slides—Breaking Barriers.pptx

Materials

- Presentation Slides (attached)
- Breakout Room Slides (attached)
- Helpful Resources (attached)
- Dispelling Career Misconceptions Action Plan (attached)
- Career Clusters Infogram (linked)

Engage

Presenter's Note: Setting Up Before the Session

Prior to the session you will need to set up the following:

1. Padlet for the Engage activity. Create a basic Padlet board. Insert the QR code into the Presentation Slides (**slide 8**) and make sure to include the link in the slide notes so you can share that with your participants as well.
2. Mentimeter for the Explore activity. Set this up as a word cloud. Insert the QR code into the Presentation Slides (**slide 25**) and make sure to include the link in the slide notes so you can share that with participants as well.'
3. Mentimeter for the Evaluate activity. Set this up as an open-ended slide. Insert the QR code into the Presentation Slides (**slide 39**) and make sure to include the link in the slide notes so you can share that with participants as well.

Begin the session by displaying **slide 2** from the attached **Presentation Slides** and welcoming participants as they enter. Draw participants' attention to the prompt on the slide.

Once participants are settled, welcome them to the session. Let them know that they'll have time to wrap up work on the opening prompt after you share the session goals and objectives.

Display **slide 3** and reiterate how happy you are that the participants have joined you.

Display **slides 4–6** and review the essential question, learning objectives, and norms for the session.

Display **slide 7** and provide participants with an additional 1–2 minutes to complete their scientist drawings.

Display **slide 8** and instruct participants to share their scientist drawings using the attached Padlet. Provide participants with instructions for how to share their drawings. Make sure to share the link in the chat for those who are unable to access Padlet using the QR code.

Display the Padlet on the screen so that everyone can see what's being shared. Encourage participants to provide their thoughts or any details about how they created their scientists with the group.

Display **slide 9** and share the related research.

"Adults in many nations associate science with men much more than with women (e.g., Miller, Eagly, & Linn, 2015; Smyth & Nosek, 2015). To investigate the origins of these associations, researchers have studied children's perceptions of scientists over several decades. For instance, children were asked to draw a scientist in a landmark study of nearly 5,000 elementary school students who were mostly from the United States and Canada (Chambers, 1983). The drawings, collected from 1966 to 1977, almost exclusively depicted male scientists, often with lab coats, eyeglasses, and facial hair, working indoors with laboratory equipment. Only 28 children drew a female scientist (0.6% of the sample), suggesting strong gender-science stereotypes linking science with men. This limited view of scientists might have restricted children's science-related educational and career aspirations, to the extent that children did not identify with such depictions."

Display **slide 10** and pose the following question: *"What do real scientists look like?"*

On **slides 11–21**, introduce the different scientists to participants.

- Slide 11: Dr. Mae C. Jemison, the first Black female astronaut and the first Black woman in space (1992).
- Slide 12: Gitanjali Rao (Ge-TAN-geli Row), the first-ever Time's Kid of the Year at 15, who, with her work using technology addresses issues ranging from contaminated drinking water to opioid addiction and cyberbullying and has taken on the mission to create a global community of young innovators working to solve problems.
- Slide 13: Verena Mohaupt, the logistics coordinator for a year-long mission known as the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) — the largest Arctic research expedition in history.
- Slide 14: Alton Brown, a chef and food scientist who has introduced new methods for and approaches to cooking. Wylie Dufresne is another example of a scientist in this industry. Dufresne is a chef and leading proponent of molecular gastronomy. Molecular gastronomy is the scientific approach to nutrition from the perspective of physics and chemistry.
- Slide 15: Daisa Taylor, a high school senior from Iowa, won $25,000 at the prestigious Regeneron Science Talent Search for her invention of cost-effective surgical sutures that change color to detect if a patient's wound is infected.
- Slide 16: Billy Malan is a pediatric nurse in Oklahoma City.
- Slide 17: Robbie Ferguson is an engineering specialist.
- Slide 18: Mayim Bialik (MYim BEEalik) doesn't just play a scientist on a well-known television show—you might recognize her from her role as neuroscientist Amy Farrah Fowler on *The Big Bang Theory*—she also earned her Ph.D. in neuroscience from UCLA.
- Slide 19: Renaldo Woodson is a senior herpetologist at the Oklahoma City Zoo.
- Slide 20: Beth Golnick is a nurse with certification as an assisted living director.
- Slide 21: Dr. Kizzmekia S. Corbett is an immunologist at the U.S. National Institutes of Health and helped develop an mRNA-based vaccine for COVID-19.

These people represent just a few examples of who is out there in the world working as a scientist.

Display **slide 22**. Share the STEM page from the K20 Center's *first* iteration of the Career Cluster Infogram. Provide participants with the following contextual information:

Even with this knowledge and understanding, we still stereotype the fields we're teaching our students all about. This is an example of a graphic from an Infogram that was developed to share career opportunity information with students. As you can see, there are a lot of things about this image that we know are related to scientists, but we still have work to do in order to break our barriers and misconceptions of who scientists are.

Display **slide 23** and share the primary areas of our "*lenses*" that we need to check for cracks These are just some of the biases to think about when addressing careers and opportunities with students. It is important as a mentoring team, or working team, that we have discussions about checking our own lenses and how we can also help share activities and information with schools and students to help break career misconceptions.

1. Religion
2. Race
3. Marital status
4. Geographic location
5. Ethnicity
6. Gender
7. Age
8. Education
9. Sexual orientation

Display **slide 24** and use the questions to guide a whole-group discussion.

Guiding Questions Discussion

How has your view of scientists changed over time?

After seeing scientists in different fields, including molecular gastronomy, has your view changed in terms of what a scientist "looks like"?

Some responses from the presentation at 2021 NCCEP Summer School:

- Just about every career has science behind it.
- Scientists basically meant Bill Nye or Beakman's World when I was a child... As an adult I realize science is so much broader than that.
- I have been amazed by the young ages of some scientists.
- It's a broader field than I thought.
- For me it began in 6th grade when I had a female science teacher who was passionate about Sally Ride—and my knowledge has been growing ever since!
- Ever since I started cooking for myself, I've become a scientist.
- As an African American woman, I never really saw any famous Black women scientists until I saw the movie *Hidden Figures*. That movie alone helped me realize that there is space for women and girls like me.
- Scientists study a large variety of subject matters, not just biology, chemistry, and physics.
- The COVID-19 pandemic has opened my eyes to all of the types of scientists and that it's not just one mold.
- Just by learning history and seeing the world evolve as I got older. I used to think all scientists were like Albert Einstein.
- I think social media has helped shine light on scientists that don't look like your "typical" scientist.
- While the view of scientists here is broad and not confined to one gender, look, etc....it's because most people here know a scientist. HOWEVER, everyone thinks auto technicians should be male. This discussion has made me realize it is simply because my kids have never seen any female mechanics. I have to find some and VISIT them!
- You can be a scientist even if you don't have a science degree...yet. Like the high school students, etc.

Thank participants for their reflection and honest conversation. Let them know that you are just getting started with this important discussion.

Explore

Display **slide 25** and explain that when we envision and discuss career fields, what we visualize in our minds and what we say doesn't always align with the reality of those careers. Oftentimes, what we believe to be a comprehensive view of a field might, in fact, be only a small fraction of what exists.

Ask participants to use the Mentimeter QR code or link to share some words that come to mind when they think of the Agriculture Career Cluster. Make sure to explain that they can enter more than one keyword and that they should not worry whether someone else has already entered a keyword that they like—words can be repeated!

Display the Mentimeter on the screen so that everyone can see what's being shared and see how the Collaborative Word Cloud is growing. Invite participants to share their thoughts. Point out that some words are bigger than others. These are words that have been mentioned more often. Ask, *Did the most common words match your responses?* Suggest that this activity is something participants can do with their students that will help open the students' eyes to a more global view of the Career Clusters.

Display **slide 26** and use the questions to guide a whole-group discussion.

- Why are these the words that come to mind when you think of the agriculture field?
- What past experiences might have affected the words you used to describe the agriculture career field?

Guiding Questions Discussion

Some responses from the presentation at 2021 NCCEP Summer School:

- Family experience
- Personal experience
- What we see on TV for sure!
- Location, what we see each day
- That is what has been taught.
- Traditional practice
- Here in Vermont, it's cows, maple syrup, and corn, but not fields of grain or sunflowers.
- Many of my ancestors worked in agriculture in Sweden and Norway. Many worked in agriculture here in the U.S., too. My maternal grandparents had a farm.
- Grew up on a cattle ranch
- We have soy and sugar cane here.
- Where you grew up, the number of people you know in that field
- Spending a week on my grandparents' farm every summer
- We all eat food and I have many memories of "shopping" at farmer's markets and roadside farm stands.
- Being from California, my experience with the field has been highlighting the importance and livelihoods of migrant and immigrant Campesinos.

Explain

Display **slide 27** and share the following with participants:

Members of the Mentoring team had to ask ourselves these questions as well to help us grow. We have grown through consistent assessment of some of our career services, such as their virtual career expos and student-led career activities. One example of the team having to address career misconceptions took place while listening to one of our Career Expo speakers share about her experiences working in agriculture and how misunderstood she believed this cluster to be. As a team, we had to adjust our mindsets, address misconceptions, and continue to learn and grow.

Another example took place as we developed an education career cluster activity, and we realized that this field also encompasses more than we had originally considered. When we think of education, because of our professional backgrounds, we often think of teachers in a classroom setting. But as members of the mentoring team worked on this cluster, we realized that it also encompasses individuals who train or teach other people in and outside of the classrooms.

Display **slide 28** and share the clip from a career talk (timestamps 10:42–11:58) in which Emily discusses misconceptions about the Agriculture Career Cluster. This talk is from one of the Mentoring team's virtual career expos, which are similar to job fairs that are hosted through Zoom. Classrooms join virtually and listen to a wide range of speakers share about their careers.

Embedded video
https://youtube.com/watch?v=eyxd5BDNhmw

Display **slide 29**. Share the live link for the attached Career Clusters Infogram and instruct participants to take a few minutes to look over the first iteration of the Infogram and consider the following:

- What might they change about the visuals that are included?
- How might they make the Infogram more global?

As they consider these questions, tell them to feel free to submit responses in the chat.

Display **slide 30** and share that one aspect the team noticed is in the Agriculture cluster. Explain as follows:

The visual representations embody the belief that this cluster's main focus is farming when we learned from our speaker that farming actually makes up a small percentage of this field. We would like to adjust the visual to better represent the career diversity present in this cluster. While this Infogram is an amazing resource that we are grateful to have, there is always room for continual growth as we adjust our mindsets.

Display **slide 31** and inform participants that they are going to take a closer look at the Infogram by moving into breakout rooms for a small-group discussion. Inform them that they will have 5 minutes to discuss the guiding questions and that each group should be prepared to share out when they return to the whole group.

Divide participants into four small groups and assign each group to one of the following career clusters:

- **Health Sciences**
- **Information Technology**
- **Manufacturing**
- **Transportation, Distribution, and Logistics**

Each group should have access to the attached **Breakout Room Slides** labeled with their cluster.

Use **slides 32–35** to help with the share-outs after the breakout session.

Extend

Display **slide 36** and share the attached **Dispelling Career Misconceptions Action Plan** document. Participants can use this template to help guide them to start their own action plan. Though this template uses the agricultural field, participants can fill it in with any number of careers to help answer student questions about career misconceptions. These questions can be used to help break the common misconceptions of careers to further increase students' post-secondary awareness.

Display **slide 37** and use the following questions to guide your discussion:

- After hearing about our career exploration program (the short video we watched or our infographics), what ideas do you have for how to help break the barrier for your students?
- Why do you think it's important for students to hear from professionals that, on first glance, do not seem to fit the standard mold for a career cluster?

Invite participants to share their thoughts in the chat or out loud. Their input might help others come up with ideas of their own.

Display **slide 38** and explain that as life-long learners we might be considered "experts" on a topic but we are never done learning. Every time we have a new set of career cluster speakers, we seem to find someone who transforms the way we see that career cluster. It's good to be vulnerable and ask others' thoughts to make improvements and have meaningful and thoughtful discussions. The best way we can advocate for our students to be open ourselves.

Evaluate

Display **slide 39** and share the closing activity, Six-Word Memoir. Explain that this is a strategy with a focus on brevity; you can say a lot with a few words.

Instruct participants to describe their feelings about today's topic or their action plan in six words. This activity requires identifying essential facts, thinking about word choice, and eliminating unimportant information. Once participants have composed their memoirs, encourage them to share using the Mentimeter.

Show the Mentimeter on the screen so that everyone can see what's being shared.

Six-Word Memoir

Some responses from the presentation at 2021 NCCEP Summer School:

- Expanding our views on career fields
- Aspire to be what you see!
- Gaining new perspectives for our students.
- Identifying current biases and misconceptions
- Opportunities to include to create inclusion
- Staying aware of biases in education
- Rural and isolated students need exposure
- Confront misconceptions with many diverse representations
- Engaging thoughtful career explanation guide
- Representation and exposure matters
- There is always more to be/see
- Think beyond your first career assumptions
- Understanding our own perceptions of careers
- Mindful, high-quality, collaborative, interactive, broad, invigorating
- Informative career representation through graphics information

Research Rationale

Adults in many nations associate science with men much more than with women (e.g., Miller, Eagly, & Linn, 2015; Smyth & Nosek, 2015). To investigate the origins of these associations, researchers have studied children's perceptions of scientists over several decades. For instance, children were asked to draw a scientist in a landmark study of nearly 5,000 elementary school students who were mostly from the United States and Canada (Chambers, 1983). The drawings, collected from 1966 to 1977, almost exclusively depicted male scientists, often with lab coats, eyeglasses, and facial hair, working indoors with laboratory equipment. Only 28 children drew a female scientist (0.6% of the sample), suggesting strong gender-science stereotypes linking science with men. This limited view of scientists might have restricted children's science-related educational and career aspirations, to the extent that children did not identify with such depictions.

Resources

- Chambers, D. W. (1983). Stereotypic images of the scientist: The draw-a-scientist test. *Science Education, 67*(2), 255-265.
- K20 Center. (n.d.). Collaborative word clouds. Strategies. https://learn.k20center.ou.edu/strategy/103
- K20 Center. (n.d.). Six-word memoirs. Strategies. https://learn.k20center.ou.edu/strategy/75
- K20 Center. (2021, July 28). Oklahoma ag in the classroom state coordinator-Emily Ague-zoom into your career [Video]. YouTube. https://youtu.be/eyxd5BDNhmw
- Miller, D. I., Eagly, A. H., & Linn, M. C. (2015). Women's representation in science predicts national gender-science stereotypes: Evidence from 66 nations. *Journal of Educational Psychology, 107*(3), 631.
- Miller, D. I., Nolla, K. M., Eagly, A. H., & Uttal, D. H. (2018). The development of children's gender-science stereotypes: A meta-analysis of 5 decades of U.S. draw-a-scientist studies. *Child Development, 89*(6), 1943-1955. https://srcd.onlinelibrary.wiley.com/doi/10.1111/cdev.13039
- Smyth, F. L., & Nosek, B. A. (2015). On the gender–science stereotypes held by scientists: Explicit accord with gender-ratios, implicit accord with scientific identity. *Frontiers in Psychology, 6*, 415.