



Panel 3B: Supporting Underrepresented Students in Capstone

Facilitator:

Sarah Oman (Oregon State University)

Panelists: Bridget Smyser (Northeastern University), Marie Paretti (Virginia Tech)

Description: Students who don't see a lot of others who look like them or think the same way as they do may need support to prevent isolation and allow them to do their best work. These panelists have some suggestions and ideas that can help.

Questions for the Panelists:

1. Could you provide an example of when you were successful at supporting underrepresented students in capstone and how you were able to see that success foster growth or positive outcomes in your students?
2. What strategies do you employ in capstone to ensure you prevent isolation in students' capstone experiences?
3. Do you have lectures or activities in capstone that teach your capstone students about diversity and inclusion?
4. How do you handle neurodiversity or students with physical impairments?
5. How can we encourage taking positive advantage of diversity to make better, more creative teams (and/or get better, more creative projects and outcomes)?

Collaborative Notes during panel:

- Panelist Introduction:
 - Marie Paretti - Virginia Tech; Engineering Education, Professor
 - 80ish students, 12 projects
 - Co-author on the Capstone2Work project:
<https://capstonedesigncommunity.org/capstone-to-work>
 - Bridget M. Smyser - Northeastern, Teaching Professor, Mechanical & Industrial Engineering
 - Sarah Oman - Oregon State University; Senior Instructor I; School of Mechanical, Industrial, and Manufacturing Engineering



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- Opening Q: Could you provide an example of when you were successful at supporting underrepresented students in capstone and how you were able to see that success fosters growth or positive outcomes in your students?
 - BMS: A 1st gen student who had to change her name and schools to hide from her abusive father, and occasionally homeless. Took longer to graduate than most. Supporting her by establishing classroom norms and rules around teamwork: can't set meeting times when people have to work, or doing things as a team that people have to spend money on (set rules for the entire class - don't single out students or teams)
 - LH: Female presenting faculty are often the faculty students are most comfortable going to and asking for help/accommodations, but this is also an 'unscalable' and is not fair to their other responsibilities. It is important to hear from the majority representing faculty as well for their ideas
 - Meet with students one-on-one if possible, and hear their concerns during the performance reviews (for example - women saying they feel like they can't speak up on a team). Give them tips and tricks.
 - As faculty, we can't always connect or understand students' experiences if they are from other backgrounds → How can we connect them with other mentors who have more direct experiences?
 - But this doesn't mean that you can't mentor someone from a different background
 - SO: setting the norm that people should be able to ask for what they need on a team
 - In team formation, asking a lot of background questions
 - Pronouns, etc, who you don't want to work with, 'Is there anything else you want just me to know about forming teams' (eg, if you want to work with just or other women, that is where you should put it)
 - Humanizing yourself in front of your class (eg, identify as in the LGBT community, self-diagnosed ADHD)
 - BMS: Also does a welcome survey in her capstone prep class
 - Name up to 2 people you don't want to work with
 - It also helps her find out who the person is that needs support on how to work on a team (they have their name down multiple times as someone people don't want to work with); often a neurodiversity statement.
 - Ideas from audience
 - Asking on the survey about technology needs, housing/food needs, etc
 - As faculty, we need to be aware of what resources we have on campus that we can point them to; still ask, even if it's not our expertise
 - Often asking your undergraduate student advisers what resources there are is a good place to start
 - Creating a sense of community in the class; starting with a snack
 - Informal 5 min meeting with each person on a team at the halfway point
 - Instead of a team meeting halfway through
 - On the welcome survey, also ask - how many other credits are you taking, and what other commitments do you have outside of class (work, family)?



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- SO: It is important for us to take opportunities to educate ourselves
 - Social Justice education initiatives and Diversity, Equity, and Inclusion training offered at your university
 - Eg, the safe zone training that ASEE does
- BMS: there's a MOOC you can take - highly recommended. ISTP: the Inclusive STEM Teaching Project
 - <https://www.inclusivestemteaching.org/>
- Q: What strategies do you employ in capstone to ensure you prevent isolation in students' capstone experiences?
 - MP: A big challenge for interdisciplinary programs is that there is time available in class for teamwork - especially since there are differences in class schedules, etc. It is also an important transition to work, where most go home at 5. Also important to observe who is being quiet, and who is not being included, on their phone, etc. Remember, just because they look disengaged doesn't mean they are 'bored' - there might be something else going on
 - Ideas from the audience:
 - Had more student-on-student issues recently; how to include accountability measures in your syllabus?
 - On the welcome survey, when asking about pronouns, also ask 'Would you like me to intervene in class if someone uses the wrong pronouns'
 - MP: Sets up community standards (the same as the whole university)
 - Has a few different modules she lectures on
 - Has a value mapping exercise she does
 - Students on the team are able to share and identify what they are good at, what they want to work on, and don't, etc
 - Making the team responsible for each other's learning
 - [Diversity, Equity, and Inclusion Tools for Teamwork: Asset Mapping and Team Processing Handbook](#)
 - The risk with lecturing about diversity is that it explicitly risks spotlighting the 1 or few students in the class that are black, say. Diversity is more about differences in background
 - SO: Lists out roles in the team charter that everyone has
 - Now includes an equity monitor: ensure people who haven't spoken much can speak up
 - (other examples: project administrator)
 - BMS: Talk about diversity in design during a variety of lectures, not just as a one-off "DEIJ" lecture
 - Reframing it in terms of 'designing it for more people increases your market size'
- Q: Do you have lectures or activities in capstone that teach your capstone students about diversity and inclusion?
[responses not captured]



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- Q: How do you handle neurodiversity or students with physical impairments?
 - BMS: A wheelchair user in a course, needed to make changes to the lab to make it accessible. Have to make sure safety equipment, commonly used tools, etc. are within reach of all students. Have a label to say that tools need to stay in an accessible place so all students can reach them.
 - Helping neurodivergent students learn tactical skills for improving teamwork
 - Help everyone understand strengths and how to use everyone on the team
 - SO: many students in this generation are much more aware of neurodivergence. But how can we help students identify this: “Did you feel that you hyper-focused on this?” → can then set up specific deadlines on things that they miss and give them tools to deal with it
 - MP: Note: this gets harder to do with more students or if you’re not an expert. Instead, you can ask if it’s ok to connect them to student resources groups, etc
 - Have also seen this come up with being overwhelmed with the number of discord channels and things going on - how to help the team set up tools/settings/methods to help students deal with that. If you don’t know about the technology platform - try to go to the team lead and ask for help developing ideas around how to make it manageable
 - BMS: Note - many disability student services centers only work with students with official diagnoses, but these can be expensive to get - not all students may be able to get them, but they may still need them
 - Psychology Today has good screening tests for ADHD, etc
 - <https://www.psychologytoday.com/us/tests/health/adhdattention-deficit-disorder-test>
 - SO: recommends going to the student resource centers herself ahead of time to check them out
 - Not just ‘go to CAPS’ but “go to Shannon’s office, she’s awesome” - “it’s right next to Quizno’s”
 - Just saying ‘Here is a list of resources’ is not enough, generally
 - MP: Can ask students if they have someone to talk to about X, Y, Z
 - If they say no - ask advisors in the department (you don’t have to have all the answers)
 - SO: sometimes students just want someone to listen
 - Audience: How to deal with rules for being alone with a student if that is against policy when emotional conversations are going to take place
 - Keep the door slightly open
 - Depends on the rules of the university
 - Can take a walk outside or find an empty classroom to find a place to talk
 - MP: If you want students to learn about how to complete the project, they have to learn to come talk to you (the instructor) when things are going poorly
- Q: Students from underrepresented backgrounds can feel especially afraid of failure because it may reflect poorly on their whole demographic?
 - Eliminating penalties for failure in grading – say looking for the final result, not intermediate
 - Framing for the whole class - experiment we ran, this is what we learned.
 - frame it as normal



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- Q: Inclusive Teamwork Award at Capstone Expo?
 - Not who is the team leader or did best on the team – who supported the team to make everyone do their best
 - Can nominate someone else on their team
 - Read excerpts from the submission
- Q: Have external sponsors or project leaders who are racist or sexist (or both). How to make sure project sponsors are aware of expectations around this.
 - BMS: Not all sponsors are external - some are student ideas with faculty advisors. Students can draw on their personal experiences (people who use crutches, a student whose parent worked on a cocoa farm in Ghana, autistic kid experiences, and being aware of sensory issues). Problems are needs that deserve solving that also highlight diversity.
 - Audience: Orientation for industry mentors to establish norms and professional communications with student teams. Make sure students know that they can come to you if they have issues with their sponsor - you are there to support them, they are not contractors for the sponsor.
 - SO: Stop working with sponsors who display these behaviors
 - MP: Can have faculty mentor present at meetings, so there is some oversight. Get feedback from teams on how the experience with sponsors/faculty mentors is going.
- Wrap-Up Q: Could each panelist provide one final remark - what's one piece of advice you'd give capstone instructors on supporting underrepresented students?
 - BMS: Keep tabs on the team dynamics. Whether it is direct observation, individual team assessments, some web form, or whatever.
 - SO: never going to be 100% right - you will make mistakes.
 - BMS: Education, education, education - it's a skill you can learn, there are resources out there. Even a little bit is helpful - find training, books, blogs
 - MP: don't let fear of failure keep you from making the effort. Work to figure out how you best build trust with your students to enable them to come to you when there are challenges with team dynamics so they feel comfortable coming to you, and that you are a safe space. If you don't know the answer, know who you can ask for the answers.