



Panel 1D: Professional Skills & Communication

Facilitator: Bridget Smyser (Northeastern)

Panelists: Cassie Bowman (Arizona State), Joanna Tsenn (Texas A&M), Eli Patten (University of Washington)

Description: Capstone is a great course to fulfill ABET student outcome 3 - communicating effectively with different audiences. These skills can be taught in many ways and our panelists will provide some ideas on what worked for them.

Potential Questions:

- What assignments/activities in your classes specifically address professional skills?
- How are these skills taught? Is there a separate instructor (i.e. from the English department) or is it part of the primary instructor's duties or is it something else?
- How are these skills assessed? Do students get direct feedback on these skills in addition to design feedback? Are these skills a separate part of the grade?
- What aspect of your program's professional skills instruction are you most proud of? What would you change?

Q: What assignments/activities in your classes specifically address professional skills?

- Cassie: What are the professional skills? Ethics, project management, professionalism, writing. How do we network? When students meet their teams, they learn how to write a professional email. Students are often bad at this. Peer review helps refine things. This makes them start thinking about writing professionally. The students have a writing lecture. Cassie is on the receiving end. Professional emails are critical. Need to engage with people of all ages. When you graduate, you're going to be interacting with these people as colleagues and network members.
- Joanna: The English lecturer develops lectures, and there is instructor assessment training. They also have industry panels with alumni to discuss professionalism in the industry, like being on time and changing their mindset to develop professional behavior.
- Eli - Has added in some workshops and guest speakers on writing and ethics. Some situations where students made poor choices and had discussions about ethics brought this into focus for the students.

Q: How do you model professional behavior? Teachers often are busy, and may not be able to give feedback quickly.

- Cassie: Uses Slack with students, but always tries to model professional and respectful responses, even if they are short. Also makes sure that she responds within 24 hours as well as expects that from students.



Capstone Design CONFERENCE 2024

JUNE 3–5, 2024 ► KNOXVILLE, TENNESSEE

- Eli: Short emails and quick responses are representative of industry practice. Communicate in ways that will reduce friction. Short and quick communication is only possible once trust has been built. Also modeling things like first emails or specific kinds of emails for the students.
- Joanna: follow the lead of sponsors. Send first emails that are very professional, but take the lead from the sponsor's response - that will suggest how formal to be.

Q: Do you monitor all the communications?

- Joanna: Yes - cc on all emails.
- Eli: Doesn't monitor, but insists that the whole team is CC'd on all emails.
- Cassie: Offers Slack workspace membership to faculty, but most decline. However, insists that team communication happens in the shared Slack channels so everyone is aware.

Q: How do we assess professional skills?

- Eli: Has an intro course where it is more structured, but during the Capstone it's more of a holistic assessment.
- Joanna: Getting some feedback, but most of it in informal ways. Teams do weekly update presentations with feedback about what they get.

Q: Do you collect feedback from sponsors?

- Cassie: in general students do a good job. When a project is structured so that one student is the client contact, then the sponsor gets a distorted picture of who the leader is or who is doing the work.
- Eli: Used RocketJudge for their expo, this gave students feedback.

Q: How do we teach students to be team leaders or project managers?

- Eli: A struggle: do we let the team decide on the leader, or do we intervene and structure that process? Requiring project definition reports or weekly reports that ask them to specify how they defined roles and tasks.
- Joanna: Ask teams to wait to identify leaders/managers. They pick a project manager about 1/3 of the way through the semesters after they know the team members better.
- Cassie: Follows the structure set up by the instructor. Some are Agile/Scrum, others are structured differently.



Capstone Design CONFERENCE 2024

JUNE 3–5, 2024 ► KNOXVILLE, TENNESSEE

Q for Cassie: Can you say more about your role? Then there is a question about not liking it when a team designates a project leader who is the only one who speaks to the industry supporter. They try to cut down on the amount of time and confusion with industry supporters, but some industry supporters say they wish they had talked to the whole team.

- Cassie: A fundamental tension between how industry works vs. training students. Cassie is an educator but also runs the Capstone outreach program for the NASA Psyche Mission. It might be worth asking what kind of interaction the particular sponsors want. She also uses Slack and has a whole infrastructure set up around that.
- Joanna: Do they meet with the team regularly, and how does that affect the communication?
- Cassie: Avoid email - would prefer students put questions in Slack when they come up. But again, this is part of her job instead of on top of the job.

Q: Is anyone using AI tools to give feedback on the work that they are doing?

- Eli: These are tools like any other and students can use them, but require reflections on how they used the tool.
- Joanna: Has students submit Grammarly score reports.
- Cassie: Before she used to do a lot of grammar and spelling fixes, now not needing to do as much mechanics checking.
- Comment: Using ChatGPT to help synthesize student feedback - workshop tomorrow evening on this topic: Using Generative AI to Optimize the Feedback Process... (Workshop 4B)

Q: One problem this year - student used ChatGPT to write their section of the final report. How do we establish a minimum set of skills that we want all team members have so that these tasks don't go to the "best writer" on the team?

- Joanna: Still trying to figure this out, especially as new versions get better.
- Eli: Students are still responsible for the accuracy of the content. Continuing questions about how to get students to develop breadth and not just play to their own strengths.
- Joanna: One policy requires students to cite if they use GenAI and also to include the prompt that they used.

Q: Do you do anything to set up the teams to promote teamwork, deal with different personalities, etc?

- Joanna: Teams must create a team charter. Also, suggest that teams do something together. Also doing peer evaluations. Also, have a guest lecture expert on conflict management. Still have to deal with senioritis.
- Cassie: From her perspective, teams often present a united front even though some students aren't pulling their weight. On the one hand, covering for teammates is a professional thing to do, but at the same time, it's not great for being able to give feedback and help. One suggestion: encourage students to



Capstone Design CONFERENCE 2024

JUNE 3–5, 2024 ► KNOXVILLE, TENNESSEE

find one person that they do feel comfortable reporting to. Some teammates may also be happy getting a low grade, while some may want an A.

- Comment: Three personality traits: Proactive, Prosocial, and disciplined. Some people just won't pull their weight. Students need to learn to deal with these differences. People can be pretty bad at their job before they get fired.

Q: How do you accommodate peer reviews with the grading?

- Eli: Students aren't calibrated on what it takes to get fired and how to give constructive feedback. In intro classes, he tries to be more deliberate with setting up teams by collaboration traits, for Capstone projects it's more about interest/skill matching. They do peer reviews in a couple of ways: peer design reviews force students to have rough drafts and share them. Structures peer design reviews to teach students about questions that could/should be asked of every project. Peer design reviews 3 times. Also does peer reviews twice.
- Joanna: Can let them know if there are frequent issues.
- Comment: Work at UC Irvine on high-frequency, low-burden peer assessment. Talk to Matt Bietz about it.

Q: How do you teach students to give a good presentation?

- Eli: Teaching evidence assertion skills (Michael Alley - Penn State - Assertions Evidence) in foundations course. Peer design reviews for posters and reports.
 - <https://www.leonhardcenter.psu.edu/staff/alley-michael.aspx>
 - <https://www.assertion-evidence.com/>
- Matt: Need to give students the chance to practice. Have them give multiple presentations in different formats.
- Comment: Teaching technical writing course that is linked to the Capstone. Using a lot of templates to help students learn how to structure their content. Value in shorter, lower-stakes presentations before getting to the expo so students have experience before they get to the Expo.
- Comment: Doing weekly presentations with a rotating leader within the group. Also having reports and drafts due before they go out to the sponsor.
- Bridget: One idea: give a really bad oral report and ask the students to critique it.

Q: Do we really need the reports? Does anyone read them?

- Cassie: Gets 65 reports. She does skim for what she cares about, but she cares more about the final product than the final report. It depends a lot on the goals of the final capstone. Also, need to consider ABET criteria.
- Joanna: Asking students to write an executive summary that the sponsors may care about. However, the report itself is more about student reflection and learning.
- Eli: Echoing executive summary. But also a chance to teach about writing to different audiences: can you communicate what you learned? Some audiences need to see the value in the project, some need specific details (like if another team will pick up the project in the future) - students need to write for different readers.



Capstone Design CONFERENCE 2024

JUNE 3–5, 2024 ► KNOXVILLE, TENNESSEE

- Comment: Write as if you will be promoted. What will the new hire who takes your old job need to know?
- Comment: Also ask students to put their report in a binder with other important documents that they can then use when they present the project overall.
- Cassie: Students struggle with scope. Important for students to think about what the people who come after them will need to know if they pick up the unfinished parts of the project.

Q: What about design notebooks?

- Joanna: Working with students to model and provide feedback about what makes a good design notebook.
- Eli: More about how notes are organized, helping students organize their thoughts, etc. Emphasizes the importance of the design notebook as a CYA measure - they can document their own progress and show what each individual has done.
- Bridget: We don't necessarily do all industry-sponsored projects, but sometimes there are sponsors who want to create patents. Design notebooks are important to trace the origin of the idea.

Q: Capstone courses tend to have a kitchen sink problem where we try to teach everything. How do we manage that?

- Eli: We struggle with that. Some advice: every year, pick a couple of areas to focus on, and don't try to do everything at once. But it's also important to make the learning objectives visible. For example, making sure that students are not only logging hours but also logging what they spent time doing so they can better reflect on their process.
- Bridget: Try to develop some of the classes earlier in the curriculum so that Capstone isn't responsible for all of the topics.

Q: Post-pandemic and virtual teams - any thoughts?

- Cassie: Pre-pandemic, it was difficult to get students to work remotely well. Now this isn't something that students have a problem with - they know and understand how to work remotely.
- Eli: Insists that peer-feedback sessions are handled in person, even though using a tool. Giving guidance about active listening and paraphrasing back what they are hearing to make sure that everything is understood. Expressing agreement and explaining why is valuable for building consensus. Rephrasing also helps clear up misconceptions.
- Comment: From the perspective of industry, remote work will be here to stay. Students need to understand how to communicate in remote situations. Many of the projects they've done have been virtual. Planning to use AR in the future to support virtual collaboration.

Q: How do you give students professional dress code feedback, especially if you are of the opposite gender? Also feels awkward if he has to critique the dress.

- Comment: What we handed out as a reference to Ohio Northern ECCS Department students this year: <https://www.indeed.com/career-advice/starting-new-job/guide-to-business-attire>



Capstone Design CONFERENCE 2024

JUNE 3–5, 2024 ► KNOXVILLE, TENNESSEE

- Comment: About how to dress: 1) How do you want to be remembered? 2) How are you able? (What resources do you have? - Remember not everyone can afford different levels of outfits.)
- Comment: Is it in the objective of the Capstone to teach them how to dress? But when necessary, described by the level of dress (e.g. Business Casual, etc.).
- Comment: Also lots of YouTube videos and online resources about appropriate dress.
- Comment: This can lead into a deeper discussion about self-presentation and functionality of clothing - what are you saying, do you want to be remembered or to blend in, are you able to adjust to different environments, do you have the pockets you need, will it easily show dirt/stains, etc.

Final Panelist Comments: What aspects of your programs are you most proud of in relation to this panel topic?

- Eli: Proud of the peer feedback and peer evaluations. Looking to improve providing peer feedback on peer feedback. How do we set a higher bar for peer feedback?
- Joanna: Happy to have the resources to help with and better assess writing and support instructors around this. They've been working to better implement writing without making a ton of extra work for instructors. Would love to move all of these issues to earlier in the curriculum.
- Cassie: Liking to really get to know the individual students, even if it's time-consuming. Also at the end of every meeting, they ask how everyone is doing as a human, not just for the Capstone, and it's a good way to get insight into the team.