



## **Panel 3C**

# **Establishing A Safety Culture in Capstone**

**Facilitator:** Bridget Smyser – Northeastern University

**Panelists:**

1. Michelle Rinehart – University of Texas at Dallas
2. Elizabeth Meier – University of Florida
3. Mike Kinsinger – Smith College

**Description:** Capstone projects are often breaking new ground and stretching student's abilities. However, as students rush to do more in limited time accidents can happen. This panel will share ideas for safety oversight in capstone design as well as how to get students, advisors, and others to develop a shared safety culture.

**Notes:**

What do you do to keep the capstone students safe?

Lizzie - Has support staff. Teaches introductory safety, watch videos, additional training for machine tools. Quizzes on Canvas.

Mike: One of 3 faculty. More like safety oversight, and works with safety staff.

Michelle: In the safety group for whole campus. Maintain the LMS on Campus (Bioraft) which is connected to card access and provides training. Works on a consult basis with students when they need advise or generate hazardous waste. Not a day to day role but as needed.

From audience: New safety guy who came in recently who developed training. New initiatives to improve safety.

From audience: We don't have a safety culture or a design studio. People work in dorm rooms and all over. Have a long way to go.

From audience: New building bringing shops together. How to train the advisors to provide safety oversight.

Do you require SOPs?



## **Panel 3C**

### **Establishing A Safety Culture in Capstone**

Michelle: Students are required to have a particular sign off. The person who is ultimately responsible is the student and the instructor. Instructor has to sign off. EHS gives advice and best practices. She has developed RAMP process handouts to lead students through steps of assessing risks and preparing for emergencies. Not officially adopted into capstone but is part of the grade for some classes. Michelle can provide info on request.

Q: Where do we look for information?

Michelle: Start with the on campus EHS folks.

Q: Identifying risks is hard when things are in process. The guards aren't in place yet when they are still in development. Lots of safety switches are good too.

Michelle: Lockout/tagout procedures are helpful for that.

Lizzie: We have students look over SOPs on equipment before they can use it. When they are working on something they might not know how to do some particular thing safely. Chemicals have an established process.

Mike: There is a general health and safety training for the machine shop. If there is something unusual then they need an SOP, such as working with blood. General lab work doesn't require an SOP.

From Audience: They don't even talk to students about safety. There are about 400 students in an interdisciplinary capstone.

Michelle: Do students have a budget?

From Audience: Yes, they have a limit of \$4K

Michelle: Remember that we are liable, not the student. Don't forget the legal things.

From Audience: Is there a checklist?

Michelle: It is really situational. Drones are another thing you have to pay attention to.



## Panel 3C Establishing A Safety Culture in Capstone

From audience: Drones are a pain, sometimes there needs to be licensing. Can get around by putting drones on a leash. SAE Aero competition still required insurance.

Q: Any restrictions on time.

Lizzie: Restictions on heavy duty power tools. Hand tools ok. Reminds them about OSHA laws not working more than 16 hours a day. They don't let folks do this in industry so you cant do it here.

Mike: Machine shop only during machinist working hours. Some experiments require a second person (on Zoom during COVID) such as chemical experimentation in a required hood.

Michelle: Machine shop 9-5 situation but separated from woodshop, which has more extended hours. Staff members available for that. Open studio has handtools available 24/7. IF they require lab space for biological/chemical experiments they need supervision and to follow lab rules.

Audience: Lockout/tagout unless machinists are present. Other school doesn't let students machine their own parts. Mike Rowe's Safety 3rd Philosophy. Take own safety seriously.

Michelle: I can't be in control of your safety - you are in charge of your own safety.

What's your biggest challenge?

Mike: We don't have that many and people tend to look out for each other. We have the other side where students are too timid. Safety taken too far to the other side. It does slow things down so you need to put things in your timeline (like SOPs and IRB approval)/ We're very fortunate.

Michelle: Biggest hurdle is getting the buy in because we don't have as many checks and balances as she would like. We want to do the thing, not put it down on paper and think about it. Getting students to stop and get approval before they do stuff when they want to just get starting is very difficult. Chemicals that get ordered get flagged so they can check for approval. Getting them to think ahead - have you thought about hazardous waste. Need to integrate safety



## Panel 3C Establishing A Safety Culture in Capstone

checklists into the course, ideally as part of the grade, or else they won't care. As state school they don't fall under OSHA, but the Texas arm of the EPA.

From Audience: Professor retired, students started working in there. There were two drums of hydraulic fracturing fluid in the lab - nasty stuff.

Lizzie: Biggest challenge is multidisciplinary nature. Understanding what level everyone is at - some work in shop, some have never touched a tool in their life. Have them fill out a form about other labs they might be using to verify that it is ok for them to use that lab and keeps lines of communication open. Skills vary a lot.

From audience: Underdeveloped frontal lobe/lack of fear

Lizzie: Needs to be a balance between too much fear and lack of fear. Don't want students to be cavalier, but don't want them to do nothing either.

From audience: Would be good to have a tool day when they were freshmen so they could get tool experience. Electrical engineers might not know how to solder. They don't use tools.

Would be nice to empower the faculty to look at the safety more and give them the list of things they definitely want to watch out for. Checklists and such.

Bringing professional accident investigators in to talk to class about safety. "If you see me come to your workplace, that's a problem"

Michelle: Lots of students, only about 20 safety people. We can't know everything.

What's most important to build the safety culture?

Michelle: Need to get them at the beginning, before they get to capstone. Need to work with the departments to get people to think about safety from day one. Get them not have complete ignorance or think they are invincible. Different tiers of work in machine shop - need to be there a while before you can do certain things.

Mike: They hear about safety from research labs, earlier classes. By the time they get to capstone they've had it hammered into them.



## Panel 3C Establishing A Safety Culture in Capstone

Lizzie: Utilize your resources. Make sure people aren't avoiding asking for help because they don't want to get in trouble. The safety person gives out their cell phone number and tells students to call any time.

Q: Any sort of safety reporting?

Michelle: We have a reporting system through Bioraft. We're one of their beta testers.

Any stories about stuff that were learning experiences or made you change policy?

Michelle: We had problem bringing in small 3D printers. Someone got hurt and we had to reconsider allowing people to bring in things from outside. You are still responsible for what comes on campus.

Q: What if they use it in their dorm room on campus?

Michelle: If it is for coursework, it is still the university's issue. A kid was removing a part from the 3D printer and used a scraper which he jammed into his hand. It was part of normal practice, but still easy to hurt yourself.

Q: What do we have to do once someone gets hurt? What post-event stuff have to happen?

Michelle: Talk to your EHS. You may have to call police, contact EHS, everyone needs to be in the loop. If someone is injured need to work with legal department for workman's comp issues. We want them to learn from the process. The last thing you want to do is to make people feel like they are in trouble, or people won't report things. In the future.

Lizzie: Wants to know about near misses. Could be something they did incorrectly, could be a broken piece of equipment. If they are ever in doubt they should call 911. Make sure they know that it's okay. They can call her for small things. EHS would then get involved and there is a procedure.

Mike: They can either call campus safety or the professor.

How about mental health issues?

Michelle: We have a reporting system on campus to report concern about mental health. One thing she's tried to impress on people are two different sides of product: Safety of them and



## Panel 3C Establishing A Safety Culture in Capstone

safety of product. Ergonomics, safety shutoffs, guards – all things kids need to think about. How safe will it be for end user? Design out ability to use it wrong (poke-yoke)

Project to shoot pellets to elephants in a zoo – what are the liabilities?

Lizzie: You hope that all the industry sponsors are very safety conscious. Some are, and it's a good resource. Not all sponsors do that. Maybe there is a way to encourage this with their sponsors.

Industry partners likely to have a lot of knowledge of regulation and are more strict. Have them share their own safety practices.

Last advice:

Mike: It's hard to build a culture. Can't be done in one semester. Got to get started though.

Michelle: There's an organization called CSHEMA – campus safety organization. Good message board for people looking to share ideas and ask questions. They have different interest groups, including one on safety culture.