Presentation Agenda

Nifty/Flopper	Institution	Topic
Bridget Smyser	Northeastern	Virtual Project Presentation Session
Jim Hartman	UNC Charlotte	Use of Adjuncts for Mentoring
John Lens/Dustin Rand	Univ of Vermont	Longer Class Sessions and Dedicated Studio
Jamie Canino	Trine Univ.	The Miniature Radio Flyer Fail
Yen-Lin Han	Seattle Univ.	Students or engineers?
Souheil Zekri	Univ. of Southern FL	Legos and K'nex in Ideation
Gaurav Shekhar	UT Dallas	Importance of documentation
Joshua Gargac	Mount Union Univ.	Motivating Test Design with Lawnmowers
Kris Jaeger-Helton	Northeastern	Protecting People: Proper Protocol or Painful Process?
Stephen Hugo Arce	FAMU/FSU	Student-organized 510(k) Review Panels
Rachael Brown	Seattle Univ.	Virtual Poster Session
Courtney Pfluger	Northeastern	Twitter Poster Session

Virtual Project Presentation Session (B. Smyser)

Summary
- Typically, students choose projects by attending a poster session put on by the advisors - but this is difficult to do virtually
- Used Microsoft Teams for a virtual presentation session, allowing for students to go in and out of each channel for each projects (as opposed to utilizing assigned Zoom breakout rooms that is controlled by a co-host)

Questions and Answers
- *Why not use Zoom?* We did try Zoom with breakout rooms, but we ultimately found it was less work to use MS Teams since students could switch rooms on their own instead of only a host being able to switch them. Microsoft Teams allowed for students to navigate their own experience.
- *Did you have any faculty who were considered guests?* We did not, but you easily could have guests included.
- *Did you consider having faculty give a video in advance? This might allow students to learn about projects asynchronously, then use the Teams channel.* We didn't want to have too much time for start-up and allow for more time for conversation, so they posted project descriptions but there wasn't enough content for a video. We post the powerpoint slides about the projects on the course management website a few days ahead of time so students can prepare.
- *How hard is it to learn to use Microsoft Teams to set this up?* It was pretty easy, although we had been using teams for a few months in the university. Basically you start a team, add all the students and advisors, make a channel for each advisor, then plan one meeting in the general room to start the event. After an introduction, each advisor starts the meeting in their individual channel and students can join whatever meetings they want.
- *How did you manage questions or uneven participation in each meeting?*   We didn't. Some projects were very popular, others less so, but there were 125 students and 25 projects, so there were rarely more than 10 students in any one meeting at any one time.
- *Does someone have to be in and managing each channel?* The professor/advisor who is in that channel is managing it. Each channel is essentially a separate meeting, that folks can join or leave at will. This would be the equivalent of having each advisor standing at their poster and students wandering around.
- *Can students use this to recruit team members for a project that they came up with?* Yes. Student proposed teams are assigned an advisor, and they hang out in the meeting with the advisor to answer questions about their projects.
- Could you set up all the rooms in Blackboard Collaborate? Yes, but we just switched to Canvas so we're still figuring it out!

Use of Adjuncts for Mentoring (J. Hartman)

Summary
- Faculty like to mentor senior design projects, but they typically don't have time, due to their research responsibilities
- Nifty: They hired 2 part-time adjunct faculty members to serve as mentors; both were engineering managers from industry and provided industry projects, while also doing a good job following grading guidelines
- Flop: Bureaucracy was difficult: if adjunct faculty members ended up being audited by ABET; can be difficult to "hire" adjunct for this role
- If you have any experience with the ABET process and hiring adjunct faculty as mentors, please contact Jim Hartman (jim.hartman@uncc.edu) - he would like to talk with you about ABET compliance with mentors!

Questions and Answers
- *How do you train or orient your mentors?* Jim personally did this since he only had two mentors, by bringing them in halfway through the prior semester so they could shadow activities, attend design reviews, have training on Canvas and grading, and attend some events during the semester.
- *Are the mentors also the graders/evaluators for the team, or are they just supporting the team?* Adjuncts did both (mentor and grade), as they needed students to be held academically accountable for their work. We pay $1500 per project per semester.
- *How many projects did each Adjunct advise?* One did one project, one did two.
- How many groups would a single faculty mentor supervise and how does that translate to the faculty full time workload equivalent? Some of our departments give no release time for mentoring, some do 3 projects = 1 class - that is what I would recommend.
    - Audience: Someone did a nationwide benchmark exercise on this (from Cal State Chico maybe?) a few years back, and they determined advising 3 capstone teams ~1 3cr course. We've been using that model for at least 10 years and it seems to be pretty accurate.
    - Audience: 3 groups would be amazing.. I am currently mentoring 6, but have done up to 10. … serious overtime (unpaid). I've done up to 10 and wouldn't recommend it. There's a difference between doing it and doing a good job at it! :(
- *Did you grade the entire capstone course/project via Canvas (i.e. utilizing its grading system) or did you "hard enter" the grades?* We hard enter the results from Canvas.
- *Are adjuncts expert in the fields of the projects? Are they expected to provide technical advice?* Not necessarily - we try to give them an electrical project if they are EE's, Mechanical for ME's, but we don't hire them to be experts in a particular field, just be able to guide students, but not do the work.

Additional Topics and Audience Comments:
- ABET issues and adjunct instructors
  - At RPI a number of instructors are adjuncts. There appears to be no inherent ABET issues. They are school employees, not outsiders, and they must follow whatever ABET protocol is needed for their courses…
  - ABET is interested to know that the adjuncts are qualified to be involved with the topics that they will be involved with. They will be listed in Table 5 of the self-study if they were employed in the prior academic year. ABET also wants to make sure that the number of adjuncts is not excessive (may reflect on the instruction if too many are used, may reflect on financial support from the institution. The benefits from having good experienced adjuncts is without question.
  - At Seattle U CE dept, we have hired external faculty advisors from industry - it has not had any problems with regards to ABET. The problem has been students having access to practitioners.
  - Temple uses adjuncts for mentorship, and we have not had any issues
  - Once you have a couple of adjuncts on board, they can help bring new folks in, too - shadow one another, etc. Rubrics for grading should alleviate any ABET concerns. We do periodic grading debriefs to ensure consistency - but since it's capstone, it's pretty variable project-to-project by its very nature.
  - We use adjuncts in a number of roles, including capstone. As long as the same assessments are used across all instructors, no matter their faculty role, there are no ABET issues.
  - We had to adjunct advisors almost every year. As long as the same data were recorded, it is fine with ABET.
  - CU Boulder has between 20-25 adjuncts each year for ME Senior Design serving as faculty advisors. We hire these folks each year. We run annual training sessions for all of our faculty advisors. We have not had ABET question this in the last 2 cycles. Agreed with RPI comment: these are CU Boulder faculty, not seen as outsiders.
- Other notes regarding hiring adjuncts
  - Another benefit of adjuncts who are from local industry is that they can help bring in industry-sponsored projects through their own networks.
  - We were able to bring in an Adjunct through a project initially--he sponsored the project. By "proving" himself, the faculty was more supportive to hiring him
  - Adjuncts are great mentors. So are former students!

Longer Class Sessions + Dedicated Studio (J. Lens and D. Rand)

Summary
- A challenge is that there are two sets of capstone projects (one taught by John and one by Dustin), and teams typically don't have enough time to meet outside of class. The class is structured as three internet class sessions a week, and sessions were typically dedicated to lectures and short discussions, but there wasn't enough time for teams to work together.
- John and Dustin changed the class schedules to require 6 hours of class time per week (as opposed to the 2.5 hours previously) that was dedicated studio space, allowing students to have built-in time to meet together.
- Intent for future offerings is to have all content available online, to allow for even more time for students to work together during "class time" rather than continuing to devote time to lecture.

Questions and Answers
- *This is a common source of team conflict, and this strategy helps to resolve that.* The only downside to this strategy is then students felt it was the only time they could work together on their project.
- *We have had this setup for the past 10 years and it really did make a difference for us also! Recently, we have added online content (reading/videos) to be done before class, leaving more time during class for discussions/project work applying the pre-work. Have you considered this?* I am going to be adding the online content before classes this year. I plan to teach the course fully online, synchronously, for at least the scheduled class times, so I will need to have a way to motivate/monitor that the pre-class content and associated work gets done. Any nifty successes on that for online?
- *Is this more for a Spring semester than the Fall? How early do you begin free studio time?* This is a two-semester capstone course and we began having free work sessions at the beginning. Around the middle of the second semester we had almost entirely free-work aside from a 10-minute startup time to remind students of upcoming milestones, answer common-interest questions, and overall share relevant news.
- *Do you utilize a timesheet tool for attendance?* I use a timesheet tool for the project work overall but not specifically for the class attendance. My TA checked attendance, which was made easier when students sit together in their work tables - a missing student in a team is relatively easy to spot, and maybe for that reason students had better attendance when we switched to this schedule and also this room type (i.e., students sit together at the same team table).
  - Audience: I have a similar setup, and we do a "team time card". It was first suggested in a 2018 capstone design conference poster, and there was a 2019

ASEE paper on it: "Using Team Time Cards to Encourage Accountability in Senior Design Projects" (K. Demoret)
- ○ Audience: I use EduSourced to keep track of time as part of the project management tool. Students do not like doing it.
- *I agree with the presenters, we (ME Dept Arizona State University) tried this in a summer session where we use class flipping. Students have pre-class assignments on reading and preparing for team meetings. In class, we have very short introductions and teams spend 2.5 hrs in teams.* I think that getting a dedicated design studio, which coincided with the scheduling change, also contributed to the improved team outputs and team experience. It seemed that most of the students in my class, which is all of our seniors in CEE, spent time in the space doing their other work, which meant their presence overlapped more readily with their teammates than if they had been scattered across campus/their apartments.

The Miniature Radio Flyer Fail (J. Canino)

Summary
- Idea was going through the entire design process in three weeks on a very small project, in the beginning of the capstone course; redesigning the Radio Flyer wagon that Jamie thought they would all be familiar with. A primary goal was to encourage student reflection; also wanted students to understand the process better, understand how long a task takes, and address communication issues early.
- Flop: "Students hated it, I didn't like how it went"
  - One mistake was that the group was different in this project than their capstone group, so any communication issues that were addressed were irrelevant
  - Students saw it as lacking relevancy
- Nifty: this was moved to the first-year design course

Questions and Answers
- *Had you thought about doing a different project that was more relevant than a wagon?* Jamie doesn't think that would work because when they see the project list, they take ownership of that project, so even if they saw more connection to the small project, they would still want to get moving on their main project.
- *How did you manage the reflection component?* Jamie assigned a paper to write and asked them to reflect, with prompts like "when did you have communication problems and why?" "what part of the process took longer than expected?"
- *Was the project done during the 'regular' senior capstone? Or was this during another course?* Regular capstone class.
- *Comment: here have been other studies in the literature where folks have tried to do some of these mini-projects during capstone, and there are some folks who have made this work, but it has to be really connected to their project in a way the students can see or they rebel as you saw.* Totally agree. All of our students are doing different projects so I found it hard to come up with an idea that connected with everyone's project but I do know that others have had success with this idea.
  - Audience: I had the same issue with relevance with labs. Students only wanted to work on their project, nothing else!!
  - Audience: I agree. Finding the relevance for the students can be hard. This is why changing the curriculum seemed to work better.
- *Comment: At RPI, I run the soph engineering design course. It's divided into a short "mini project" followed by a longer team project. There is no relationship between the two projects. The mini is done with 2 person groups, their project chosen from a short list. Teams are then 7 people, team self determined project guided by faculty to help with scoping.* This looks like a good model. I do wonder if there is a difference between doing it with sophomores and seniors? I know my seniors expect to complete a large project during senior design while my sophomores are used to shorter projects.

Students or Engineers? (Y. Han)

Summary
- Co-PI for RED Project: Fostering Engineering Identity. The goal is to build a culture that fosters engineering identity; this is one of the changes they had made.
- Change the language used in senior design projects; for example:
    - instead of "students" → "engineers"
    - instead of "professor" → "manager"
    - Lectures → workshops
    - Learning objectives → professional responsibilities
    - Due dates → deadlines, schedules
- Nifty: Students had a good response, especially with URM students. Three-hour focus group sessions revealed that students thought it was very cool to be on a first-name basis with faculty
- Flop: Difficult to get faculty buy-in from other courses in switching to the "professional language" use

Questions and Answers
- *How did you measure the impact of the change in language? Did students actually notice without you pointing it out?*   We had surveys designed and we administered them at the beginning of the senior year and the end of the senior year. Students needed some time to adjust to the language change (especially at the beginning). For example, they still asked for "how they will be graded" at times. They first didn't feel comfortable calling faculty by names but they became more adapted to it towards the end of the year. Preliminary findings show that students have better professional skills, problem-solving skills, etc. We will present the data at ASEE 2021.
- *In some states, you cannot use the word "engineer" unless they pass the PE exam.* In those cases, we recommend using "engineer-in-training" instead.
    - Audience: I believe that in medicine, 3rd and 4th year medical students are referred to as "Dr." in the clinical setting, even though they are not MD's yet.
- *Do you get any push-back from the students if you have them do any work not directly related (or they don't see the relationship) to their project with this model? Ours often complain we don't let them "just get on with the project".* At Seattle U, we tried to tie everything we did with their professional formations. Most students had no issues.
    - Audience: We've heard that here @ RPI too. So the fall goal is for us to better connect the dots for them.
- *Are your course documents written similar to Standard Operating Procedures that are used in industry? Does your course follow ISO 9001 design controls?* The project briefings were provided by sponsors, so they were in various formats. We have a wide range of projects and we asked each project to begin reviewing engineering standards that are applicable to their own project. There were "status check-in's", which were short

presentations the teams gave every other week. The first status check-in was dedicated to standards. The courses (3 quarters) have the objectives that are aligned with common design processes/controls.

- Audience comments about the Nifty Idea:
    - I like this approach - it helps create a different way for students to think about design
    - With more than 20 years of industry experience & teaching Senior Design for over a decades, I am using exactly the same language & approach for more than last five years
    - We are using a similar approach.

Legos and K'Nex in Ideation (S. Zekri)

Summary
- When students start design, they have a lot of experience in solving closed-loop problems, but open-ended problems are more difficult, and students have difficulty with divergent thinking (ideating, coming up with multiple ideas).
- Intended to be a discipline-agnostic activity. Activity happens in the beginning of ideation phase. Each student receives one Lego or K'Nex piece, and then they must add their piece on to the object and pass along to the next student. At any time, the students can decide that the object is complete, and students must present their object and describe its utility.
- Students were somewhat interested; in the future, Souheil will add more activities like this through "play" that challenges students to think divergently throughout.

Questions and Answers
- *Do you have an early class (sophomore year, perhaps) where you cover these ideation topics on smaller projects, or is capstone the first time they really practice it?* Engineering students take a foundations course that introduces them to Engineering Design. They don't see large open-ended design projects until their senior year. I will be moving to a three-semester long design experience that starts during the Spring of Junior year and hope that will help.
- *Is it to enhance creativity and innovation, or enhance team dynamics?* I find such activities to do both. Team dynamics are improved with every activity that fosters collaboration. This particular one focuses on enhancing divergent-convergent thinking.
- *Do you give them a particular prompt? How do you introduce this?* Each group is prompted with an initial Lego or K'nex piece given at random.
- Will you be able to respect social distancing with an 8-student hybrid lab format? Will students have to wear gloves, masks and face shields? Very good question! Things are so up in the air right now. I am planning to have them sit at least 6 ft away from each other, wear masks and place plexiglass barriers between them. It will certainly be an adventure!
- Audience comment: I really like this idea. I recently wrote a paper where we were looking at creativity in capstone, and we found that a lot of the current ideation techniques are very language based, which can be a disadvantage with ESL students. I've been looking for less verbal ideas - so thank you!

The Importance of Documentation (G. Shekhar)

Summary
- Started a consulting class in Fall 2019, where students are taught some consulting concepts (tech consulting, management consulting) and students work on a project.
- In the middle of the class, saw some issues arise with management of expectations of the project sponsor - some sponsors were happy with the progress, and some wanted to be more aware of the student deliverables due at the end.
- In the first three weeks, students do a project charter, where the sponsor signs off and sees what students are delivering at the end of the semester. Often, students would not document all of the deliverables properly in this charter. To address this, Gaurav introduced the Paper Bridge activity:
    - Students must make a bridge out of paper and tape, and each piece of paper and tape costs $$. First, students should ideate and document their process.
    - After they do this, another group must use another student's plan to create the bridge. This revealed gaps in what students did not document in their plan and instead were keeping in their head.
    - In most cases, students could not create a bridge, reinforcing the idea that you need to write details out in black and white, to make sure anyone can read it and be in sync on the ideas.
    - Then, students were given a week to revise their project charters, keeping these lessons in mind.

Questions and Answers
- *How would you do this virtually?* You can do any activity requiring a documentation piece.
- *Were students told ahead of time that they would need to share the plans?* No.
- *Suggestion: The students should compare the finished weight of their own construction with the example that a third party group built using only the created instructions/ documentation. Bonus points for how close (%) they get to each other.* Yes that was the original intention, however in the interest of time, was never done. I shall be adding that to the coming semester.
- *WOW! Great activity. This is definitely something that I want to try at home!!!!!!! Do you have more material on this? A paper or poster or lesson plan? How long a class period did you have to accomplish this?* Yes, I can share the plan with you. You can email me on gaurav.shekhar@utdallas.edu. It took about 1 hour, with the 2 phases of activities and the evaluation.
- *I tried something like this to illustrate the design process and importance of understanding the requirements, but students thought it was a waste of time. But I didn't include the documentation aspect, which might reinforce your point.* I do understand

your point. The "importance of documentation" piece wasn't revealed until the end. I would recommend trying this again to see if adding the documentation piece helps.
- ○ Audience: I think the documentation ties it all together...

Motivating Test Design with Lawnmowers (J. Gargac)

Summary
- This exercise is the just the start of our DOE module. Each group is required to develop a SOP stack for their project following this exercise. The intent of the activity is to motivate students to complete performance tests.
- "If we are designing a lawn mower, what do we need?"
    - Part 1: Develop design requirements for a new lawn mower
        - Solicit ideas from the class
        - Students say: Be able to mow hills, quiet motor, etc.
    - Part 2: Design of experiments
        - Students are split into groups and they must ensure that the lawn mower created by student suggestions fits all of the design requirements.
        - Identify tests that can be used to assess performance of each criteria.
            - I.e. to test if a mower clogs, students will suggest mowing 2 acres of land and then determining if it clogs
            - Instructor suggests ways to be more specific (what is the grass is wet? How long is the grass?)
    - Part 3: Presentation and Discussion
        - Students explain their experiments.

Questions and Answers
- *Do your students learn design of experiments (DOE) elsewhere in the curriculum?* They don't have a specific experimental class but they do have a lot of labs, but this is one of the first times where they develop their own experiments. We are trying to address this more in our lab courses, but there is limited DOE in the curriculum. Most focuses on simulation design. Generally, this is the first time our ME students are required to do physical performance tests. They will start developing SOPs for each of their requirements.
    - Audience: I agree that students are generally not complete in their experimental design. If we have a project that requires this, we have a Systems Engineer on the team as they have a class in DOE.
- *Do you have the students talk to users to identify needs and requirements instead of coming up with them on their own?* This is meant to be a 1.5 hour activity done in class during the second semester of capstone. Its purpose was not to practice the development of design requirements, but designing experiments. They often consider themselves as user though to determine some interesting requirements.
- *There may be industry test standards that they could/should use to test.*   This is probably true and can be a discussion point. The purpose of this exercise is practice test design by creatively applying the resources they have at their disposal.

- *Did you think of other candidates for the focus other than lawn mowers? Just in case the population isn't familiar with lawn mowers…* Everyone knows the lawn mower in rural Ohio. A lawn mower is what I chose because it would be easy to develop design requirements requiring complex test plans. Feel free to replace with any other device - Anything could work really. Ideally, you want a product that gives flexibility in design requirements and test design.
    - Audience: A blender might be a good alternative. They also clog!
- *If you have teams that need to design and build actual prototypes, how did you deal with that when students have to be remote?* Some teams had enough of their project built to test at their homes. Others had to do additional simulation work to prove their device would work. They were still required to submit SOPs for their physical tests assuming that someone else will complete those in the future.

Protecting People: Proper Protocol or Painful Process? (K. Jaeger-Helton)

Summary
- When doing human subjects research, proper protocol from IRB must be followed, to address ethical reasons ("respect for persons, beneficence, justice").
- First try at this activity:
  - Message was "protecting human subjects in research: THIS IS GOOD."
  - Students are tasked with filling out an IRB application for their project.
  - Students didn't have clarity for why it was important ("a hoop to jump through").
- Second iterations:
  - Messages were
    - "protecting human subjects in research: AVOID THE BAD."
    - STUDENTS protecting human subjects in YOUR future testing: this is the IDEA(L)!
  - The next time they did this, they also presented studies about what can happen if proper protocols aren't followed (i.e. testing a peanut-shelling process without considering peanut allergies).
  - Students only had to complete a portion of the IRB process.

Questions and Answers
- *How long did they wait to get IRB approval?* Students don't need to wait for IRB approval, they just fill out the protocol, and the instructor reviews the application.
- *How long does the process take to complete with the IRB? I tried to include the process in my class but found it took too long to fit within the course time.* This is an assignment to prepare them in Capstone 1 for the prospect in Capstone 2 as well as what they may see in industry (like at Bose, or in health care settings). The feedback comes from the Capstone Leadership and it is not submitted to the IRB. Doing this assignment helps when/if it really needs to happen as it is familiar to the students. Also, often by practicing on the application form, teams really clean up their protocol and plan well even IF they do NOT need IRB approval, as they have considered many of the essential details in advance.
  - Audience: IRB can take months to complete with proper training required. Best to plan for long term application
  - Audience: On our campus, it takes too long for a single semester… as a result, I simply avoid this. I DID do one IRB approved project, so I have been through the full process… and we worked with the IRB to learn about the i dotting / t crossing… And, we actually DID do the work, gathering data, etc

- ○ Audience: At Northeastern, survey related IRB stuff is fairly quick, and that's a lot of what our students end up doing. We've had pretty good luck with people being able to test things, but they do need to start thinking about it early.
- *Suggestion: We've had students complete the online CITI training (bonus: the certification is good for 3 years). It also helps them decide if they actually NEED IRB approval for their project, which they usually don't.* Right!! We do a version of that as well if there is a study that is probable or likely to be going on the books - So true, there's a lot to learn there!
- *Suggestion: Consider using case studies involving medical device recalls to convince students that meeting regulatory (and IRB) requirements are important.*

Student-Organized 510(k) Review Panels (S. Arce)

Summary
- Motivation: describing FDA regulations to students can be dry and boring.
- Stephen had student teams critique other team's work with regards to FDA regulations, which students enjoyed and found more interesting than perusing the FDA website.
- Can be done over Zoom

Questions and Answers
- *How easily is this transferable to other types of regulations?* The rubric for how to make a decision is listed on Stephen's slide; the FDA has very clear checklists for how to make sure something meets regulations. You could use other agency's checklists/guidelines/standards in place of these. Send me an email if you want to discuss this more for your program: sarce@eng.famu.fsu.edu
- *I do some drone projects so something related to the FAA might be interesting...do you have any additional details on how to do this?* If there is a similar submission/application process that gets reviewed by the FAA, you can set up a role-play scenario where the students from other teams act as the review panel.
- Suggestion: Use examples of medical device recalls to impress on students why meeting FDA regulations are important. This drives home the importance and brings it to life. They see how their work can impact patients.

Virtual Poster Session (R. Brown)

Summary
- Typically, students participate in a poster session presenting the results of their capstone project. This was not possible given Covid.
- Students each hosted their own Zoom room for their poster session and used slides instead of a poster.
- Flop: however, some students had people come into their rooms, and some students did not have anyone show up.
- In the future, there will be larger Zoom sessions with breakout rooms for each department.

Presenter Note:
> The student presentation format is visible here: https://www.seattleu.edu/scieng/project-center/projects-day/projects-day-2020-presentation-videos/ Unfortunately, I took down the 1-minute intro videos due to sponsors not wanting these posted to the public long term. I also took down the virtual poster session because we did not record these. If anyone is interested in seeing the structure of the program pages, I do still have access to them and I am happy to share. Just contact me at brownra@seattleu.edu.

Questions and Answers
- *Who are the attendees of the poster session?* People from industry, sponsors of the project, faculty, family; it is completely open to the community. Typically, 400-600 people attend, but via Zoom, over 1100 attendees showed up.
- *Did you do any poster judging in this format?* Typically, we do not do that; in fact, students did not do posters for this format, and instead had slides to share in their Zoom room.
- *Have you considered doing short videos instead of posters?* Students did 1-minute videos as "trailers" which were sent out to attendees, so they could decide which sessions they wanted to go see and which student teams to talk to during the virtual "poster session" afterwards.
    - Audience: We had teams prepare videos discussing their projects (not live Zoom sessions), in addition to their online posters, and got a lot of hits on those over a week. This is our site: https://projectexpo.calpoly.edu/
    - We also had our students create videos to replace posters, leaving the sessions to focus on Q&A
- *Comment: In my department, we did not do judging this year… because we were concerned that judging would actually have judged privilege more than skill.* This is why we definitely did not judge this year. We also allowed students to opt out of student presentations on Projects Day due to Covid and the protests in response to George Floyd's death. We had 2 teams out of 36 choose this option.

- Audience experience:
    - We did a virtual end of year session in our ECE senior design and did this in Zoom with breakout rooms and we had "judges" and family and friends walk through. In person we usually have about 15 visitors and the virtual meeting brought us about 30 visitors. We had posters and had instructions for visitors to enlarge parts they wanted to see. It seemed to work very well.
    - We did student choice judging this year and it worked really well. We had students provide their videos so other teams could view them at their leisure and then vote for different awards.

Twitter Poster Session (C. Pfluger)

Summary
- To replace the typical poster session to show chemical engineering capstone design projects, students created a Twitter account for their design team and tweeted their poster using the hashtag "#CHME4703Poster".
- Students had 24 hours to post their poster, then for others to post comments, questions, and to discuss. Students were required to comment on a certain set of other posters via a Google Form, and on Twitter, to ensure that there was engagement.
- Attendees were ChE students, faculty, alumni, and the broader community, including AIChE and ASEE.
- Event consisted of over 275 tweets, 382 likes, and 81 retweets.

Presenter Note:
> Here is the initial assignment that I give the students about the assignment.
> https://docs.google.com/document/d/1MRGeC6ErG7mbcnZ4yOKhjPukJt9zzGNeOlyH1mSAl28/edit?usp=sharing

Questions and Answers
- *For people who are unfamiliar with Twitter, how much of a learning curve is there?* The Royal Society of Chemistry had a tutorial that I used to create a document on how to do this, what was expected of them, how to post on Twitter, how to download the app, etc. Here is the link to their information: https://blogs.rsc.org/rscpublishing/2019/05/24/rsc-poster-2020/
- *Were there any IP issues with posting posters on Twitter?* My students come up with their own ideas for designs, or projects are found by groups or from faculty. There are no IP issues, as there is no proprietary data or designs.
- Audience Feedback:
    - I really love this idea! So creative and a great way to get students engaged!
    - This is an awesome idea! I can't wait to do this next year (even if the poster session is on campus)