



## Panel 4C Community Engagement and Service

**Facilitator:** Rod Wetterskog – University of Texas at Dallas

**Panelists:**

1. Jenny Retherford – University of Tennessee, Knoxville
2. Elizabeth Meier – University of Florida
3. Sarah Brownell – Rochester Institute of Technology

**Description:** Working with community groups and non-profit organizations can enrich the capstone experience, providing mutual benefits to students and community partners. This panel will share ideas on how to find these types of projects, how to scope them, potential changes needed to curriculum and mentoring, and how to manage them for successful outcomes.

**Notes:**

How do you find projects?

Sarah: Came in with a lot of contacts which really was helpful, university community partnerships so used that office to help, student affairs helped, also students have relationships with community already

Rod: With COVID, new resources for students have popped up like food, shelters, etc.

Jenny: Had to break into the market when moved to Knoxville, didn't deliberately seek out community projects - it happened naturally. Used ASEE and professional organizations to help find connections as those members are typically already motivated. Local network of engineers and those that hire engineers for projects helped source projects.

Lizzie: Tried to use already existing institutions in the community when we don't have the connections yet with personnel. Used a marketing and business class as well to have them work on reaching out to community and develop that market concept as a project themselves.

Do they cost money?



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Jenny: our projects are not funded or sponsored, we have support from our department. Most of the projects are using workstations and drawings, not actually building anything. Part of our projects are helping these communities understand how much it would cost them to solve their problem so they can go to their govt entities to have a proposal to get this done. Some funds needed through grants for student travel to go to the sites for information gathering.

Lizzie: We're self-funded. The money brought in through industry has to fund the machinery, student assistance, etc. The NPOs won't be expected to fund these projects, so looking for other grants, asking the NPO to find the funding through their grants contacts.

Sarah: We've tried all the above. We have sliding scales of fees, from \$500 up. Large industry partner fees help offset costs to NPO projects. We've done crowdfunding, now we're partnering with VentureWell. College Advisor Board is good source as well - bring them the project ideas and they pick and choose what to fund on personal interest.

Rod: In kind donations - lots of companies out there that are willing to donate. Also employer interest groups - for example, program that recruits women into STEM will fund some.

Audience: Watching the news, story about a NPO that was hiring people who are blind or visually impaired. Found multiple project ideas to help the NPO employees that were visually impaired to help them work.

Audience: Some clients want to scope the project with the clients, but some programs want the project scoped prior to student team development. How do you work through problem definition, when, and with who?

Jenny: Students start with a "drafted scope of work". We will never finalize this document (ever changing). Looked for this project before we found you, the students, so scope was done without knowing student team skillset. Fundamental need is defined, but scope of work is narrowed based on student talent. Students work with client to develop "technical scope of work" so client also learns who they are working with (while team learns who the client is).

How do you work with non-engineering clients?

Jenny: External local engineer is attached to each team for technical mentorship. You have a professional responsibility to ensure the solution is competently accurate.



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Are the mentors doing it out of volunteer or are paid?

Jenny: Ours are volunteers - alums are great sources. Also opportunity for professional development for a junior engineer to mentor the team (tell the manager you need some junior engineers to mentor projects).

Sarah: Different kinds of community engagement. Sometimes need different timeline or curriculum for some projects to help create authentic community partnership.

What happens if there is no one to sustain it, update it, etc. if there is no one at the NPO to keep it up?

Lizzie: Read that the professor of the capstone class turned into the one to maintain it - obviously not ideal to have it fall to the faculty, especially year after year when you get to dozens of projects.

Audience: WPI model has faculty dedicated to specific region, where that is a portion of their job is to maintain projects.

Sarah: sometimes city has technical experts to maintain it if they are the client

Jenny: long term relationships can be good where client can come back and say this worked but I'd like it to now do X, Y, and Z.

How are you defining community? Who are you working with? Are you focused on geographical?

Sarah: Focus on local and on Haiti partnership - place based communities.

Lizzie: Sometimes outside state of Florida, but mostly in state to let students travel to the sites and work more closely.

Jenny: take the opportunities that come about. Done work in surrounding counties, try to stay in 3-hour driving radius (even 3 hours is difficult for logistics). Also work in Panama with community and university partners there.



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Travis at ASTM: interested in helping and providing resources for projects as well as student resources. Student membership helps to get involved, but if you are looking for funding or mentorship, we can help find those people by using our networks.

DO you have experience with short term projects rather than maintaining long term projects?  
Jenny: Experience is that it doesn't maintain relationship with NPO even if it is shortterm - one and done. Know at the start you are not committing to long term relationship.

Lizzie: Sometimes client comes with project where solution is done in one semester, so try to implement into freshmen or junior design project.

Sarah: Haven't tried to do short term, but turns into long term when first solution doesn't work as intended.

Jenny: sometimes weve had to manipulate the project to get it to fit into the academic schedule. Also, had to have conversations with clients about how we have A-quality students, but we also have B- and C-quality, so clients can be aware of expectation early. Be clear that these are not professional.

Sarah: we don't do urgent-need projects, we want exploratory projects.

Jenny: these are groups that are trying to change peoples lives, this is critical paths that impact daily lives, so impact/burden is high

Audience: if client comes with urgent need, respond with idea of hiring interns, student organizations, makerspaces, etc.

Rod: short term project had great success, so they then pitched making it into 2-3 year project to develop it more robustly.

Sarah: relationship with customer is really important. So if the first time doesn't go well, use it as a learning experience to adapt scope or whatever to ensure partner still gets the content.

Rod: can go to faculty in that field that needs the shortterm project and task a specific class that term/semester to solve the problem.



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Jenny: have a conversation with students ahead of time to make sure they understand how to behave in certain situations and areas (for example, don't walk on person's property in Tenn as trespassing could be dangerous or wearing a orange vest will make people distrust you in certain areas of Tenn due to mistrust in govt in that area).

Sarah: Examples, don't take pics of people when scoping locations that are potentially drug areas, don't leave equipment where it can be stolen. Students aren't aware of these different areas that they aren't experienced being in, where some of the NPOs might be located (like homeless shelters, etc.).

Jenny: I'd like to promote public sector work. Not a term everyone thinks of. This is a space that is not necessarily service, you are working with government services. That may be an untapped space in areas other than Civil. I dont think these representatives are being approached by other disciplines like Mechanical.

Rod: Our CS dept is working on digital mapping of hte city.

Sarah: In terms of grassroots, students need more preparation, so faculty do as well. So don't start there for NPO work. Start somewhere smaller. The engineering field has had a lot of bad projects that are used as case studies. There can be a lot of mistrust from bad projects - community members have been let down before, so how can they trust you this time around.

Lizzie: I want to learn more about the intake process of working with groups, not just the scope of work, but what does that introduction look like. What types of questions are you asking these organizations?

Sarah: Good resources in other depts on campus like Business and LIberal arts as they know more about relationships than the engineering depts. Let the anthropologist guide and critique me. Campus Compact is an organization that campuses can join. Fair Trade Learning. Also brought a book that was helpful. Connecting Civil Engagement and Social Innovation was book that was really helpful.