7 pages of double sided for 15 min

1 page single spaced for 5 min 15 min would be about 3 pages

Michelle to do introduction including goals of today, goals of other webinar days

Introductions of 3 panelists

Slide 1 Title Slide

Susan Slide 2 Overview

Here is an overview of today's session.

Thank you Michelle for the introduction and for your work in organizing this conference. We will start our session with an overview of who needs to be on the RED team drawing on the NSF call for proposals. Then I will describe more on the role of the social scientist. Geoffrey Herman will describe the role of the engineering/computer science education researcher. Note that RED includes engineering and computer science. I am an engineer so I apologize if I focus on engineering education and don't always state computer science education. CS is definitely included and there are several RED projects happening in CS departments. Jeremi London will then describe the role of the evaluator or evaluators. We will interweave stories of successful RED teams drawing on our own experiences and those of other teams who have provided input. Note that these stories are intended to serve as examples of possible ways to assemble a team and to illustrate the variety of approaches that might be adopted. There is no one right way to assemble such a team. Then we will share advice that we have gathered from most of the RED teams.

Then we will have half an hour for questions. Michelle Camacho will facilitate the Q&A. As she said earlier, please write your questions using the Q&A feature. You may enter them at any point throughout the session and we will answer as many as we can during the last 30 minutes.

Susan Slide 3 Poll on How do you write a proposal? Options a, b, c only

Let's start by getting some information from you.

So how do you normally write an NSF proposal? You can choose all that apply.

a) I write proposals as a sole PI

b) I write the whole proposal and then pull in colleagues to add their names

c) I have a few key collaborators that I always develop proposals with

I'll give you a few seconds to respond and then we'll look at the results.

OK. So here are the results…

Susan Slide 4 Poll with options a through 3

Many of you have probably been successful using those strategies for NSF proposals. How about these items?

d) I carefully read the call and strategically decide who should be on the proposal

e) I brainstorm the ideas for the proposal with a team before iteratively writing the proposal narrative

Note that the RED program is different than other NSF grant programs. What you might have done for writing a proposal for a different division or program may not work in this context. To write a successful NSF RED proposal, you need to do D and E. The call for proposals has some unique aspects and must be carefully reviewed. To create and sustain a revolution is truly a team effort and requires folks with different types of expertise. Assembling such a team will be the focus of our session today.

Susan Slide 5 Story of Rowan

Let's consider the story of Rowan University's RED team as an example of the importance of carefully selecting your team and being persistent. Rowan's project is "REDTED – Revolutionizing Engineering Diversity, Transforming Engineering Diversity." Their project aims to revolutionize the Civil and Environmental Engineering Department at Rowan University to radically increase diversity and achieve high retention and graduation rates of all Civil and Environmental Engineering students. To achieve that goal, they are examining their admissions process, creating a more inclusive department through curriculum revisions and training of faculty, staff and students and setting up a peer mentoring program. The PI initiated the discussions on the proposal idea with her department and then invited the Social scientist, a sociologist, whom she had worked with in the past and had experience with examining the culture of engineering.

Rowan's RED team includes some team members from across campus who's titles might surprise you. Would you have thought of including someone from your Admissions or Financial Aid departments? Because their project involves admissions, Rowan's PI invited the Vice President for Strategic Enrollment Management to join their team. This individual is responsible for enrollment and retention of students including Admissions and Financial Aid. On the grant, he provides guidance on review of admission standards and assistance with outreach efforts. They also included the Assistant Director of the Office of Multicultural Affairs to provide assistance with workshops, extra-curricular programming for students from diverse backgrounds to ensure success and assistance with setting up a new Engineering Learning Community.

Note that Rowan submitted a proposal in the first round and was not successful. Some of the aspects that they changed in the second round where they were successful relate to the composition of their team. In the second submission, they included an Engineering Education researcher chosen based on her expertise as well as her commitment to

underserved and underrepresented groups based on her previous research. They also included an external evaluator chosen based on a recommendation from colleagues. Finally, in the second submission they included support letters from the External advisory board and articulated the composition of the external advisory board clearly.

So again, two valuable lessons from Rowan's experience are to strategically consider the composition of your team and to be persistent. It may take more than one submission to be successful in obtaining RED grant funding.

Susan Slide 6 who is on RED team?

Here is exactly what it says in the NSF call for proposals for RED. This might look a bit daunting. Let's go through it one piece at a time. Remember that the folks at NSF have developed this call carefully with consideration of the elements needed to successfully meet the goals of RED. This includes someone with the power to make change (department head), someone who is knowledgeable about culture and change (social scientist), and someone who knows what is happening in CS/engineering education research so it is critical to include all of these elements.

Susan Slide 7 PI

The PI must be a department head or a Dean. The NSF call says that this is to "establish institutional accountability". For change to occur, it is critical to have someone in administration who can support change. Or provide leverage as illustrated in this figure.

In your career, you may have heard or been part of the development of inspiring ideas that emerged from and were championed by faculty in departments but did not take hold because they were not supported by the administration. As one example, I remember as a young faculty member that I had an NSF grant and did a lot of course development for a first year class. This was generally supported but my department head felt that it was more important that I demonstrate that I could teach "real electrical engineering classes" like circuits. So I was assigned circuits and someone else taught the first year course I had developed. It was difficult to sustain the innovation of the NSF project since I did not get to teach it enough times to make it easily transferable to someone else. Had my department head been the PI on the project, things would have been different. And that is just an example from one class. RED projects must be broader so the institutional support is even more critical.

Susan Slide 8 Social Scientist and Engr Ed

These words come from the NSF call for proposals.

An expert in engineering education or computer science education research is needed. This person should be familiar with the literature in this area and be able to ground the project plan in that literature. For example, have similar ideas been tried at other institutions? What are best practices? I am the engineering education researcher on my team at USD and have been working in this area for years. Geoffrey Herman who is the computer science researcher on his team at

the University of Illinois will talk more about the role as it ties to RED, how to find someone with this expertise, and what they might do on the grant.

An expert in social science must be included. This person could be from a number of different departments. For example, at USD ours is Michelle Camacho, a professor of sociology. At the University of Texas at El Paso, the social scientist is an assistant professor of education. The department where they are from is not as important as their expertise. This person should be familiar with the literature on organizational change. They need to be able to advise the team on change processes, developing a culture of change, and creating meaningful ownership among faculty, students, and staff. According to NSF, this person also should help with evaluating departmental dynamics and monitoring change processes. I will talk more about the role as it ties to RED, how to find someone with this expertise, and what they might do on the project a few slides from now.

Susan Slide 9 Others on RED team

Let's briefly consider who else you might include on your RED team. NSF requires that you describe in the proposal how the department or college's External Advisory Board will be involved in the project. Specifically, how will they be used to advance the proposed plan? Who will be included and why, and how will they contribute to the project? This might be a good way to bring in industry partners. If relevant to your project, you might also bring in community partners.

In the NSF Call for proposals they call for an Evaluation Plan based on the theory of change and the desirable outcomes of the proposed revolution. NSF requests that you enumerate appropriate indicators of success related to accomplishing the goals and objectives and a timeframe to seek measurable change. It might be most appropriate to hire or designate someone on the team to take on this role." There are multiple ways that this can be accomplished including having a single individual, a team of experts, or an evaluation board. Jeremi London will talk more about this later in this session.

For coPIs, consider who else would be helpful in completing your project. Who do you need as allies? Administrators? Young faculty? Respected faculty? Who are change agents on your campus? Remember the example of Rowan University who included their Director of Strategic Enrollment Management and Assistant Director of the Office of Multicultural Affairs because they felt these individuals would enhance the chances of their changes being implemented on their campus. Illinois has a Chief Medical Officer for a local hospital as a senior personnel member to promote closer ties with medical practitioners. There are many different possibilities for who to include on your RED team. We encourage you to think creatively and focus on who is needed to accomplish the goals of your project.

Susan Slide 10 Tips on budget allocations

Here are a few tips on budget allocation. Be sure that budget matches the workload.

- Don't budget all $2 million for implementation, there need to be research and evaluation components too!

- Don't expect the engineering education researcher or social scientist to do all of the work without giving them the resources to do so. Be sure that the scope of work is appropriately represented in the budget and that it really is a team effort.
- Reviewers expect to see 10-20% of the budget allocated to evaluation. This is an indication that you are taking evaluation seriously. This may be an unfamiliar item to you if you have done purely technical research in the past. It is more common in social science research. Jeremi London will talk more about this in little while.

Susan Slide 11 Why a social scientist?

These words come from the NSF call for proposals.

There are people from a variety of academic backgrounds who study change. Sociology and Education would be good places to look for them. I am sure it is not new to any of you when I say that change is hard. Change without a plan and an understanding of the current culture and models for successful change is even harder. For those of you who are social scientists, many of you may take this expertise for granted. For those of you in engineering, you may, like me, have not realized that people study things such as change. To change an organization, it is important to understand the culture. I think this requires a collaboration between those inside the culture (in this case, engineering faculty and administrators) and those outside (social scientists).

Susan Slide 12 Example USD

I'd like to share with you the example of my own RED team at the University of San Diego as an example of leveraging opportunities across campus and benefitting from the expertise of the social scientist. Our project is entitled "Developing Changemaking Engineers." Our Dean is the PI and coPIs include the Associate Dean and the Chairs of Electrical, Industrial and Mechanical Engineering. We are aiming to "revolutionize" engineering education, with the aim of preparing students to innovate engineering solutions developed within a contextual framework that embeds humanitarian, sustainable and social justice approaches with technical engineering skills. The idea to apply for a RED grant came from our Dean. I have been working with Michelle Camacho, our social scientist on RED and the organizer of these webinars, for many years. So when we needed a social scientist on the RED grant proposal, I asked her.

How did Michelle and I meet? You know those faculty development lunches that you may be too busy to attend? Well, I met her at one of those on our campus years ago. We got to talking and found that we had some things in common including children of similar age and interests in service learning. Later when I participated in an NSF funded program on engineering education research, I was awarded some money to find a mentor in social science. I then went to Michelle and asked if she would be interested in working with me. She said no and that she was too busy. However, I was persistent and eventually we began working together and have done so for over a decade including several NSF grants and a book on Latinas in Engineering entitled The Borderlands of Education (available on Amazon). It has been tremendously valuable to me to have her perspective in our research. Sometimes she will ask me questions that I would never have considered. For example, in engineering we talk about helping our students "become

engineers". Once Michelle asked me why we described it that way. My response was something like. Don't all faculty describe their education process as helping students become practitioners of that discipline? She then explained that in sociology they are not assuming that all of their students will become sociologists. They are developing them as educated citizens but they might be sociologists or social workers or follow other career pathways. Some of this has to do with engineering being a "profession". However, it is also an example of the culture that we may take for granted without someone's outside perspective. On the RED proposal, Michelle was invaluable in helping shape the ideas from the title, to how we could tie in with other initiatives across campus, to crafting the narrative particularly the sections relating to the change model, research methods, and evaluation. She is excellent at synthesizing the ideas of our team and her perspective as a sociologist is a key to this skill.

So again, two valuable lessons you might take from our experience at USD are to leverage opportunities across campus to develop collaborations with social scientists and to work together on the ideas of the proposal as well as the narrative.

Susan Slide 13 how to find a social scientist

Ok. So if you did not go to faculty lunch and meet a sociologist or had an education professor whose child was on your child's soccer team, how else might you find a social scientist?

First of all, I encourage you to consider your project needs. What expertise would be the most valuable? There is a huge range of expertise.

When you are trying to find someone, here are some areas of expertise key words that might be helpful. You might see these on colleagues across campus's biographies or webpages for example: culture, organizational change, theories of change, collective ownership, departmental dynamics, monitoring change processes, social and behavioral change, co-creation of change processes, negotiation, leadership, and change management,

Susan Slide 14 How to find a social scientist departs

I have mentioned sociology and education as departments where sociologists on RED teams are from. Here is a list of possible departments where you might look for a social scientist. It is very important to match your project needs to the expertise of the social scientist. Not all social scientists are the same just like all engineers are not the same.

- Sociology
- Education, especially educational psychology, possibly educational leadership
- Psychology, especially organizational / industrial psychology, social psychology (attitude change)
- Business, Advertising / Marketing
- Ethnic studies
- Science & technology studies (STS), including history / philosophy of science
- Human Resource Development (HRD)
- Organizational Development (OD)
- Organizational learning

- Faculty development/Center for teaching and learning
- Social cultural anthropology

Susan Slide 15 Where are social scientists on RED from

Here is a list of where the social scientists on the current RED teams are affiliated. Note that there is quite a range for the 13 projects. Two teams have someone from Education and two from Sociology. The others are all different areas. Note that Information and Learning Sciences is in Library Sciences.

Susan Slide 16 inviting a social scientist

A common experience for social scientists is that someone, such as an engineering professor, approaches them, usually a few days before the proposal is due and says something like "*So the solicitation says we need a social scientist. Are you one? Can we list you?"*

[CLICK]

This is NOT the best way to bring a social scientist onto your team.

[CLICK]

Instead here are some of our thoughts and advice. Get a recommendation. If you have a colleague who has worked effectively with a social scientist, ask for a recommendation. When you approach the social scientist, ask if / how the solicitation could fit their research program. Help them understand the project. Bring the entire team together for discussion. Work toward shared ownership and understanding so that the social scientist is an important member of the team not an afterthought. Find someone that fits your team culture. Build rapport or a relationship early. And finally, iterate on the project idea with the social scientist. Their expertise in culture and change can greatly enhance the proposal and the project itself.

Now Geoffrey will talk more about the role of the CS/Engineering Education researcher.

Remember to write your questions at any point throughout the session using the Q&A feature. We will answer as many as we can during the last 30 minutes.

Geoffrey Slide 17

If you look at the RED solicitation, you'll notice that that it begins with the prefix "Professional Formation of Engineers." Now this is an extremely important part of the solicitation that the NSF program officers have spent a long time thinking about and it is not simply a throwaway phrase. You will need to address the question "what is the professional formation of engineers?" in your proposal and you will need to address how your revolution is going to address that question. If

you have NOT attended the previous webinar on revolutions, I encourage you to attend look up that session's recording to learn more about this topic. Briefly though, the idea of professional formation is that - simply preparing our students with technical content is not enough. They have many other skills such as communication, teamwork, and so on that are important for them to be able to be successful engineers. You can go to a wide range of different research literature to understand what professional formation might mean, looking at journals in engineering studies, anthropology, or education as well as turning to industry partners to hear more about what they look for in graduating engineering students. As far as this webinar is concerned, though, we encourage you to use the CS or engineering education researcher on your team to help you to define "what is professional formation" and how your revolution will address it.

Geoffrey Slide 18

Now, let's get a little deeper into the specific roles that the computer science or engineering education researcher can play on your team. First, unless the engineering education researcher is already an integrated member of your department, the base idea for your revolution should originate from the department and not the education researcher. It's important that the proposed revolution addresses real challenges that face your department and that the faculty in your department agree necessitate change. So, when you approach the education researcher, they will most likely serve the role of "first external reviewer" on your proposal idea." The computer science or engineering education researcher will be familiar with the education research literature and will be better able to vet whether your proposal idea has sufficient support from the research literature to be plausible. Conversely, they will also be able to tell you whether the idea has been tried before and how "revolutionary" your proposal idea sounds. The balance between finding an idea that sounds plausible but is new and revolutionary is perhaps the hardest balance to strike in writing these RED proposals, so it's important to have an insider who can help your team navigate that landscape. In choosing your education researcher, I would encourage you to find a colleague who has prior NSF funding from, or has sat on panels for, programs such as Improving Undergraduate STEM Education or Research in the Formation of Engineers. Those researchers will be a bit more familiar with what the NSF program officers are likely to fund. Finally, the computer science or engineering education researcher can help your proposal "appear legitimate." There will be other education researchers on the panel and they will be looking for your proposal to cite the relevant research literature and to use the jargon of their discipline. Be sure to ask your education researcher to help you spruce up the language and references.

Geoffrey Slide 19

For example, in my experience at Illinois, we had several departments that were interested in submitting RED grants. So, our dean decided to hold an internal competition to decide which department would have permission to submit to the limited submission. The dean and a group of education researchers were organized as an ad hoc panel to review the proposals. To provide a bit of context, the Department of Bioengineering had recently become a key player in developing a new college of medicine for our campus. This effort had placed the department in a bit of a crisis, needing to both develop a new curriculum for the new college of medicine while continuing to deliver their existing undergraduate curriculum. The faculty were stretched thin. So the BioE department put together an initial proposal that proposed the original idea of aligning the undergraduate curriculum with the new curriculum that was being developed for the new college of medicine. This new curriculum would leverage the new infrastructure of the medical

school to provide undergraduates with clinical immersion experiences. The hope was that these clinical experiences would help the undergraduates better understand the needs of doctors and patients so that they would be able to design technologies that would have a better chance of being used by doctors and patients. I loved this proposal idea and offered to serve as the engineering education researcher on the project. As the proposal moved forward, we kept the core idea of the proposal intact, and I used my knowledge of the education research literature to provide justifications for why the proposal sounded promising based on educational principles and I developed a framework for how the clinical immersion experiences could be used to support one conception of professional formation.

Geoffrey Slide 20

As the proposal developed, we discovered that we would likely need to shift our classes toward using project-based learning. This created a new challenge, our faculty generally did not know how to use project-based learning. Our project, therefore needed a faculty development component to sound credible. Now not all projects will need a faculty development component, but many will. This faculty development can come from a number of places, such as your center for teaching and learning, your advisory board, or the computer science or engineering education researcher. Regardless, it is likely that the education researcher will have a good professional network to help the team identify the appropriate individuals and plans to create a faculty development component should it be needed.

Geoffrey Slide 21

The first two roles that I described focus on ways that the engineering education researcher can improve the quality of your proposal. The next role of the education researcher is an essential role that they must play and is the reason that simply having traditional engineering faculty who teach is insufficient for a RED proposal. The engineering education researcher is responsible for developing a research plan. The goal of the RED proposals is not simply to help your department do something revolutionary, but for your department to generate new foundational knowledge that will help other departments follow your revolution. Research is our way of generating this new foundational knowledge. Therefore, like any research grant, your RED proposal must review prior research literature and demonstrate a gap in the literature that necessitates your revolution. The identification of these gaps in the literature should help you to identify research questions and methods. As a reminder, there will be computer science and engineering education researchers on the panel, and they will be scrutinizing your research plan. Critically, the research plan should go well above and beyond simply measuring whether students or faculty like the changes to your department.

Geoffrey Slide 22

For example, the Illinois RED team is creating a health-need-centric curriculum and we will study the impact that this new curriculum has on students' motivations to learn and the development of their professional skills. While traditional curriculum is organized by the technologies or science that engineers will use such as mechanics of materials, signal processing, or physiology, our new curriculum will focus on the technical and societal needs that necessitate that the students learn about those technologies or science. For example, we may create a curricular track that focuses on pain management or diagnosing pathologies. Solving these problems will necessitate that students will learn about physiology and learn how to use signal

processing to process images. It is our hope that this new curriculum will help students better understand why they need to take the courses that they need to take and will help them stay motivated throughout their studies. My job on the project is to design research protocols that will measure students' motivation and to develop metrics that will help us measure students' professional skills. Finally, I will specifically look at whether this need-focused curriculum is more attractive to women and minority students.

Geoffrey Slide 23

The last stage of any proposal provides another possible role for the computer science or engineering education researcher. As we've mentioned before, NSF is not interested solely in helping your department execute a revolution. Rather, NSF wants your department to be the first of many departments that will be revolutionized. The research plan should include a robust publication strategy that will help disseminate what your team has learned to other institutions. Additionally, the education researcher will likely have a different professional network than the primary department. As a likely outsider to your department, they will probably be more easily able to identify which parts of your revolution would translate to other departments or disciplines and which are idiosyncratic to your department. This outsider perspective can help your team better formulate a dissemination strategy that would attract other departments.

Geoffrey Slide 24

Coming back to our example at Illinois… the BioE faculty and I identified very different possible members for our external advisory board. Our advisory board figured strongly into our dissemination plan as we will lean on them to help us identify which parts of our revolution might translate to other disciplines. The BioE faculty on the team identified other faculty from near peer bioengineering and medical departments that were facing similar challenges to our department. These connections provided some obvious pathways to directly translate our revolution to similar departments. The BioE faculty also had extensive industry contacts who would reinforce our messaging the students needed to better understand the clinical needs the drive bioengineering. In contrast, as the education researcher, my network helped us identify faculty from different disciplines and from different types of schools. These types of connections will help us identify the core features of our revolution and figure out which parts can translate to other types of schools or departments. Similarly, our network also helped us connect to key people in ABET who could help us potentially translate our local revolution into national-level policies for accreditation. This connection also has helped us reduce concerns about whether our revolution might threaten our ABET accreditation.

Geoffrey Slide 25

Of course, all of this advice is not useful if you can't find a qualified computer science or engineering education researcher. Like any research field, there is a wide range in the skills, expertise, and focuses of these researchers. You will want to spend some time making sure that the skillset of the education researcher you bring on matches what your project needs. The majority of these researchers will be housed in departments of STEM education, engineering education, science education, and so forth. Sometimes STEM education researchers will be housed in bigger education departments such as curriculum & instruction or education psychology. However, many engineering education researchers are also in traditional engineering departments. Looking through the list of alumni from engineering education PhD

programs might help you find one of these hidden researchers. Searching grants.gov for awardees of NSF programs such as Improving Undergraduate STEM education, Research in Engineering Education, and Research on the Formation of Engineers can provide pointers. If all fails, your center for teaching and learning may be able to steer you toward one of these researchers or they may even employ one!

Geoffrey Slide 26

As you can see on the following slide, the engineering education researchers on existing RED grants come from a variety of departments.

Now Jeremi will talk more about the role of the evaluator.

Once again, remember to write your questions at any point throughout the session using the Q&A feature. We will answer as many as we can during the last 30 minutes.

Jeremi Slide 27 Typical Role of Evaluator

Thus far, we have talked in-detail about two of the roles on the RED team. Now, we'll discuss one last one—the evaluators. Just like each of the other roles, the evaluators can help during the proposal development phase and during the project. When developing the proposal, they can help with defining measuring goals. For example, they can help ensure that the project goals are specific, measurable, time-sensitive, etc.

[CLICK]

During the project, they are a valuable asset to the team as well. Among other things, they can provide an external perspective on how well the project goals are being met and potentially help with brainstorming ways to recalibrate, if necessary. While this form of verbal feedback can happen as part of ongoing conversations with the evaluation team, they also assist by documenting and assessing progress toward the goals. This form of written feedback oftentimes comes in the form of an evaluation report; this is a document the evaluation team generates each year of the project and is a report that is submitted with the annual report submitted to NSF.

[CLICK]

One thing that's worth noting is the typical amount of funding allocated in the budget for evaluation. Plan to allocate approximately 10-20% of the budget to evaluation. They play a non-trivial role in the project, and the allocation of an adequate amount of resources to this role communicates to reviewers that you acknowledge this and plan to engage your evaluation team in the project in meaningful ways.

Jeremi Slide 28 Innovative Role of Evaluator for RED

What I have just shared are some typical ways to engage evaluators in the project; now I'll share a few innovative ways to engage them. We said this earlier, but it is worth repeating: all roles of the team play a valuable part in the attainment of the overarching goals of each RED project and the RED program goals. RED projects are focused on enacting lasting change, and this

oftentimes requires a shift in the department's culture. In some cases, this means collecting data in "your own backyard". Ask the social science and engineering education researchers on the team-- this can get tricky sometimes! An outsider's perspective can help with this. For example, as part of studying culture, there may be a need to explore the experiences faculty have had in the department, but their stories may involve some of the people on the RED team (e.g., PI who is oftentimes the supervisor of many who are directly involved with the project).

[CLICK]

In situations like this, the evaluation team can help with issues of confidentiality. This might be in the form of compiling and preparing the data for analysis in a way that minimizes the possibility of sharing personally-identifiable information.

[CLICK]

Some of the RED teams are more "top-heavy" than most NSF-projects of this size. If you find yourself in a situation where there are very few students on the project, you can also consider utilizing the evaluation team to assist with some of the baseline data collection or preliminary data analysis. These are just a few examples of how to engage the evaluation team in non-traditional ways.

Jeremi Slide 29 Example: Arizona State University

The ASU RED team is an example of a team that is engaging the evaluation team in both traditional and innovative ways. The idea for our RED project emerged after a convergence of events. 1) There was a critical mass of engineering education researchers forming at the Polytechnic School. (As of now, there are 8 faculty who designate engineering education as their primary research area.) 2) Plans to start an engineering education PhD program were well-underway. 3) A few years ago, the Polytechnic School was in the midst of a transition from being in the College of Technology to being in ASU's College of Engineering. 4) The Polytechnic School was known for using innovative pedagogy (e.g., through the use of the "design spine" and project-based woven throughout the undergraduate engineering curriculum). Given the convergence of these four events, the RED RFP seemed like an opportunity to think about the next level of "revolution".

When forming the team, the PI was determined by the nature of the call. The rest of the ASU RED team includes the other 7 engineering education research faculty at Poly. The exact roles on the project were determined by project foci/research angles. We're an example of a "top-heavy" team; there are more faculty than students working on our RED project. Additionally, we represent 20% of the tenure-track engineering faculty in the engineering programs at Poly. When conducting research on our department's culture, it is unlikely that people's stories will not include *at least* one person from the RED team. Issues of confidentially and anonymity are more a non-trivial concern for some of our participants. In light of this, our evaluation team has been extremely helpful with navigating concerns about the confidentiality of the data and with handling a few of the tasks that graduate students would typically assist with on a project like this.

Jeremi Slide 30 How to Build the Evaluation Team

As we have done with the other project roles, I will share some advice on how to find people to function as evaluators on your RED project. One way is to gather recommendations from others. For example, it is quite possible that the social scientist and/or engineering education researcher on the proposal may know evaluators. By extension, other colleagues who have led or worked on projects that called for an evaluator would be excellent resources for getting recommendations on possible evaluators.

[CLICK]

Apart from getting recommendations from others, check to see if your institution has an evaluation unit, or if those in your office for institutional research can point you to people who have evaluation expertise. Let's not forget about our colleagues in the local School of Education, Centers for Teaching & Learning as a source to look for evaluation experts (and recommendations of who to turn to).

[CLICK]

Apart from recommendations from others and exploring campus resources, it is also possible to identify external companies to handle the evaluation part of the project. at the Quality Education Designs, Gary Lichtenstein, is a good example of this.

[CLICK]

One thing to keep in mind is that, depending on your project needs, the evaluation component of your RED project may only call for one evaluator while others would benefit from an evaluation team

Jeremi Slide 31 Advisory Board vs. External Evaluation

I will wrap-up my discussion on evaluators by having a brief discussion about the distinctions between the advisory board and evaluators. For the RED project, the two are distinct. Both the advisory board and the evaluation team help provide an outsider's perspective on the RED project; and as I have mentioned before, having this outsider's perspective is especially important when we want to talk about understanding and shifting the culture since. Unknowingly, some things will remain latent without the nudge of an outsiders' point of view. However, although the two are similar with the respect to the idea that they provide an outsider's perspective, the evaluation team **cannot** be interchangeable with your departmental advisory board.

[CLICK]

Over the past few slides, I have discussed ways to engage with Evaluators. The advisory board for the RED project, however, must have some overlap with the department advisory board. If we pause to think about it, that makes sense, right? The RED project is focused on inciting a revolution that will lead to lasting change in your department. This may include changes in administrative polies, shifts in the approaches to teaching and learning—all of these things will ultimately affects the kind of students that graduate from your program. Your departmental advisory board also has a vested interest in the kind of students that graduate from your program.

[CLICK]

The members of the advisory board that you choose to engage on the RED project should have complementary expertise and access to networks that might be useful for leveraging throughout the life of the project. Thus, it is useful to have the advisory board engaged throughout the project. This is important for most NSF projects, but it's *essential* to the success of your RED project.

We will conclude the formal presentation of this webinar with our top 10 tips related to RED teams. I'll begin with a few tips, then turn it over the other facilitators to wrap it up before the Q&A time.

Jeremi Slide 32 Top 10 Tips

1. RED is not like most other NSF programs.
    - The RED program is different from most NSF funding mechanisms. In this presentation we've described the essential roles of the RED team, and how – collectively—they address the overarching goal of the project and program. Given the uniqueness in the nature of this program and the interdependence among the different facets of the project, the need for a very cohesive, multi-disciplinary team is more critical for the success of a RED project that what might be acceptable for other programs. The PI plays an important role on the project, but they cannot do it all.
    - Another distinction relates to the connection between the RED projects. When a team receives a RED award, they are joining a national cohort of change leaders. In addition to focusing on RED activities going on at a single institution, there are activities that occur throughout the year to foster community within and between the cohorts of RED teams. Two examples of this include our regular conference calls in which one person from each RED team typically attends; and collaborations like this webinar. This which resulted from the combined efforts of RED team members at several institutions who were interested in helping to provide mentoring to others interested in responding to the next RED RFP. In short, the variety of ways in which the teams feel like they are part of a cohort of national leaders and this is something that makes the RED program different from others. It's important to keep this in mind.

[CLICK]

2. Read RFP carefully.
    - This is piece of advice that applies to responding to any RFP, but is still worth repeating here: read the details of the RFP carefully. Ensure that you comply with all of the requirements. It would be a shame to go through the work of coming up with a revolutionary idea, and ending up submitting a non-competitive proposal because of something that could have been avoided. It might even be useful to have someone on the team make a checklist to ensure that all of your bases are covered before the submission. Of course, you should be thoughtful about *how* you cover your bases, but at a minimum, ensure that all of the bases are covered.

[CLICK]

3. The PI needs to be actively engaged.

- As we've mentioned before, the RED project is unlike most others. Given the desire to make changes that last long after the funding for this project ends, it is important that the PI –the administrator on the project—is actively engaged throughout the project. It is difficult to underestimate the importance of ensuring that the PI is extremely connected to the various dimensions of your project.

Now I'll turn it back over to Susan to share more tips.

Susan Slide 33 Top 10 Tips (slide 2) Susan

4. Choose team members strategically
    - Cast a wide net beyond your department. Who else can help you?
    - Include allies on your team in preparation for powerful political opposition. Change is hard and likely to meet with resistance particularly from those who have been around for a long time. Are there folks on your campus who would be good allies for convincing others to adopt change?

[CLICK]

5. Build a team that enjoys working with each other.
    - Have fun! This is a lot of work. It is much more likely to be successful if you enjoy working together. This includes the entire team. Consider having a team kick-off or social events. Be sure to meet regularly and keep those lines of communication open.
    - Find common values and align goals. Be sure that all members of the team are committed to the goals of the project.

[CLICK]

6. Build mutual respect, especially for the engineering education researcher and social scientist. This is a team effort. The CS/engineering education researcher and social scientist are important members of the team but can not incite and sustain a revolution alone.

Now I'll turn it back over to Geoffrey to share more tips.

Geoffrey Slide 34

The RED grants require a ton of different information: a description of your revolution, a definition of professional formation, a research plan, a change theory, a dissemination plan, institutional data, and so forth. You can't fit all of this information into the proposal unless everything fits together tightly. In less stringent grant proposals, I have often been able to divide

and conquer, giving separate sub-sections to different PIs. This strategy is less likely to work for RED. You will need to share drafts of sections early and often. You will need to come up with a clear, tight, simple message that informs every section of the proposal to reduce the complexity of your proposal for reviewers. I spent more time on our RED proposal than I have on most other proposals.

[CLICK]

To make this all work, you will need to iterate, iterate, iterate. You will particularly need to focus on iterating between the different roles on the project, making sure that no role feels that their voice is not being heard.

Geoffrey Slide 35

As with many aspects of the RED grant, you will need to balance the tension between demonstrating why your team is uniquely able to execute your proposed revolution while also demonstrating that your team is representative enough of other departments that they can follow your lead. One way to do this is to highlight past successes and efforts that other departments can easily emulate. Your prior efforts can help reveal reviewers believe that your team is situated for success and that other departments could make similar incremental efforts to prepare for a similar revolution.

[CLICK]

Finally, like the goal of building a team that you enjoy working with, you need to propose a change that you really believe in. Many of the funded RED teams have said that they were sufficiently excited to pursue their revolution regardless of whether their proposal was funded. These teams would likely need to move more slowly without the extra money, but they were nonetheless willing to execute the revolution. The more your revolution aligns with your departmental or university mission and the more it addresses real challenges that your department faces, the more believable your proposal narrative will be.