

Creating National Leadership Cohorts for Making Academic Change Happen: Sharing Lessons Learned Through RED Participatory Action Research (REDPAR) Tipsheets

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Introduction

In 2015, we inaugurated our work with teams who were funded through the National Science Foundation REvolutionizing Engineering and Computer Science Departments (RED) program. In our project—funded first by a NSF EAGER grant, and then by a NSF Research in the Formation of Engineers (RFE) grant—we seek to support the RED teams in their change processes and understand how the RED teams make academic change on their campuses. We are also strategizing how this information about change can be captured and communicated to other faculty and administrators of STEM programs. Because our RED Participatory Action Research (REDPAR) Project is a collaboration between researchers (Center for Evaluation & Research for STEM Equity at the University of Washington) and practitioners (Making Academic Change Happen Workshop at Rose-Hulman Institute of Technology), we have challenged ourselves to allow for both aspects of the work—research **and** practice—to be treated equitably. This includes how we communicate within REDPAR and how we communicate with the RED teams. It also includes how we disseminate the research and practice work that is the foundation of our project. Specifically, we have considered with care the various channels for communication and the modes of conveying our work that are at our disposal, such as conferences like ASEE and research journals like *Journal of Engineering Education* [1], [2], [3]. These two examples represent typical forms of communication that are accepted within the engineering education community, but both require extended time frames in order to reach their intended audiences. In order to convey our work more rapidly and encourage action in the engineering and computer science education communities, we have created a new mode—the RED Participatory Action Project Tipsheet. The purpose of this paper is to introduce the tipsheet mode, discuss the process that led to its development, and demonstrate how it can provide important research-to-practice information for use by the engineering and computer science education communities.

Background

Our work on tipsheets emerges from our participatory action research with the NSF REvolutionizing engineering and computer science Departments (RED) teams to investigate the change process within STEM higher education. The RED funding mechanism is designed to support awardees in creating systemic change, both to improve educational outcomes in the middle years of college and to create more inclusive environments for students. The currently funded projects range in scope from one department to a whole college. NSF requires that teams are multidisciplinary, including instructional faculty, education researchers, social scientists, and

administrators (e.g., the department head or college dean). In addition to funding the RED teams, NSF has also funded RED Participatory Action Research (REDPAR), to support the work of RED teams and to conduct research with the RED teams on the change process across project sites. Our work as REDPAR investigates research questions related to systemic change projects while also facilitating connections across teams and providing customized academic change faculty development curriculum.

While much of the translation of research to practice literature is in the health promotion and clinical medicine fields, the findings are still relevant for organizational change research. Research indicates that some of the translation problems result because the information shared does not reflect an understanding of contextual factors and/or is not deemed to have external validity [4]. Given that REDPAR research is focused on many types of organizations that received RED grants, and the research broadly addresses themes among these contexts, we can write tipsheets to help other change agents understand basic propositions/themes that come from the research across contexts. This helps bridge the research-to-practice divide.

The tipsheet mode also addresses a concern in engineering and computer science circles: the relevance of education research to the practical goals of making change happen in classrooms, departments, and programs. For some in higher education, research can be viewed as not useful, not accessible, and even irrelevant to those who could benefit from it [5], [6]. The benefits derived from a project with researchers and practitioners working together can be seen in projects like REDPAR, where there is a strong focus on making sure the research results are relevant to the intended audience; relevance is one of the key principles necessary for researcher-practitioner collaboration [6], [7].

As a mode that supports both research and practice, the tipsheet accomplishes several important goals. First, the content is drawn from both the research conducted with the RED teams and the practitioners' work with the teams on specific skill sets considered important tools for change makers [1], [2], [3]. Each tipsheet takes up a single theme and grounds the theme in the research we have conducted while offering practical tips for applying the information. Second, the format is accessible to a wide spectrum of potential users, remaining free of jargon and applicable to a variety of department and program contexts. Third, by publishing the tipsheets ourselves, rather than submitting them to an engineering education research journal, we make the information timely and freely available. We can make a tipsheet as soon as a theme emerges from the intersection of research data and observations of practice. The tipsheets can then be utilized as needed by change agents, a strategy that is supported by research that emphasizes the importance of supporting organizational change through a non-linear process [8]. Finally, rather than force compliance with the practices outlined in the tipsheet, we encourage the use of the best methods for supporting the change project. These methods emerge from within the RED community and represent a consensus of effective strategies. The method of implementation—sharing the

tipsheets widely, making them available at no cost on the websites, aligning sessions at the RED PI meeting with tipsheet topics—offers a novel approach to conveying and emphasizing the positive outcomes.

Tip Sheet Design and Organization

In order to make our work accessible to and usable by a variety of audiences, we drafted, tested, and revised the tipsheet design several times. The resulting format provides, we feel, an important balance between research and practice, illustrated in the outline below:

- Select a theme that has emerged from the research or from observation of practice.
- Pose a powerful question related to the theme.
- Follow that question with a practical “tip” that reflects the research-based answer to the question.
- Conclude the section with research evidence, in our case, quotations taken from focus group interviews with members of RED teams that address the theme.

The format is illustrated in Figure 1, drawn from the Shared Vision Tipsheet.

Figure 1: Example of the format from the Shared Vision Tipsheet.

What Does Shared Vision Look Like?

Change agents embrace a broad conception of shared vision, including common language, shared expectations, shared sense-making, meaningful roles for all participants, and shared products. By speaking about issues with the same terms, identifying how all can contribute, and sharing the credit for impacts and outputs, change agents can shepherd the vision development process.

→ **TIP:** Allow team members to specify what they expect, what they can offer, and what they need to be successful. Put all those cards on the table. When people see the entire picture of the team context, they are more apt to be creative and inclusive about solutions and promoting the team's interests. Continue these conversations so that people's roles and contributions can evolve if outside commitments change.

“I think we've all learned a lot about what those words mean. We used social justice, humanitarian, sustainability, peace, in the proposal, but we didn't have a common understanding of what those words meant. I'm not sure any of us had an understanding of what that would really look like in engineering. We've spent some time around trying to discuss now what we think those terms mean. Certainly my understanding of them is different now...I think some of that has also influenced what we think success looks like or what the kinds of things are that we're going to do.”

“Some research-interested faculty got involved in thinking about this change as a research problem: How do you make prep work better? When is the in-class time? What sessions can you develop to test this? So turning the teaching into a research problem has gotten some of the faculty interested.”

Thus far we have produced tipsheets on three topics: Communicating Change, Creating Strategic Partnerships, and Shared Vision (see appendix for the sheets). Each topic/theme was

selected based on themes that were emerging from the research data gathered through focus group interviews and from the practice of working with the RED team members at the annual Principal Investigators meeting and during the monthly RED Consortium calls conducted on Zoom. Once the topic is selected, members of the REDPAR team draft, review, and revise the tipsheet, ensuring that it aligns well with both research and practice. Because we are determined that the tipsheets be brief, we have limited each tipsheet to a double-sided 8.5 x 11 US standard sheet of paper. The limits of the format have forced us to be focused on the content we include and ruthless in remaining clear in our language.

With regard to dissemination, we have shared the tipsheets with the RED team members and with the wider engineering and computer science education communities. They are available on our organizations' websites:

<http://depts.washington.edu/cerse/research/current-research/> and
<https://academicchange.org/>

We also bring the tipsheets with us to conferences and make them freely available. During our presentations at ASEE—both in conference sessions and in the NSF poster sessions—we offer the tipsheets to attendees who express interest. We have also begun to use the tipsheets as the basis for workshops and presentations. For example, at the American Association of Colleges and Universities STEM conference in November 2018, we presented a workshop on the topic of shared vision for change projects. The interactive workshop was developed with the tipsheet as the source of content, and the tipsheet served as a resource for attendees to take away for use on their home campuses.

Conclusion

As of this writing, we have plans for additional tipsheets on topics that have emerged from what we are learning about the work of the RED teams. For example, we are at work on a tipsheet that focuses on multidisciplinary team formation and development, a theme that has recurred as new projects are funded through the RED program. In addition, as new RED teams are funded (a new cohort will be added in 2019), we will share what has already been learned about change with RED team members through the tipsheets. Finally, we envision a workshop developed based on the content of each sheet. These workshops will enable us to disseminate what we have learned about academic change through this project and propagate that information to faculty and administrators who wish to make academic change happen on their campuses.

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COMMUNICATING CHANGE

A Tip Sheet from REvolutionizing Engineering and Computer Science Departments (RED) Participatory Action Research

Communicating change to various stakeholders is a critical aspect of change management. This tip sheet presents strategies that highlight research findings resulting from focus group discussions and conference calls with NSF's RED grantees. The quotes from research participants highlight these findings. For more information, contact redpar@rose-hulman.edu.

Listen Well

When given the opportunity to engage in authentic, supportive dialogue, stakeholders will happily provide their perspectives, feelings, needs, and constraints, to allow change agents to inform their work and create meaningful messages about the upcoming changes.

- ✓ **TIP:** Use various strategies like formal or informal focus groups, facilitated group listening sessions, a question dropbox, or social media requests to listen to stakeholders.

“To think about long lasting organizational change, you have to hear the voice of every person in that environment, the staff, the TAs, the administration...so while faculty are the drivers of the change [in our project], it will only be sustainable if everyone is on board.”

Create an Intentional Approach

Different stakeholders need to learn about different aspects of the project. Creating uniformity of core premises among various types of communications emphasizes the quality of the change effort while enabling nimble and flexible messaging.

- ✓ **TIP:** Adopt strategies like core metaphors or imagery, a set of talking points with versions formulated for different audiences, and a communication calendar to create unified messaging.

“I run in to the provost once every three weeks, and I have my talking points and my elevator pitch. It helps to be prepared. He needs to know the points very quickly.”

Acknowledge Shared Values

Successful change agents create opportunities to communicate the relationship between their change and the story and values of the department or institution - things like workforce preparation, service and stewardship, integrity, equity and justice, or faith.

- ✓ **TIP:** Craft messages that communicate how change supports the shared values, how change aligns the organization's values to today's realities, and how change creates an opportunity to position the organization to enact shared values.

“I think all of us want to know how can we make the engineering curriculum more inclusive, what can we do, and at the same time everybody still struggles with needing to cover core content, and if we do something else, will we lose that.”

Speak to Stakeholder Motivations

Change projects have numerous stakeholders, all with different interests in the process and outcome. Successful teams understand that motivations for participation in or resistance to change activities vary widely among these stakeholders, and that motivations are complex.

- ✓ **TIP: Frame the project in a manner that appeals to various motivations, to allow stakeholders to find elements of interest to them.**

“Some very research interested faculty got involved in thinking about this [project] as a research problem, for example, how do you make pre-work better, when is the in-class time, what type of sessions can you develop to test this? So turning the teaching into a research problem has gotten some of the faculty interested.”

Place Communication in Context

Change occurs in the context of the institution, discipline, and national landscape in higher education. Creating natural connections to these contexts helps stakeholders understand the larger picture and identifies points of synergy for communication efforts.

- ✓ **TIP: Emphasize connections to existing or planned efforts like strategic plans, major structural reorganizations, capital campaigns, national reports, disciplinary society position statements, or anticipated licensing changes.**

“The strategy we employed was to discuss the initiatives of the grant together with the institution initiatives that revolved around the strategic planning process...to come and talk about the strengths, weaknesses, threats as they related to the themes of changemaking and other strategic planning themes.

Expand the Team

High-functioning teams recognize that skills in communication expertise are required for forward motion of their change efforts. Communication expertise includes finding dissemination outlets, defining metaphors, creating documentation, and crafting rhetorical analyses of audiences.

- ✓ **TIP: Create a strong partnership with existing marketing and communications staff, hire a consultant to provide guidance on messaging and branding, or formally incorporate a communications specialist on the team.**

“[We have] a communications specialist who is not an engineer but trained in communication and she is part of our department and sees what we do but can communicate that to those outside the department. Using individuals who specialize in communication...that is a plus.”

CREATING STRATEGIC PARTNERSHIPS

A Tip Sheet from REvolutionizing engineering and computer science Departments (RED) Participatory Action Research

Creating strategic partnerships with stakeholders, supporters, and collaborators is a key tactic for change management. This tip sheet presents approaches used to create successful partnerships, using research findings resulting from focus group discussions and conference calls with NSF's RED grantees. The quotes from research participants highlight these findings. For more information, contact us at redpar@rose-hulman.edu.

Identify the Motivation for Partnerships*

Teams emphasize a broad range of possible motivations for engaging in partnerships: proactively building connections, diversifying or supplementing the team's skills, finding and cultivating advocates, attracting resources, increasing impact on- and off-campus, and more. Unclear or opaque partnership motivations lead potential partners to wonder at the value and merits of a relationship. By clearly identifying the motivation for the partnership, all potential partners can evaluate that motivation relative to their own needs and abilities to contribute.

→ **TIP:** Engage in project soul-seeking to identify the meritorious reasons for partnering on an effort and inquire about the motivations of the potential partner; being explicit and open is an advantage and helps avoid operating with an unstated agenda.

One team's work involved fitting into institutional requirements, an area with which they were unfamiliar. To advance their work, "We met with our legal counsel. So when we draft language on admissions, and when we are revising admissions standards in future years, [we know] what is or not allowable by law, and what we can articulate or not articulate. Also, [we went to] our publicity office on campus to see about how do we market or what kind of logo we can use, what kind of acronym we can use."

Align and Leverage Social Capital and Institutional Capital

Strategic partnerships begin with relationships among people, not groups. Effective change agents take advantage of opportunities to invest in relationships. From the institutional perspective, resources including technology, information access, expertise, control over decision-making, and space comprise capital that can be contributed to or requested from partnerships. Bringing the interests of the partners into alignment, along with the capital they can contribute, generates forward progress in change efforts.

→ **TIP:** Create a catalogue of the personal and institutional capital and networks "owned" by members of the potential partnership, including that of various team members; this catalogue can reveal possibilities for aligning interests among partners.

While examining ways that existing relationships could support the current project, one team discovered, "One of our research questions has to do with scalable assessment. So through another project we've gotten to know the people at an online grading platform. We're gearing up to use them on a pilot basis. They've been responsive and that has been a good collaboration so far."

Establish Partnership Goals and Governance

Change efforts involving partnerships must serve the interests of all parties, both institutionally and individually. Communication about the goals of the partnership and how the partnership operates allows all parties to remain clear on how their goals will be met. Points to consider include: what formal and informal communication channels will be used, what activities can lead to early and obvious wins for all participants in the partnership, what are the clear metrics for short-term and long-term success for all partners, and what will be the meeting schedule.

→ **TIP:** Leave no feature of the partnership unstated or assumed; although conflict is inevitable, the more specific partners are about who does what, when, to what ends, and how, the more likely conflict can be productive rather than relationship ending.

When describing the developing relationship with their university's teaching and learning center, one team stated "We had the conversation with them: how are you planning to do this? What is your timeline? What logistics are involved? We are using them to think about what parts of the courses we can flip, how to do more active types of teaching, and using different types of assessment. They're going to come back to us with some ideas and get together with junior instructor and discuss what they can do: what can you teach in a different way? How can we help you link information from one module to a different module? What does that mean? What will that look like? What can you demonstrate that shows those concepts?"

Address Struggles with Maintaining Successful Partnerships

Successful change projects invest in work of creating a shared vision for change, identifying the contributions to and impact for each partner, and re-negotiating as circumstances (e.g., institutional priorities or team membership) shift. Work styles, goals, and membership of partner groups change over time, as do the institutional pressures and responsibilities of partner organizations.

→ **TIP:** Practice the approach of "assume positive intent" on the part of partners, and use an attitude of inquiry to query the situation to discover how partners are experiencing the struggle.

In working to impact the composition of the incoming class, one team experienced challenges with their partners. They said, "Our biggest pushback is from the admissions people regarding the rules of what we can try to extract from students using survey tools, and also how to understand how to keep students. We try to get scholarships and money, but we're running into state ordinances, if they are from the state we have to take them and we can't have targeted scholarships. That's not to say we can't solicit an outside group to offer scholarships to students who are underrepresented in engineering. So how do we get past the challenges of admissions and how do we work with them...there is a staff member in admissions who was listed as a collaborator on the grant, but we try not to overly rely on him due to how busy he is. So we're trying to identify people who can work with us. If we get caught up in bureaucracy, we won't be able to meet deadlines."

*We used the partnership framework of Pamela Eddy in organizing these results.

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CREATING SHARED VISION

A Tip Sheet from REvolutionizing engineering and computer science Departments (RED) Participatory Action Research

Shared vision is a foundation for transformational and sustainable change. Shared vision brings a group of people into alignment as a coalition and force for change. Shared vision is inclusive and empowering. Rather than focus on buy-in, successful change agents create opportunities for the coalition to develop goals and plans together. This tip sheet presents approaches used to create successful partnerships, using research findings resulting from focus group discussions and conference calls with NSF's RED grantees. The quotes from research participants highlight these findings. For more information, contact us at redpar@rose-hulman.edu.

Whom Do Change Agents Engage?

Successful change agents engage a broad array of stakeholders, including faculty and instructors of all stripes, students, staff, advisory boards, local professionals, support offices, administrations, alumni, and more. The effort it takes to engage these stakeholders early in the change process is repaid through better ideas, increased engagement, and both tacit and explicit support.

- **TIP:** During a team meeting, create a master list of every member's professional relationships, with both people and groups, being as specific as possible. In other words, name names. Thinking broadly, identify which of these people and groups are stakeholders in the change effort or could otherwise participate in the vision process. Make a schedule to reach out to these stakeholders on a regular basis.

“I just want everyone to think about long lasting organizational change, you have to hear the voice of every person in that environment, the staff, the TAs, the administration, so while faculty are the drivers of the change, it will only be sustainable if everyone is on board.”

“What we call the naysayers are a critical part of our social network, we want them to be naysayers. When we were writing the proposal they would come forward and criticize and help us find any potential drawbacks so we can improve them together. They may resist change, but they're part of the intended structures. We want them there, we want them to speak up, we want to hear them so we can see the problem from various angles.”

Why Should Stakeholders Participate in Shared Vision?

Change agents can build a broad coalition for change by understanding the reasons individuals have for engaging in your change effort. Nontraditional incentives, the opportunity to engage in an open and participatory process, support from institutional leadership, and compelling evidence of the need for change all contribute to the desire for stakeholders to participate in developing shared vision. Change agents can highlight different benefits of participation as stakeholders reveal their interests.

- **TIP:** Create a living document that captures stakeholders, their needs and interests, and benefits resulting from the shared vision process. Be specific and bold in developing this list. Listen carefully and ask for clarification when stakeholders identify a new need or a new benefit.

“In my department, I made sure the first time I evaluated everyone I carefully considered their teaching evaluations. It is clear that success in teaching is important for their advancement in their career and will be part of their evaluation. Most people welcome that and said they like that we pay attention to teaching evaluations. We are also accounting for these activities in their workload. Changing the teaching style now counts as a new course.”

What Does Shared Vision Look Like?

Change agents embrace a broad conception of shared vision, including common language, shared expectations, shared sense-making, meaningful roles for all participants, and shared products. By speaking about issues with the same terms, identifying how all can contribute, and sharing the credit for impacts and outputs, change agents can shepherd the vision development process.

► **TIP:** Allow team members to specify what they expect, what they can offer, and what they need to be successful.

Put all those cards on the table. When people see the entire picture of the team context, they are more apt to be creative and inclusive about solutions and promoting the team's interests. Continue these conversations so that people's roles and contributions can evolve if outside commitments change.

"I think we've all learned a lot about what those words mean. We used social justice, humanitarian, sustainability, peace, in the proposal, but we didn't have a common understanding of what those words meant. I'm not sure any of us had an understanding of what that would really look like in engineering. We've spent some time around trying to discuss now what we think those terms mean. Certainly my understanding of them is different now...I think some of that has also influenced what we think success looks like or what the kinds of things are that we're going to do."

"Some research-interested faculty got involved in thinking about this change as a research problem: How do you make prep work better? When is the in-class time? What sessions can you develop to test this? So turning the teaching into a research problem has gotten some of the faculty interested."

What Strategies Encourage Shared Vision?

The work needed to create shared vision is significant in time invested, scope, mental effort, and impactful on the other work of change agents. Given that fact, specific, ongoing effort is needed to implement the strategies that promote shared vision. Consider brainstorming sessions, regular co-working times, collaborative management, and communication efforts as opportunities for shared vision development.

► **TIP:** Few professionals respond to being told what they should think, while many respond to telling others what they think. Facilitate scenarios that allow for opportunities to share thoughts, ideas, and perspectives. Even skeptics can participate in a change effort when change agents cheerfully request "tell me what you think," followed by solution generation and opt-in ways to continue the engagement.

"What I remember from our retreat, it was the first time the team's vision was shared with a larger group. I was surprised with how many people gave us feedback that it wasn't revolutionary enough. There were more boundaries to push. So, some ideas came out of the retreat that weren't part of the initial plan."

"I think that having everyone in the room, and having everyone feel included, really helped gain traction and gain momentum more so than we would have in other ways."

For more information on creating shared vision, see *Developing a Shared Vision for Change: Moving toward Inclusive Empowerment* (preprint manuscript) at <https://osf.io/f7jgn>. For more information on the RED program, see *Making Academic Change Happen* at academicchange.org.

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