

Passing the Torch: Lessons Learned About the Importance of Social Learning in Sharing Change Expertise Across NSF RED Cohorts

Dr. Eva Andrijcic, Rose-Hulman Institute of Technology

Eva Andrijcic serves as an Associate Professor of Engineering Management at Rose-Hulman Institute of Technology. Her major interests are in the areas of risk analysis and management, and organizational change management.

Dr. Elizabeth Litzler, University of Washington

Elizabeth Litzler, Ph.D., is the director of the University of Washington Center for Evaluation and Research for STEM Equity (UW CERSE) and an affiliate assistant professor of sociology.

Rae Jing Han, University of Washington

Dr. Rae Jing Han (they/them) is a Research Scientist at the University of Washington Center for Evaluation & Research for STEM Equity.

Dr. Nadia N. Kellam, Arizona State University

Nadia Kellam (she/they) is Associate Professor of Engineering and the Associate Director for Research Excellence within The Polytechnic School of the Ira A. Fulton Schools of Engineering at Arizona State University. She is a faculty in the Engineering Education Systems and Design PhD program. Dr. Kellam is an engineering education researcher and a mechanical engineer. She is also deputy editor of the Journal of Engineering Education and co-chair of ASEE's Committee on Scholarly Publications. In her research, she is broadly interested in developing critical understandings of the culture of engineering education and, especially, the experiences of marginalized undergraduate engineering students and engineering educators.

Dr. Sarah Rodriguez, Virginia Polytechnic Institute and State University

Sarah L. Rodriguez is an Associate Professor of Engineering Education and an affiliate faculty member with the Higher Education Program at Virginia Tech. Her engineering education research agenda centers upon engineering and computing identity development of historically marginalized populations at higher education institutions. Currently, Dr. Rodriguez is involved with several large-scale interdisciplinary research projects focused on institutional environments and STEM identity development are sponsored by the National Science Foundation (NSF) and the Kapor Center. In recent years, she was selected as an Early Career Awardee and Faculty Fellow with the American Association of Hispanics in Higher Education (AAHHE) and a NASPA Emerging Faculty Leader. She also received the Barbara Townsend Early Career Scholar Award by the Council for the Study of Community Colleges (CSCC) and gave the distinguished ASHE-CAHEP Barbara Townsend Lecture. To learn more about her current projects, visit <http://sarahlrodriguez.com/>

Dr. Diane T. Rover, Iowa State University of Science and Technology

Diane Rover holds the title of University Professor of Electrical and Computer Engineering at Iowa State University (ISU). She also currently serves as the alliance director for the NSF Iowa, Illinois, Nebraska IINSPIRE LSAMP (Louis Stokes Alliance for Minority Participation), co-leads projects in the department funded by NSF Revolutionizing Engineering Departments (RED) and Scholarships in STEM (S-STEM) programs, and is a co-PI of the NSF Center for Advancing Research Impact in Society led by the University of Missouri. Her teaching and research have focused on engineering education, high impact educational practices, inclusive educational practices, broader impacts of research, embedded computer systems, system level design, parallel and distributed systems, and performance analysis. Dr. Rover began her academic career at Michigan State University and has served in department and college administrative positions at MSU and ISU, including associate dean of engineering. She has engaged with many academic institutions and professional organizations, including community colleges, both U.S. and international universities, and various boards. She has served in various leadership roles within IEEE, ASEE and ABET. Dr. Rover is a Fellow of the IEEE and of ASEE.

Dr. Vanessa Svihla, University of New Mexico

Dr. Vanessa Svihla is a learning scientist and professor at the University of New Mexico in the Organization, Information and Learning Sciences program and in the Chemical and Biological Engineering Department.

Dr. Sriram Mohan, Rose-Hulman Institute of Technology

Sriram Mohan is a Professor in the Department of Computer Science and Software Engineering at Rose-Hulman Institute of Technology. Sriram received a B.E degree in Computer Science and Engineering from the University of Madras and M.S and Ph.D. degrees in Computer Science from Indiana University. During his time at Rose-Hulman, Sriram has served as a consultant in Hadoop and NoSQL systems and has helped a variety of clients in the Media, Insurance, and Telecommunication sectors. In addition to his industrial consulting activities, Sriram maintains an active research profile in data science and education research that has led to over 30 publications or presentations. At Rose-Hulman, Sriram has focused on incorporating reflection, and problem based learning activities in the Software Engineering curriculum. Sriram has been fundamental to the revamp of the entire software engineering program at Rose-Hulman. Sriram is a founding member of the Engineering Design program and continues to serve on the leadership team that has developed innovative ways to integrate Humanities, Science, Math, and Engineering curriculum into a studio based education model. In 2015, Sriram was selected as the Outstanding Young Alumni of the year by the School of Informatics and Computing at Indiana University. Sriram serves as a facilitator for MACH, a unique faculty development experience, aimed at helping faculty and administrator develop a change agent tool box.

Prof. Arun R Srinivasa, Texas A&M University

Dr Arun Srinivasa is the Holdredge/Paul Professor and associate department head of Mechanical Engineering at Texas A&M University and has been with TAMU since 1997. Prior to that he was a faculty at University of Pittsburgh. He received his undergraduate

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Introduction

The NSF Revolutionizing Engineering Departments grant program (NSF IUSE/PFE:RED) seeks to help departments and sometimes schools develop and implement transformative changes to dramatically change the status quo of what they have been doing. These grants support teams of faculty, staff, and students to work together in service of their transformative goals. RED grantees from across the United States are convened by the RED Participatory Action Research team (REDPAR) to learn new skills and knowledge from REDPAR and from each other (Andrijcic et al., 2025). Over the years, these convenings have become a Community of Practice (CoP) where people can learn from each other in a supportive space (Güler et al., 2024).

Learning occurs in a social context through observation, imitation, and modeling, rather than just through direct personal experience or reinforcement. In order for social learning to be effective, people must pay attention to what is happening, remember what they observed, be able to replicate the behavior, and be motivated to do so (Bandura, 1977). In the RED community, this social learning occurs within a Community of Practice (CoP), a site of social learning and identity formation (Wenger, 1998). A CoP is not simply a community. CoPs are distinguished by three elements: mutual engagement refers to members navigating issues together; joint enterprise refers to forming a shared purpose; and shared repertoire refers to developing a set of norms, ideas, and tools (Wenger, 1998). Given its inter-institutional, inter-cohort structure, with intentionally designed as well as organically developed elements, the RED CoP additionally serves as a community of transformation (Güler et al., 2024; Kezar et al., 2018). Unlike traditional CoPs, communities of transformation are usually multi-institutional networks that focus on “transforming participants’ consciousness and radically reimagining the status quo as opposed to improving upon existing practices” (Güler et al., 2024).

The RED CoP provides a space for RED grantees to engage with each other in a variety of ways - from monthly virtual meetings, to annual in-person meetings, through collaborative conference panels and publications, to collaborative development of resources for change agents (Williams et al., 2023). These activities create an interactional learning space that seems to facilitate change agency (Güler et al., 2024). The interdisciplinary, inter-institutional, inter-cohort, and long-standing nature of the CoP has helped teams better understand change-making, share resources and ideas, normalize challenges, build camaraderie, and workshop new ideas (Güler et al., 2024).

While inter-cohort interactions are frequent in the RED CoP, in 2025, five Alumni of the RED CoP (PIs and co-PIs from graduated RED teams) were invited by the REDPAR team to share lessons learned from their change efforts at the RED annual in-person meeting, via a keynote panel and mentoring of active RED teams. To identify key best-practice themes, the REDPAR team used a structured, collaborative process that drew on the combined professional experience of the RED Alumni with RED projects. Before the panel, RED Alumni first reflected individually on what they had learned from their work on the project, using a shared set of guiding prompts. They then collaboratively compared what was similar and what differed across perspectives. Through ongoing discussion and joint interpretation, the group identified common patterns and important distinctions, which were ultimately distilled into five overarching themes representing the most relevant and transferable best practices which were presented during the keynote panel.

Although the key best-practice themes were initially articulated during the keynote panel, they emerged and were reinforced through ongoing social learning interactions within the RED CoP, including mentoring conversations with RED Alumni during the RED annual in-person meeting and continued dialogue in subsequent virtual CoP meetings. In this way, these best-practice themes reflect not a one-time dissemination of lessons learned, but an iterative process of mutual engagement, shared sensemaking, and refinement over time, consistent with social learning and CoP theory.

This paper summarizes some of the lessons learned by RED Alumni (arranged in five themes), which helped their projects succeed. It's important to note that these themes may not appear in project publications, as they often emerged at different stages of the work and are primarily shared through community knowledge; accordingly, related citations may be limited.

Theme 1: Communication

Some of the major findings in this theme are centered on how RED teams tailored messages and modes of engagement to different community members (within the team, departments, students, administrators, and external partners). RED Alumni highlighted practical advice about adapting communication to audience needs, motivating participation, and responding strategically when push-back emerged. During the panel, RED Alumni shared a number of strategies they used and challenges they encountered. The following is a lesson learned by one of the RED Alumni:

Our team fostered a climate of mutual respect that encouraged open discussion of concerns, research observations, and diverse perspectives. Clear communication was maintained through email and efficiently run bi-weekly meetings focused on key updates, including conferences, data collection, and project changes, with sub-teams regularly reporting progress to ensure transparency and alignment. As new members joined, including myself as a new faculty member, we checked in to ensure the project supported individual professional goals, such as tenure,

while collectively developing a deeper understanding of large-scale grant work, including organizational structures, budgets, timelines, and deliverables.

Another RED Alumni reflected on the importance of having regular communications with audiences beyond the project team, highlighting the importance of scheduled times at annual department retreats and external advisory board meetings, for example.

Theme 2: Buy-In

It wouldn't be an organizational change project without some organizational pushback. Change is hard, and community members need to be "brought along" with the project in different ways. RED Alumni described multiple approaches for navigating differing perspectives and responses to the project. The discussion examined how support was cultivated beyond the core team, including reflections on early expectations and actual engagement, strategies for engaging and motivating additional faculty and staff, and the kinds of concerns raised by skeptics - including how teams handled student resistance when it occurred. One RED Alumni reflected:

We experienced initial push-back from students when we completely changed the curricula, threading design challenges through first-year and core courses. We identified two strategies that helped address this. First, we explained the rationale for the changes to students, including briefly sharing research that informed revisions to our approach to technical writing. Second, we sustained the changes over time, and students who entered after the revisions largely accepted the instructional approach.

Another RED Alumni suggested:

One of the ways we enhanced buy-in was to make a broad menu of options that made it almost impossible not to participate. This approach reflects the idea of a CoP, which has core and peripheral members (Lave & Wenger, 1991). By asking faculty to identify their interests and motivations and to locate themselves in the community based on the ways they were already participating, more faculty identified themselves as part of the project. We also brought change activities into existing norms and structures, such as having engineering education-focused guest speakers at the departmental seminars and discussing teaching during faculty meetings.

Theme 3: Teaming and interdisciplinary issues

Teaming issues are often related to communication challenges, shared values, and conflict. When individuals from different disciplines come together, there is a need to create a common language and understand individual motivations. The discussions around teaming and interdisciplinary issues focused on the internal dynamics of RED work, especially when engineering administrators, engineering faculty, engineering education researchers, and social scientists collaborate. This conversation foregrounded how teams navigated differences in

interpretation, power differentials, and overlapping expertise; how some teams integrated (rather than siloed) the social scientist role; and what approaches helped teams handle difficult conversations, maintain shared awareness of interactions, and reset working agreements when progress stalled. Below are lessons and experiences that were shared during the RED panel by two RED Alumni:

We resolved interpretive differences by clarifying key terms and specifying procedural steps. Power dynamics were managed through intentional inclusion, with our leader consistently seeking input from postdoctoral scholars and early-career faculty. Tensions arising from overlapping expertise were addressed by more clearly dividing tasks and responsibilities. We collaborated closely with our social scientist by regularly engaging their expertise, integrating them into all relevant activities, and inviting annual presentations from both the social scientist and evaluator to maintain transparency. Supporting their scholarly participation further prevented siloing. Although we were not aware of every subgroup interaction, biweekly updates ensured cross-team cohesion. Leveraging preexisting collaborative teaching in multisection classes was also a key to build trust and connect peripheral participants to more active participants.

One key lesson was the importance of vetting external collaborators before involving them in the change effort. When technical writing emerged as a challenge for faculty, we sought campus expertise; however, the initial consultant approached engineering faculty from a deficit perspective and promoted a rigid, one-size-fits-all model of instruction. Recognizing that such framing would hinder efforts to support student-centered pedagogy, we instead partnered with individuals who were willing to meet faculty where they were and acknowledge the institutional structures shaping their teaching. This shift ultimately enabled substantial improvements in our technical-writing instruction and fostered a productive, long-term collaboration.

Theme 4: Project continuity and sustainability

Since all the RED Alumni on the panel had completed their projects, it was a unique opportunity to understand how they were able to continue their work after the grant funding ended, and what sorts of preparation they completed before the funding ended to ensure that they could sustain key parts of their projects. During the project continuity and sustainability conversation, the discussion shifted attention to maintaining progress across the life of the grant and beyond it. RED Alumni discussed how teams managed continuity through leadership transitions (within the project and at higher administrative levels), what early decisions supported or hindered sustainability, and how teams decided what to sustain - ranging from curricular artifacts to structural, cultural, and disciplinary shifts that underpin lasting change. Below one of the RED Alumni highlights the value that the RED CoP brings to individual team members:

When navigating difficulties within my team, I found it invaluable to connect with faculty from other RED teams who had faced similar- and sometimes different - challenges. This larger RED

network became a mutual support space where we could both give and receive guidance during our institutional change work. After our RED grant ended in 2021, these connections evolved into ongoing collaborations with faculty from two other RED teams. Together, we've continued to advance institutional change and support other change agents engaged in equity-centered projects across STEM and university-wide initiatives. Though demanding, this work has been deeply rewarding and has helped expand the foundation for success among institutional change leaders.

Another RED Alumni reflected on strategies that enabled sustainability of efforts at their own institution: from helping faculty include elements of existing projects into broader impacts or educational components of new grants, thus facilitating sustainability of some elements of existing efforts; to creating structures, policies, toolkits (Turns et al., 2023) and other artifacts which can be used after the project ends.

Theme 5: Opportunities

RED teams sometimes experienced unexpected events that became opportunities, and some of these sometimes required people to work outside of their area of expertise. The opportunities discussion focused on adaptive capacity: how teams reframed unexpected events as opportunities and managed pivots that sometimes required operating beyond prior expertise. In this discussion, the panelists reflected on learning, reframing, and strategic adjustment as essential parts of change leadership rather than detours from it. Below are a couple of lessons shared by RED Alumni:

Our initial RED proposal did not unfold as planned. We had hoped to focus on mid-career faculty and support them in transforming their teaching practices, but this group showed little interest in engaging with the project. However, we discovered an unexpected opportunity: teaching-track faculty proved enthusiastic about experimenting with new pedagogies and sharing both successes and challenges through informal lunch meetings and lightning talks. Though unplanned, this pivot yielded lasting programmatic change. Their engagement fundamentally shifted our departmental culture toward valuing teaching innovation.

Working through PI changes was also an opportunity to reaffirm the goals of the RED project and reinvigorate it. It also signaled to the department that this is a departmental effort/responsibility and not just from the PI and a few core members.

Conclusion

The experiences shared by RED Alumni demonstrate that organizational change in higher education extends far beyond strategic planning - it demands adaptive leadership, intentional communication, and sustained commitment to shared purpose. By navigating communication challenges, addressing resistance thoughtfully, building cohesive interdisciplinary teams,

planning for sustainability, and remaining open to unexpected opportunities, these change leaders have not only transformed their own departments but have also contributed to a broader culture of change-making across engineering education. Perhaps most significantly, the RED CoP itself exemplifies the power of social learning: by creating spaces where change agents can connect, share lessons learned, and support one another, we amplify the impact of individual efforts and build collective capacity for transformative change. As current RED teams face their own challenges, these RED Alumni voices offer both practical guidance and the assurance that difficulty and adaptation are not signs of failure, but essential elements of meaningful, lasting institutional transformation.

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