

# **Leadership Succession in the National Science Foundation Revolutionizing Engineering Departments Projects**

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Julia M. Williams joined the faculty of the Humanities and Social Sciences Department at Rose-Hulman Institute of Technology in 1992, then assumed duties as Executive Director of the Office of Institutional Research, Planning, and Assessment in 2005. From 2016-19, she served as Interim Dean of Cross-Cutting Programs and Emerging Opportunities. In this role, she supported the work of faculty who create multi-disciplinary learning opportunities for Rose-Hulman students. Williams' publications on assessment, engineering and professional communication, and tablet PCs have appeared in the Journal of Engineering Education and IEEE Transactions on Professional Communication, among others. She has been awarded grants from Microsoft, HP, the Engineering Communication Foundation, the Kern Family Foundation, and National Science Foundation. Currently she supports the work of the Revolutionizing Engineering Departments (NSF RED) grant recipients. She has received numerous awards including the 2015 Schlesinger Award (IEEE Professional Communication Society) and 2010 Sterling Olmsted Award (ASEE Liberal Education Division).

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In leadership research, focus is often on the qualities and skills that an individual must develop in order to lead successfully. Goleman, for example, identifies emotional intelligence--self-awareness, self-regulation, motivation, empathy, and social skills--as the core leadership quality [1]. Similarly, Bennis and Thomas highlight the importance of “crucible” experiences, negative events that allow the leader to learn and grow four essential leadership skills: engaging others in shared meaning; distinctive, compelling voice; integrity; and adaptive capacity [2]. Leadership succession, however, is often relegated to status as a managerial activity intended to ensure the continuity of the project team. In contrast, we believe that leadership succession is an important leadership skill that team members should cultivate. We are learning about leadership succession in the context of National Science Foundation Revolutionizing Engineering Departments (RED) projects, academic change projects that involve diverse teams over multiple years. The RED funding mechanism is designed to support awardees in creating systemic change both to advance equity and inclusion within educational environments and to improve the professional development of students with a focus on the middle years of college. NSF requires that teams are multidisciplinary, including instructional faculty, education researchers, social science experts or organizational change experts and administrators (e.g., the department head or college dean).

As of 2021, NSF has awarded 26 RED grants to 24 institutions. Awarded institutions include both public and private schools with student populations ranging from over 4,000 to over 67,000. While the currently funded projects range in scope from one department to an entire college, the majority of RED projects focus on one department and include the following areas: chemical, biological, civil, environmental, electrical, mechanical, computer, biomedical, and aerospace engineering, as well as computer science. All RED teams share overarching goals related to transforming engineering education, while teams’ change-making processes vary. For example, one computer science-focused project from a large public institution integrates courses for undergraduates to develop industry-relevant professional skills. Another project at a smaller private institution mobilizes its focus on identity and inclusion by integrating experiential learning opportunities and implementing reflection portfolios for students to assess their own engineering identities.

In addition to funding the RED teams, NSF has also funded our work, the RED Participatory Action Research (REDPAR) project, to support the work of RED teams and to conduct research with the RED teams on the process of change in academia. Our work as REDPAR investigates research questions related to systemic change projects while also supporting connections across teams and providing customized change-making curriculum. The curriculum is designed to cultivate RED team members as change agents and to support their efforts to transform their departments and colleges. We facilitate monthly virtual calls and an annual in-person meeting for the consortium of RED teams where team members work together on activities designed to foster change-making skills. Each RED team is invited to participate in REDPAR activities as soon as their grant is officially awarded by NSF, though there is no formal requirement for participation. All teams have attended at least 24% of the monthly calls; on average, teams have attended 67% of the calls. All teams have attended the in-person RED meetings and all teams have participated in at least one focus group discussion (described below).

As defined by the RED solicitation, each RED project must be led by a department chair and/or dean. Through focus group discussions with RED project team members (part of our work as a funded NSF project described below), we have identified leadership succession challenges that are common across all teams. To probe more specifically into the issues of leadership succession, we asked RED teams to respond to a survey (Table 1). Fifteen distinct schools answered; of those, only one didn't experience any leadership changes at the project or school level at the time of the survey.

Table 1: Survey of leadership change among RED teams

Type of leadership change	% (count)
PI change	46.67% (7 of 15 programs)
High-ranking academic leadership change	85.67% (13 of 15 programs)
Change in both PI and high-ranking academic leadership	40% (6 of 15 programs)

Our survey asked about other leadership changes as well, for example, a higher-level administrator (i.e., Dean or Provost) leaving during the life of the project. We didn't specifically ask if the dean was a PI, suggesting that teams could have experienced loss of PI or loss of someone in higher administration who may or may not have been supportive of their initiative. While the RED project team members acknowledge in hindsight that leadership succession is something that they must deal with, they seldom anticipate or prepare for it in advance. Emerging from our research is the REDPAR Tip Sheet on the topic of Leadership Succession, the sixth in a series of research-based, practice-focused guides that present our findings in an accessible way. In our poster, we review our findings regarding leadership succession as it impacts RED teams to serve as a resource for all team members.

Every academic change project requires planning, from the selection of team members and identification of needed resources, to setting project goals and creating metrics. Many academic change makers, however, neglect to plan for change in leadership on their projects [3]. Leadership change can take many forms. Planning for leadership succession should be a component of a project team's planning process, since leadership changes are likely in today's volatile academic environments. Based on what we are learning from the RED teams, we have identified three specific components of effective leadership succession planning. In the discussion below, we support our findings with quotes from focus group discussions and conference calls conducted with RED grantees. The quotes from research participants highlight these findings.

### **Preparing for Leadership Succession at the Start of a RED Project**

Ideally every project team—whether a RED team or not—would plan for leadership succession at the start of their project. While leadership change in other aspects of academia—such as presidential leadership changes, for example—is slow moving, leadership change in projects like RED occurs frequently and quickly. As we stated earlier in this paper, leadership changes have been regular occurrences for which the team members have often been unprepared. While many RED teams have experienced leadership change, few have planned for leadership succession by creating a

plan that can be implemented when (not if) leadership change occurs. A basic plan would consist of documenting team roles, responsibilities, task lists/task status, to name a few of the operational dimensions of the change project. There is, however, more than operational concern.

We see several important aspects to leadership succession preparation. First, project teams are best served if the vision for the project is shared by all team members, rather than being the vision solely of the principal investigator or a small leadership team. We have discussed creating a unified voice elsewhere [4], and we invite ASEE attendees to consult that resource listed in the References. Second, documentation of team values, specific talents of team members, communication preferences among the team members, and other dimensions is particularly important to create in advance of a change in leadership.

### **Using Unified Voice as a Tool in Leadership Succession**

A change in leadership within a project or department has a direct impact on both the immediate tactical direction, as well as the long-term strategic direction, of the change project. When a leadership change seems likely, change teams should use this time to ensure that the entire team and the new leadership is on the same page. Realigning the team around a unified voice for change will lay the foundation for long-term success [4], [5].

Based on our work with RED teams, we recommend that the project team revisit the project's vision (often a part of the original NSF proposal) and facilitate a conversation that encourages all team members and the new leadership to share their thoughts, ideas, and perspectives on the change initiative. Having a unified voice will help rally the team and provide a sense of mission for the team to follow. This is reflected in the quote from a RED team member below:

When the [RED] proposal was funded, I had already stepped down from my leadership position... We had new faculty, new leadership, and that really forced us to sit back and think about what we wanted to do now that all the players had changed, and so we spent really a whole year just trying to redefine what we're doing.

### **Leadership Succession as an Opportunity**

A change in leadership at the department/college/university level can also provide an opportunity for the team to expand the reach of the project. Teams must invest time and resources into cultivating relationships with the new leadership hierarchy. These relationships can help sustain their change initiative by making it part of the organizational culture. Teams must also be aware of some challenges as they attempt to spread their change initiative beyond the initial project boundary. Each department has its own microculture and teams need to be flexible as their effort is adapted to other contexts. We recommend investing in relationships and partnerships with stakeholders and academic leadership who can help embed the principles of the change initiative as a part of the rituals and culture of the organization [6], [7]. This finding is reflected in the quotes below from two different RED project team members:

[Change in leadership] has helped us expand beyond [our engineering discipline]. We had to be adaptable to make these transitions in leadership. As we try to support other departments getting them on board and making some of these changes college-wide, we have to be adaptable because every department has a different context. Our transitions have been a

learning experience in having to be adaptable.

I would say one unforeseen benefit has been the direction that the institution has taken. We have hired a new President and we had a strategic planning process unfold after the grant was funded. In our efforts to align the goals of the grant with the direction of the institution, we were able I think to achieve greater buy-in across the institution. The goals of our grant have resonated with some of the goals of the strategic planning process... Rather than swimming against the wave, we've been able to swim in the direction that the tide has been flowing. That's been useful, especially for resource allocation and thinking about new directions moving forward.

## **Conclusion**

Through working with RED teams to support their change processes, we have learned that leadership succession planning is rarely planned for but happens regularly. We suggest that change teams 1) explicitly discuss succession planning in their projects, before it is necessary, 2) work to create a unified voice for the project with the new team composition, 3) be flexible with assignment of existing tasks and responsibilities as new team members come in with new talents and skills, 4) invest in relationships, and 5) embed principles of the change initiative into the rituals and culture of the organization.

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