Developing a Shared Vision for Change: New results from the Revolutionizing Engineering Departments Participatory Action Research

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Abstract

This research paper describes participatory action research with change agents who are engaged in making academic change on their campuses through the NSF REvolutionizing Engineering and Computer Science Departments (RED) Program, focusing on the first cohort of awardees. Through REDPAR (RED Participatory Action Research), an NSF-funded collaboration between Rose-Hulman Institute of Technology and the University of Washington, we work with the RED teams to investigate the change process and also provide training and support. This paper addresses one of the research questions guiding the study, "How do change agents empower stakeholders to develop a shared vision for change?" We find that the RED teams have pursued different paths to engage their respective stakeholders, from building strategic partnerships with external stakeholders such as industrial advisory boards to initiating structural changes to shift internal culture in their institutions. We envision that these results will 1) demonstrate practices for initiating change in engineering and computer science departments, and 2) help other organizations understand how different types of stakeholder engagement can propel or decelerate a large-scale change project.

Introduction

Within the science, technology, engineering, and mathematics (STEM) education community, there are repeated calls for changing the way we educate our students (Fry, 2014; Vest, 2006). And yet, despite the development of research-based teaching strategies, innovative co-curricular projects, and many years of funding and development from a variety of foundations and corporations, change in STEM education is not pervasive. The lack of systemic change points to an important problem with the approach to change that the STEM education community has pursued thus far: change has been targeted at the course and curriculum levels, rather than at institutional levels. This research paper describes participatory action research with change agents who are engaged in making academic change on their campuses through the NSF REvolutionizing Engineering and Computer Science Departments (RED) Program. The first cohort of RED recipients began their grants over a year ago, with the second cohort joining them in the change process in the summer of 2016. A third cohort will be added in summer 2017.

In line with participatory action research (Reason & Bradbury, 2001), this project seeks to produce knowledge and action that is directly useful to the RED awardees. We bring together theories of institutional change within higher education (Kezar, 2001; Kezar & Eckel, 2002) in order to understand how each RED team conceptualizes the change process. Through REDPAR (RED Participatory Action Research), an NSF-funded collaboration between Rose-Hulman Institute of Technology and the University of Washington (UW), we work with the RED teams to investigate the change process and also provide training and support. This paper addresses one of the research questions guiding the study, "How do change agents empower stakeholders to develop a shared vision for change?" The teams have been developing shared visions for change within their institutions as part of the early steps of the change process. The first cohort is farther

along in this process and is thus the primary focus of this paper. The present time is apropos for reflecting on effective strategies and remaining challenges for the first cohort for incorporating stakeholders in visioning, as the second and future third cohorts may be able to incorporate these strategies.

Context

The NSF RED program is designed to support awardees in creating sustainable change in engineering and computer science higher education, both to improve undergraduate educational outcomes, through a focus on the middle years of undergraduate education, and to create a more inclusive environment for students and faculty. The projects range in scope from one department to multiple departments to college-wide. Project goals include incorporating social justice components throughout the educational process; imbuing curriculum with an intense focus on project based learning and using flipped pedagogies; utilizing a maker mindset to encourage innovation and risk-taking; and dismantling the traditional isolated course structure in favor of modules and threads.

NSF aims for the innovative changes designed and implemented by the RED awardees to be scalable and adaptable to a wide variety of institutions. Further, NSF envisioned the RED awardees working as a consortium (REDCON) to advance and promote the outcomes of their work. The REDPAR project is designed to facilitate the consortium-level work, provide training and resources on academic change, and to conduct research on the change processes occurring at and across project sites. The Rose-Hulman members of the REDPAR team provide consultation, offer monthly consortium calls, and facilitate in-person professional development workshops for the RED teams. These training resources were developed by the research on organizational change (e.g. Foote et al., 2016; Henderson et al., 2011; Lester & Kezar, 2012) and have been used in Rose-Hulman's Making Academic Change Happen (MACH) project. The UW members of the REDPAR team (i.e., the authors of this paper) investigate the academic change processes occurring across the schools through a participatory action approach, co-producing knowledge with the team members.

In the case of incorporating new teaching methods and curricular designs to STEM academic programs, education entrepreneurs manage both technological innovations and the people and organizations that will implement the innovations. In the proposal development stage, RED applicants strategized about which curricular innovations would be best suited for their institutional contexts. They planned how to implement these changes, but these plans were not often made in open deliberations within their institutions. Reaching out to stakeholders happens after the grants are received, and this is when the real groundwork for the change project commences. To begin their educational revolutions, RED recipients needed to connect with department constituencies and garner their support. This paper focuses on one of five REDPAR research questions: How do change agents empower stakeholders to develop a shared vision for change?

Literature Review

The structures and strategies of change can be approached from many different theoretical and methodological perspectives (Barnard and Stoll, 2010; By, 2005; Kezar, 2001; Kingston and

Caballero, 2009). Because the change processes studied here were all prompted by a specific call for proposals (CFP), we narrow our focus to the approaches to change represented within that CFP. The RED CFP established that the desired change processes should be inclusive. It asserted that "agents of change come in all forms (faculty, students, staff, administrators, other program partners) and all should be empowered as actors of transformative change" (NSF). The NSF Engineering Division clearly specified that the departmental change they seek should use an expansive conception of *stakeholders*, meaning all the individuals who can contribute to the change or who are affected by it (Freeman, 1984; Benneworth and Jongbloed, 2009). When enacting large-scale institutional change, it is especially crucial that change leaders "construct networks of complementary players that collectively possess the skills and resources needed to achieve success" (Hargrave and Van de Ven, 2006: 869) in re-making an institution. These change agents (i.e., new-found collaborators with the change leaders) are drawn from stakeholder groups; limiting stakeholder engagement will preclude potential change agents from furthering the change process and could be crippling. As Kezar (2014) observed, "The fewer people that are involved, the more likely externally imposed changes will take a long time because key individuals needed to move change along will be unaware" (55). The list of "faculty, students, staff, administrators,, and, other program partners" calls attention to the fact that individuals at all levels, not only at the top of an institution, have considerable power (Kezar et al., 2011) to shape a change process. No individual within or partnered with the department should be seen as inconsequential.

Institutional context drives *how* change leaders empower stakeholders to become change agents. Kezar and Eckel (2002) observed several strategies of stakeholder empowerment in three different higher education institutions. Reflecting a high level of trust in senior administrators, one institution kept strategic planning informal, which communicated that the change process was flexible and not heavy-handed. Another developed an institution-wide process for soliciting input and investing stakeholders with power to affect plans and outcomes. The third operated under devolved authority, entrusting individual colleges with designing their own plans to align with the institution's broader goals. Change agents must be able to read their institutions' culture, Kezar and Eckel concluded, in order to develop effective strategies for empowering stakeholders within their specific contexts. Empowerment can take different dimensions, and there are no bounds to what it looks like. The crux of empowerment is its result, not its process.

Why empower stakeholders to develop a shared vision for change?

Stakeholder empowerment is not a strategy to eliminate resistance, although it may have that effect. Its real goal is to preempt ethical issues in a change process. In an age when "most of the current ethical frameworks for organizations, as well as in society, operate from the notion of the importance of deliberative stakeholder processes" (Kezar, 2014:214), change leaders must consider how stakeholders can be included in more than a nominal way. University colleges and departments are diffuse institutions, not organizations with strong hierarchies (Kuhn, 2008), which further cements the importance of empowering stakeholders to be change agents. University structure and culture predicate the involvement of a broad range of individuals to enact change.

Furthermore, the scope of RED projects, and the pervasiveness of departmental change more generally, requires that department constituencies modify their roles and job duties, which might

be perceived as changing the psychological contract (Barnard and Stoll 2010) between the department and its employees. Changing expectations can be a source of discomfort and opposition, but trust in change leaders can mitigate these feelings (Oreg, 2003). A key task for RED project personnel, then, is to develop and maintain the trust of department stakeholders. RED teams can accomplish this through developing a shared vision for change.

Developing a shared vision is a cooperative effort of creating and agreeing on the frames (Benford and Snow, 2000) of the change project, including the goals, strategies, roles, and individuals involved. Shared vision is an ongoing process that can and should occur at any stage in a change process or in the life of an organization. Through envisioning together, leaders and stakeholders establish and re-establish shared language and shared imagination of the future (Kezar 2014). Inviting stakeholders into the visioning process is an act of co-orientation that helps project leaders and stakeholders "tune in" to each other (Kuhn, 2008). Co-orientation is a way to "marshal consent" (Kuhn, 2008) for the new rules of organization and action. Co-oriented stakeholders become a community of change agents that can influence their peers and encourage buy-in and adoption of change (Luthans, 2002). These individuals can continue communication with more hesitant or resistant individuals. The growing network of collaborating change agents can disseminate the new concepts and cultural models (Rao, Monin, and Durand, 2003) and multiply the efforts of the change leaders (Lozano, 2006).

Shared Vision and Resistance

Changing curriculum and culture is difficult. The NSF Engineering Division has sponsored a few different programs for creating change in engineering education, and the RED CFP reflects the division's institutional learning. The RED CFP called out "barriers to faculty adoption of engineering or computer science education innovations" (NSF) as a particular focus for proposals. In tandem, RED proposals are to demonstrate "[a,n appreciation that faculty participation, engagement, development, and belief in the scholarship of learning are critical to success" (NSF). NSF recognizes that a major challenge for departmental change is engaging and eliciting cooperation from faculty. Resistance can stem from many issues, such as perceptions of ethics transgressions, lack of information, and misinformation. Developing shared vision can co-opt resistant faculty and fold them into the change process, giving them input as well as the opportunity to learn more about it (Luthans, 2002). Embracing faculty and other stakeholders as full partners through a shared vision process is a proactive way to expose concerns and strategize about incentives for change adoption. While visioning for the change project might be a site of contestation and conflict (Hargrave and Van de Ven, 2006) which can be a barrier for the RED leaders' success in instituting change, the process is also an opportunity for RED leaders, faculty, staff, and other stakeholders to dialogue about their hopes and fears. In fact, conflict within the visioning process can be productive and generative (Coser, 1957; Hargrave and Van de Ven, 2006) if RED project leaders are able to adapt to alternative ideas and address stakeholders' concerns. A shared vision process is more complex than simply building buy-in for a project. While shared vision and buy-in certainly have overlap, the former requires more time, energy, and broader stakeholder engagement than is typically needed for buy-in.

Methods

Utilizing qualitative data from focus group discussions, we examine the importance of various communication strategies employed by the first cohort of RED teams in their efforts to build faculty buy-in and develop feelings of inclusion and ownership. We use this data to describe how RED change agents empower stakeholders to develop a shared vision for change.

We conducted focus group discussions via phone or video conference call with all six first cohort teams. The focus groups were conducted in November and December 2015, which was approximately six months into the first grant year. These focus groups were designed to gather information on the initial stages of the RED projects, including preparation, relevant previous experiences, successes and challenges encountered thus far, institutional climate, and expected outcomes. Two members of the research team attended each focus group, one to facilitate and the other to take notes and transcribe the discussions.

Focus group content and consent procedures were included in comprehensive review of REDPAR research plans by the UW Human Subjects Division, which granted exempt status to the project. At the start of each focus group, the facilitator reviewed participant rights and researcher responsibilities before requesting affirmative verbal consent from each participant. After reviewing the transcripts, we developed a coding scheme to catalogue institutional context, motivations, aspirations, team dynamics, communication strategies, engagement with stakeholders, and progress towards change goals. Using Nvivo qualitative data software, each transcript was read three times and coded on the second and third reads.

To protect confidentiality, we have created pseudonyms for the six schools. The Crossing State University RED team is instigating change within an engineering department that is part of a large college of engineering. The RED project at Heritage University is likewise introducing change to a specific department within an engineering college at a large university. At Midland State University, the goal is to revolutionize a whole college at a large university. At the medium-sized Northern University, the RED team is working to change a whole college. At New University of Technology, a medium-sized university, RED change leaders are reimagining a department within an engineering college. The final RED team is located in a department at University of the Valley State, a large, urban institution.

Results

Who and How

RED teams described talking to a variety of stakeholders when kicking off their projects. Some commonalities emerged in how they engaged with people at their universities. The RED teams had begun to work with a range of individuals and groups, including faculty, advisory boards and local professionals, and students. Outreach to stakeholders had occurred mainly through meetings with stakeholder groups, but propinquity lent itself to informal conversations as well.

The focus group discussions about stakeholders focused on faculty, with occasional mentions of other constituencies. Four of six teams led workshops during faculty retreats or planned separate faculty retreats. The fifth school, Northern University, held a series of informational meetings for faculty. The sixth, Heritage University, encountered considerable difficulty in communicating

with faculty due to institutional structure; the university college was split into several sub-units that were not organized to coordinate across faculty in sub-units. "There are so many people it is hard to get them all together at the same time. It's even hard to get on agendas for smaller groups," reported a Co-PI. "I feel like the machinery…was not in place to get word out." The team at this university was in process of sending a representative to faculty meetings for each sub-unit.

Three schools (University of the Valley State, Crossing State University, and Heritage University) contacted advisory boards already connected to their departments or colleges, two of whom had been able to schedule meetings and noted support and excitement from these boards. Another team, Midland State University, was developing a new network of local professionals interested in providing professionalization opportunities. Three of the six schools mentioned staff once each (University of the Valley State, Crossing State University, Heritage University), but not in connection to shared vision for change. No team commented on specific outreach to staff or their inclusion in department meetings or retreats about RED projects, although this may have occurred without our knowledge. Two sites (New University of Technology, Northern University) described undergraduate or graduate students as end-recipients of their projects but not participants in the change processes, and only two sites indicated that they had engaged in outreach to students about project goals (Midland State University, Heritage University).

All of the RED teams conceptualized faculty as their primary stakeholder group. The project teams are primarily composed of faculty or academic leadership, so it is unsurprising that these individuals looked first to their peers for implementing change in their units and in classrooms. Furthermore, faculty were foremost in project teams' minds because they were anticipated to present the most challenges and yet were described as "critically important" to project implementation. A Co-PI at Midland State University explained, "I do not expect problems with buy-in at higher levels.…If we are going to get anywhere close to our goals,…[t]hat is our biggest challenge, getting sufficient numbers of faculty to be proponents and be engaged."

At the beginning stages of their change projects, a few RED leaders were encountering some of the predicted reluctance of faculty. Among the faculty at Heritage University, "there is ambivalence, not outright obstruction," observed a Co-PI. This Co-PI guessed that early-career faculty were hesitant about an increased time commitment when their burgeoning careers already required an immense time investment.

While Northern University project leaders expressed particularly high levels of apprehension about gathering support from faculty members, they had some success with mitigating resistance. Prior to their school's information sessions about their project, faculty had developed misconceptions about the project and its scope. Faculty thought their work would be irrelevant to the planned changes or that there would be no professional compensation for involvement in the changes. The information sessions were able to communicate information to dispel these rumors. Turnout was higher than expected, and backlash was lower than expected. Heading towards actual implementation of their project's plans, Northern University project leaders were only encountering resistance from a cadre of faculty who routinely resisted change and offered no RED-specific opposition.

In sum, all RED project teams had begun communication with some of the stakeholders in their change project and courted support for the projects' goals. Some teams had contacted a broad range of stakeholders, while others limited their scope to faculty. Staff and students were generally not targeted for engagement, to our knowledge. Teams used faculty retreats, unit faculty meetings, and RED-specific information sessions to communicate about their projects with stakeholders.

Communication with Stakeholders: Informational versus formational

While teams were thinking about stakeholders and could describe interactions and plans for communicating with them, oftentimes communication with stakeholders appeared to be for the purpose of disseminating information (informational) rather than to develop shared vision (formational). Only about half of the discussion about communicating with stakeholders concerned vision-building, formational communication that evidenced the project team inviting stakeholders to influence plans for change. Teams displayed different philosophies of how to engage with stakeholders, in part as responses to their institutional contexts.

At, Northern University, rumors and misconceptions backed team leaders into focusing on information-focused communication. Project leaders had not consulted with faculty at the earliest stages of the project. Consequently, discussion at the information sessions centered on clarifying the project scope. Some faculty expressed disappointment about items they thought had been left off the project, and the team explained that it did in fact include these components. The team was not able to focus on accepting influence (Small and Rentsch, 2009) or developing a consensus about the vision in these key meetings.

Since Crossing State University, had a considerable foundation in a previous curricular change program, discussion of project progress in the focus group covered faculty roles within the institution more so than ways the project team had begun to communicate or engage with faculty. Faculty were already involved in, and seemed to therefore already have shared vision about, a central project component that had departmental coordination across courses. A Co-PI described, "We have a structure where faculty had already bought in and given up autonomy for a part of their course. That enabled us to do this because they were more willing to work on this." Another Co-PI, a social scientist, noted that "[they] took a lot of time to think about rolling it out to make sure it wasn't being 'imposed.'" Though they did not delineate their process for developing buy-in, the social scientist mentioned that, for a project to be successful, it was important to "develop a set of shared goals."

One institution, New University of Technology, had experienced frequent curricular change in its recent history, so its RED team chose to study faculty values before making a strong pitch about another set of changes. RED projects incorporate cultural change with curricular change, and this team wanted to understand their faculty culture in order "to tag onto that value system." For this team, shared vision started with ensuring that "[faculty] feel their ideas are being valued and they have good ideas and they are getting something out of it." This team treated other faculty as partners with expertise in the local context. The combination of solicitation and response is a formational communication process whereby the team empowered faculty stakeholders to shape the institutional structures that will reward cooperation and implementation. Faculty described

what cultural values should be maintained, and project leaders now have critical insight into what sorts of cultural change will be most welcome.

University of the Valley State outlined a similarly formational communication process, but this team pursued a different strategy. They held their first faculty retreat about the grant before they submitted their proposal to NSF "to make sure before we went forward with the proposal that people were ready with the concept and all on-board." After receiving the grant, the leaders called a second faculty retreat to review the plans and re-establish shared vision. Project leaders showed openness to feedback and accepted influence from retreat participants. One of the leaders reflected, "I was surprised with how many people gave us feedback that, our project, 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." This team modeled a second path to sharing a vision for change that engaged the largest set of stakeholders at all stages of the project.

Strategies for developing a shared vision

The successes and challenges experienced by the six first cohort RED project teams highlight seven strategies for developing a shared vision for change.

New University of Technology, University of the Valley State, and Midland State University envisioned **incentives** as a way to counter or preempt resistance. Team leaders at University of the Valley State concluded that a prior change effort did not stick because it had no incentives aligned to it. For this change project, they designed an incentive structure to restructure teaching loads and reweight faculty teaching evaluations. Midland State University also rebalanced faculty reviews to give more weight to teaching evaluations. The New University of Technology team observed that "the reward structures don't align with the change, they, want to make," so they were researching what incentives would align with faculty values.

Two of the teams communicated that the RED projects had **leadership support**, either directly or indirectly. At a faculty retreat, the Crossing State University team "sent the message that RED was not an imposed thing and not a thing this little group is doing on the side." They located the authority for the project as coming from college leadership while simultaneously offering partnership instead of authoritarianism. In a different approach, the Midland State University team developed communication themes consistent with the Dean's already-established strategic planning vision for their unit.

The Heritage University project team had "a built-in level of **trust**" because one of the project leaders is a school graduate and has personal history with the faculty. Team members thought that this individual had the highest rapport with faculty and experienced the most success in developing buy-in.

Similar to Crossing State University, the Midland State University team did not want to impose change on faculty, but wanted to convince them, in part, through the **evidence** of their success. They had created opt-in support and incentives for curricular change and then invited the change adoption process to occur naturally. The project manager elaborated, "We have a strong base of faculty who have begun, and we have data, so they can see the evidence. We are hoping that,

along with the messaging, will recruit more faculty." This team plans to use data and evidence of early successes to motivate additional faculty to be involved.

Teams reflected on the need to be **respectful** of improvements that had already been made as well as the faculty's existing strengths. One team, Northern University, experienced some push-back because initially "[faculty] felt like people weren't honoring what was already done." A Co-PI from New University of Technology said, "We haven't just jumped out and said, hey RED is here we're going to fix you … we want to be cognizant and respectful."

Engaging stakeholders in **cooperative** ways can also be a strategy for developing a shared vision for change. In meeting with an external advisory board, the Crossing State University project leaders initially felt anxiety and insecurity about how the advisory board would respond to their pitch. However, the meeting was "tremendously successful in terms of the advisory board seeing how they could contribute to the project now and over time." The board supported the project because they agreed on their cooperative role in the project.

One of the teams told us that they thought strategically about the **order of engagement** of key stakeholders, although we expect that other teams also had these conversations. At the first RED PI meeting, the Rose-Hulman members of REDPAR facilitated an exercise to help team members consider strategic relationships from the dual axes of level of influence and interest. The RED team at Heritage University told us that they strategized about which key individuals to develop buy-in with first, after participating in this exercise during the annual PI meeting. The Crossing State University team also returned to the context map they made at the annual meeting to deliberate over how to dedicate their resources effectively.

Discussion

The results from the first cohort of RED schools suggest that there are various successful ways for departments/schools to engage stakeholders and build buy-in. From building strategic partnerships with external stakeholders such as industrial advisory boards to initiating structural changes to shift internal culture in their institutions, we find that the RED teams have pursued different paths to engage their respective stakeholders, in part because of their institutional contexts. While a couple of the schools described what sounded like multi-stage shared vision processes, most of the responses we heard from team members were about buy-in. We do not know if we are finding mostly buy-in related comments because that is what the groups are focusing on or because our data is limited at this point in time. We plan to continue to ask about shared vision to understand the depth of the engagement with stakeholders at the participating schools.

Below we reflect on practices for initiating change in engineering and computer science departments and provide some take-aways that other organizations can use to understand how different types of stakeholder engagement can propel or decelerate a large-scale change project.

Think about timing from the beginning

The RED teams engaged with diverse stakeholders to different extents, with some teams focusing on faculty members and other teams engaging students, staff, and advisory boards as well. Research indicates that in the first stages of a change process, it can be difficult or

impossible to enact change for all stakeholders (Lozano, 2006) and change leaders must prioritize what changes to make first and which stakeholders to target. University of the Valley State was able to engage with faculty stakeholders on a deeper, formational level because they had already done the work of getting buy-in during the proposal process. This graduated buy-in resulted in the ability to move forward more quickly once the grant was received. In contrast, the Northern University RED team did not engage their faculty stakeholders during the proposal process, and have spent a good part of the first year of the grant informing their stakeholders, and better understanding how to make the proposed activities fit within their department/school culture.

It is especially important to start with a shared vision, but the literature (Bruhn et al. 2001) suggests that involving stakeholders throughout all phases of a change process is important. We will continue to examine this issue with the RED teams as they move through their grant periods.

Context matters for this work

The context of a given program and previous curricular or culture changes that have been attempted (successfully or not) can cause additional barriers for creating a shared vision for change. One of the RED teams described needing to understand the faculty culture better before moving forward with their changes because in the past, there had been multiple attempted curricular changes which were not very successful. In this case, history caused reticence on the part of the faculty and meant that the team needed to develop a deeper understanding of needs and values before moving forward.

The tactics or strategies used to develop a shared vision for change are highly influenced by context. The lack of hierarchy with minimal oversight of faculty is a key context important to understand when examining changes within academia. Even the best ideas would experience resistance if they were pushed down from top leadership. In academia, perhaps even more than industry, it is important to engage in a process with all stakeholders to create a shared vision for change. We heard from teams that they valued strategies such as respect, cooperation, and trust; these are good strategies to use with peers when trying to make changes from the "bottom-up." However, at least two of the teams described using the support of top leadership to help get buy-in for their projects. In addition, the use of different kinds of incentives, and building those incentives into existing department or college structures, is something that may not work at all schools, depending on organizational cultures and leadership buy-in. Similarly, the context can make a difference for communication strategies when the day-to-day leadership of the RED team is a relatively new faculty member compared to the dean of a college.

Inclusive empowerment for a collaborative change process

Focus group participants named faculty, students, administration, and practicing professionals as stakeholders in the change process. However, RED team members described buy-in almost as a uniquely faculty-oriented process. Conversations separated buy-in and stakeholders, as if to categorize constituencies into whether they were involved in implementation versus generally impacted by the change processes. Faculty became the primary constituency in the "buy-in needed" group since the change processes require their commitment. And yet shared vision is not only a result of buy-in. In fact, shared vision is an on-going and collaborative process rather than

an achievement. The very language of "buy-in" implies that there is a context or situation to which the faculty are committing, ahead of the actual planned activities. This logic prompts informational communication, in which change leaders provide details about plans and goals, essentially offering a proposition for faculty to join or resist.

In contrast, formational communication empowers faculty or other stakeholders to contribute to the change process, offering alternative or additional ideas for goals or how to implement the change. Several teams had engaged in formational communication, but without establishing continuing processes for formational communication, they had not quite developed shared vision. Their empowerment of stakeholders was inconsistent. At least in what they reported, teams' empowerment of stakeholders was also uneven; students and staff were largely left out.

Obstacles and challenges

Obstacles described by the teams included not getting faculty members engaged early enough, which limits the formational communication that can occur and requires more informational communication. In the case of schools experiencing ambivalence or resistance, this research indicates that empowering faculty to voice their concerns and offer suggestions about project design might alleviate some of the concern and move the faculty from ambivalence to active support.

The conclusions that can be drawn in this paper are limited by the timing of the grants so far. It is still early in the change process—we can discuss the apparent strategies and challenges so far, but the timeframe does not allow us to assess how these strategies impact the overall success of their projects. Further, these conclusions are limited in that all of the change projects within this study exist within the context of receiving an NSF RED grant, and thus we are unable to tease out the specific impact of this context. Finally, the results would be strengthened with the results from the second cohort of RED teams, as the data are currently from a very select sample of schools.

Acknowledgements

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