Shared Vision for Change in STEM Education: Linking Research to Practice in RED Projects

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Abstract*— This Research to Practice Work in Progress paper addresses the importance of creating shared vision for change in STEM education. While many educational reform initiatives accomplish their goals in the short-term, only systemic change can truly improve quality and inclusion in engineering and computing education. Developing shared vision is an often repeated recommendation for effective and sustainable change from organizational consultants and scholars of higher education). In our work, we have found that embracing stakeholders as full partners through sharing vision is a proactive way to expose concerns and incorporate a variety of viewpoints into the change process. Shared vision is a useful concept that can be made more accessible and actionable through social scientific research on how change-making teams engage and empower stakeholders to collaborate on their projects.

Keywords—shared vision, academic change, communication, teams.

I. Introduction

This Research to Practice Work in Progress project addresses the importance of shared vision for change in STEM education. While many educational reform initiatives accomplish their goals in the short-term, only systemic change can truly improve quality and inclusion in engineering and computing education. Developing "shared vision" is an often repeated recommendation for effective and sustainable change from organizational consultants [1] and scholars of higher education [2]. Embracing stakeholders as full partners through sharing vision is a proactive way to expose concerns and incorporate a variety of viewpoints into the change process. Building shared vision requires broad stakeholder engagement and infuses the change project with both personal agency [3] and effective participation. The recommendation of shared vision resonates with educators and administrators trying to build coalitions for change, but it is difficult to implement due to a limited understanding of what shared vision includes and how to cultivate it across stakeholders.

II. Project Context

Shared vision is a useful concept that can be made more accessible and actionable through social scientific research on how change-making teams engage and empower stakeholders to collaborate on their projects. In this longitudinal study of teams making cultural, structural, and curricular change in engineering and computer science departments, we examine strategies for developing and sustaining shared vision. Our methodology is abductive, moving recursively between data and theory-building to remain open to new or contradictory findings, keeping existing theory in mind while not developing formal hypotheses [4]. The data in this study comes from our participatory action research with university change agents activated through the NSF REvolutionizing engineering and computer science Departments (RED) Program. Through an NSF-funded collaboration between Rose-Hulman Institute of Technology and the University of Washington, we are working with these change-making teams to investigate the process of change and facilitate consortium-level community, training, and support. We coded monthly group calls and focus groups collected across three years using a coding scheme based on initial reviews of the data we collected and studies of academic change by Kezar [5, 6] and Kezar and Eckel [7]. The full coding scheme included motivations, institutional cultural and organizational contexts, team dynamics, engagement with stakeholders and partners, communication strategies, and progress towards change goals.

III. Initial Findings

We have found that in the initial stages of their projects, the language used by many teams belied a lack of true

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partnership or specific plans on how to achieve shared vision. This contrasted with clear desires for stakeholder cooperation, especially by faculty. One focal point for this contradiction was the language of buy-in. As a concept, buy-in is limiting for PI teams. It predisposes change leaders to favor informational communication in order to get stakeholders excited about decisions, rather than formational communication that involves them in decision-making. Searching for buy-in prompts leaders to think about overcoming resistance and counter-arguments, rather than accepting input and collaborating.

As contexts have changed and projects progressed, teams have adjusted to meet challenges and include more stakeholders. They learned from their experiences and adopted new strategies targeted at improving inclusion and empowerment to solve specific problems they did not identify at the outset of their projects. We find that teams establish shared vision with stakeholders through appealing to a range of motivations, honoring what has come before them, engaging stakeholders via strategies of co-orientation and integration, and sharing the labor of change. One important outcome of our work has been a four-component model for cultivating shared vision: co-orienting stakeholders through communication; establishing agency; co-creating project products; and honoring what has come before. These four components were derived from the research data of our project and reflect the closing of the "research-to-practice" loop. The model is best illustrated through examples of campus practices that we have collected from the RED projects.

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