PRACTICAL STEPS FOR INSTITUTIONAL LEADERS TO FOSTER SYSTEMIC CHANGE IN SUPPORT OF EXCELLENT STEM UNDERGRADUATE EDUCATION

Conversation Module 5

Presented by Kacy Redd at the meeting of the
Roundtable on Systemic Change in Undergraduate STEM Education
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WHO IS THIS MODULE FOR?

This module is designed for dedicated but time-pressed leaders who want to ensure that the undergraduate educational experiences offered by their institutions serve the needs of the full array of students in higher education today. While specifically relevant to presidents, provosts, and deans, it may also be helpful to department chairs working with their faculty colleagues, student affairs leaders working with their staff, and other institutional leaders, including those with informal but influential power. We encourage senior leaders to work with other dedicated colleagues to define institutional change goals and co-develop and align strategies that will deepen the educational experiences and the learning outcomes for all of today's students. In the context of planning strategically to manage changes and challenges facing higher education, institutional leaders have reason to focus on the quality of the undergraduate learning experience and student retention.

The ideas in this module complement those offered in other modules that discuss ecosystem approaches to institutional change (Module 2), the nature of STEM academic culture (Module 3), and the definition and importance of creating institutions fully ready to support students' learning goals and needs (Module 4).

KEY IDEAS IN THIS MODULE

STEM education contributes to national goals such as ensuring the country maintains economic security and global competitiveness, healthier communities, and leadership in innovation in science. Meeting these goals requires that institutions provide environments where students experience the opportunity and support that leadto success, seen in graduation rates, fruitful employment, and meaningful lives. Yet many students encounter challenges and barriers throughout the postsecondary educational experience. These challenges include, for example, navigating unclear transfer policies and confusing degree pathways, accessing rich experiential learning opportunities (e.g., research experiences or internships), and grappling with the financial demands of higher education. Institutional leaders committed to supporting and achieving student success can guide their institutions to create learning environments that build bridges from student aspirations, aptitudes, and experiences to learners' growth and success.

Leading significant change initiatives to foster such effective learning environments involves guiding and collaborating with colleagues to create an inspiring vision that defines the change goal. Institutional leaders also have a platform from which to amplify and reinforce the vision and the importance of the change goal–and they should use that leadership platform to encourage institutional involvement in advancing the vision and change goal. Effective change leadership involves empowering key stakeholders to collaborate and work toward the goal. Such a goal must recognize that a university or college is a dynamic organization with a complex internal organization (including students, faculty, staff, and multiple units) that is embedded in a broader ecosystem (including other institutions, employers, funders, government agencies, and accrediting bodies) (Austin, 2011; Kezar, 2018; Lee, et al., 2023). These ecosystem concepts are discussed in Module 2.

Given the complex ecosystem that every higher education institution navigates, a systemic change approach is required. Systemic change requires using more than one lever or strategy simultaneously to encourage

transformational change. Leading effective systemic change involves working with faculty and other institutional members to develop a plan that uses multiple strategies (some related to the internal context and some to the external context) to advance shared goals. Wide involvement in change efforts from stakeholders across the ecosystem can be very helpful, since the perspectives, backgrounds, and abilities of all stakeholders contribute to the quality and excellence of the community.

HOW CAN HIGHER EDUCATION LEADERS INVOLVE THEIR COLLEAGUES IN IDENTIFYING WAYS TO STRENGTHEN STEM UNDERGRADUATE EDUCATION?

Administrative leaders are well-situated to elevate an inspiring vision and raise questions and frame conversations about the many ways in which faculty and staff can strengthen undergraduate STEM education. One way to involve faculty and staff is to invite them into conversations about changes that foster institutional environments that enable students to reach their learning goals. Examples of questions leaders might raise in meetings or conversations include:

- What are our institution's values or principles about supporting students as individuals with diverse educational and professional interests, needs, and challenges as they engage in their academic work? How and when are these goals communicated and made transparent in institutional decision-making, resource allocation, and program design, as well as to internal and external stakeholders?
- What is the change goal, opportunity, or challenge that our institution wants to address? What do we want to do differently in service to our goal to provide educational experiences that optimize opportunities for all our students to achieve success? How can we ensure that our institution is "student-ready"? (See Module 4 for more about being a student-ready institution.) How does the change goal relate to the institution's strategic plan and priorities?
- How can we develop a broad coalition of supporters and allies (faculty, staff, and community members) committed to developing and implementing strategies that ensure students have the support needed to achieve their learning goals, as aligned with institutional strategic priorities?
- How can we take a systemic approach to nurturing a more "student-ready" institution? What levers for change would be most impactful to encourage institutional movement toward the change goal?
- In our institutional context, what are we doing well that we want to scale? Are there ways to amplify what we are doing well?
- What barriers exist at the departmental, school, and institutional levels, or in the broader context, that may impede our progress to strengthen undergraduate STEM education? How can we address such barriers?
- How will we know if we are making progress? What metrics and indicators can we use to track progress and make data-informed decisions throughout the change process?
- What professional development opportunities can we provide to support faculty and staff as they work with the institution's full array of learners?

WHAT STEPS CAN LEADERS TAKE TO STRENGTHEN STEM UNDERGRADUATE EDUCATION?

A plethora of well-developed sourcebooks, frameworks, rubrics, and toolkits are available to help institutional change leaders (see the references below and the Module Collection Resource List). Of course, institutional leaders can examine, adapt, or customize resources in ways that are most useful and relevant to their specific and unique institutional context. In deciding on specific change strategies, leaders will want to work with their faculty and staff to create clear goals, identify metrics by which to assess progress, and consider financial costs and potential savings. Additionally, from the start, leaders will benefit from considering what sustainability will mean in a successful change effort and what benchmarks will be useful measures of progress.

The research on organizational change in higher education (Elrod, et al., 2024; Laursen & Austin, 2020) highlights key steps that are useful for change leaders to consider as they nurture change to strengthen undergraduate STEM education. Informed by the literature on organizational change, Module 2 provides an overview of an ecosystem approach to transformative change. Here we offer very practical steps, aligned with the ecosystem perspective explained in Module 2, to help change leaders get started in defining a vision and goal (in collaboration with institutional colleagues) and bringing colleagues together in advancing that goal:

- **Map the ecosystem in which the institution is situated.** Institutions can conduct a stakeholder analysis to list internal and external actors in the ecosystem, including: core stakeholders (e.g., students, faculty, and institutional leaders, and others); internal subsystems (e.g., departments, curricula, advising offices, student support services, etc).; and external connections (e.g., community organizations, alumni, industry partners, non-profits, national initiatives, etc.). A useful exercise is to visualize the nature of the connections between these stakeholders to identify gaps where the addition of resources or relationships could strengthen the ecosystem.
- **Engage faculty and other stakeholders in defining the change goals.** Faculty are at the center of the work of a higher education institution. Efforts to enhance the excellence of STEM education require the involvement and commitment of the faculty. Organizing discussions around the questions suggested above can interest and engage faculty and others in the change process. Other strategies can also help institutions achieve a shared vision and wide buy-in for change goals. For example, higher education institutions can form teams (involving faculty members, administrators, students, and external partners) and partnerships (including developing multi-institutional consortia or regional workforce development programs) to co-create goals and objectives for improving undergraduate STEM education and to identify pathways to achieve those goals. Shared planning can be advanced through regular summits to consider ongoing alignment and collaboration.
- **Define priorities and customize and align change plans with the specific institutional context, culture, and priorities**. Consider the broad ecosystem and how it informs and influences the change goal and change process. (See Module 2 where an ecosystem approach is discussed.) Ideas that worked elsewhere can be inspiring and might be adapted, but deciding which plans to use depend on the context. The specific change goals and the processes to reach them are likely to be most effective if they are related to and supportive of the overall institutional mission and priorities. When possible, finding ways to use work already underway and commitments stakeholders have already made can provide a strong foundation for further change efforts.
- **Use data to support and monitor the change process and guide decision making.** Data can be used strategically throughout a change process. Change leaders can share data with institutional stakeholders as part of an explanation for the importance of the change goal. Data can also be a useful resource in making decisions about what actions to take. For example, data can be used as part of a Start/Stop/Continue Framework to help leaders decide on specific actions to facilitate their goal to strengthen undergraduate STEM education. “Starting” involves identifying new initiatives to improve alignment with ecosystem needs. “Stopping” involves discontinuing practices that no longer serve strategic goals. “Continuing” may involve scaling up successful initiatives, finding economies of scale, or developing needed new infrastructure. Success metrics that rely on data (e.g., retention rates, student outcomes, or the extent of faculty participation in professional development) can help change leaders monitor and determine the impact and success of change efforts. Furthermore, providing ongoing opportunities for discussion of data about the student experience and the institutional culture can ensure continued community involvement in the change process to strengthen the undergraduate learning experience.

- **Ensure support for organizational leaders and stakeholders working on the change goals**. Supportive strategies might include workshops and certifications for department chairs and faculty on systems thinking and change leadership, and designating STEM ecosystem coordinators or champions to advocate for reforms that strengthen undergraduate education. Institutions might also create steering committees to monitor and encourage progress toward goals and ensure objectives and actions are aligned with intended outcomes. Supporting institutional change leaders also means recognizing that change takes time and that all the change work need not happen at once. Celebrating early wins can be motivating to change leaders and stakeholders across the institution. Ensuring that there is a sustainability plan is also motivating. Developing steps to advance change goals over time means considering strategies to build change into ongoing institutional processes or establishing partnerships with others. For example, change leaders might consider integrating successful initiatives into core budgets rather than relying solely on one-time, temporary, or grant funding; developing partnerships for resource sharing, such as shared laboratory facilities or faculty exchanges; and seeking multi-year grants or endowments to secure long-term funding. Such efforts help change leaders maintain energy over the long-term period that is typically needed to develop, implement, and establish processes for sustaining change efforts.

WHAT RESOURCES ARE AVAILABLE TO HELP HIGHER EDUCATION CHANGE LEADERS?

The reference list for this module points readers to several publications that provide practical advice about steps and stages in the change process within the unique context of higher education. As discussed in Module 2, various frameworks are available to help institutions engage in organizational change processes. The Module Collection Resource List includes a number of these frameworks that can give practical guidance to institutional change leaders about approaches to change, specific steps to consider, and tools to use in the process. Some of the resources discuss strategies for change in particular institutional types in higher education.

Authorship: Ann E. Austin, Michigan State University, Emily Miller, Association of American Universities, and Kacy Redd, Association of Public & Land-grant Universities, with thanks to the many current and former members of the Roundtable listed in the supplemental resources component of this collection.

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