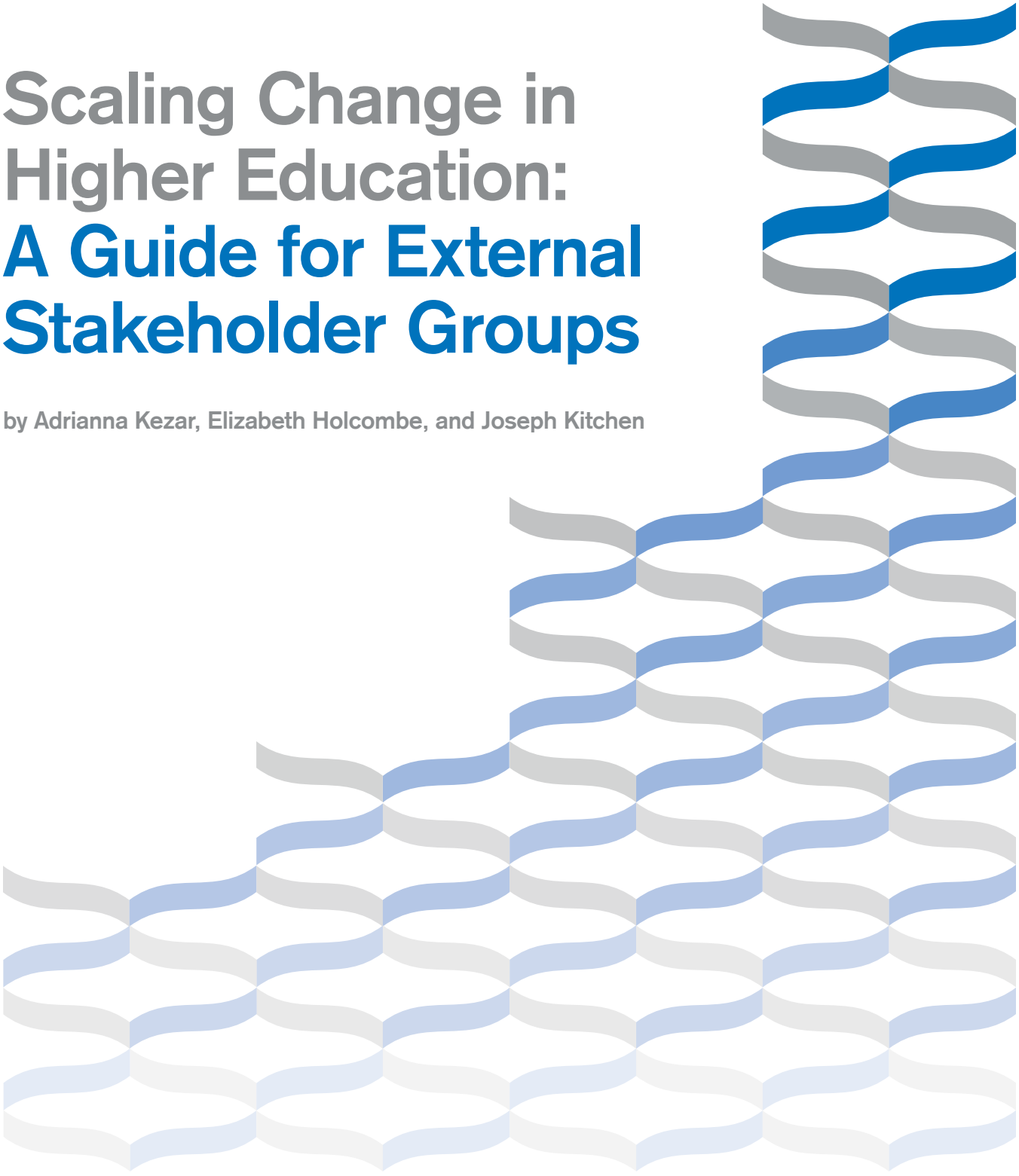
Scaling Change in Higher Education: A Guide for External Stakeholder Groups

by Adrianna Kezar, Elizabeth Holcombe, and Joseph Kitchen



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Contents

Introduction

Increasingly, institutions of higher education are facing numerous complex challenges. These include:

- expanding access;
- supporting success among first-generation, low-income, historically underrepresented minority groups, and other underserved populations;
- implementing evidence-based teaching practices, assessment, and new technologies;
- improving the quality of curriculum through service-learning, international and global perspectives and interdisciplinarity;
- addressing on-going challenges with remedial education, student transition, and inclusion;
- cost-cutting for improved affordability;
- altering hiring and contracts for faculty and staff to create conditions that allow them to better support students; and
- integrating new practices or topics like sustainability that support prosocial goals and provide an example for students of real-world connections to the curriculum.

Many external groups, such as foundations or national associations, have chosen a particular issue or area in which they want to support higher education institutions as they attempt to make progress addressing these complex challenges. This guide is for these key external stakeholder groups (policymakers, national associations, reform groups, accreditors, foundations, government agencies, business and industry) that support change and reform of the higher education enterprise. It presents a toolkit that provides advice for external stakeholders on how to be effective partners in working with colleges and universities to support changes that go to scale. National organizations often work directly with institutions so we will be mentioning institutions from time to time as part of the strategy.

Scale is typically defined as a reform or change affecting more than just small group of students and often involving multiple departments, units, and institutions. In the guide we refer to scale up, scaling or scale, which all refer to this same process.

Scale is typically defined as a reform or change affecting more than just a small group of students and often involving multiple departments, units, and institutions. Goals around scale may differ substantially by stakeholder organization. While no longer the norm, some groups work primarily with individual institutions and consider a practice to be scaled when it becomes widespread at a single campus. Stakeholders working on these types of efforts are already well-served; many guides, including Association of American Colleges & Universities' *Increasing Student Success in STEM* and Adrianna Kezar's *How Colleges Change*, exist to support change on individual campuses.

Alternatively, some foundations or agencies work with a set of campuses, sometimes joined through consortia, other times through multi-campus projects. This guide will be helpful for such multi-campus efforts, as will *Scaling and Sustaining Change and Innovation*, a report by Kezar sponsored by the Teagle Foundation that focuses on lessons learned about implementing and sustaining changes among 10 consortium-funded projects that involved close to a hundred campuses.

However, this guide will be especially valuable for external stakeholders who are aiming for large-scale change of practice or policy across multiple institutions or the entire higher education sector. Foundations, agencies and non-profits are hoping to foster change at an even broader scale that will not just affect a set of campuses, but rather an entire sector, a discipline, or all of higher education. Such ambitious efforts include Vision and Change in Undergraduate Biology Education and Partnership for Undergraduate Life Sciences Education (PULSE), which works to change curriculum and teaching across all of biology. Similar efforts are also occurring in physics with the Strategic Programs for Innovation in Undergraduate Physics (SPIN-UP) project and through accreditation in engineering. Additionally, accreditors and the National Institute for Learning Outcomes Assessment are currently working to achieve scale in the use of student learning outcomes and assessment.

While this guide is focused on improving teaching and learning, the lessons can be used by organizations to scale other forms of change.

To demonstrate an example of such large-scale change efforts in action, we share lessons learned from the Association of American Universities (AAU) Undergraduate STEM Education Initiative (see p. v). This project has the goal of scaling evidence-based teaching practices across AAU institutions (top research universities) and teaming up with others working to improve undergraduate STEM education to make excellent teaching a norm in research universities.

This guide evolved from the study of the AAU Initiative, and can be used in tandem with the larger, final project report, *Scaling Improvements in STEM Learning Environments: The Strategic Role of a National Organization*, which provides more detail on the concepts that follow. This guidebook provides specific tools and advice for stakeholder groups to create a strategic approach to scaling change. In short, this guide will help organizations understand critical strategies informed by theories of change:

1. assess organizational strengths and weaknesses
2. ensure distributed leadership
3. evaluate framing and language for change
4. utilize multiple theory-based strategies
5. create and assess a systems approach
6. leverage influence strategies
7. build and support networks
8. create feedback loops

While we suggest that action in each of these areas is important for scaling change, an organization may choose to focus on and improve just a few strategies. We begin with an overview of theories of change and then outline eight strategies organizations can use to facilitate change. This is not a linear process and any step can be engaged in any order. However, we recommend that organizations first identify and develop the appropriate *leadership* or *language* (steps 2 and 3), before tackling *influence strategies* and *networking* (steps 6 and 7). Once the right framing and leadership are in place, networks will likely be easier to develop.

We also provide concrete prompts in each section, yet one need not follow each step in this guide to be successful. The prompts are merely questions to help think through an influence strategy or method of deploying multiple theories of change to make these processes more concrete for those needing such guidance; one can also be successful by considering these issues more conceptually. In the end, reflection on these processes will enhance one's approach to scale.

Strategies for Scaling Change

Setting the context for scale	Scaling practices	Refining scaling practices
▪ Asset assessment ▪ Distributed leadership ▪ Language and framing	▪ Multi-theory ▪ Systems ▪ Influence ▪ Networks	▪ Feedback loops

About the AAU Undergraduate STEM Education Initiative

In 2011, the Association of American Universities (AAU) launched a five-year initiative in partnership with member institutions to improve undergraduate teaching and learning in science, technology, engineering and mathematics (STEM) fields that moves beyond individualistic approaches (e.g. single classrooms or departments) to change.

The overall objective of the AAU Undergraduate STEM Education Initiative is to influence the culture of STEM departments at AAU universities so that faculty are encouraged and supported to use teaching practices proven by research to be more effective in engaging students in STEM education and in helping students learn.

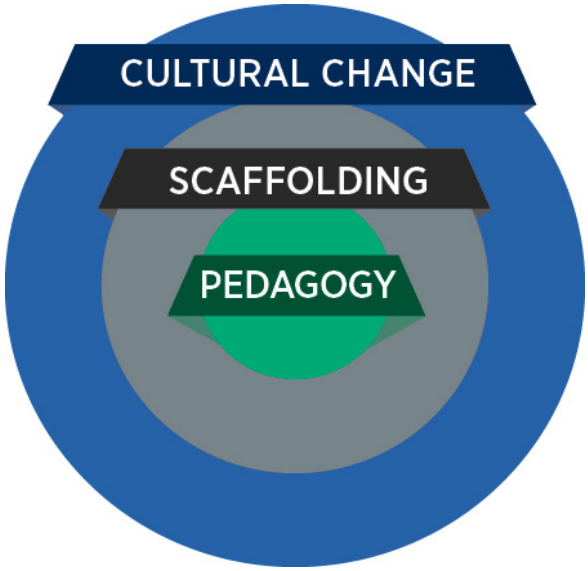
The overall objective of the AAU Undergraduate STEM Education Initiative is to influence the culture of STEM departments at AAU universities so that faculty are encouraged and supported to use teaching practices proven by research to be more effective in engaging students in STEM education and in helping students learn. The goals of the Initiative are to:

1. Develop an effective analytical framework for assessing and improving the quality of STEM teaching and learning;
2. Support project sites at a subset of AAU universities to implement the Framework, and develop a broader network of AAU universities committed to implementing STEM teaching and learning reforms;

3. Explore mechanisms that institutions and departments can use to train, recognize, and reward faculty members who want to improve the quality of their STEM teaching;
4. Work with federal research agencies to develop mechanisms for recognizing, rewarding, and promoting efforts to improve undergraduate learning; and
5. Develop effective means for sharing information about promising and effective undergraduate STEM education programs, approaches, methods, and pedagogies.

In collaboration with its member universities, AAU developed a *Framework for Systemic Change in Undergraduate STEM Teaching and Learning* ("the Framework," see Figure 1) to guide institutions in their commitment to facilitate change in undergraduate STEM education. AAU selected eight member campuses to serve as demonstration project sites. Over three years, each of the eight project sites implemented a major undergraduate STEM education project that incorporated key elements of the Framework, including: *pedagogy*—implementing and assessing the efficacy of research-based pedagogies; *scaffolding*—supporting faculty learning and development (e.g. providing a center for teaching and learning, enhanced classrooms); and *cultural change*—working to change policies and practices that are not supportive of undergraduate teaching (e.g. tenure and promotion policies). Ultimately, these project sites served as laboratories to implement the Framework and they are the first phase in an effort to encourage broad-based reform of STEM undergraduate teaching practices at AAU research universities and beyond.

Figure 1
The Framework



AAU is also actively bringing together more campuses from among its members to form an AAU STEM Network. The AAU staff envision a collaborative network that will help to support and link AAU institutions grappling with similar challenges and barriers in reforming and improving STEM teaching and learning for undergraduate students. Complementing these efforts is AAU's work on metrics. AAU developed a set of baseline measures (e.g. how many courses involve technology or active learning) of the Framework, such as use of evidence-based teaching practices and professional development offered that project sites (and other institutions) may use to better understand the current status of teaching and learning and to begin documenting progress. These measures align with the Framework, as they ask about changes in introductory courses, development of more active learning classrooms, faculty learning communities, or changes in tenure and promotion policies.

The research project that generated this guide followed the AAU Initiative in real time; the researchers observed Initiative meetings and events, then interviewed faculty, administrators and collaborators with the Initiative about their perceptions of what they felt was working to scale change as well as what might not be working as effectively. The project involved three years of observation, review of thousands of pages of documents, and interviews with over 110 people. The final report from the project can be found at pullias.usc.edu/scalingstemreform.

Scaling STEM Reform Project Data

3 years of observations	110+ interviews	Thousands of pages
at AAU Initiative meetings and events	with faculty administrators, and collaborators with Initiative	of documents reviewed

pullias.usc.edu/scalingstemreform

Theories of Change

Before considering a strategy for scaling change, it is important to become familiar with various theories or approaches to change in order to ensure alignment between theory and action. Theories of change are *explanations* of how change occurs or progresses in an organization, and thus helpful in illustrating the potential ways change may unfold. And in fact, funding organizations are increasingly asking for proposals that articulate a theory of action around how leaders will implement their project and what evidence exists that such an approach to change will work. An organization might use one or several of these strategies.

We will refer to these theories throughout this guide, so we introduce them here first. Specifically, we describe six sets of theories that Kezar has found undergird change processes in higher education, particularly those focused on scale: institutional theories, network theories, theories of organizational learning, cultural theories, political theories, and systems theory/ institutionalization. Each theory of change has different assumptions about the key levers that drive change and the necessary actions that should accompany them. For more details see Kezar's book, *How Colleges Change: Understanding, Leading, and Enacting Change, 2nd Edition* (2018).

A. Institutional Theory/Influence

Institutional theory (IT) emphasizes change as a result of external forces and the reshaping of cultural norms and logics. IT describes the impact of broader forces and organizations outside of college campuses on change, including accreditation, economic changes, disciplinary societies, corporatization of campuses, state policymakers, neoliberalism, and national agencies such as the National Science Foundation (Powell & DiMaggio, 1991). These external forces and organizations are known as *fields*. The *societal field* encompasses broader societal forces like economic changes that are more remote yet still shape campus actions. The *organizational field* is composed of organizations that are more directly tied to higher education (such as accreditors, foundations, or national associations), which can also help deliver and temper societal forces. Examples of how forces in the organizational field shape change include: national associations pushing for a more similar general education curriculum across institutions; accreditors pushing for assessment of student learning outcomes; or presidents altering their institutions' missions to be more research-oriented in pursuit of prestige to be more like elite institutions (Boyce, 2003).

IT leverages legitimacy and *influence* as ways to motivate change. This lever is often seen in *isomorphism*, where institutions mimic each other and grow more similar; this phenomenon is particularly apparent when less prestigious institutions mimic more prestigious ones (Scott, 2008; Taylor & Morphew, 2010). But influence can take many other forms, as well, such as *normative* approaches where certain values or approaches are legitimized, such as the recent widespread increase in awareness of diversity and inclusion issues on college campuses (Scott, 2008). In these normative approaches, shaping norms, language, discourse, and logics that underlie organizations can be a lever of influence for external organizations interested in promoting change. Change, when it occurs, is a result of a new schema or set of norms, embedded in language, transferred through discourse and entrenched in institutional structures over time through a system of institutional logics—a driving rationale for how things should operate (Scott, 2008). For example, the AAU Initiative attempted to build a new norm around teaching excellence at research universities through discourse and framing—by using language suggesting that AAU institutions should be "as excellent in teaching as in research." Legitimacy is also critical in that only certain players in the field are seen as being able to drive new norms, standards, and logics (Scott, 2008). In higher education, these are often the most prestigious colleges and universities or the most prominent national organizations.

Historically, various studies have demonstrated how elite research universities such as Harvard served as the gold standard for other institutions, which began to mimic the research activities of these elite universities. The AAU Initiative aimed to utilize the isomorphic power of research universities to shift and change the overarching norms about research within higher education to balance them more equally between teaching and research, and to institutionalize the notion that faculty should be as excellent in teaching as they are in research.

B. Network Theories

Networks (sometimes called social networks) are groups of people with some sort of specified relationship or tie; networks can be composed of people who work in the same organization or industry, or who know each other socially or through shared activities (Borgatti & Halgin, 2011). In terms of promoting change, networks can function to build relationships, connect various previously disparate aspects of a system, disseminate information, facilitate learning, and eventually scale change. Many empirical studies demonstrate that changes in behaviors and mindsets have been a result of networked diffusion models in which innovators began utilizing new practices, and then after some success, others began to become aware of the practice and utilize it as well (Rogers, 2003; Tenkasi & Chesmore, 2003). Networks create the informational channels for change ideas to flow, a community to innovate in safe spaces, and intellectual capital and knowledge about how to implement change (Tsai, 2002). Webs of relationships are often the chief determinants of how well and how quickly change efforts take hold, diffuse, and are sustained (Daly, 2010).

Researchers have identified several key ways that networks lead to change. First, networks offer a set of mechanisms that enable change—through communication systems, knowledge transfer, alteration of schema or mindset, shaping of attitudes, increasing of problem-solving, and accountability (Ahuja, 2000; Borgatti & Foster, 2003; Kraatz, 1998; McGrath & Krackhardt, 2003; Szulanski, 1996; Wasserman & Faust, 1994). Second, two specific outcomes of social network formation have been related to change—learning and social capital (Borgatti & Foster, 2003; Burt, 2000; Kilduff & Tsai, 2003; Tenkasi & Chesmore, 2003). The relationships in social networks promote learning among network members, and learning has been strongly linked to changes in behavior (Tenkasi & Chesmore, 2003). Networks also provide social capital that facilitates the change process (Burt, 2000), varying from knowledge about how the organization works to influence to finances. Third, change often involves risk-taking that can be less problematic if it is done collectively rather than individually (Valente, 1995). If one's peers are engaging in the same behavior, then one is more likely to also engage in this behavior (Rogers, 2003; Valente, 1995).

The AAU Initiative leveraged the power of its network of member institutions to promote learning and provide an environment for peer institutions to undertake a potentially risky change process together. The Initiative created a network of networks by linking the AAU network (and its subnetworks of department chairs, deans, provosts, presidents, and centers for teaching and learning) to other STEM reform networks. It also joined a coalition called CRUSE—Coalition for Reform of Undergraduate STEM Education, a group of national associations working to improve the effectiveness of undergraduate education.

C. Organizational Learning Theory

Theories of organizational learning suggest that learning is a key driver for change (Senge, 1990). Without people challenging existing assumptions, reviewing new information, and undergoing an inquiry process that leads to a consideration of new ways to conduct work, change can be difficult. If learning is missing, actors will lack the knowledge to adopt new practices. Organizational learning involves information available within organizations, the way that information is shared, facilitative mechanisms for learning such as teams, networks (as described above) or data dashboards, sharing of best practices, and more generally looking at the ways that individuals within organizations examine or understand concepts. Organizational learning theories focus on issues such as acquiring information and ideas, interpreting data, turning information to knowledge, knowledge recall and memory, and ways to sustain learning by embedding it into the organizational structures, often termed knowledge management (Argyis & Schön, 1996; Garvin, 1993). Studies from multiple disciplines demonstrate the infrastructure that needs to be in place to support organizational learning (e.g. improved data systems, knowledge management systems), best practices for fostering learning (e.g. better formats for displaying information to different stakeholders, team practices that help interpret information to create knowledge), and the leadership and culture (e.g. creating a culture of trust, leaders supporting risk-taking and innovation) required to ensure organizational learning occurs (Argyis & Schön, 1996; Kezar, 2005).

The AAU Initiative employed a number of actions that fit within organizational learning theories of scaling change. For one, the AAU leadership facilitated learning through its networks, allowing members to adopt practices from each other's campuses. To that end, the eight demonstration sites served as laboratories that tried out new practices, so that the results of those efforts could inform and be adopted by other campuses. Moreover, four out of the Initiative's five main objectives—including developing meetings for information sharing about the best practices for STEM reform, working with institutions and departments to support faculty, and supporting project sites to develop and implement the framework—related to organizational learning. The Initiative was also informed by the collection of data. Surveys were conducted to determine the extent to which evidence-based teaching practices were used on member campuses, understand practices to assess teaching in promotion and tenure, and assess learning spaces. These surveys helped fulfill a major goal of the Initiative, which was to develop measures that could help institutions determine their progress and learn how to improve implementation by use of data to inform their actions.

D. Cultural Change Theories

Culture change happens when the underlying values and assumptions of a campus change. New values are reflected in the practices, policies and structures of the organization (Kezar, 2013; Kuh & Whitt, 1988). Much of the early literature focused on culture change at the institutional level focused on leaders and how their priorities, language, discourse and actions shaped culture; in these studies, change occurred as a result of shifting leaders' priorities, language, discourse and actions to reflect the desired culture (Schein, 2010). More recent literature has shown that change agents can work to change culture at multiple levels of the organization (Kezar, 2013). Culture change can also create deeper changes that are more permanent because culture change works at changing the unconscious assumptions that drive behaviors within organizations and systems (Kegan & Lahey,

2009). Strategies for change agents to create culture change range from vision setting, discussion of mission and values, explorations of existing values, creation of new rituals and symbols, alteration of language and communications to reflect new values, and leaders' efforts to communicate new values (Kezar, 2103).

AAU utilized the cultural change approach by attempting to alter the value system of STEM departments to realize the potential of evidence-based teaching practices, new curriculum, and student learning goals and outcomes.

E. Political Theories

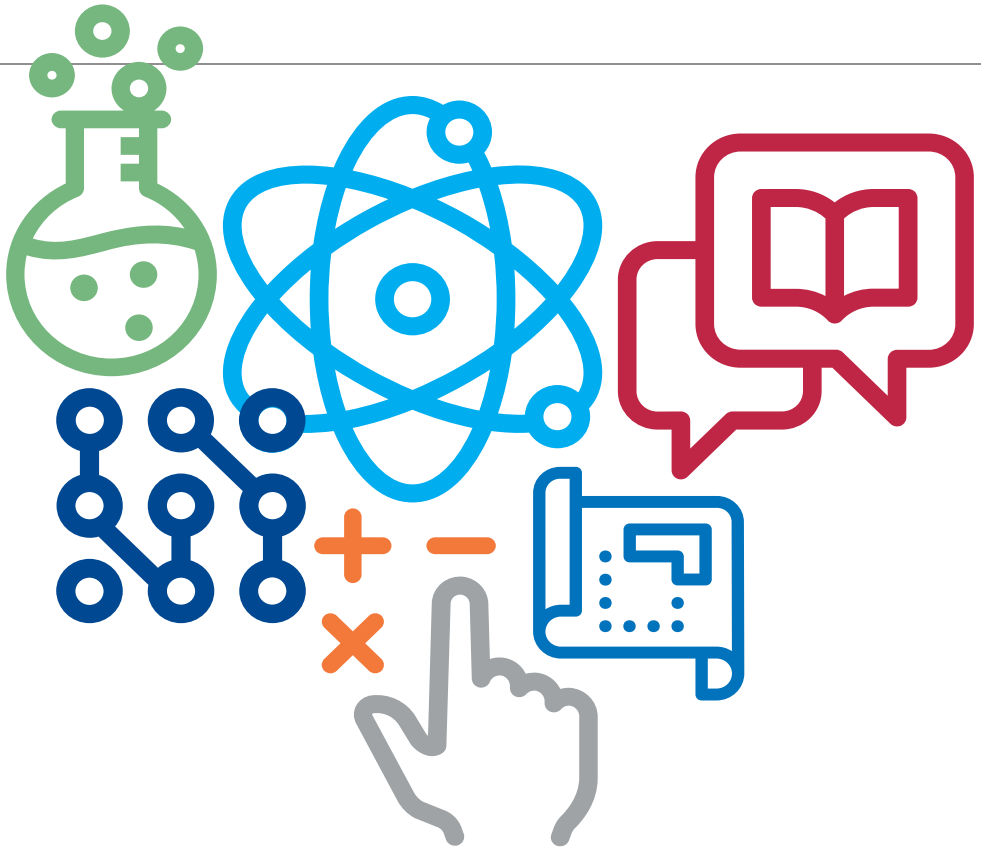
Political theories examine how collective action can be leveraged for change vis-a-vis coalitions, development of allies, and partnerships. Strategies include agenda-building, bargaining, consciousness-raising, campaigns, and persuasion processes (Bolman & Deal, 2017; Kezar, 2013). The political approach can turn into a social movement if it moves to a widespread, more collective effort. It often begins as grassroots activism, but over time can develop into a full movement involving vast numbers of people. Political approaches center on use of power, persuasion, and communication to sway changes. They also focus on aligning interests of diverse groups, assuming individuals have differing interests.

AAU used the political approach by tailoring communication strategies to various groups, such as faculty, deans, and senior leaders, while also working to build consensus around the importance of excellence in undergraduate STEM education. AAU appealed to faculty members' interest in disciplinary strategies and evidence around changing teaching practices and appealed to deans and senior leaders' public concerns about the affordability and quality of undergraduate education and declining state funding.

F. Systems Theory and Institutionalization Theory

Systems theory examines the interrelationship of various subsystems within an organization and the interconnections between organizations. In order to change teaching and promote more evidence-based teaching practices, professional development alone is insufficient, as classroom practices are also tied to incentive systems, departmental norms, facilities, campus priorities, and student expectations, for example. In systems theory, change is most likely to be achieved when all aspects of the system are adjusted. Many studies of change adopt a systems approach, exploring internal mechanisms like reward systems and policies as a way to influence change (Kezar, 2013). Systems theory suggests an interrelationship of various aspects—tenure and promotion requirements, professional development, institutional commitment, and classroom assessment. It also suggests how policies and practices need to be altered in support of a change. Institutionalization theory suggests that the institutional infrastructure and leadership must support changes for them to scale and be sustained. Institutionalization can also be seen as a facet of systems theory itself, in which the institution is a system and various parts need attention in order to be altered. This theory emphasizes incentive and reward structures in particular. But this theory suggests the importance of aligning policies and practices to stated change direction.

The systems approach is evident in the AAU Initiative's effort to operate at multiple levels: (1) project demonstration sites; (2) the AAU network; (3) work with federal agencies; (4) and the broader higher education system. The most well-articulated level within AAU's systems approach is the institutional system. As noted in the introduction, AAU developed a *Framework for Systematic Change in Undergraduate STEM Teaching and Learning* to guide institutional commitment to facilitate change in undergraduate STEM education and *Essential Questions and Data Sources* to measure progress of their reform efforts. This required identifying key levels of change, the agents of change, the mechanisms of change, and models for scaling and sustaining change.



Strategies for Scaling Change

Chapter 1 Assess Organizational Strengths and Weaknesses

One of the most important lessons derived from the AAU Initiative study is the importance of organizations engaged in change processes to start by assessing their strengths or assets to help devise the best and most strategic approach. Particularly for complex phenomena, there will be multiple organizations engaged in addressing the issue. Organizations can be most effective when they target their strategies to capitalize on their unique strengths. Strengths or assets can often be identified by exploring an organization's identity—the unique characteristics or features that define an organization.

For AAU, strengths included their ability to:

1. influence leaders such as presidents and provosts and other prestige and influence organizations within the overall sector,
2. create and leverage networks,
3. define overarching logics or value systems for the enterprise, and,
4. work across various stakeholders of the higher education system, ranging from the National Science Foundation to partners in STEM reform such as the Bay View Alliance to the entire set of AAU institutions.

But an understanding of strengths will only partially serve organizations. Organizations also need to understand their limitations so that they might best focus their energies where they can have the most impact, rather than expending effort in areas unlikely to yield meaningful change. For example, AAU's work to institutionalize change at the project site level was difficult given their lack of influence with faculty and staff, their inability to work closely with project sites to help develop their teams and leadership to overcome barriers, and other work that required more day-to-day relationships and work.

We have created a tool for organizations to assess or map their unique strengths and assets using the theories of change and associated strategies described in the previous section. Particular strategies may be well-developed, emerging, or non-existent at your organization. You will likely NOT have examples of every strategy at your organization, and it is also unlikely that everything you do have is well-developed. That is normal. Understanding what strategies are already well-developed at your organization and deciding upon which new areas to prioritize is more important.

The version below (Table 1) is partially filled out with some examples from the AAU Initiative to help you get an idea of how to think through this process. As an illustration, we outline how AAU used institutional theory. For institutional theory, influence is the major strategy used to create change. In order to leverage influence, we provide areas to assess—groups you might have influence with, type of influence you might have (e.g. incentives vs. regulation), strategies for influencing (e.g. communications, grants/resources), and areas of greatest legitimacy for influence (e.g. disciplinary standards, assessment of learning, norms for research universities).

Groups may also choose to use other strategies or approaches not listed here. Whatever approach you use, it is important to consider your assets and limitations with these approaches.

Instructions: Using Table 1, consider each theory of change and identify which strategies are well-developed, emerging, or nonexistent for your organization. A blank version of this table is available as Appendix A.

Table 1: Asset Assessment Tool (with examples from AAU Initiative)

Theories of Change	Strategies for Scaling Change	Strategy is Nonexistent	Strategy is Emerging	Strategy is Well-developed
Institutional Theory/Influence	*Type of groups*		Have influence with administrators but not faculty	
	Type of influence		Have some incentives through grants	
	Influence vehicles or strategies		Communications, resource, competition	
	Areas of greatest legitimacy		Defining excellence in research university context	

Theories of Change	Strategies for Scaling Change	Strategy is Nonexistent	Strategy is Emerging	Strategy is Well-developed
Networking	*Number of existing networks*		Partner with a foundation, a nonprofit and 12 other institutions	
	Type of functions performed by existing networks			Use existing networks to raise funding, promote and market the change, brainstorm implementation, share information, and provide social support
	Leadership capacity within networks			Have a steering committee, mentoring program, succession plan, co-chairs for different networks
	Ability to connect to new networks	At present have not connected to other networks		
Organizational learning	*Data collection and management capacity*		Working with member campuses to build data and analytics systems around teaching	
	Venues to share information and data			
	Vehicles of deliberation			
	Capacity to lead inquiry groups			
Culture	*Legitimacy to articulate new value system*			Prestigious and well-respected among members and aspiring members
	Access to key stakeholders to try out language and get feedback			
	Ability to craft a powerful message and frame appropriately for audiences			
	Dissemination venues for communicating values			

Theories of Change	Strategies for Scaling Change	Strategy is Nonexistent	Strategy is Emerging	Strategy is Well-developed
Politics	*Ability to set an agenda*			
	Ability to coalesce various groups to work together			
	Skill in information campaigns and social media			
	Negotiation skills with groups with differing interests			
	Lobbying and advocacy			Robust advocacy organization within AAU, existing relationships
Systems	*Ability to shape and align incentives*	Realigning incentives is not an area that AAU has any experience in		
	Ability to work across and align departments or units			
	Mapping various parts of a system and identifying which aspects can be shaped and aligned			

Chapter 2 Ensure Distributed Leadership

The literature on scale suggests that leadership throughout the system is critical for scaling changes. Interviewees noted how leadership among faculty, at the department level, at the institution, among AAU presidents and provosts, and within the disciplines were all needed for change to occur. Distributed leadership draws on leadership throughout the system and does not make distinctions between leaders in formal positions of authority versus informal leaders in terms of their value and importance for creating change. Leaders at different levels have insights into particular issues related to the change content as well as process. Distributed leadership includes those outside positions of authority including faculty, professional association employees, staff at disciplinary societies, and those in formal positions of authority such as administrators, disciplinary association leaders, or policymakers. Reform efforts would benefit from an organization facilitating the development of leaders at these multiple levels in support of improving undergraduate STEM education. The AAU Initiative partially played this role through its annual meetings that had content knowledge about change processes and leadership development. Distributed leadership needs support from funders, however, in order to develop new ways of working and managing change.

As an organization you need to consider how you are developing leadership throughout the system you mapped. You may not need to create new leadership opportunities, but can link groups to existing leadership opportunities.

Instructions: For each area in need of leadership development (e.g. ground-level, middle managers, senior leaders), identify if your organization is already doing work in this area, could potentially do more work in this area, or could refer organization stakeholders to existing resources.

Table 2: Inventory of Leadership Development

Area of leadership development	Areas of leadership development where we are already conducting work	Areas of leadership development where could be doing more work	Existing resources to refer leaders for development
Bottom-up with faculty and staff			
In the middle among department chairs, deans, and other mid-level administrators			
Senior administrators on campus			
Faculty in disciplinary societies			
Staff in disciplinary societies			
Staff at associations			
Leaders in associations			

Some campuses create their own leadership development programs for faculty and staff.

We also provide some links to leadership development opportunities to which you might send faculty, staff, and administrators for further development.

List of Existing Leadership Development Opportunities

- **Project Kaleidoscope** provides leadership development opportunities for STEM faculty and administrators.
- **Science Education for New Civic Engagements and Responsibilities (SENCER)** provides leadership development opportunities for STEM faculty and administrators.
- **American Council on Education (ACE)** offers leadership development for mostly senior administrators, but some leadership development is also offered to middle-level administrators such as deans and department chairs.
- **Higher Education Resource Services (HERS)** provides leadership training mostly for women aspiring to higher levels of leadership, but often brings in and supports mid-level administrators as well. It is open to both faculty and administrators. HERS also offers a leadership institute focused on STEM.
- **American Academic Leadership Institute (AALI)** offers programs and other forms of assistance for academic leaders in various administrative positions.
- **Harvard University** offers programs aimed at multiple levels of leadership for both faculty and administrators.

Some programs are focused on particular institutional types:

- American Association of State Colleges and Universities (AASCU) Leadership Institute is for those interested in leading or aspiring to lead a state college or university.
- American Association of Community Colleges (AACC) and League of Innovation offer leadership development for those in the community college sector.
- The Council of Independent Colleges offer leadership training for those in the liberal arts sector.

Certain regional groups, such as the Big Ten Academic Alliance, also offer leadership development. And some publishers, such as Magna Publications, focus on academic leadership and offer helpful resources and workshops.

Leadership development is also offered for particular professional groups in student affairs or business officers; the American College Personnel Association (ACPA) Leadership Educator's Institute and National Association of College and University Business Officers (NACUBO) leadership programs are just two examples of these.

Chapter 3 Evaluate Framing and Language for Change

An area that is also often unexamined in change processes is a consideration of any new underlying values being instilled alongside the change, and the language, framing, and messaging around the new value system. An important lesson from the institutional theory literature is that the strongest and most sustainable ways to scale change are to alter underlying value systems—termed the "institutional logics." Organizations attempting to scale change should very carefully evaluate the logics they are developing (whether intentionally or not) and the language used to articulate the new logic. Just as individual institutions must carefully craft a vision around change for institutional strategic planning processes, scaled change efforts must also articulate a "common agenda" and, even more importantly, a compelling new set of logics to undergird institutional action across the sector. Our study identifies how AAU went about articulating a new institutional logic, the ways in which it was successful, as well as some of the areas that could have benefited from more discussion with stakeholders. The study identifies how attention to language can be particularly important in scaling changes. For example, AAU carefully developed a logic that resonated with all stakeholders—that AAU universities need to be as excellent at teaching as they are in research.

Differences in language among individuals or stakeholder groups can also result in barriers or issues that upend change processes. The analysis conducted in the study used to inform this guide examined group differences to help understand how different perceptions of the role of AAU (e.g. understandings about AAU as an organization, interpretations of the Framework document, definitions of scale in terms of change) played a role in hindering the change process at various points. These findings suggest that checking in with constituent groups from time to time on core assumptions and perceptions and can be helpful to identify misunderstandings or emerging understandings. This seems particularly important for change processes such as this that involve so many different stakeholder groups.

For example, AAU developed a Framework to support what changes would improve undergraduate STEM education as well as provide a process to do so. Yet the Framework was not understood by many involved in the Initiative. Administrators were much more likely to understand the Framework than faculty because of the type of language used. Faculty and some administrators, including department chairs, often struggled to understand the Framework in terms of what cultural change was involved, and how the infrastructure supported departmental work. The differences in perspective suggest that AAU—as well as other organizations that engage faculty and mid-level staff and administrators—may need to consider ways to help these groups better understand institution-wide work. Therefore, both communication as well as learning and development issues can emerge as you explore group differences.

Instructions: Use Table 3 to write down the change issue and language being considered when communicating to different groups.

Table 3: Communicating Different Change Issues to Different Stakeholder Groups

Issue	Faculty	Staff	Administrators	Policymakers	Other—please list
Importance of student learning outcomes	Relate to disciplinary standards	Relate to improving learning and student experience	Relate to demonstrating accountability to policymakers and value added for education to the public	Relate to demonstrating accountability to public	

Chapter 4 Utilize Multiple Theory-Based Strategies

Remember, theories of change are explanations for how change unfolds or progresses. The way change occurs can vary given the stakeholders, leadership, and organization. In projects that involve multiple stakeholders and complex motivations and issues, using multiple theories of action to scale change can be extremely valuable. Leaders in AAU adopted a multi-theory approach to the change process that allowed them to move forward more efficaciously Systems change, learning, influence, institutionalization, cultural change, and networks are varied and complex approaches to change.

It is all too common for change efforts to adopt a more simplistic approach to change, and AAU's deployment of multiple strategies, informed by various theories of action, increased its chances of success. Had AAU only attempted learning as a change strategy, for example, the organization would not have had the impact it did. Embedding strategies which can be used in multifaceted ways as AAU did is also a very efficient way to use time and resources, finite factors that are generally in low supply for change leaders.

Here is an example of how AAU took a single mechanism—annual meetings—and infused it with multiple change approaches for more impact.

AAU's annual meetings brought together all the faculty and administrators involved in the Initiative to share ideas across campuses and to network. In addition, AAU hosted a second meeting that included non-project sites and invited representatives from all 62 AAU campuses to network with Initiative faculty and administrators. The annual meetings were intended for campuses to share progress they were making on their pilot projects and to brainstorm and work through shared issues such as challenges in addressing reward structures. The annual meetings and workshops were highly regarded, as people enjoyed the opportunity to get together in person, network, share and learn information, and consider the various threads needed to support sustained change. These meetings helped develop networks, facilitate learning, influence participants, and reinforce systems logic and create systems thinking. Below, we review how annual meetings drew on multiple change approaches.

IT/Influence. Many individuals talked about the impact of having the meetings at AAU national offices or in Washington, D.C. and including AAU staff and national leaders in those meetings. The physical space and people were noted as influential. In the words of one faculty member: "It's hard to exactly pinpoint, but there was something about being in Washington, D.C. and mixing with people I would never get a chance to interact with, and feeling like this is so different from other meetings I might go to." The prestigious nature of the speakers at annual meetings was mentioned in several other sections of the *Scaling Improvements in STEM Learning Environments* report.

Networks. The annual meetings were a key approach to supporting and connecting various networks from disciplinary groups of faculty, directors from Centers for Teaching and Learning, and innovators in STEM. Annual meetings provided networking opportunities through socials and unstructured time, created networking groups comprised of faculty in particular disciplines and administrators in specific roles, and connected champions who were passionate about these issues across different AAU campuses who were often isolated or made to feel as just one of a handful of people on their own campuses that cared about these issues.

Organizational learning. Many interviewees expressed how the annual meetings were important opportunities for learning. As one faculty member described: "I think the most successful aspect were the meetings—they provided us a chance to reflect on our work, to learn about what other people

were doing, to hear about what's happening at the national level, and recommit to the work." Some interviewees also commented about more specific learning outcomes from the meetings, such as the adoption of practices from other campuses, particularly the use of data analytics pioneered at University of California, Davis, for example.

Systems theory and institutionalization. Additionally, the annual meetings were an opportunity to reinforce a systems theory of change and institutionalization, as the meeting structure utilized the Framework document. Sessions also focused on specific areas within the Framework such as addressing promotion and tenure, improving professional development, and considering learning outcomes. The meetings leveraged leaders in the national movement of STEM reform and national organizations that could impact change at different levels and areas in the system. For example, the Cottrell Scholars worked with disciplinary societies through expert faculty; the Center for the Integration of Research, Teaching and Learning worked with a network of campuses and reached faculty and administrative leaders as well as emerging faculty; and the National Academy of Sciences shaped the national dialogue among faculty leaders.

REFLECTION

Given the earlier asset mapping, what are the 2-3 strength areas of your organization and how might these strategies be leveraged together? What mechanisms might be used and infused with various theories of change for greater synergy?

Chapter 5 Create and Assess a Systems Approach

Every organization will be able to work at different levels of the system to promote change. Some associations and organizations might be very well-prepared to work with individual faculty on professional development or curriculum reform efforts; other groups might be really well-positioned to assist mid-level leaders like deans and department chairs; other associations have regular workshops where they work with campuses to help institutionalize changes and are well-positioned to help with creating campus-level change. Some organizations can work across multiple parts of the system—with external groups like accreditors, with consortia of institutions and with individual institutions. AAU was an organization that could work at multiple levels (although not equally effectively at each level) and utilized this capability. Organizations should establish where they can work best within the overall system and strategically apply their efforts there.

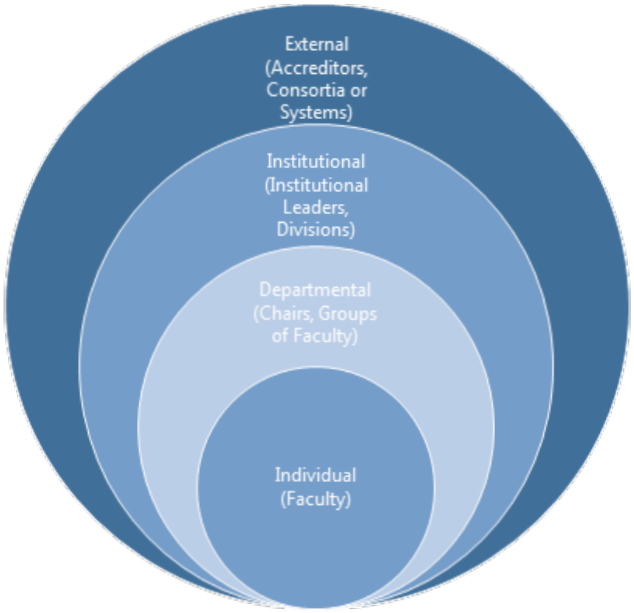
As an example from the AAU Initiative, AAU conducts much work at the external level of the system. AAU is a policy and advocacy organization that partners with federal agencies and associations in order to conduct its work. AAU staff regularly interact with the National Academies, National Science Foundation, and foundations. This allowed AAU to leverage these groups as part of the Initiative. AAU also networks presidents and provosts and has direct regular contact with institutional leaders at AAU campuses. AAU does not have regular contact with academic departments or with individual faculty, and this makes work at these levels more challenging. Thus, in mapping the system, AAU is best positioned to act at the external and institutional levels. Certainly, organizations can work at multiple levels, but they should recognize additional work may be needed to have an impact.

Engaging and Aligning the System

Research has shown that the more levels of the systems that are impacted, the more likely changes are to scale and be sustained. One of the beneficial outcomes of the AAU Initiative was thinking about aligning different efforts within the overall landscape of improving undergraduate STEM education. It is important to fund and support future work that aims to align various organizational efforts as Coalition for Reform of Undergraduate Education (CRUSE) is attempting to do. CRUSE is a coalition focused on STEM reform that involves six national organizations and meets regularly to share information and plan together in order to support the overall goal of undergraduate STEM reform. This work to align the efforts of many organizations began during the AAU Initiative and needs additional resources and support to demonstrate further impact. However, the initial efforts were perceived to be promising.

Figure 2
Levels of the System

(Austin, 2011/2014)



TASK 1: Locate your work on the overall system map in Figure 2, and consider various parts of the system that your organization can impact.

Instructions: Use Figure 2 above to complete each prompt below. Write where you would locate or place your work in reference to each level of the system illustrated in the diagram.

1. Locate your work related to individual faculty, if any.

2. Locate your work with departments or across groups on campus, if any.

3. Locate your work with institutions, if any.

4. Locate your work in terms of working with and drawing on other external groups, if any.

5. Locate the interactions or synergy of your work across the system. Do you already work to build connections or alignment across multiple levels?

Chapter 6 Leverage Influence Strategies

In addition to a systems approach, considering your organization's influence within the system is also important. The literature on change has very little articulation, definition, and specific examples of influence strategies from an institutional theory perspective that try to shape overall norms in a system. The study of AAU was able to provide concrete descriptions of what influence can look like within higher education settings, ranging from setting up institutional competition, peer and benchmark comparisons, branding, awards, site visits, to partnering with influential organizations (see the report, *Scaling Improvement in STEM Learning Environments*, for more details).

Every organization has the ability to influence some set of groups or individuals, and consideration of the most effective influence strategies is particularly important for a strategic approach. But influence is generally an implicit strategy and not one that organizations conduct strategic planning around—even though it is an important lever for change. This report helps articulate some of the influence strategies that organizations might consider. Certainly, the AAU is unique in its prestige and can realize influence strategies that many other organizations are not able to. However, the idea of planning an influence strategy and mapping out individuals, groups and organizations in which a change agent has influence is a generalizable strategy.

AAU, for its part, was able to influence institutional leaders by creating competition in which leaders did not want to be perceived as getting behind others in a particular area of work priority. Media and press coverage pushed institutional leaders to prioritize teaching improvement. Seeing another institution in the press for addressing the quality of teaching pushed leaders to make this a priority. And site visits with AAU staff also directly influenced leaders.

AAU was also able to influence faculty by using the name of other AAU institutions. Noting that Brown University or University of Pennsylvania was working on improving its teaching compelled faculty from other institutions to pay attention when they otherwise might not have. Faculty and academic departments were also compelled by a national departmental award for teaching. And departments found partnerships with influential groups like Howard Hughes Medical Center important and helpful in getting deans and department chairs' attention—especially as groups campus leaders cared about were attending AAU meetings. These are just a sampling of influence strategies which worked at various levels of the system.

TASK 2: Map your organization's potential influence on Figure 2 (see p. 16).

Instructions: Use Figure 2 to map the potential influence of your organization and the levels where you might have the most influence in the system. Describe the ways you can leverage your potential influence. Note areas where you might have significant influence, as well as those where you might only have some influence.

In terms of approaches to influence, consider as a starting point the techniques used by AAU—external rewards, recognition and awards, media and press, site visits, partnering with other influential organizations, creating standards, developing benchmarks, name-dropping AAU, branding as an AAU site, and competition between institutions—and consider other approaches you might use.

1. Relevant individuals to system (e.g. faculty, student affairs staff, disciplinary or institutional leaders)

a. Significant influence
b. Some influence
c. No current influence but important to my effort

Approaches to influence (How can your organization go about influencing these individuals or groups?):

2. Relevant departments, campus groups related to system

a. Significant influence
b. Some influence
c. No current influence but important to my effort

Approaches to influence:

3. Institutional aspects of system

a. Significant influence
b. Some influence
c. No current influence but important to my effort

Approaches to influence:

Chapter 7 Build and Support Networks

Our study of the AAU Initiative identified how networks can be extremely successful in scaling change, as they can serve many functions ranging from information sharing, dissemination of logics and new values, brainstorming, and learning, to emotional support, influence, and safety in numbers for risk taking, as well as resource development. Our study also demonstrated the importance of connecting multiple networks, providing support for networks, and developing leadership to maintain networks. Organizations can utilize the lessons from this study to help define and implement networks for scaling change. Again, organizations often organically allow networks to develop and may not intentionally think through how networks are utilized and connected to scaling change. The multiple network functions identified in the AAU Initiative would not have flourished without the planning and attention of AAU staff.

AAU was careful to build and support new networks, to map and identify the type of functions occurring with their networks, and to conduct planning to support their networks, including building in informal networking time, connecting people across the networks, or communicating within and across the network.

In this section, we ask you to consider your existing networks and their levels of development in terms of supporting change. We also ask that you use this section to brainstorm new networks and relationships that do not yet exist but might be important to build.

List key groups that you network with related to the initiative you are undertaking:

Instructions: For each of the networks listed above, fill out Table 4, mapping the various network features—functions and structures—in order to consider ways to improve the networks with which you are currently working.

Table 4: Network Features and Strengths

Network Feature	Non-existent	Emerging	Well-developed
Share information and build knowledge			
Build resources			
Build cultural capital			
Create relationships			
Provide emotional support			
Promote learning			
Exercise influence			

Network Feature	Non-existent	Emerging	Well-developed
Identify meaningful subgroups			
Provide informal time to build relationships			
Provide resources and means to meet and interact			
Provide means to communicate			
Provide opportunities for deeper and less intensive interaction for both weak and strong ties			
Get key individuals and opinion leaders involved			
Develop network leadership			
Demonstrate value of the network for existing and potentially new members			

In examining the network features of existing networks, which might need further refinement?

In examining your list of networks, what new networks would you like to build? How would this new network support your goals?

Chapter 8 Create Feedback Loops

Creating feedback loops around change processes is important and benefits groups in efforts to create learning and adoption of new practices. Feedback loops are mechanisms to obtain information that can help adjust one's approach or strategy. Feedback loops can also benefit other processes we noted, such as communication around logics, influence strategy, and network building. These would all be key areas for feedback.

AAU created several feedback loops. The organization conducted regular evaluations of its meetings, entertained informal assessment with project site leadership, and collected data and annual reports from campuses as a way to provide information to support learning.

Instructions: In Table 5 below, identify in the first column feedback loops that already exist. If none exist, use the second column to describe feedback loops you can create to get feedback on that issue.

If you do identify feedback loops in the first column, we ask you to evaluate whether the feedback loops are providing adequate feedback. If not, use the second column to consider additional feedback loops. We provide a few examples of what we mean by feedback loops. A blank version of the tool is available as Appendix B.

Table 5: Feedback Areas and Feedback Loops

Feedback areas	Existing feedback loops	Creating new or adding additional feedback loops
Networks and relationship development	Faculty surveys noted how informal networking opportunities at meeting were useful	Survey centers for teaching and learning about whether they need more networking opportunities
Influence strategies		
Communication	Other national STEM reform groups provided input about how other campuses were perceiving the Initiative	
Organizational learning		
Leadership development		
Team interactions and development		
Language and framing of ideas around change		
Information sharing		
Data use and expertise		
Incentives and rewards		
Examining links between parts of the system to affect change		

Conclusion and Next Steps

Higher education stakeholders that are external to campuses have been and can be important catalysts for change—particularly large scale changes. The history of higher education reflects that external groups have helped guide many important advances, from increased access, advances in research and teaching, to improved student success and new roles for campuses to play and expand their reach in society. In order to best maximize the role that key external organizations can play, our research offers insights into various planning steps that can guide this work. In this final section, we provide a space for reflection and summary of the key areas needed to implement scaled change. We hope that planning groups use this to synthesize their thinking from across the various sections and to consider their strategy moving forward more holistically.

While you can start anywhere to plan your scaling strategy, we suggest the following eight areas, with conducting an asset assessment, ensuring distributed leadership, and framing of work being most helpful in the beginning, followed by a multi-theory action plan, systems planning, leveraging of influence, and network building. Once an overall strategy develops, we recommend mapping feedback loops.

Summary and Reflection

Instructions: Use the space below to write down the strengths and weaknesses you identified through completing this guidebook for each planning area.

Planning area	Strengths and weaknesses	Notes
Asset Assessment	Strengths: Weaknesses:	
Distributed Leadership	Strengths: Weaknesses:	
Language and Communication	Strengths: Weaknesses:	

Planning area	Strengths and weaknesses	Notes
Systems Planning and Thinking	Strengths: Weaknesses:	
Multi-Theory Strategies	Strengths: Weaknesses:	
Networks	Strengths: Weaknesses:	
Feedback Loops	Strengths: Weaknesses:	

Appendices

Appendix A: Asset Assessment Tool

Theories of Change	Strategies for Scaling Change	Strategy is Nonexistent	Strategy is Emerging	Strategy is Well-developed
Institutional Theory/ Influence	*Type of groups*			
	Type of influence			
	Influence vehicles or strategies			
	Areas of greatest legitimacy			
Networking	*Number of existing networks*			
	Type of functions existing networks			
	Leadership capacity within networks			
	Ability to connect to new networks			
Organizational learning	*Data collection and management capacity*			
	Venues to share information and data			
	Vehicles of deliberation			
	Capacity to lead inquiry groups			

Theories of Change	Strategies for Scaling Change	Strategy is Nonexistent	Strategy is Emerging	Strategy is Well-developed
Culture	*Legitimacy to articulate new value system*			
	Access to key stakeholders to try out language and get feedback			
	Ability to craft a powerful message and frame			
	Dissemination venues for communicating values			
Politics	*Ability to set an agenda*			
	Ability to coalesce various groups to work together			
	Skill in information campaigns and social media			
	Negotiation skills with groups with differing interests			
	Lobbying and advocacy			
Systems	*Ability to shape and align incentives*			
	Ability to work across and align departments or units			
	Mapping various parts of a system and identifying which aspects you can shape and align			

Appendix B: Feedback Areas and Feedback Loops

Feedback areas	Existing feedback loops	Creating new or adding additional feedback loops
Networks and relationship development		
Influence strategies		
Communication		
Organizational learning		
Leadership development		
Team interactions and development		
Language and framing of ideas around change		
Information sharing		
Data use and expertise		
Incentives and rewards		
Examining links between parts of the system to affect change		

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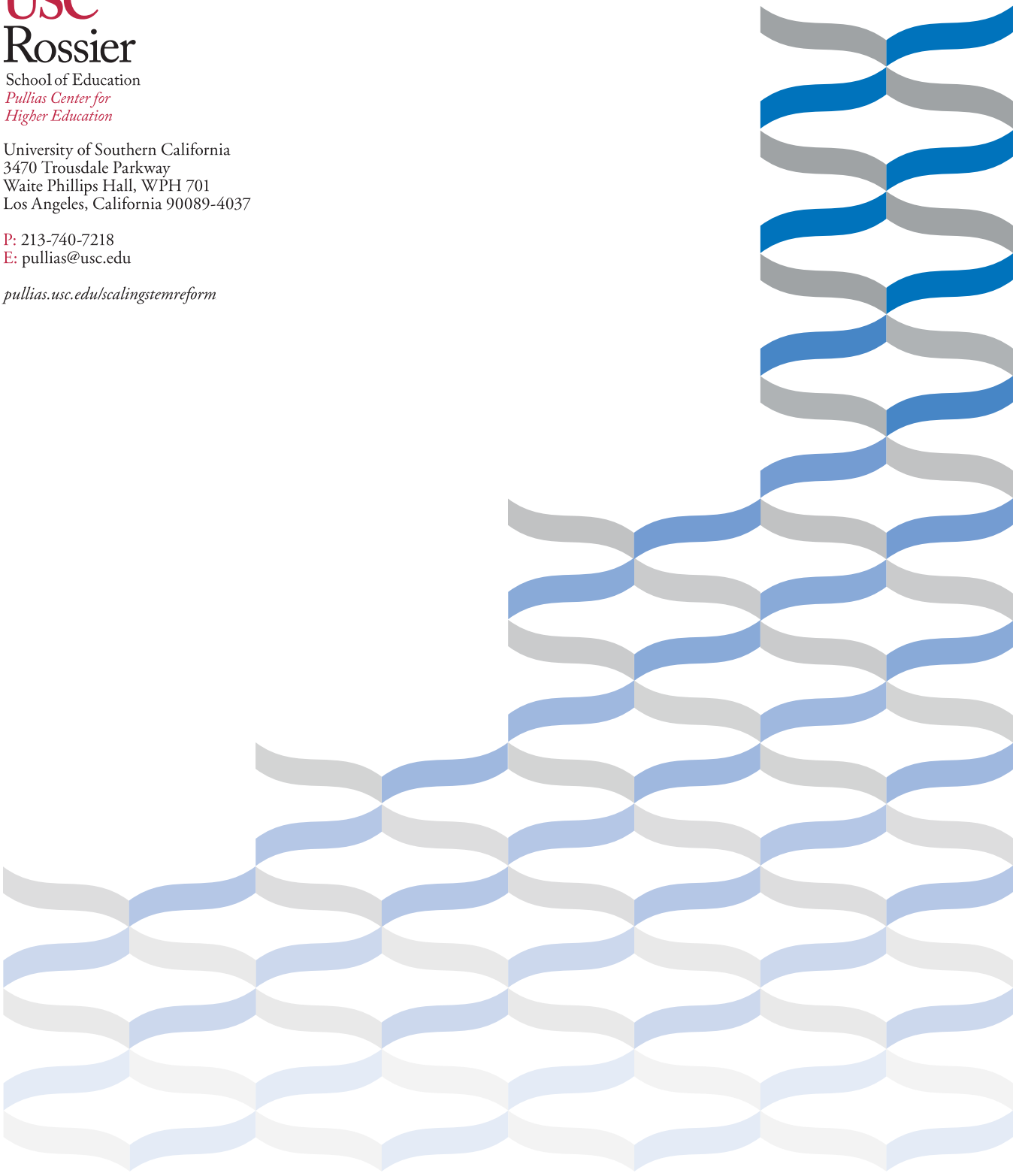

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