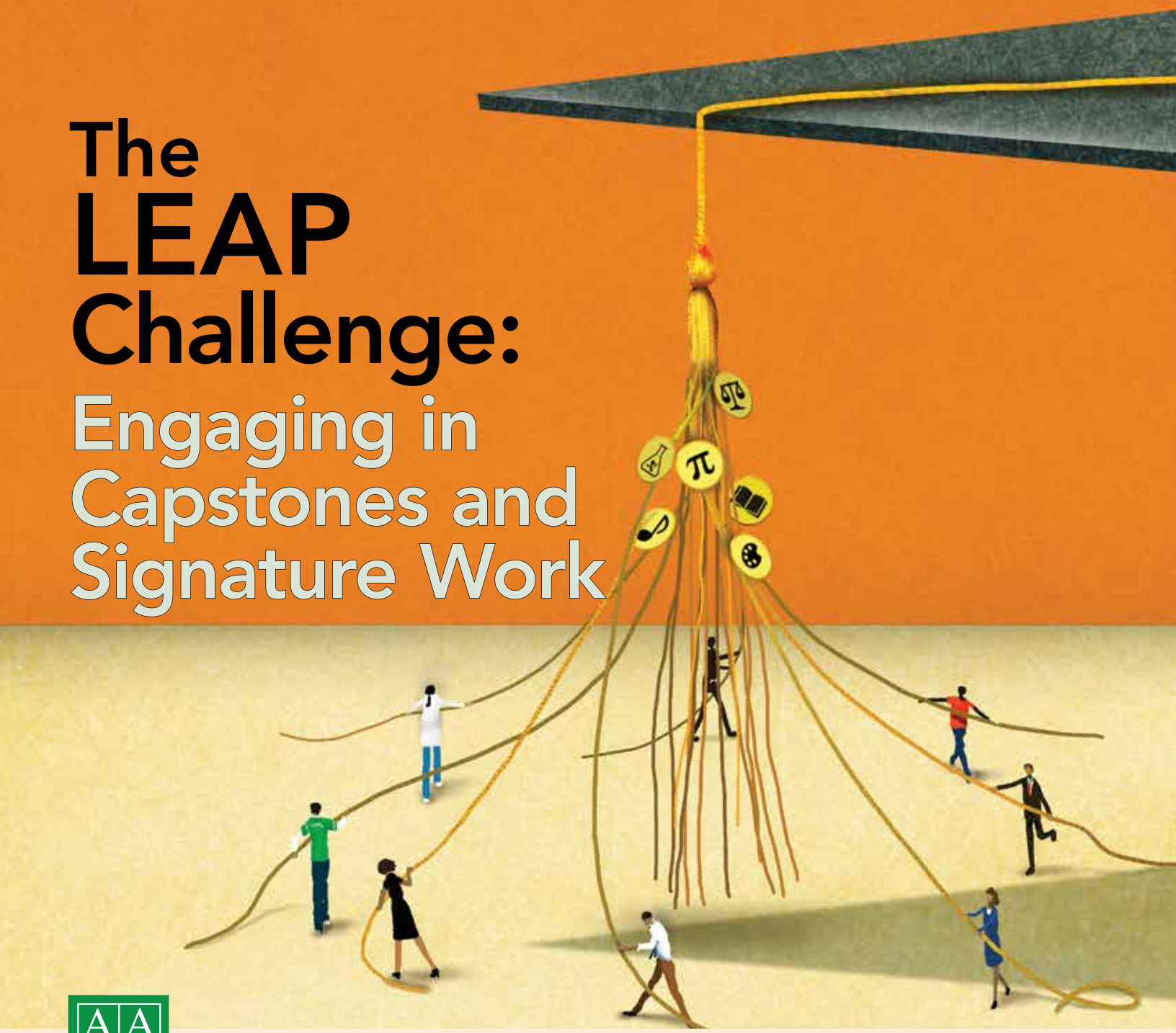
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peerReview

EMERGING TRENDS AND KEY DEBATES IN UNDERGRADUATE EDUCATION

The LEAP Challenge: Engaging in Capstones and Signature Work



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Today is your day! Your mountain is waiting.
So . . . get on your way.

—Dr. Seuss, *Oh, the Places You'll Go!*

Commencement is one of the most joyous occasions on campuses. As a time to celebrate and mark the end of students' time at their alma maters, commencement calls upon graduates to envision their futures. This year—amid a Wall Street boom and disruptions caused by the #TimesUp and #MeToo movements—commencement speakers on campuses across the country offered a variety of insights about navigating our complicated world. The following quotes are a sampling of that wisdom.

"Whatever you choose for a career path," actor Chadwick Boseman advised the Howard University graduating class, "remember the struggles along the way are only meant to shape you for your purpose."

Attorney and journalist Ronan Farrow told his Loyola Marymount University audience, "You will face a moment in your career where you have absolutely no idea what to do. Where it will be totally unclear to you what the right thing is for you, for your family, for your community . . . but trust that inner voice."

"Before you go out in the world, map yourself," film director Ava DuVernay recommended to the 2018 Cornell University class. "What will be your story? Your movie? You're the director. You're free to experience and interpret this life from this moment on as you decide, as you declare."

As members of the class of 2018 begin to build their post-undergraduate paths, graduates who had the opportunity to participate in capstones and signature work will no doubt find those educational experiences to be invaluable. Signature work, the centerpiece of the Association of American Colleges and Universities (AAC&U) LEAP Challenge effort, calls for all college students to integrate and apply their learning to complex problems and projects that are important to the student and to society. When done well, capstones and signature work projects help students become critical thinkers skilled in analysis and argument.

This issue of *Peer Review* explores the work of AAC&U's LEAP Challenge: Engaging in Capstones and Signature Work eight-campus consortium. Sponsored by the Arthur Vining Davis Foundations, the project was led by Amy Jessen-Marshall, AAC&U vice president of the Office of Integrative Liberal Learning and the Global Commons, and Nancy Budwig, AAC&U senior fellow. Consortium members—administrators and faculty from Augustana College, Bates College, Clark University, Connecticut College, Elizabethtown College, Nebraska Wesleyan University, Oberlin College, and the College of William & Mary—worked with AAC&U to show how capstones and signature work can become essential and expected, rather than available and optional.

Instead of providing articles about individual campus perspectives, many of the pieces in this issue were written by teams from multiple consortium campuses to examine the topic through several lenses, including defining and framing signature work on campuses, curricular change and strategies for organizing signature work, student preparation for signature work, institutional readiness for signature work, and assessing signature work. Those articles are bookended by Budwig and Jessen-Marshall's article on making the case for capstones and signature work and Jillian Kinzie's observations about the state of signature work. By presenting the consortium's research and reflections, we hope to advance conversation and support other campuses in scaling up their own signature work efforts.

As graduates move beyond campuses after commencement, their participation in capstones, signature work, and other high-impact educational practices will benefit students in all future endeavors. To this point, AAC&U President Lynn Pasquerella recently shared this guidance with Mary Baldwin University's graduating class: "The capacities engendered in you to think critically, to communicate clearly, to work in diverse teams on global issues, to make ethical judgments, to be adaptable and flexible in the face of rapid change, to apply your knowledge in real-world settings, and to engage in sympathetic imagination—imagining what it is like to be in the shoes of another different from oneself—will enable you to thrive in work, citizenship, and life."

—SHELLEY JOHNSON CAREY



Making the Case for Capstones and Signature Work

▸ **Nancy Budwig,** Professor of Psychology, Clark University; Senior Fellow, Office of Integrative Liberal Learning and the Global Commons, AAC&U
Amy Jessen-Marshall, Vice President of the Office of Integrative Liberal Learning and the Global Commons, AAC&U

Early in 2015, the Association of American Colleges and Universities (AAC&U) began an initiative called the LEAP Challenge with the goal of encouraging and assisting institutions as they created and scaled capstones and signature work on their campuses. This initiative, housed in AAC&U's Office of Integrative Liberal Learning and the Global Commons, was designed to provide a collaborative space for administrators and faculty from eight diverse liberal arts campuses—Augustana College, Bates College, Clark University, Connecticut College, Elizabethtown College, Nebraska Wesleyan University, Oberlin College, and the College of William & Mary—to examine and further develop curricula that result in all students, not just the most fortunate, being well-prepared to engage in significant signature work before they graduate. The project was supported by a grant from the Arthur Vining Davis Foundations. Recognizing that each campus would arrive at different solutions to deepen campus engagement with the LEAP Challenge: Engaging in Capstones and Signature Work consortium, AAC&U also hopes to catalyze further work on other campuses by sharing the experiences of the consortium through this issue of *Peer Review*.

Capstones and signature work require students to practice the kinds of sustained work that will be part of their lives whatever they do, enhancing students' abilities to become critical thinkers who are skilled in analysis and argument around a complex problem.

The LEAP Challenge initiative aims to provide capstone and signature work opportunities for all students to integrate and apply their learning to complex problems and projects important to the students and society. Capstones and signature work are not captured in one assignment; rather, they require students to practice the kinds of sustained work that will be part of their lives whatever they do, enhancing students' abilities to become critical thinkers who are skilled in analysis and argument around a complex problem. AAC&U President Lynn Pasquerella notes that "capstones and signature work, offered to all students across every major, is one of the best approaches to cultivating the perception, intellectual agility, and creative thinking necessary for them to thrive in a globally interdependent, innovation-fueled economy. By asking students to address big questions and grand challenges from their first to final semesters, colleges and universities encourage students to test the edges of their own ambition and develop new levels of agency."

AAC&U selected the eight institutions because these campuses were already working on intentional and progressively more challenging curricular designs that encourage students to develop the



skills and knowledge necessary to produce a significant piece of work on a problem they define. The campuses were brought together for regular meetings. Over the first two years, the consortium was led by David Paris and Kathy Wolfe, who both served as vice presidents of the AAC&U Office of Integrative Liberal Learning and the Global Commons. After their departures and in the final year of the project, Amy Jessen-Marshall, AAC&U's new vice president of this area, and Nancy Budwig, an AAC&U senior fellow in residence, took over the leadership role for institutional discussions and disseminating the work of this consortium. The articles in this issue of *Peer Review* attempt to distill outcomes of our collaborative efforts over the past years in a way that will be useful to other schools working on capstones and signature work. The project's member schools all learned a great deal and believe that widening the network to include experiences of other institutions will ultimately enhance the quality of student-centered and equitable learning on campuses nationwide.

EMERGING THEMES

This issue organizes the collective work of the consortium and efforts at our individual campuses around five themes that emerged over the course of our time together:

- *Defining capstones and signature work.* This includes discussion of how campuses came to infuse meaning into the overarching definition that AAC&U provided for capstones and signature work and describes patterns that emerged across campuses as they defined what capstones and signature work meant to them.
- *Organizing capstones and signature work.* This theme examines where responsibility for signature work was located on consortium campuses and explores how capstones and signature work were embedded in available programming and committees on campuses and whether new organizational structures or positions were created to oversee this work.
- *Student preparedness for capstones and signature work.* The consortium spent considerable time discussing the skills and capacities students need to engage in capstones and signature work and discussed how it is often thought that only the very best students on our campuses were ready to employ the range of skills and capacities such work requires. We focus here on the various efforts on our campuses as we considered how to build learning pathways that allow all students—not just the most advanced—to be well-prepared to engage in high-quality capstones and signature work.
- *Institutional readiness for capstones and signature work.* This fourth theme looked at how our institutions were set up for scaling signature work and focused on some of the barriers and obstacles that came up as capstones and signature work began on our campuses. We also review the solutions that were tested and that ultimately helped campuses as they attempted to fully scale capstones and signature work.
- *Assessing capstones and signature work.* A topic that kept emerging is how one can assess capstones and signature work. Many campuses note that this is still an area that needs significant attention. Here we describe practices in place and some early findings pertaining to efforts to assess capstones and signature work on our campuses.

Rather than present case studies of individual campus responses to the above list of themes, project members have modeled true integrative learning by coauthoring articles on each of the topics above. All of the articles that follow were written collaboratively, with the authors named taking the lead in collating responses from all of the consortium schools. In a final article, Jillian Kinzie, Associate Director of the Indiana University Center for Postsecondary Research and the National Survey of Student Engagement Institute, discusses what is known about quality learning and equity in capstones and signature work using the nationally collected National Survey of Student Engagement (NSSE) as a springboard for observations.

MAKING THE CASE FOR WHY CAPSTONES AND SIGNATURE WORK MATTER

The campuses involved in the consortium were selected because they had already made progress in capstones and signature work. Yet one of the major lessons from the consortium has been that this work has not been easy to scale. Stepping back from the project and examining how work proceeded, one issue on most campuses concerned making the case for why capstones and signature work matter. Implementing these projects is a big ask for faculty who would need to provide new levels of support to their students. We consider now how the issue has been framed to date, and we put forth an alternative framing that we believe will not only propel this work, but also help campuses better align campus structures, policies, and professional development opportunities in support of these efforts.

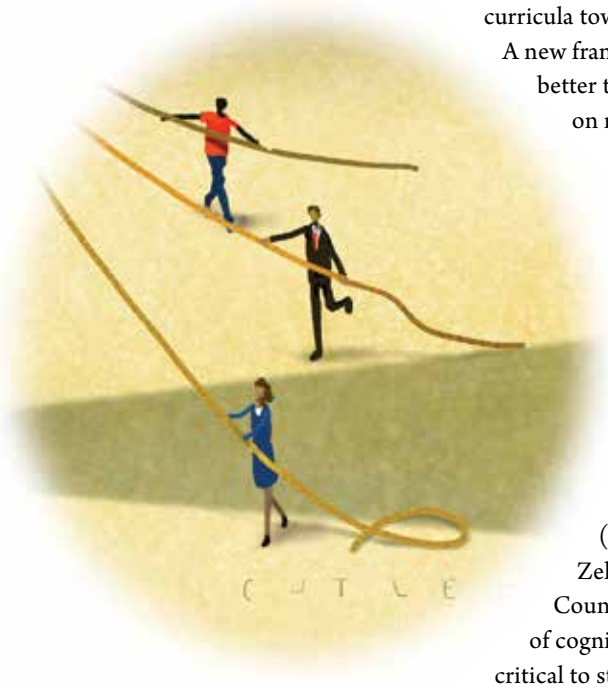
REFRAMING THE CASE IN TERMS OF STUDENT LEARNING

Every new initiative is situated in a time and place, and the work on the LEAP Challenge is no exception. Because it was initiated after one of our country's most significant periods of financial distress, which had an enormous impact on higher education, it should be no surprise that an initiative focused on capstones and signature work has been framed in terms of the importance for student success after college. For instance, much has been made about the links between capstones and signature work, the skills needed to successfully complete such projects,



and employers' beliefs about skill sets and capacities needed to be ready for employment. A comprehensive survey of employer beliefs (Hart Research Associates 2015) supports efforts to enhance capstones and signature work on our campuses. For instance, it was found that 91 percent of the employers surveyed say that critical thinking, communication, and problem-solving abilities are more important than a potential employee's undergraduate major. Furthermore, 87 percent of the same employers report that they would be more likely to consider hiring candidates if they had completed an advanced, comprehensive senior project. More recent findings reported annually in Job Outlook surveys created by the National Association of Colleges and Employers continue to show a gap between recent graduates' readiness to enter the workforce and the skills and capacities employers seek (National Association of Colleges and Employers 2018).

At first glance, a focus on employers' needs seems like a compelling way to frame efforts on campuses to develop capstones and signature work. Certainly, this framing speaks to the concerns of prospective students and families who are concerned about job prospects after college. But are there better frames for fueling this work on our campuses? Frames, as noted by linguist George Lakoff (2004), cannot be seen or heard. Following the work of others in cognitive science, Lakoff claims that frames are part of the cognitive unconscious, or "structures in our brains that we cannot consciously access" (Lakoff 2004, xv). Lakoff goes on to note that reframing can be an important tool for social change in that speaking in new ways influences thought patterns. While the focus on employer needs may be compelling to students and their families, and it certainly is important, we suggest that, based on efforts pertaining to the LEAP Challenge over the past two years, reframing the work could help move the needle on our campuses. Making the case for capstones and signature work only around employers' values is not likely to persuade faculty and others on campuses who value liberal education to reinvigorate curricula toward more engaged learning.



A new frame is needed. We believe it is better to make the case by drawing on recent research in the developmental and learning sciences on student success and student learning. Over the last decade, an exponential growth in our understanding of human learning and development points us to new ways of understanding student learning and development. Much of this work (e.g., Budwig, Turiel, and Zelazo 2017; National Research Council 2000) highlights a range of cognitive and noncognitive factors critical to student success. While rapidly impacting curricular reform efforts in the K–12 arena, this work has been noted to have had minimal impact in reform efforts in higher education (Budwig 2013). Findings from the developmental sciences emphasize the importance of developing the whole student, and this has led to consideration of a range of factors beyond cognitive abilities that appear to be predictive of student success. Such factors include social and emotional aspects of learning, including a student's sense of belonging, interest, and motivation. Similarly, findings from a large body of work from the learning sciences emphasize the importance of engaged learning and participatory practice, again highlighting that the best learning stems from deep and meaningful experiences (see Lave and Wenger 1991; Yeager and Walton 2011).

Capstones and signature work are not only important to future employers, but they are critical because they embody the best pedagogical practice for how students learn. Furthermore, as reviewed in a new report commissioned by the National Academies of Sciences, Engineering, and Medicine (2017), framing the case for capstones, and signature work in terms of signature work experiences goes hand in hand with what developmental and learning scientists have recently reported is critical to the predictive promise for college success, especially for underserved populations.

We contend that moving the needle on the sort of campus change required to implement capstones and signature work will require a stronger and more immediate framing of why this work is important. Framing this work in terms of student success and focusing on capstones and signature work as a platform for engaging in the kind of best practices outlined in recent studies of human development and learning will establish a more compelling frame for faculty on campuses that embrace



integrative liberal learning than a focus on employer needs. Furthermore, this framing is consistent with promoting inclusive excellence and equitable outcomes based on our knowledge that the practices associated with capstones and signature work advance student success for diverse populations and are believed to enhance college graduation rates and inclusive excellence.

CONCLUDING COMMENTS

The efforts of the eight campuses described in this issue provide an impressive beginning for defining and organizing structures on campuses to support capstones and signature work. Most campuses have learned that capstones and signature work require creating developmental pathways that prepare students for work across their time on campus. The campuses note that attending to the professional development of faculty and staff has also been required to build the necessary institutional capacity. Assessment efforts are in the early stages, but the LEAP Challenge consortium institutions view them as critical to helping campuses monitor and adjust practices as they begin this ambitious work.

Reframing the development of capstones and signature work on our campuses by emphasizing the importance of this work to student learning, inclusive excellence, and equitable outcomes is critical, and we believe it is an important and urgent catalyst to campus change. By itself, though, it will not bring about sustained change. A new framing, with its focus on the whole student, leads to a ripple effect in how we think about a range of campus issues including strategic planning, policies and procedures, and organizational models built on traditional boundaries between disciplines, between the curricular and cocurricular areas, and between student and academic affairs. Ferren and Paris (2015) outline some beginning thoughts on the importance of considering such issues, and additional examples of this contention can be found in Budwig, Michaels, and Kasmer (2015). As the LEAP Challenge work on capstones and signature work has unfolded, we have realized the importance of attending to these issues, but they go beyond the scope of this project.

There is much to be learned from the eight campuses who describe their efforts as they considered ways to scale capstone and signature work on their campuses. We hope this work generates a second round of learning as we unite to improve student learning and inclusive excellence on our campuses. ▪

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Defining and Framing Signature Work on Your Campus

▸ **Mike Egan,** Associate Professor, Education, Augustana College
Kristi Kneas, Dean for Academic Affairs and Faculty Development, Elizabethtown College
Michael Reder, Director, Joy Shechtman Mankoff Center for Teaching and Learning, Connecticut College

In 2015, the Association of American Colleges and Universities (AAC&U) launched its second century as a higher education leadership organization with the introduction of the LEAP Challenge initiative, which provides a vision for liberal education in the twenty-first century, arguing that institutions of higher education must prepare students to engage a world rife with complex "unscripted problems" (e.g., climate change, global migration, political polarization). The most pressing issues of our day, AAC&U points out, cannot be adequately approached solely with focused disciplinary techniques. Rather, the new generation of citizens who will address these problems must be equipped to understand the breadth of contributing factors (e.g., social, scientific, economic, technological, cultural) and be prepared to integrate these perspectives to arrive at creative solutions to significant problems. The LEAP Challenge proposes that all students, throughout their college years, should develop and practice such complex and important work, which AAC&U refers to as signature work.

The parameters of the LEAP Challenge, including a preliminary definition of signature work and a charge that it should be required for *all* students, were communicated in a special issue of *Liberal Education* (Tritelli 2015). A signature work project or experience should be substantial and broad, and "reflect and demonstrate cumulative and integrative learning across general and specialized studies" (Schneider 2015, 6). While the work connects with a pressing issue in the larger world, it is described as "signature" because it should correspond to each student's interests and expertise. "In signature work, each student addresses one or more problems that matter—both to the individual student and to society as a whole" (AAC&U 2015, 18). In addition to the goal of producing thinkers prepared to engage modern challenges, making signature work accessible to all students is also an issue of equity. While some of our college students already engage in rich scholarly work that resonates with the signature work construct, the majority do not (Schneider 2015). Access to signature learning experiences is uneven, as first-generation students, underrepresented students of color, and economically challenged students are much less likely to complete high-impact educational projects (Finley and McNair 2013).

DEVELOPING INSTITUTIONAL DEFINITIONS OF SIGNATURE WORK

While it is difficult to find fault in the idea that students should produce meaningful integrative work, there is also an inherent tension between the generality of the LEAP Challenge's charge (calling for *all* students to experience signature work) and the layers of specificity involved in implementing it (signature work projects must be facilitated by institutions with distinctive missions, and each student's signature work project should be unique). This tension is apparent in AAC&U's own literature, as signature work is described not only as "the expected standard of quality learning in college" (AAC&U 2015, 16) that "ought to become a degree qualification requirement" (Schneider 2015, 8), but also as an entity that will inevitably "take on many forms" (Peden 2015, 22).

Through AAC&U's project, LEAP Challenge: Engaging in Capstones and Signature Work, supported by a grant from the Arthur Vining Davis Foundations, a consortium of institutions were invited by AAC&U to respond to the LEAP Challenge. One of our first activities has been to actively resolve this tension by facilitating signature work in ways that are appropriate and feasible for our individual institutions and our students.



The first step in this process involved crafting definitions of what signature work would mean on our own campuses. Of course, no institutional definition should stray too far from AAC&U's vision; doing so would render "signature work for all" as a meaningless national goal. Peden (2015) provides useful guidelines indicating elements that should be common even as institutions adapt the concepts to their own settings. He argues that signature work projects must align with three criteria:

1. Students must have some agency in identifying the nature of their project.
2. Projects must be integrative, drawing on multiple components of the student's education.
3. Student projects "must address 'big problems'—students should apply their learning to real-world issues that matter to society and to the student" (22).

Schneider (2015) suggests that high-impact educational practices, while not equating to signature work, do provide productive launching points from which students and their mentors will be able to craft signature projects aligned to Peden's criteria. Indeed, our institutions have found that high-impact practices (HIPs) have become useful starting points in framing our definitions of the broader concept of signature work. (For more information on high-impact practices, see Kuh 2008; Eynon and Gambino 2017.)

THE CAPSTONE'S RELATIONSHIP TO SIGNATURE WORK

While the teaching practices and learning experiences known as HIPs are not the same as signature work, one HIP, the senior capstone, clearly has a large degree of overlap with signature work. By definition, a capstone project will be integrative in nature. Well-designed capstone experiences also have the potential to be driven by student interests, to be applied to real-world issues, and to integrate knowledge beyond the student's major to include interdisciplinary concepts explored through general education, academic minors, internships, cocurricular learning opportunities, and other sources. Most institutions in our cohort have chosen to frame signature work in relation to senior capstone programs, though we will outline exceptions to this solution.

Our shared participation in the LEAP Challenge consortium provided the impetus for institutions to reexamine or redefine existing senior capstone programs. Bates College, for example, has a long history of facilitating capstone projects that are meaningful to the students and important to the field of study and/or to the larger society. Bates facilitates such projects for most of their students, reporting that nearly all of the graduating class completes a senior thesis. While Bates has a highly developed capstone program, they also report that collaborating with AAC&U and other institutions on the concept of signature work has pushed them to consider ways to strengthen and optimize student experiences with senior theses and capstones, and at other points in students' time at Bates. Through interinstitutional collaboration, Bates expects to learn more about the specific elements that make signature projects compelling and explore strategies for students to integrate and reflect on such experiences over their college careers.

While participation in the LEAP Challenge project was one motivator driving partner institutions to reexamine senior capstones, curricular change processes on campuses were another force that led institutions to align their existing capstones more closely with the precepts of signature work. Over the last five years, Nebraska Wesleyan University has worked to reimagine its entire curriculum as it strives to coherently integrate learning—both inside and outside the major—across each student's four-year experience. The senior capstone is an integral and culminating part of that effort. Informed by the signature work construct, Nebraska Wesleyan's faculty approved the following guidelines for senior capstone projects in 2017:

In every capstone course, students will be required to

- synthesize and integrate cumulative knowledge;
- apply learning and create new knowledge;
- work independently, bringing their own ideas to their work;
- present the results of the capstone work to an audience;
- meet rigorous professional and disciplinary standards;
- reflect on their own development.

Like Nebraska Wesleyan, Augustana College is also restructuring its curriculum as its campus transitions from a trimester calendar to a semester calendar. One significant change has involved redefining Augustana's capstone program, called Senior Inquiry, and sharpening its alignment to signature work. Augustana's existing guidelines for the Senior Inquiry projects are well-aligned to Peden's (2015) criteria for signature work, but the forthcoming curricular changes have enabled this campus to make the alignment more explicit. In 2017, Augustana's faculty approved the updated guidelines shared below. The earlier guidelines (shown in plain type) remain the foundation of Augustana's definition of signature work, but those earlier guidelines have been clarified with language borrowed from AAC&U (shown in italics).

- The Senior Inquiry project is substantial in meaning and impact. *The project should be meaningful to the student in that the student identifies the question/topic independently or in collaboration with the instructor. The student will communicate why the project is meaningful and impactful via a reflective component.*
- The Senior Inquiry project is communicative of the discoveries made in the project. *It includes substantial writing and/or visible results.*
- The project is reflective of one or more of (a) the nature of knowledge and



inquiry; (b) self-awareness and connection with others; (c) the relationship of individuals to a community. *This will be demonstrated through appropriate forms of reflection on learning.*

- *The project integrates various elements of the student's education,* with specific emphasis (i.e., two or more areas) of the general education curriculum. The project results in a permanent record.

ENHANCING PREPARATION FOR A SIGNATURE CAPSTONE

Students at Clark University and Connecticut College generate their signature work through capstones as well, and these institutions also consider curricular scaffolds that prepare students for the senior capstone to be integral pieces of the culminating work. In expressing how signature work is defined on their campuses, these institutions emphasize that the holistic curriculum supports students as they identify questions of personal and societal significance, integrate knowledge while investigating these questions, and communicate their learning via both incremental and culminating projects.

Clark recognizes that students' ability to produce original and meaningful work must be intentionally developed over time, hence their campus aspires for its students to demonstrate the capacity to generate and successfully apply knowledge in increasingly complex organizational, social, and civic contexts. First- and second-year students at Clark develop foundational skills through general education courses and introductory courses in the major. Upper-level students take a Problems of Practice (PoP) course that provides a transition from their earlier work in a given field to their senior capstone, where they will be expected to apply their knowledge and make a specialized, signature contribution to the field and/or beyond. PoP courses are often project-based experiences in which students work as a team for an extended period. Led by a faculty member, students in this course investigate and respond to an engaging and complex question, problem, or challenge. PoP students also engage with an extended network of collaborators who might include peers (as peer learning assistants), graduate students, and experts from beyond the campus. The PoP experience, which requires students to delve into a specific problem or emergent issue, is immersive, exposes the productive tension between theory and practice, and has proven to be risky and messy because PoP projects generally do not yield tidy solutions by the end of the term. These courses do not examine methods in a vacuum, but instead put methods into contextually appropriate practice. The PoP experience necessitates reflection on self, the field, and the development of one's identity. These intermediate-level courses allow students to develop a "feel for the game," and by modeling independent and collaborative work, PoP experiences prepare students to flourish later when engaging with their culminating senior capstone.

Connecticut College recently created its new Connections curriculum, which asks students to integrate their overall academic experience, including their general education courses and their majors, over the course of four years (see Budwig and Low and Hayden-Roy et al. in this issue of *Peer Review* for more information). Within Connections, each student chooses an Integrative Pathway in which everyone tells the story of his or her liberal arts education within a broad intellectual framework. The Connections curriculum takes the most impactful components of the college's long-standing (and optional) interdisciplinary centers' certificate programs, typically completed by only 15 percent of students, and requires those integrative experiences of all students (see https://www.conncoll.edu/academic-centers; https://www.conncoll.edu/connections/integrative-pathways). Every pathway is organized around a central theme; that theme helps students frame an individualized "animating question" that provides a focus for their work.

Each Integrative Pathway consists of four principal components:

- Thematic Inquiry: Every student must take a designated course that presents the theme and provides an overview of the pathway.
- Curricular Itinerary: These three courses, taken in a variety of departments and disciplines, allow students to explore the theme of the pathway in light of their animating questions.
- Global/Local Engagement: Each pathway requires students to pursue purposeful engagement in a local or international context, such as study away, an internship, or community-based learning.
- Senior Reflection: Each pathway provides an opportunity during the fall of senior year for students to reflect on the different elements of their pathway, in the context of their overall undergraduate experience. This component is connected to an all-college symposium, at which students will share their responses to their animating questions with the wider college community.

These pathways are the main mechanism through which Connecticut College students are asked to integrate their work and create a final, signature project. Integrative Pathway themes that have been approved by the faculty include Bodies/Embodiment; Cities and Schools; Entrepreneurship, Social Innovation, Value, and Change; Eye of the Mind: Interrogating the Liberal Arts; Global Capitalism; Peace and Conflict; Power/Knowledge; Public Health; and Social Justice and Sustainability: Developing Resilient Communities Locally and Globally. Other pathways still under development include "Identity" and "Global New London." The entire Connections curriculum is framed under the umbrella of "full participation,"



a campus culture that "enable[s] people—whatever their identities, backgrounds, or institutional positions—to enter, thrive, realize their capabilities, engage meaningfully in institutional life, and enable others to do the same" (Sturm et al. 2011).

FACILITATING SIGNATURE WORK THROUGH HIGH-IMPACT PRACTICES

Senior capstones are not the only HIP that can be harnessed to facilitate signature work. Elizabethtown College's Signature Learning Experiences (SLE) program, instituted in fall 2013, requires all students to choose and complete at least two experiences from among five categories: (1) internship/practicum/field placement; (2) research under a faculty mentor; (3) capstone experience, project, or developmental portfolio; (4) cross-cultural experience; and (5) community-based learning. Through these experiences, which occur in the curriculum, the cocurriculum, and the SLE program, a student is mentored by faculty instructors and guided by academic advisors who have been trained to ask "big," developmentally appropriate questions. With this help, the student chooses and completes a body of work that the school's website states is "as unique as your own signature." In some cases, particular SLEs are built into departmental curricula, so choice refers not only to the specific categories of SLEs but also to the nature of the specific SLE work (e.g., the topic of undergraduate research or the site of a study abroad semester).

While other institutions in our cohort view the senior capstone as the clearest example of a signature work program reaching all students, most institutions also highlighted how additional HIPs scaffold, support, or complement the capstone. Nebraska Wesleyan uses eportfolios as tools that help foster the integrative goal of their capstone program. Augustana's Senior Inquiry capstone program includes a faculty-directed or assisted research project. Some form of real-world engagement (be it through study away, community learning, community-based learning, or internships) is included in both Clark University's and Connecticut College's programs designed to prepare students for a culminating capstone. Hence, while the pedagogical practices recognized as high impact are not synonymous with signature work, our cohort of institutions has found that the provision of HIPs for our students is a necessary component of facilitating their signature work.

ENHANCED UNDERSTANDING OF SIGNATURE WORK'S MEANING, IMPORTANCE, AND ASSOCIATED CHALLENGES

Our collective effort in defining signature work on our campuses enables us to share a more nuanced vision of how this construct might be defined and how it might play out in practice. As we examined institutional definitions and understandings of signature work, common descriptors emerged. These terms include *transformative, high impact, culminating, integrative, applied, self-directed, independent,* and *substantive*. As evident from the institutional definitions and constructs cited in this article, signature work results in tangible outcomes, typically with students' communication of a final product and clear demonstration of higher-order thinking on Bloom's taxonomy. Most institutions highlight that the final product is reflective of a student's understanding of modes of inquiry and the construction of knowledge, and some institutions, through careful advising and/or mentoring, also promote a student's reflection on the meaning of their signature work in relation to self, others, and communities.

Defining signature work, of course, is much easier than ensuring that each of our students completes such work during their college years. Preparing students and faculty to meet the spirit of the LEAP Challenge is certainly a daunting task, but it is well worth pursuing. The claim that signature work experiences can effectively prepare our graduates for unscripted and multifarious twenty-first-century problems is not unreasonable. Our institutions have found that HIPs are indispensable vehicles for facilitating signature work. The present reality in the United States is that traditionally underserved students are much less likely than their more affluent peers to experience HIPs, even though it has been found that underserved students actually reap greater educational benefits when they are engaged with HIPs (Kuh 2008). Signature work promises to enhance these benefits even more, prompting students to reflect on the meaning of these rich learning experiences as they integrate and apply their learning toward significant problems facing local, national, and/or international communities. We join AAC&U in challenging higher education institutions to ensure that all students have the opportunity to produce signature work. ▪

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Processes of Curricular Change and Strategies for Organizing Signature Work

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Over the last few years, eight colleges and universities have committed to curricular change that incorporates "signature work"—work that allows students to pursue their own projects (or questions) that integrate and apply their learning to complex problems that are important to both the student and society. On each campus, the process of curricular and cocurricular change is still developing. Stemming from the LEAP Challenge initiative of the Association of American Colleges and Universities (AAC&U), the schools in the LEAP Challenge: Engaging in Capstones and Signature Work consortium, supported by a grant from the Arthur Vining Davis Foundations, have had the opportunity to critically reflect upon their efforts, learn from one another, and compare notes on the progress of their respective campus initiatives. In this article, we will consider how the process of change played out on our various campuses, offering an account of our collective experience with illustrative examples. We hope to provide some models for moving forward to schools considering similar processes and to list some of the challenges we have encountered that schools might anticipate when planning similar processes of change.

PROCESSES OF CHANGE

The consortium schools came into the LEAP Challenge initiative determined to use signature work to enhance student learning and be certain that their institutions' strong programs of liberal education were fully manifested in every student's educational experience. In each instance, the signature work initiative change process was embedded in larger curricular change processes that preceded or accompanied the work on signature learning. For instance, at Augustana College, the development of signature work for all students followed in a series of curricular changes that had been developing over the last eight years, providing an existing framework to integrate efforts aimed at scaling signature work. Clark University, Connecticut College, and Nebraska Wesleyan University initiated signature work as part of institution-wide curricular revisions in which integration of learning was a major objective; the signature work initiative on these campuses was constituted within the new structures of learning for students. Bates College, Elizabethtown College, and Oberlin College included signature learning as part of a larger process of institutional development and strategic planning. In every instance, signature learning was incorporated within the development of curricular structures, institutional priorities, and processes of change. And in each instance, the processes of change were not mandated, but emerged from preexisting institutional priorities and faculty engagement, and in most cases they were driven by institutional research or the systematic use of research on effective teaching and learning. While there was structure to the process of change, in every instance there was also tolerance for the messiness of making institutional curricular revisions, and campuses modified the process of change as dictated by the circumstances. In the end, the changes were shaped by each school's identity and what they wished to provide for their students.

As a result, campuses had existing structures, courses, programs, and requirements that could be used to facilitate the development of definitions, models, and practices of signature learning.



For instance, at Elizabethtown, definitions that resulted from strategic planning were compared to existing courses and cocurricular experiences in the initial phase of development. Nebraska Wesleyan consulted with every department to develop a full inventory of each department's capstone practices; the results were then archived in a shared online location and used to match departments together to consult and learn from each other. Bates assessed their college-wide thesis requirement, which had dimensions similar to signature learning, in order to better understand what was actually happening with such work. Faculty at Augustana reviewed their Senior Inquiry courses, which revealed some unevenness in how that requirement represented the features of signature work. At Oberlin, a curriculum-tuning initiative created a context for considering how to better integrate and culminate student learning, and how to use the advising process to nurture the habits of mind at the heart of signature learning. These inventorying efforts were used to assess what was already present, and they were used as a springboard to launch change. This preliminary work was also an extremely important tool used to engage departments and other constituencies in the process early on, and it allowed institutions to identify how effective the curriculum was in providing high-impact learning for all students. This process can also allow concepts of signature work to reflect the actual culture and practices of the institution and to emerge as intentional efforts to connect "knowing to doing"—moving from theory to practice.

STRATEGIES FOR ORGANIZING SIGNATURE WORK

For many—but not all—of the consortium schools, developing an institutional definition of signature work and guiding the adoption of that definition through the school's legislative processes were at the heart of the process of advancing signature work on campus. Different schools employed different steering vehicles for this process.

Elizabethtown and Clark employed a main academic legislating committee to engage campus constituencies in the process of defining and adopting new curricular standards that incorporate signature work into learning required of all students (with a parallel process led by the administration to engage the governance board).

Augustana, Nebraska Wesleyan, and Bates established a signature learning team to move the process of engaging faculty and other important constituents forward in envisioning, defining, and proposing curricular changes related to signature work. In that process, it was often a priority to engage departments, build support for the new or enhanced learning objectives, and explore how departments would participate in the delivery of the new curriculum. Cocurricular advising processes were also incorporated into the models at Elizabethtown and Oberlin. In the case of Nebraska Wesleyan, they developed an institutional profile of signature work by (1) having each department chair define signature work, (2) categorizing the responses, and (3) refining the definitions by integrating definitions of signature work from AAC&U into the results, a process that resulted in the adoption of a common institutional definition with which to move forward.

At Augustana, Clark, and Elizabethtown, the proposal to adopt a university-wide graduation requirement for culminating work involved a full faculty debate and eventual vote. In these cases, the path forward involved developing a process that enabled departments and faculty to be vested in the results. In many cases, the issue of equity—of involving all students in the full benefits of the curriculum—served to engage faculty across the university in the exploration of ambitious goal setting and adoption of signature work. Oberlin, however, did not attempt to develop a common definition of signature work before moving forward; rather, the definition emerged as departments worked on the integration of student learning. In the spirit of inclusive excellence, Oberlin found that expanding beyond the traditional honors project—which is perfect for some, but perhaps not appropriate for all—to a more broadly cast culminating experience was a compelling strategy to broaden access and promote opportunities for students to reflect upon their educational experiences within and beyond the curriculum.

For many institutions, the process of developing, expanding, or fortifying signature work involved pilot programs, either with model courses or revised departmental curricula. Connecticut College built upon and connected to ongoing curricular changes as the school re-envisioned its entire four-year general education curriculum. The faculty developed and piloted a variety of 100-level courses that introduce and nurture the habits of mind required for students to successfully undertake integrative signature work during their senior year. They also created and piloted a variety of pathways that are based upon their already successful certificate programs offered by their four interdisciplinary academic centers (see the article by Egan, Kneas, and Reder in this issue of *Peer Review*).

At Elizabethtown, some departments hastened to incorporate the new curricular requirements into their majors, and other faculty and professional staff members refined existing curricular and cocurricular experiences so that they would meet the institutional requirements of signature work. At Nebraska Wesleyan, several departments volunteered to model the new signature work features in their departmental capstone process; at Bates, a number of departments revised their thesis



to include signature work features, and the results were closely monitored. Clark faculty developed dozens of new courses using grant funding. In many instances, it was important for schools to find and support the "early adopters" and use their willingness to pilot the changes to translate theory into practice and provide tangible evidence of the possibilities of changing the curriculum, while also monitoring the attendant challenges that accompany such changes.

The translation of the ideal of signature work into the practices of each institution highlights the many ways signature work can be implemented. At Clark, the Problems of Practice (PoP) courses and a revised graduation requirement provided a new structure for student learning that included signature learning within each student's path. PoP courses are intermediate-level experiences through which students develop independent and collaborative work that prepares them to flourish in their culminating capstone.

Elizabethtown students engage in conversations with their faculty advisors, who facilitate students' selection of two or more meaningful signature learning experiences (from among five different categories) that will enrich their education and fulfill the graduation requirement.

At Nebraska Wesleyan, existing capstones are being revised and fortified to incorporate practices that integrate student learning through eportfolios and reflection. In each capstone, students use their eportfolios and both general education and departmental coursework to reflect on their learning trajectory, to raise questions that will guide their capstone work, and to launch themselves into that work.

At Augustana, the adoption of a Senior Inquiry requirement for all students within the graduation requirements infused signature work into the broader curriculum. Augustana reclassified its existing Senior Inquiry program from strictly a major requirement to a college-wide graduation requirement, thus establishing a system where the college's committee overseeing the general education curriculum could ensure that all capstone experiences on campus align to shared standards.

At Bates, departments are experimenting with new pedagogies and approaches to extend and enhance the integration of student learning.

Connecticut College's new Connections curriculum asks students, beginning in their first semester, to consider their own goals and priorities in light of the college's liberal arts mission. Students develop transdisciplinary thinking and application through a series of courses and experiences that span their four years at the institution as part of a pathway that requires them to integrate their majors, general education courses, cocurricular experiences, and interests in a culminating signature experience during their senior year. At each institution, signature work initiatives involved enhancing and fortifying teaching and learning that was already central to the mission of providing students a liberal education. The critical function of each signature learning initiative is to enable the integration of student learning and make the process of that learning clearer in the minds and practices of those who teach and those who learn.

WORKING THROUGH CHALLENGES

As each school moves forward with implementing changes to bring signature work more to the center of teaching and learning, issues and challenges continue to arise. First, signature learning is labor-intensive, often involving faculty in more mentoring and collaboration, both with each other and with students, and in most institutions, faculty time and energy are already fully engaged. While most faculty embrace the ideals of making signature work a universal experience of students on campus, resource limits can disable momentum for change. Often, effective curricular reform doesn't involve adding to what is already going on; instead, it considers how to evolve systems toward more effective practices. It is important to factor into the budget the necessary incentives and rewards for faculty and staff who engage in the significant changes required to implement new processes of learning.

Another significant concern involves the differing cultures within departments and disciplines, and the need to work with departments collaboratively to consider flexible models that can accommodate the needs of different programs. Integrating work across the curriculum, especially when located at the level of the major or department, has proven to be tricky. It is important to incorporate students into the process when developing your work, not only as a constituency to consult but also as effective advocates and carriers of your new practices. The success of your process will partly depend upon how well you can nurture new ways of thinking, build the process from the grassroots, and involve the larger campus community—not only faculty, students, or administrators, but student-life, coaches, librarians, curators, and staff of various stripes—in internalizing the changes in institutional systems of learning. Finally, once an institution starts up the new cycle of teaching and learning, there must be accompanying adjustments to institutional assessment, a careful monitoring of the success of the new or fortified curriculum, and a system to feed the results of this assessment back into the curriculum. Realizing the benefits of curricular change of this scope requires a long-term institutional commitment from senior administrators, faculty, and staff, and a recognition that the process must work its way into the institutional culture. For each of these institutions, the process is ongoing and organized around cycles of continuous improvement. ▪



Student Preparation for and Engagement with Signature Work

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For the institutions who participated in the LEAP Challenge: Engaging in Capstones and Signature Work consortium, led by the Association of American Colleges and Universities (AAC&U), a major outcome has been sharing findings about who engages in capstones and signature work and what we are learning about students' preparation. It has become clear that capstones and signature work need to fit with the broader trajectory of students' academic work and development—not as an add-on, but recognized by students as the natural outcome of their ongoing studies and broader experiences. From the student perspective and experience, what do we know and what are we learning about who engages in signature and capstone work? And what is needed to broaden successful participation in and engagement with signature work? This article will consider how schools are ensuring that all students can engage in capstone and signature work, where that work is located (for instance, whether it is part of a core curricular experience or an optional summer program), and what we are learning from our students and faculty about student readiness. One issue central to the various campuses is that current curricular experiences are not yet ensuring that all students are well-prepared to engage in this type of work, including even our most talented students. This article shares our joint learning about student engagement with and preparation for capstone and signature work on our campuses.

WHO PARTICIPATES IN SIGNATURE WORK?

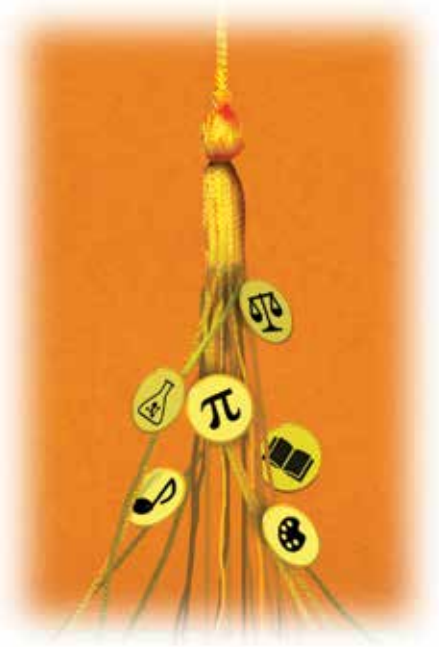
As noted in the LEAP Challenge description from AAC&U (2015), "Signature work can be pursued in a research project, in a capstone experience, in thematically linked courses, in a practicum, or in service learning settings." The overlap among high-impact practices (HIPs) and signature work is notable, but the two are not interchangeable. In signature work, it is critical that students have agency in leading the work (with faculty mentorship), and that students also have the opportunity to apply their learning to complex or unscripted problems.

The overlap among high-impact practices (HIPs) and signature work is notable, but the two are not interchangeable. In signature work, it is critical that students have agency in leading the work (with faculty mentorship), and that students also have the opportunity to apply their learning to complex or unscripted problems.



In addition, signature work requires that students integrate learning from their major, general education courses, and cocurricular activities, as well as reflect on their learning. Access to and completion of learning opportunities such as capstone projects, research or other independent creative scholarship, internships, and study abroad enhance the likelihood that students will accomplish signature work, but they provide no guarantee. Colleges and universities contemplating scaling up student engagement with signature work must keep in mind that although high-impact practices can and often do provide venues for signature work, more needs to happen to ensure that the benefits of signature work are realized. According to the most recent National Survey of Student Engagement (Center for Postsecondary Research 2017), 61 percent of seniors report participation in at least two HIPs. Of those students, 45 percent reported that they completed a culminating senior experience, including capstones, with a range of 46 percent to 74 percent depending on the type of college or university. For the colleges participating in the signature work project, most have stated goals of 100 percent participation in capstone projects, with some schools well on the way to meeting that goal. Across our schools, we found that linking signature work to capstones and some other high-impact practices presents an opportunity for scaling up student signature work, though this work needs to be well thought-out.

Given that many of our schools had capstone seminars in place, this was a natural starting place for them to consider scaling signature work. The participating schools came to the recognition that completing a capstone by itself did not necessarily mean a student engaged in signature work as defined by the LEAP Challenge (https://www.aacu.org/signaturework). Not only do capstone experiences cover a wide spectrum nationally (see Henscheid 2000 for a survey of capstone offerings), that variation can occur within a single campus. Among our participating schools, capstones often ranged from upper-level seminars to independent research or internships. At Clark University, many faculty initially believed that requiring signature work as part of the curriculum would not be a challenge or necessary since students were already completing capstones in their major. The other reaction that project team members encountered, particularly from departments with large enrollments, was that these culminating experiences needed to be individual research-related projects. However, faculty in these departments expressed that it would be impractical for every student to complete an independent, original research project. While we recognized that an assessment of capstone goals and departmental practices is a necessary first step for determining how signature work may connect to capstones already existing in the curriculum, work on our various campuses showed there is more to be considered.



Upon examining and assessing the nature of capstone experiences at participating colleges, existing departmental capstones often met criteria for student engagement in signature work, but many either did not or might not depending on how the capstones were set up. Because most capstones are designed around content or skills needed for a major, signature work components such as integration of learning outside the major and reflection were not necessarily included. A review of syllabi at Augustana College, for example, found that most capstone courses did not ask students to integrate learning from outside the major, many lacked a reflection component, and others lacked opportunities for students to make the project their own. As discussed by Hayden-Roy et al. in this issue of *Peer Review*, although many participating schools have opted to consider ways to incorporate signature work into students' capstone experiences, each school has opted to do this in different ways.

STUDENT READINESS FOR ENGAGING IN SIGNATURE WORK

As part of the LEAP Challenge, we have also realized that not all students are ready to engage in meaningful signature work when they arrive at the capstone experience. As our schools began to discuss implementing signature work as a student requirement, a question surfaced about the preparedness of our students to do this work. Each of our schools found it helpful to consider efficient and effective ways to make sure students arrive at the culminating capstone experience with requisite skills and capacities so the experience is most meaningful to the student and the



burden to faculty is not too great. Ways to do this are discussed below.

Another issue that arose in our discussion of scaling signature work for all students on our campus related to whether institutional resources could keep pace with student expectations and choices. Students are often drawn more toward independent, self-designed projects as opposed to doing their signature work as part of ongoing projects organized by an instructor or other mentor or as part of a group project. One discussion theme was that defaulting to all individual projects does not represent the professional norms in many fields of study, spreads resources thin, and therefore limits the size and scope of projects. There is a critical need for students to learn how to provide creative, individual work within groups. Across our various schools, we came to believe that group projects allow faculty to capture students' independent contributions and gained skills, and can indeed meet signature work goals.

LOCATING SIGNATURE WORK

One central finding stemming from our joint discussions in the consortium was that signature work needs to fit with students' academic work and development, recognized by students as the natural outcome of their work and broader experiences. To broaden successful participation in and engagement with signature work, each participating school asked whether such experiences needed to be optional or required, and, if required, where signature work resides (e.g., within the major or a general education requirement).

Of the seven schools that have implemented ways to scale-up participation in signature work experiences, six did so as required work and one as part of an optional pathway (see table 1). Five use the major capstone as the means to ensure all students participate, although there are variations in how signature work connects to the capstone. At Bates College, Nebraska Wesleyan University, and College of William & Mary, the focus is on incorporating signature work requirements into the majors' capstone courses, which are overseen by departments.

At Augustana College, in response to observed variations across departmental capstone experiences, signature work is now a general education requirement expected to be completed as part of a student's major capstone. The college's general education committee assesses the signature work components. This approach leaves room for some students to continue their valuable off-campus research experiences, such as Research Experiences for Undergraduates programs funded by the National Science Foundation that may be accepted in their majors to satisfy capstone requirements, while also completing a separate portfolio or other integrative component to satisfy a graduation requirement and fulfill the broader signature work goals. At Clark University, signature work is also a student graduation requirement that is either completed in the major as a capstone project that meets the signature work criteria or coordinated through the university's Liberal Education and Effective Practice (LEEP) center (see: http://www2.clarku.edu/leep/). Elizabethtown College made their signature learning experience (SLE) a student graduation requirement, allowing options for how students may complete their signature work (see http://www.etown.edu/academics/). After the college enacted the SLE requirement, departments responded by instituting capstones in majors to ensure their students fulfilled the requirement. The college also demonstrated institutional commitment by increasing funding to a Summer Creative Arts and Research program.

At Connecticut College, students complete an Integrative Pathway as part of their general education curriculum. Designed and implemented by interdisciplinary groups of faculty members, the Integrative Pathway asks students to integrate their major, their general education courses, and their own individual interests. The college's interdisciplinary centers provide another avenue for students to integrate their education (see https://www.conncoll.edu/academic-centers/).

TABLE 1. LOCATION OF SIGNATURE WORK AND REQUIREMENT STATUS

	LOCATED IN THE MAJOR AND OVERSEEN BY THE DEPARTMENT	LOCATED AS PART OF A GENERAL EDUCATION PROGRAM OR OTHER UNIT	INVOLVING CURRICULAR AND COCURRICULAR OPTIONS
Required	▪ Bates College ▪ Nebraska Wesleyan University ▪ College of William & Mary	▪ Augustana College ▪ Connecticut College	▪ Clark University ▪ Elizabethtown College
Optional	▪ Oberlin College		

Scaffolding: The Role of Pathways

To help students successfully complete integrative signature work toward the end of their college experience, we need to nurture the skills necessary for that work. If signature work is to meet the basic criteria of being integrative and drawing on the diverse parts of a



student's education, addressing real-world issues (i.e., "big problems"), and focusing on a topic that is identified and directed by students (Peden 2015, 22), the educations we design must nurture these habits of mind from our students' first semester. It is not surprising that students need practice and support along the way to develop the ability to successfully make sense of their educations and apply what they have learned to real-world issues. But how do we ensure that students can garner these abilities along the way?

One approach is to scaffold these skills and habits of mind throughout their college educations, introducing them early on to projects that help them practice integrating and applying ongoing learning to a project. These experiences will refine their thinking and better prepare them for the integrative signature work they will complete before they graduate. This sort of gradual and scaffolded approach is consistent with best pedagogical practices articulated in sociocultural perspectives on human learning and development (see Sawyer 2014; Wertsch et al. 1980; Wood, Bruner, and Ross 1976). Equally important, such scaffolding addresses two issues raised across our campuses—the preparedness of all students for signature work, and the distribution of labor-intensive faculty mentoring required for successful signature and capstone work.

We believe that guided pathways provide one kind of scaffold for students by intentionally helping them connect the dots across learning experiences. These pathways have worked well when they are defined by faculty around common learning outcomes that are student centered, helping to prepare students well for their future work and life. The call for pathways encourages campuses to design and sequence learning in ways that explicitly map the learning outcomes across the entire college experience, with new experiences building intentionally on prior experiences at progressively more challenging levels from initial courses to final capstone experiences. Intentionally providing directions and markers along the pathways is critical to ensure all students are integrating their experiences holistically rather than gathering a set of disconnected experiences. As McNair (2016) notes, "Designing purposeful and intentional pathways for student achievement requires educators to help students understand the 'why' and the 'how' of student learning."

Intentionally providing directions and markers along the pathways is critical to ensure all students are integrating their experiences holistically rather than gathering a set of disconnected experiences.

Connecticut College has developed one of the most comprehensive approaches to scaffolding students' curricular learning through the new Connections curriculum, which requires students to undertake an Integrative Pathway. The design captures the core features of scaffolding through its guided pathways approach. These pathways are organized around central themes (for example, Bodies/Embodiment, Peace and Conflict, Public Health, or Global Capitalism). Each Integrative Pathway consists of four major components, each offering scaffolding to help students prepare for integrative culminating work (see Egan, Kneas, and Reder in this issue of *Peer Review* for further details).

Pathways typically begin with a thematic inquiry course, taken during the sophomore year, that introduces students to the pathway's theme and helps them formulate their "animating question." That question will help focus and guide their work over the next two years, and a student then goes on to explore his or her question through a variety of courses taken in different disciplines. As part of a pathway, usually during a student's junior year, he or she is required to engage either locally or globally by undertaking a study away, internship, or community-based learning experience.

The final integrative signature work for a pathway takes place during the fall of a student's senior year and includes a senior reflection seminar and a culminating project. The results of that project are presented at a symposium, where students share their responses to their animating questions with the wider college community. As part of this final integrative work, students are asked not only to reflect on the different elements of their pathway, but also to consider their entire undergraduate experience, ideally including their majors and their significant cocurricular experiences. The Connections curriculum asks students to integrate their individual liberal arts education within a broad intellectual framework (see: https://www.conncoll.edu/academics/degree-requirements/connections/).



Such integrative work requires students to take a broad view of their educations, reflecting upon significant questions, thinking across different disciplines, and considering what other disciplines beyond their majors might contribute to their own knowledge. Because the Connections curriculum is designed to be a four-year experience, Connecticut College introduces students to the thinking and skills needed to successfully integrate and apply their educations beginning in their first semester. First-year seminars, in addition to the explicit goals of connecting the topic of the seminar to other courses in the curriculum and exploring opportunities for local or global engagement, also require students to discuss the college's liberal arts mission and core values. Many faculty use a written assignment that asks students to critically consider their own goals and educations in light of the school's mission and values, requiring them to reflect upon where their own strengths lie and what skills and values they would like to develop or explore further—in addition to what courses they might take related to these goals.

Making connections between and among courses across disciplines is nurtured further in other experiences such as ConnCourses, which are designed to be an alternative to traditional introductory (usually 100-level) courses. In ConnCourses, students explore a discipline's connection to the other liberal arts and sciences. Intentionally diverse in perspective, ConnCourses examine how knowledge is constructed in a specific field of study and then ask students to connect those ideas and concepts to the world around us. ConnCourses cultivate an integrative approach to learning and problem solving, prepare students for the work they are expected to do over their four years at the college, and are engaging for both the teacher and the students, regardless of their intended major. (Visit https://www.conncoll.edu/connections/conncourses/ for a more comprehensive listing of current ConnCourses and their descriptions).

In both the first-year seminars and ConnCourses, students are required to not only make transdisciplinary connections, but also be critically reflective by considering how what they learned applies to themselves and the world around them. The ability to make those connections, developed from the beginning of their educations, is essential preparation for the integrative, signature, culminating work they will be required to complete. Making those connections also helps them to take a broad view of liberal learning, allowing students to tell compelling stories about their own educations, and the value of that education in their personal lives, to their local communities and the larger world.

CHALLENGES

The experiences of the various schools in the signature work consortium highlight two kinds of challenges across our campuses. First, we note that most schools used existing structures and requirements as the basis for inserting signature work into the curriculum, and the most common method was to revise some sort of senior capstone experience. However, many of the schools are questioning whether capstone projects meet the ambitious learning goals of signature work and have noted that, especially when organized within the majors, it is tricky to ensure that signature work's broad integrative learning goals are being met. Some schools have set up mechanisms to keep an eye on this, such as the use of additional assessment committees. A second challenge plays out in the opposite direction. To ensure that students are meeting the ambitious goals of signature work, some schools have redesigned their curricular structure by creating new curricula. This redesign process is not easy for schools to work through, and the schools taking this approach have had issues with faculty fatigue and the institution's capacity to scale the new curriculum without steady resources.

No matter the challenges, the consortium schools agree that preparing students to undertake meaningful, integrative capstone work requires intentionality when designing curricula. That preparation appears to be key to enabling all students to be well-prepared to engage in the kind of signature work that we know will serve them well as they move beyond the campus to live lives of meaning and purpose. ▪

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Institutional Readiness for Signature Work

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There is little doubt that the principles and practices of integrative liberal learning reflected in signature work can be of immense value in educating undergraduate students. As is noted in Budwig, Ratliff-Crain, and Reder's article in this issue, the work of the LEAP Challenge: Engaging in Capstones and Signature Work consortium has shown that most students need substantial assistance in preparing for signature work, but students are not alone in that need. Every institution in the consortium has noted that there is a significant level of institutional readiness needed for the full value of signature work to reach all students at colleges and universities. As Ferren and Paris (2015) have noted, there is demonstrated need for faculty leadership to deliver on the promise of the LEAP Challenge (see https://www.aacu.org/leap-challenge), which called on campuses to guide students in significant signature work projects that are meaningful to the student and to the world. Participants in this project also learned quite a bit about what sorts of institutional capacity building need to take place for integrative liberal learning to occur. This article follows that line of work, looking at the professional and institutional development our consortium schools believe will enhance student signature work on their campuses. We look first at faculty development and then continue to examine other forms of campus leadership, as well as institutional structures and supports that have been created to enhance the chance for all students to succeed.

PROFESSIONAL DEVELOPMENT FOR SIGNATURE WORK

Faculty Development

The consortium schools have recognized that effective mentoring of signature work is likely to require faculty development, as supporting students in these self-authored, applied experiences requires a distinctly different set of skills from those associated with the traditional classroom. Faculty development programs help faculty gain a shared understanding of the definitions and requirements of the work and enable them to acquire skills to support students as they engage in signature projects, integrative learning, or capstones.

Consortium institutions have adopted two broad approaches to faculty development as it relates to signature work. Schools that included signature work as part of significant curricular reform tend to have more deliberate and comprehensive approaches to faculty programming. Elizabethtown College, for example, requires multiple signature learning experiences and has developed specific advising training to assist faculty in helping students choose the "purposeful life work" or "signature learning" (SL) experiences that are hallmarks of their new curriculum. In addition, the college has applied for grant funding to provide faculty development for courses that will include community-based learning or community-based research, as well as for interdisciplinary offerings which may fulfill the SL requirement. Similarly, as Clark University designed their curricular framework, Liberal Education and Effective Practice (LEEP), to include culminating capstones and signature/experiential projects, they recognized the need for significant professional development. Clark used existing structures and tools—digital resources, shared tools, and ongoing learning communities—to build capacity to mentor both types of experience. For instance, a faculty learning community—organized to work on redesigning capstone seminars to be more integrative—provided a forum for faculty from five disciplinary areas on campus to discuss and design culminating courses and to create artifacts and tools to help others design future culminating capstone courses. The use of existing structures to address faculty



development needs is also apparent in Connecticut College's scaling efforts. Having approved a new Connections curriculum, Connecticut College planned its annual three-day Camp Teach and Learn activities to include a variety of workshops and activities related to the new Connections pathways model. In 2016, the inaugural year of Connections, Camp Teach and Learn included topics like global engagement and citizenship, redesigned first-year seminars, and the creation of ConnCourses—all components of the newly approved curriculum.

A handful of participating institutions did not undergo significant curricular reform but were interested in ensuring that students experienced integrative, signature, or capstone learning in the context of existing campus offerings. At these institutions, efforts have been less centralized, and the emphasis has been on defining and optimizing learning experiences in specific domains. At Augustana College, for example, Senior Inquiry has become a general education requirement for all students. Faculty development has emphasized creating signature experiences that are well-defined and consistent across majors. As a result, the college has created a committee that will provide guidelines, review, and approval for signature courses. Similarly, Nebraska Wesleyan University has worked on fortifying its capstone experiences by ensuring that they conform to institutional definitions of signature work, but it is still refining its faculty development programming. At Bates College, signature learning occurs in a variety of settings, and the focus has been on optimization of thesis, capstone, community-engaged, or purposeful work experiences. As a result, faculty development has been decentralized and specific to different disciplines and majors. For example, some faculty learning has occurred in the context of existing department and program reviews, during which faculty read and evaluate thesis work according to goals and objectives developed by the unit. As part of a recent general education assessment, faculty also completed survey questions on dimensions of thesis performance for their seniors, providing additional feedback and faculty conversations on the thesis requirement. Selected capstone courses have also been evaluated and reviewed. For community-engaged work, Bates College's Harward Center for Community Partnerships has developed programming to assist entering faculty in developing community-based components for their courses. Similarly, for the college's purposeful work and internship programs, faculty have worked with staff to develop infusion courses, in which career-related topics could be introduced to existing courses. The college is still considering integrative components such as eportfolios, structured reflection, or course-based assignments for these various experiences.

Faculty development has emphasized creating signature experiences that are well-defined and consistent across majors.

Beyond the Faculty

Many of the consortium schools have located signature work within the major as a capstone requirement and thus have focused professional development on faculty. Other schools have involved a wider group of mentors and have cultivated not only faculty leadership, but also the leadership of others in academic and student affairs. Sharing the responsibility for student learning requires a common vocabulary and collective understanding of the goals of signature work among both faculty and staff. For these reasons, some institutions have also created professional development mechanisms for staff involved with signature and capstone work.

The efforts at Connecticut College to bring faculty and staff together are examples of professional development that go beyond the faculty. First, the Joy Shechtman Mankoff Center for Teaching and Learning conducts a conversation series six to eight times each semester around emerging issues in teaching and learning. Over the past several years, the focus has been on the new Connections program. Connecticut College leaders indicate that in the past, the series was pitched for faculty with a focus on in-class innovation and learning pedagogy, but they also note that as their curricular framework encouraged more coordinated efforts of staff and faculty, the series has included both groups. Second, Connecticut College's Camp Teach and Learn workshop, recently focused on elements of the Connections framework, bringing faculty and staff together to learn more about the redesigned first-year seminars, including team advising, 100-level ConnCourses, and the new pathways programs.

Clark University has another example of professional development that extends beyond faculty. As noted above, through grant funding for professional development, Clark has booted up a series of learning communities involving faculty to redesign the capstone experience in order to conform to new signature work and capstone requirements. A second



learning community included both faculty and Clark's LEEP Center staff (academic support services), and it focused on the development of resources for both project-based and experiential learning. For instance, the staff liaison from the study abroad program worked alongside a faculty member to develop a capstone course after students returned from study abroad experiences in Asia, and in another case, faculty in the learning community developed tools and resources around issues of community engagement. Over time, these development activities became part of the programming at the Center for Excellence in Teaching and Learning (CETL) at Clark, with faculty and LEEP Center staff sharing their learning and resources at the annual professional development day with faculty and staff from across campus.

ALIGNING ORGANIZATIONAL SUPPORTS AND STRUCTURES

Advising

Schools that already had capstone requirements in the major noted that they did not need any new advising or mentoring structures, though several schools noted a need to focus on issues of faculty workload and resources, especially as increasing numbers of students double major and take on more than one capstone project. Other schools have considered new ways for advising to take place, such as Connecticut College's team approach to first-year advising that involves faculty and staff. Clark University also has developed a multi-tiered system of advising that involves both faculty and staff in co-advising roles. All students enroll in a first-year seminar called a "First-Year Intensive," and the instructors typically act as the students' faculty advisor until they declare their major, at which point students transfer to a faculty advisor from that major. In addition, all students have advisors in the LEEP Center, which provides not only student advising but also academic support services. Piloted in the 2017–18 academic year and launching to all students in 2018–19, students will have two required advising meetings with an advisor in the LEEP Center. Each student will be required to visit the LEEP Center for a "sophomore check-in" when they declare a major and "senior checkout" when they are cleared for graduation. Sophomore check-in is the advising point most relevant to Clark's implementation of signature work, as students will be guided to think about how they might fulfill the LEEP Culminating Capstone, and they will work with their LEEP Center advisor to put a plan in place to ensure that they are sufficiently prepared to complete the capstone successfully. For senior checkout, students work with their LEEP Center advisor to confirm their LEEP Culminating Capstone plan and construct an actionable plan for after graduation.

New Organizational Structures and Oversight to Facilitate Quality Signature Work

As consortium schools focused on practices to develop the whole student, and as these schools engaged in practices that help students develop an understanding of complex problem-solving through tighter integration of the curricular and cocurricular experiences, new organizational mechanisms sprouted up on the various campuses to help guide this work. At least four methods for scaling have been noted across the universities and colleges in the consortium.

First, some schools have developed new committee structures or revised existing ones. For instance, Bates has a new Academic Affairs Council that is charged with not only academic oversight but also curricular planning and resources. Other schools, such as Augustana, have developed new oversight committees recognizing the need to go beyond departmental reviews. For instance, Augustana has developed a mechanism of joint jurisdiction whereby a faculty general education committee oversees the general education curriculum, while the Educational Policies Committee (EPC) oversees the design of majors, and together they consider Augustana's capstone requirement of Senior Inquiry. Nebraska Wesleyan University has formed a Signature Work Initiative Task Force that provides the administrative structure for working with departments on further developing the capstones in concert with the priorities of the Signature Work Initiative. The task force consists of the dean of the College of Liberal Arts and Sciences, the associate provost for integrative and experiential learning, and representatives from each academic division; this allows connections to the divisional structure of consultative meetings.

A second method of ensuring oversight of the integrative learning that capstones and signature work require has been the decision at some schools to create new administrative positions. For instance, Elizabethtown has a modified academic affairs structure that now includes an assistant dean for academic achievement and engagement who oversees some of the signature learning experiences. Similarly, Nebraska Wesleyan has an associate provost for integrative and experiential learning.

A third method to facilitate the scaling of signature work has been the expansion of programming on campus that provides necessary infrastructure to facilitate quality experiences for students. Many campuses have built summer programs that allow for signature work. Some other examples include the expansion of career development through the Blue Jay Flight Path Career Program at Elizabethtown, which is designed to connect students with internship opportunities and



mentoring. The mentoring will include fostering students' intentionality around the selection of particular signature learning experiences. Elizabethtown also has reorganized some support offices like study abroad to expand opportunities. Connecticut College has used its interdisciplinary offices and centers as part of its Connections pathway program to provide added opportunities, as has Clark University through its various research centers where students can apply to be employed on or off campus in signature work opportunities both during the semester and over the summer. Similarly, Bates College's new Purposeful Work program provides funded internship opportunities for students during the summer.

Finally, to enhance integrative liberal learning and support high-quality signature work, some institutions have developed totally new organizational structures. For example, four years ago, Clark reorganized its structure and created the LEEP Center by bringing together offices including academic advising, career services, community engagement, innovation and entrepreneurship, study abroad, and the writing center. The idea was that the staff in the existing offices would support LEEP implementation by providing a second layer of advising that complements traditional faculty academic advising by (1) helping students link together the curricular, cocurricular, and extracurricular pieces of their undergraduate experience; (2) designing innovative programming to prepare students for the realities of their cocurricular and applied experiences; and (3) connecting students to people, opportunities, and organizations that might serve as mentors or catalysts for experience and support. While the LEEP Center has been working with students across these three areas through individual appointments and group programming, the center is taking steps to ensure that support for the LEEP Culminating Capstone and other key initiatives are scaled appropriately.

CHALLENGES IN SCALING SIGNATURE WORK

Almost all of the schools noted that seed grants have played a role in early interest in aligning course work and signature experiences for students. While grants (whether internally or externally funded) have kick-started the work, two issues arose at many of the schools in the capstones and signature work project consortium. These issues include finding the time for mentoring student signature work and aligning reward structures with signature work.

One challenge that schools have regularly noted is the fact that capstone and signature work is labor intensive. The mentoring that goes into defining and developing signature projects can be quite demanding for the mentors and goes beyond typical class teaching loads. Schools that have had students working on individual signature projects have struggled with issues of staffing as this work is scaled. Because the mentoring takes significant time and is not evenly distributed, some schools are struggling to find enough mentors, and some mentors are concerned about keeping up with the intensity of the work that often goes beyond contractual obligations. Those schools that have been at this for longer periods of time have found it helpful to initiate programs that allow for groups of students to work together and/or to be part of larger mentoring programs, and they have found ways to build the oversight of signature work into normal faculty workloads.

A second challenge at many schools is the fact that rewards and processes are not always aligned with faculty and staff investments in signature and capstone work. Many schools note that although signature work is highly valued and central to the schools' strategic plans, they struggle because the promotion, evaluation, and reward structures at these schools have not always revised evaluation criteria or found other ways to reward the efforts of those faculty and staff who engage in such work. The group has strongly encouraged implementing policies and procedures in ways that are a better match for the efforts faculty and others engage in related to signature work. ▪

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Assessing Signature Work

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The complexity and varied outcomes associated with signature experiences have presented many assessment challenges for participating institutions in the LEAP Challenge: Engaging in Capstones and Signature Work consortium, led by the Association of American Colleges and Universities (AAC&U). Each college and university evaluated outcomes by developing customized approaches that were designed for both the type of experience and the specific institutional mission or culture. Higher education's emphasis on signature work is a recent development, and most of the consortium schools believe their institution has yet to make significant progress in assessing such work. In this article, we will examine some of the early efforts to assess signature work with a particular focus on practices used at individual colleges to assess students' reflections, as well as student and institutional preparedness for signature work. We will also discuss some of the challenges and issues faced as work on this front has moved forward.

USING EXISTING INSTITUTIONAL DATA

Assessing undergraduate signature work may seem daunting at first. After all, institutions often vary in how they define and implement signature work within their curricula. These differences may lead administrators and professors to the conclusion that they must create new assessment mechanisms. Creating new assessments may be necessary, depending on the unique circumstances of each institution. However, it is often possible to assess signature work in meaningful ways using existing institutional assessment practices. In this section, we illustrate how our institutions have applied three distinct, existing assessment tools to help evaluate undergraduate signature work. In doing so, we hope that other institutions may use these examples to implement their own signature work assessment measures.

Among the institutions participating in AAC&U's capstone and signature work project, the most common assessment tool was an institutional or departmental senior survey. Some institutions also employed an alumni survey or a general survey of current students. Through these assessment mechanisms, students self-report learning outcomes or rate their preparedness for signature work. Institutional research offices often administer senior surveys to measure a variety of outcomes within the curriculum, cocurriculum, or other aspects of campus life.

There are several benefits associated with the use of a senior survey. First, some institutions require students to complete a survey before graduation, thus ensuring a high response rate and robust data across academic disciplines. Second, given that many institutions already have a plan in place to administer a senior survey, adding targeted questions regarding signature work to an existing survey requires a modest amount of work on the part of administrators, faculty, and students.

The National Survey of Student Engagement (NSSE) is another survey assessment option available to many institutions. NSSE already includes several questions that can measure involvement in signature work and high-impact educational practices, depending on how signature work is defined at a given institution. There are several benefits of employing NSSE data in the assessment of signature work. First, NSSE includes questions regarding capstone courses and other high-impact practices that may constitute signature work. Given the breadth of NSSE questions, administrators and faculty can dig deep into NSSE data to better understand how signature work influences reflective and integrated learning, faculty-student interactions, student perceptions of their institution, and other important indicators. Second, NSSE provides comparative summary data for peer institutions. While these data may be somewhat basic in their scope, they nevertheless provide insight as to whether one's home institution is excelling or falling behind



relative to other colleges and universities. Such information may help to inform changes to the curriculum and signature work. Finally, NSSE collects data from students in different years, allowing for assessment of effective scaffolding or incremental changes in student experiences.

While assessments like NSSE and senior surveys are primarily concerned with outcomes, syllabus audits can help to assess inputs to determine if course assignments and activities meet an institution's definition of signature work. Academic oversight committees can review course syllabi from time to time, and signature work syllabus audits could be built into the review process to ensure that curricular activities align with institutional definitions of signature work. This method provides another means of quality control to ensure that there is consistency across all offerings that are classified as signature work.

Admittedly, none of these assessment methods are perfect. For example, all of them are indirect approaches; they do not involve direct evaluation of students' signature work artifacts or products. However, each provides a mechanism for assessing signature work using existing assessment frameworks at a variety of institutions. Furthermore, if an institution already makes use of one or more of these assessment mechanisms, they can measure signature work inputs and outcomes in an efficient manner.

WHAT WE ARE LEARNING FROM EARLY ASSESSMENT DATA

Students' Readiness for Signature Experiences

Many schools involved in the project reported concerns about preparation for signature work. To date, none of the schools have developed a systematic, centralized way to assess student readiness for this type of complex learning, and most assessment of preparation is still in the early stages. In general, there is a paucity of research on undergraduates' readiness for independent or self-directed work. The extant studies tend to be in applied fields like engineering or health (e.g., Sahoo 2016; Long and Afgyekum 1983), with little written on the liberal arts. Given the financial and human resources that increasingly are being directed toward signature work experiences in American liberal education, assessing student readiness and adapting projects to ensure they are academically appropriate and suited to student skills are critical. The four schools whose data are reported below offer signature experiences for all students and have decentralized approaches to both overseeing and evaluating this kind of work. Other schools that have more centralized approaches are in the initial phases (see the article by Budwig, Ratliff-Crain, and Reder, in this issue of *Peer Review*).

Two campuses participating in the project have ensured adequate preparation for signature work through curricular oversight at the department level. Augustana College, which requires Senior Inquiry (SI) experiences for all students, reviews the design of departmental curricula for coherence and sensibility. This process ensures intentional, developmental, and coherent design of the major, including the capstone, which in turn should adequately prepare students for the work. However, Augustana has not engaged in assessment of individual student readiness for SI.

Similarly, Elizabethtown College has all students participate in at least two signature learning experiences (SLEs)—internships, study abroad/away, research with faculty, community-based learning, and capstone courses and experiences. Assessment of the SLEs is decentralized, with preparedness assessed at the department level. With a general education revision underway, Elizabethtown is emphasizing the acquisition of skills that are most salient for SLEs, such as intercultural competence and problem-solving, as they consider scaffolding within majors.

Nebraska Wesleyan University and Bates College assess student performance in capstone experiences as one indicator of the students' preparation. Nebraska Wesleyan's first cohort of students completed the four-year Archway Curriculum in May 2018. Like Augustana College, Nebraska Wesleyan has relied on a well-designed curriculum to ensure preparedness. The Archway Curriculum emphasizes skill scaffolding, integrative learning, and experiential pursuits, and it was designed to ensure better preparation, autonomy, and academic self-awareness as students approach the capstone. At Nebraska Wesleyan, assessment of student learning in the capstone will provide insight into the effectiveness of the new curriculum in providing adequate preparation.

At Bates College, where there are a variety of signature experiences available that are largely decentralized, the assessment of student readiness has depended on the point of entry. For those doing community-engaged work, instructors and staff work with students to ensure that projects are appropriate and that students have the requisite skills to develop and support a community collaboration. A post-experience survey includes items on preparation (e.g., "I was adequately oriented to or prepared for community-engaged work.").

In the context of senior thesis work, Bates College has collected institution-level data on thesis outcomes over the last several years, including narrative and survey data about student learning. The data suggest that not all students are well-prepared for thesis work. Figure 1 summarizes faculty assessments of student readiness for thesis work on a variety of dimensions. The challenges appear to be in the areas of development of topics/research ideas and insight into personal strengths and weaknesses.

Similarly, according to Bates's senior survey data, about a quarter of students report that they are not well-prepared for a thesis. On average, faculty rate student preparation lower than students rate themselves (see figure 2); these data suggest that there is work to be done to provide students with the skills to successfully complete these experiences.

INSTITUTIONAL READINESS FOR SIGNATURE WORK

One key question that came up repeatedly



in our consortium meetings had to do with faculty and staff workload and institutional readiness to scale signature and capstone work. While part of the issue pertaining to workload had to do with the rewards for and accounting of this work, another challenge is related to professional development and the extensive mentoring involved in signature projects. There has been a significant amount published on the importance of mentors and their impact on student learning. For instance, in studies stemming from the Survey of Undergraduate Research Experience (SURE), learning has been directly correlated with students' evaluation of their mentor, and mentoring on a long-term project is one of the key indicators of student success after college, as reported in the 2014 Gallup Purdue Index Report (see Lopatto 2010; Nicholson et al. 2017).

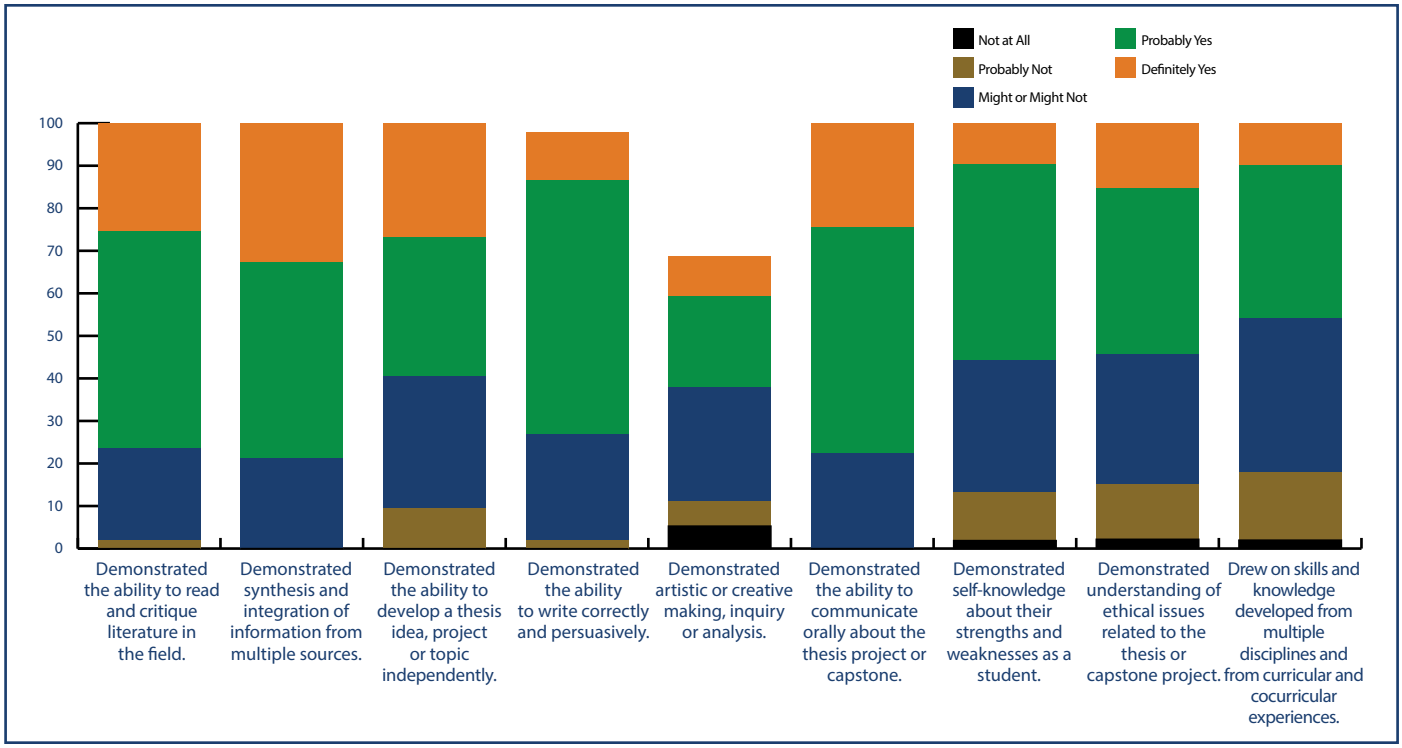
While it has been noted that mentoring plays a formative role in student success, studies of undergraduate research note that students typically report more than one mentor for their work, and evidence suggests that different mentors in a given network play different roles (Bradley et al. 2017). Early on, as capstones and signature work were being scaled at Clark University, Michelle Bata, associate dean and LEEP (Liberal Education and Effective Practice) Center director, worked as part of the consortium of schools publishing on mentoring networks. Examining survey data from an exploratory study of 146 undergraduate researchers at several different schools, they found that co-mentored and multi-mentored projects were noted by many of the students. This was especially true for interdisciplinary projects. Furthermore, this study noted that although faculty members were most frequently identified as mentors, others were as well (e.g., peers, graduate students, postdocs). And it was reported that students often highlighted the distinct roles played by different sorts of mentors (e.g., providing disciplinary expertise, logistical support, emotional support).

Such exploratory work may help address issues raised by faculty as capstone requirements are considered. For instance, an analysis suggests that Clark students typically indicate that they had more mentors than students at other schools and 68 percent reported at least two faculty mentors, something that could prove difficult to sustain with scaling. Most important was the finding that students reported turning to each mentor at Clark for a variety of kinds of support, whereas at some other schools, students reported more differentiation, as mentor networks distributed mentoring functions to ensure student success. Early evaluation can help institutions design professional development programs that target evidence-based best practices for co-mentoring. This kind of iterative assessment is essential to the success of capstones and signature work.

DIRECT ASSESSMENT: ASSESSING STUDENT REFLECTION

At this stage in our institutions' signature work

FIGURE 1. BATES COLLEGE FACULTY RATINGS OF STUDENT THESIS SKILLS





implementation, assessment data are still provisional. However, many of us have noticed gaps between goals and practices in the pedagogy of meaningful, iterative reflection. Some types of signature work (internships, study away, practicums) are more likely to incorporate midsemester self-assessment or iterative journaling; other types (independent research, theses) are less likely to include such reflective elements. Nonetheless, all students benefit from opportunities to reflect at multiple times in their signature projects and processes (e.g., see Peden, Reed, and Wolfe 2017).

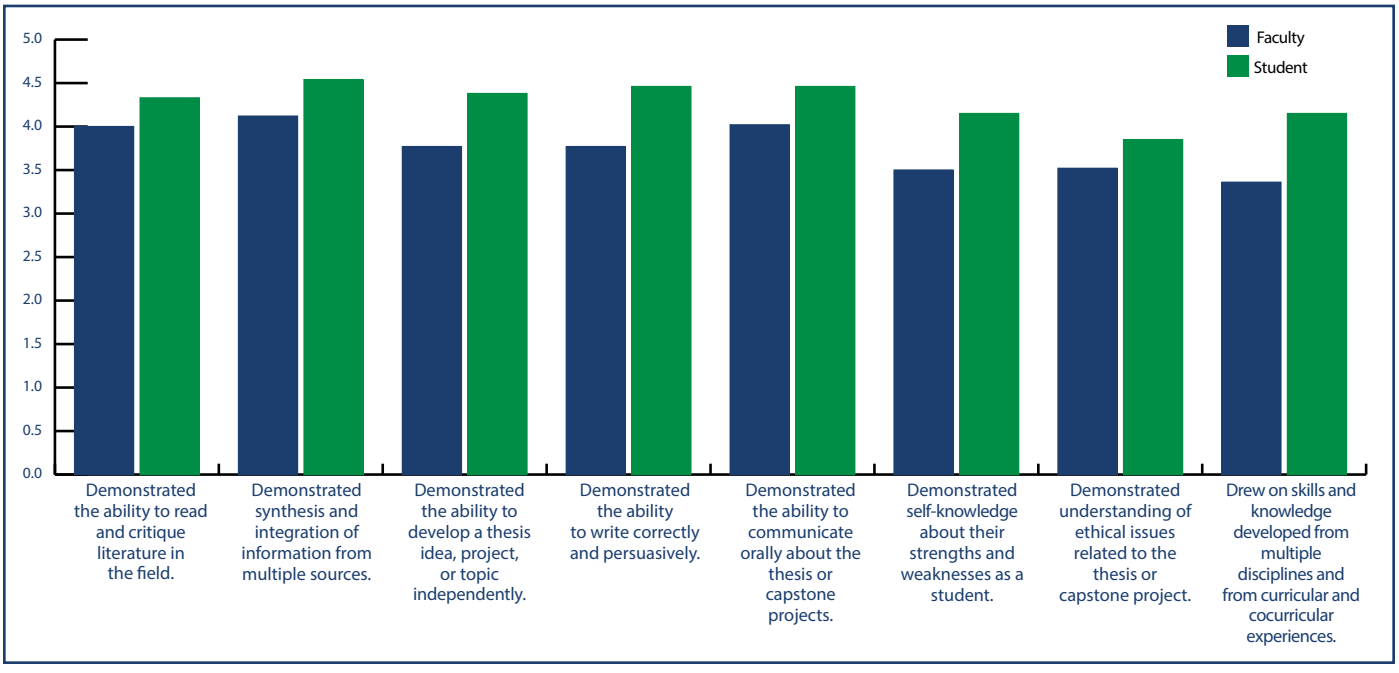
Augustana College conducted a collective syllabus review for all Senior Inquiry courses to determine how consistently these courses addressed different signature work criteria and goals. There was strong evidence that the Senior Inquiry courses across campus met four of the signature work criteria, with a notable gap in areas related to reflection on learning (Peden 2015). Other campuses in the project had similar challenges with reflective activities, either anecdotally or in their formal assessment results.

At Nebraska Wesleyan University, many departments were unsure how best to include reflection in their capstone projects, even as students in a few departments had multiple opportunities for reflection, both vocational and self-evaluative. Bringing departments together to discuss signature work opened conversations among departments about their different capstones, which previously had been implemented in isolation from one another. These conversations both revealed disparities and provided mechanisms for departments to learn from their peers. Moreover, as a result of this process, Nebraska Wesleyan faculty revised the university's definition of capstones to include the element of reflection explicitly.

Elizabethtown College has assessed the extent to which students who completed different signature learning experiences reported accomplishing different NSSE indicators. The NSSE indicators that most closely track students' reflection ask students whether they "examined the strengths and weaknesses of your own views on a topic or issue" or "learned something that changed the way you understand an issue or concept." Analysis of NSSE scores for juniors and seniors at Elizabethtown showed a positive correlation between community-based learning and study abroad for both of the reflection-related NSSE indicators (McClellan and Kopko 2015). It is worth noting that NSSE does not measure any other potential types of reflection (e.g., vocational exploration, strengths analysis, evaluation of cumulative academic or professional growth) that may occur within SLEs.

Faculty and staff who support signature work may not all prioritize reflection; the need for students to gain mastery of disciplinary content or professional skills can easily obscure the need to develop metacognition or self-knowledge. Moreover, many faculty members feel uncomfortable eliciting or evaluating student reflections. The uneven success in implementing reflection in capstones and signature work will likely need to be addressed prior to and within the capstones and signature work experiences. As Mary and Michael Ryan (2013) point out, work at different levels of sophistication can all be called reflection, so faculty members must make a concerted effort to scaffold the teaching of reflection if students are to progress from simple narration to a deeper and more meaningful analysis and synthesis.

FIGURE 2. BATES COLLEGE SURVEY RATINGS OF THESIS PREPARATION (1–5, WITH 5=STRONGLY AGREE OR DEFINITELY YES)





Among the schools involved in the project, there were no reports of using standardized instruments like the brief questionnaire that Kember et al. (2000) describe in their article on measuring the level of reflective thinking.

Institutions that make consistent use of eportfolios are well-positioned to make the connection between reflection and assessment across a student's academic career in order to improve both individual and institutional outcomes (Peden 2015). Programs that incorporate students' scaffolded and intentional use of eportfolios at multiple times and in multiple areas can develop students' capacity for meaningful reflection within and about their academic and professional trajectories, reflection that takes into account both past work and future directions (Treuer 2014). For reflection to become a high-impact capstone practice, students must have carefully calibrated experiences to build this skill throughout their academic programs, and faculty must have scaffolded opportunities to practice mentoring student reflection.

LESSONS LEARNED: CHALLENGES ASSESSING SIGNATURE EXPERIENCES

Signature work not only provides a powerful pedagogy for student learning, but it also offers opportunities for students to demonstrate what they have learned and to apply their learning to unscripted situations. Thus, educational institutions and programs can use assessment techniques to ascertain student proficiency in applied skills such as integrative thinking and problem-solving, as well as in common outcomes such as written communication and analysis. To the extent that students pursue their own inquiries into real-world problems, signature work can also provide insight into how students develop personal and social responsibility.

In this issue of *Peer Review*, Egan, Kneas, and Reder note that—although signature work may require certain kinds of knowledge, dispositions, and skills—institutions and programs will vary in the outcomes they expect students to master. That is, what an educational organization or unit determines to be signature work will depend on that entity's mission and culture, which in turn will have implications for assessment. One university may place a high value on global learning, while another will emphasize ethical training, perhaps from a particular value or faith-based tradition. An engineering or business program may expect students to apply their expertise in enterprises that create social value. Assessment of signature work in such contexts should tap into those intended outcomes.

The way in which institutions structure signature work and signature assignments also complicates assessment efforts. In this issue of *Peer Review*, Hayden-Roy et al. note that many of our schools are making signature work a culminating capstone experience in the major. One challenge has been to ensure that *general* knowledge, skills, and dispositions are assessed, not only knowledge, skills, and dispositions pertaining to capping off the specific learning outcomes of the major. In addition, while some colleges require a single project such as a senior thesis or an eportfolio, others permit students to choose the signature practice that best fits their academic and career plans. When signature work is defined to include high-impact practices, such as supervised research or community-based learning, students may complete multiple signature experiences at different points of the college career. This means assessment coordinators must make decisions about what kinds of signature work should be assessed, when, and by what means. These choices should be part of a larger campus conversation about how and toward what ends assessment results will be used.

CONCLUSION

Assessment of signature learning is still in the formative stages. Several institutions report using standardized surveys like NSSE to inform them about aspects of signature work, but they report challenges that include the variable definitions of signature experiences and the need to assess complex constructs like integrative learning or reflection. ePortfolios hold promise for both promoting reflection and providing material for assessment. Finally, participating schools expressed concerns about student preparation for signature work, given that not all students may be ready for original, self-authored projects. Early data on student and institutional preparedness have played a formative role in how schools are scaling this work. ■

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Assessing Quality and Equity:
Observations about the State of Signature Work

▸ **Jillian Kinzie,** Associate Director of the Indiana University Center for Postsecondary Research and the National Survey of Student Engagement Institute

Learning experiences that require grappling with complex problems and projects that are important to students and to society are worth guaranteeing for all students. Bringing students through a learning experience that demands holistic integration is exactly the kind of practice all graduates need. The articles featured in this issue of *Peer Review*, which were written by faculty, administrators, and staff who participated in the capstones and signature work project from the Association of American Colleges and Universities (AAC&U), demonstrate first hand what signature work entails for students and faculty and illustrate how colleges and universities can define, organize, scale, and assess this work.

Signature work's emphasis on providing students a substantial occasion to apply and integrate learning to a pressing issue in the larger world suggests a conceptual relationship to the popular high-impact practices (HIPs)—active learning experiences that promote deep learning and are associated with desirable student outcomes, including improved student retention, grades, and graduation rates. Signature work is clearly an extension of the well-established HIP—the capstone—which is a culminating experience that caps off the integration of educational experiences leading to a demonstration of mastery. The rising popularity of HIPs and the overlap between capstones and signature work suggest the time is right to reflect on these parallel activities. In this article, I offer some observations about the current state of signature work and their ancestor, capstones, and then discuss the extent to which institutions in the LEAP Challenge: Engaging in Capstones and Signature Work consortium, supported by a grant from the Arthur Vining Davis Foundations, are addressing the challenges of this important work, including a focus on the challenges of assessment.

The rising popularity of HIPs, and the overlap between signature work and capstones, suggest the time is right to reflect on these parallel activities.

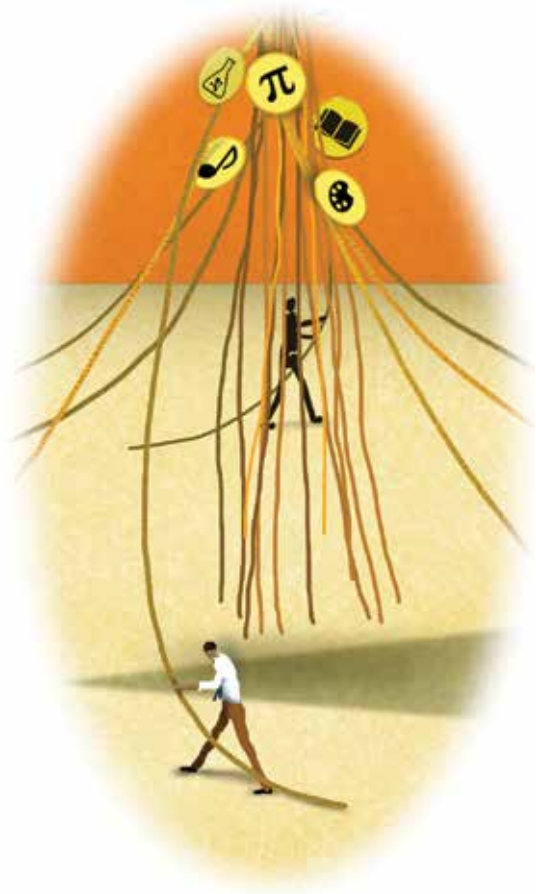
TAKING STOCK OF CAPSTONES

Several years ago, in a *Peer Review* article titled "Taking Stock of Capstones and Integrative Learning" (Kinzie 2013), I summarized extant research on the nature, scope, and outcomes of culminating experiences and discussed integrative learning in capstones. At that time, there were some clear patterns. Students at smaller-enrollment, baccalaureate liberal arts, and private institutions were more likely to have done a capstone; the most common form of capstone was a major paper, project, or thesis; and most capstones were completed in the context of the major. As reported then, and affirmed by Kuh and O'Donnell (2013), capstone participation is positively associated with a range of educationally effective practices, in particular with greater gains in measures of reflective and integrative learning. I concluded that capstones are educa-



tionally rich, potentially integrative experiences, but also raised concerns that capstones that are very focused in the discipline may not contribute to desired outcomes including integration of ideas and perspectives across fields or applying learning to a wider context. I also asserted the need for institutions to be more intentional about fostering the level of integration that educators envision.

Revisiting the topic of capstones recently, I discovered that most of the earlier findings still hold true. National Survey of Student Engagement (NSSE) 2017 results show that about 44 percent of seniors have completed or are in the process of completing a capstone, which is consistent for the last five years. Students at baccalaureate and private institutions continue to be more likely to participate in a capstone. Corresponding with the racial/ethnic demographics at these institution types, white students participate in capstones more than students in all other racial/ethnic groups, and first-generation students have lower levels of participation than their non-first-generation peers. Updated analyses of the relationship between capstones and all ten NSSE Engagement Indicators (http://nsse.indiana.edu/html/engagement_indicators.cfm) and perceived gains and satisfaction are significant and positive. The positive association between participating in a capstone and measures of integrative learning, such as combining ideas from different courses, connecting learning to societal problems, and including diverse perspectives in assignments, is a particularly important indicator of the power of capstones and, by extension, signature work. These findings affirm that capstones are an educationally beneficial educational practice; however, they also show that participation is unequal.



Notably, several challenges I originally identified for integrative learning and capstones to move forward—including the need for student reflection on their learning, scaffolded experiences that build to the capstone, and capstones that foster coherence and integration—have been addressed by institutions in the capstones and signature work project. For example, the need for students to reflect on their learning, including for metacognition and integration, is demonstrated in capstones and signature work projects that specify reflection as pedagogy and that include reflection essays as part of an eportfolio. It is also demonstrated in required reflective components that ask students "why the project is meaningful and impactful," "to reflect on their own development," or more broadly "to reflect on the integration of their overall academic experience." Connecting guided reflection to signature work helps students achieve learning goals.

Consortium institutions also addressed my call for greater scaffolding by designing experiences throughout the curriculum that build skills necessary for capstones and signature work including (1) in general education and introductory courses in the major, (2) via a connected curriculum that leads students down an integrated path, and (3) in a prerequisite course on complex problems that leads to the capstone. Finally, building on the value of having multiple HIPs, several consortium institutions explicitly connected other HIPs—including undergraduate research, service learning, and internships—to signature work experiences. Importantly, the experiences of the institutions in the consortium offer a critical reminder that the quality and depth of student learning is very much dependent on ensuring that students can practice complex work through carefully crafted, outcomes-based, scaffolded assignments and projects.

Although HIPs have been lauded for the beneficial effects they can produce for historically underrepresented students (Kuh 2008), they have also been critiqued for uneven levels of participation across racial/ethnic groups and for their association with deficit-minded campus practices that create barriers to equitable participation (Finley and McNair 2013). Fortunately, the scalability of signature work signals some hope for assuring access for underrepresented students. On another hopeful note for inclusive excellence, signature work's focus on a problem or project important to the student can help vali-



date students as "knowers" and honor learning that is relevant to students' lives and experiences.

ASSESSING SIGNATURE WORK

The institutions in the capstones and signature work project made significant progress to define, organize, and scale signature learning. However, by their own admission, most institutions made only modest headway on assessing signature work. At least one institution in the consortium demonstrated an important first step toward strengthening the assessment dimension of capstones and signature work by conducting an inventory of capstone examples, practices, and outcomes. At another institution, an in-depth assessment of the key qualities of signature work revealed unevenness in the embodiment of signature work, providing valuable information about where improvements were needed. Some institutions also used surveys to assess students' preparation for signature work as well as their perceived learning gains. These assessment activities are all good first steps.

Much like capstones, which Banta and Palomba (2014) asserted were rich with direct information about student learning, signature work can be valuable for the assessment of both individual student learning outcomes and program effectiveness. Basic assessment activities toward these goals could include simple inventories counting courses with signature work, mapping signature work across the curriculum and in majors, and examining the equity of student participation in signature work. Syllabi audits could provide evidence of the alignment of signature work with intended outcomes. Signature work products could also be reviewed to classify and study the range of problems and projects that students chose to address. NSSE data could provide institutions a sense of the impact of signature work. For example, institutions with NSSE data could identify relevant items, such as reflective and integrative learning and solving complex problems, and compare results prior to implementing signature work and after implementation, or compare results for students who experienced signature work with those who did not, including whether differences exist by race/ethnicity or first-generation status.

The assessment of signature work can provide institutions and programs with evidence of how well students are prepared for twenty-first-century learning needs.

More in-depth assessment could focus on assessing individual student learning in terms of integrative learning and the application of learning. For example, the extent to which signature work fostered students' pursuit of important, complex problems could be assessed by categorizing and assessing the complexity of problems and projects, and by asking students about the extent to which the work empowered them to pursue projects that were important to them. Student reflection exercises could also be reviewed for the source and depth of student agency in defining an important problem and learning gains. Assessments could include indirect methods such as course evaluations and student surveys, while rubrics could be used as a direct approach to assess complex problem-solving, integrative learning, and application and synthesis demonstrated in signature work products. The assessment of signature work can provide institutions and programs with evidence of how well students are prepared for twenty-first-century learning needs.

CONCLUSION

Signature work is an inviting educational concept that holds promise for ensuring more students have learning experiences that prepare them for work and life beyond college. Concerted efforts to assess signature work would provide needed evidence about the extent to which the objectives of integration and application to complex problems are being achieved, as well as evidence that topics important to the student and to society are being pursued. Much like capstones, which have grown in popularity as vehicles for assessing student learning and program quality, signature work products can become valued, authentic embedded-assessment methods to assess educational effectiveness and students' capacity to engage in a world rife with messy, unscripted problems. ▪

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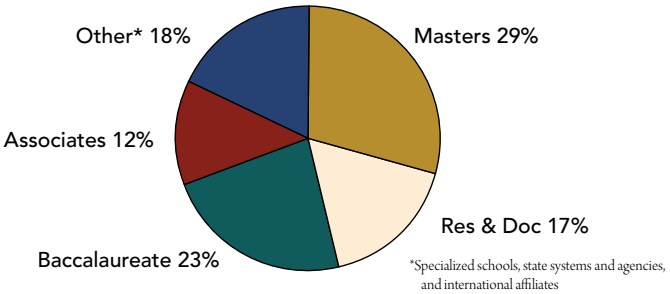
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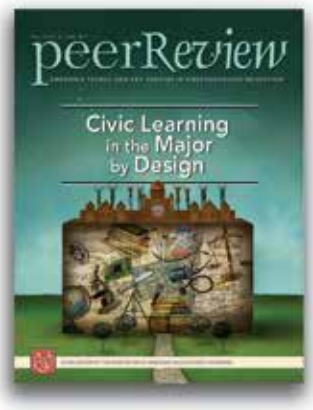
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