Improving Faculty Preparation in Research Universities:

Insights from The Teagle Foundation's Graduate Student Teaching in the Arts and Sciences (GSTAS) Initiative

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Executive Summary

The Teagle Foundation's *Graduate Student Teaching in the Arts and Sciences* (GSTAS) initiative, first piloted in 2010 and expanded in 2012, engaged hundreds of graduate students, faculty, staff, and senior administrators across eight elite universities and two professional associations in thinking deeply about undergraduate teaching and learning. The goal of the GSTAS initiative was to strengthen the practices of current and future faculty in using evidence to enhance student learning, through effective, sustainable, and replicable programs preparing graduate students for undergraduate teaching in the arts and sciences.

This white paper describes findings and lessons learned from site visits to seven GSTAS grantees: Northwestern University, Cornell University, Stanford University, Columbia University, Princeton University, the University of California-Berkeley, and the American Historical Association (AHA). We argue that a key element of success in these programs was their treatment of the development of knowledge and practice in teaching, and the development of knowledge and practice in research, as both similar and synergistic. We also observe that, despite substantial differences in project design, the Teagle projects constituted a graduate-level version of "high-impact practice," such that participants experienced first-hand the kinds of instructional strategies supported by much of the scholarly literature they were reading.

Continuing efforts to enhance graduate student preparation for evidence-informed teaching could draw inspiration from the gradual institutionalization of assessment in higher education. The institutional patterns and practices that have helped assessment to take root were nascent in the GSTAS projects we evaluated. While these projects were small in the context of their institutions, they loomed large in their impact. There is merit, and there is promise, in supporting the projects that have been launched, and in planting new projects with a diversity of participants and in a diversity of institutions.

We suggest that, project successes notwithstanding, institutional and departmental cultures that devalue the instructional mission of the university, whatever its Carnegie classification, remain a significant challenge to scaling up efforts such as those described here. Finally, challenges notwithstanding, we conclude with recommendations for continuing to advance the long trajectory of change in the preparation of graduate students for effective, evidence-informed teaching.

Common project strengths and challenges in relation to the GSTAS objectives are summarized below.

OBJECTIVE 1: DEVELOPMENT OF EVIDENCE-INFORMED TEACHING PRINCIPLES AND PRACTICES

ENGAGEMENT OF GRADUATE STUDENTS WITH EVIDENCE ABOUT EFFECTIVE TEACHING AND LEARNING

- Graduate students engaged thoughtfully and productively with the scholarly literature on evidence-informed teaching.
- Programs provided long-term professional development, not short-term TA training.
- Projects provided more limited opportunities to learn about and practice assessment.

DEVELOPMENT OF EVIDENCE-INFORMED TEACHING PRODUCTS, PRACTICES, AND PHILOSOPHIES

- Projects supported graduate students in developing high-quality teaching products.
- Projects enhanced teaching proficiencies and practices, both for graduate students and, depending on project design, for faculty.
- Projects enhanced graduate students' confidence in their preparation to teach well.
- There was variation across and within projects in the extent to which participants could apply teaching products and practices.

OBJECTIVE 2: CULTIVATION OF COMMUNITIES OF PRACTICE

COMMUNITY OF PRACTICE FOR PARTICIPATING GRADUATE STUDENTS

- Graduate students developed strong teaching-focused ties with one another.
- Graduate students strengthened their connections with faculty project participants.
- Projects created opportunities for teaching-focused feedback.
- Projects widened the community-of-practice circle for graduate students.
- Both graduate students and faculty developed enhanced appreciation for interdisciplinary conversations about teaching.

COMMUNITY OF PRACTICE FOR PARTICIPATING FACULTY, DEPARTMENTS, AND OTHER UNITS

- Project faculty developed a stronger sense of community of practice.
- Projects widened the community-of-practice circle for some faculty.
- It was difficult to engage additional faculty or departments.

SUSTAINABILITY: PROJECT CONTINUATION AMONG GRANT RECIPIENTS

- Project designs gave priority to sustainability.
- Projects sought to leverage market incentives.
- Projects invoked institutional priorities.
- Projects engaged senior leadership.
- Projects sought to "right-size" and target budget requests.
- Projects promoted transplanting, grafting, and cross-fertilizing.
- Projects drew attention to institutional incentives.
- Institutions and individuals must find and fund the time.

SCALABILITY: PROJECT EXPANSION TO OTHER PARTICIPANTS, UNITS, AND INSTITUTIONS

- The Teagle initiative generated a diverse array of project models.
- Individual and departmental project participants were diverse.
- Many institutional and department cultures remain indifferent or hostile to investment in teaching.
- Project expansion may be limited by the dynamics of self-selection.
- Tenure, promotion, and compensation policies provide few incentives to invest in teaching.

LESSONS LEARNED AND KEY RECOMMENDATIONS

CHARACTERISTICS OF SUCCESSFUL PROJECTS

- Successful projects recalibrated the relationship between research and teaching, treating them as synergistic rather than divergent.
- Continuing efforts to enhance graduate student preparation for evidence-informed teaching could draw inspiration from the gradual institutionalization of assessment in higher education.

CONTINUING SUPPORT FOR EXISTING PROJECTS COULD INCLUDE:

- New funding to strengthen the institutionalization of the GSTAS initiative in current participating universities and the professional association
- New funding to build networking opportunities for current participating research universities and the professional association
- Intentional diffusion of GSTAS project elements into existing institutional programs and practices

EXPANSION TO OTHER UNIVERSITIES AND PROFESSIONAL ASSOCIATIONS COULD INVOLVE:

- Funding for GSTAS projects in other elite research universities
- Funding for GSTAS projects in additional universities that offer doctoral education but that are not included in the Comprehensive Doctoral classification
- New funding to carry the GSTAS initiative to multiple professional associations
- Funding for the Preparing Future Faculty Program (PFF)

The Graduate Student Teaching in the Arts and Sciences (GSTAS) Initiative

Research universities in the United States award degrees to approximately 50,000 Ph.D. candidates every year (National Science Foundation 2016). In demanding programs, these students develop deep knowledge in their fields, advanced skills in research methodology, and values and habits that will shape their scholarly practice for years to come. Over the course of their careers, they produce outstanding research that enhances the intellectual base of academic disciplines and drives critical innovation and productivity in economic, social, and technological spheres. The significant achievements and impact of U.S. research universities and their Ph.D. graduates is widely recognized in professional circles throughout the world.

Yet even as they encounter – and often begin to produce – cutting-edge research in the content of their disciplines, most graduate students learn almost nothing in the course of their Ph.D. programs about research in teaching and learning, whether in general or in relation to their fields. Almost inevitably, preparation for their scholarly role overshadows preparation for any other professional faculty role, especially that of teaching undergraduates. Some benefit from a day or two of "teaching tips" in a workshop for new Teaching Assistants, and a fortunate few may complete a more intensive teaching certificate program offered through a university-wide teaching and learning center. But such programs, even the more comprehensive certificate programs, offer limited opportunity to engage and apply research on undergraduate teaching and learning to actual practice. It is the rare academic department whose culture and practices routinely support meaningful teaching preparation.

This is hardly a new development. We, and nearly all of our faculty contemporaries, had the same experience in our own Ph.D. programs more than thirty years ago, as did the faculty members who taught us, and as do the vast majority of graduate students in Ph.D. programs today. Even those who enter graduate school with undergraduate teaching as their primary career aspiration find little in the way of intentional programming to support the development of their knowledge or skills as teachers. This, despite calls from every imaginable sector – employers, politicians, policy makers, accreditors, public intellectuals, and professional associations in higher education – to strengthen the quality of undergraduate learning in U.S. colleges and universities. And this, despite a growing body of research about how students learn that can shape instructional practice, and the enhanced capacity and commitment of college and university faculty to assess what students actually *do* learn as a result of those practices.

This gap – some might say chasm – between the demand for improvement in student learning and the supply of rising faculty prepared to meet that demand was the

principal impetus for the Teagle Foundation's *Graduate Student Teaching in the Arts and Sciences* (GSTAS) initiative, first piloted in 2010 and expanded in 2012. Projects funded by the initiative engaged hundreds of graduate students, faculty, staff, and senior administrators across eight elite universities and two professional associations in thinking deeply about undergraduate teaching and learning. The goal of the GSTAS initiative was to strengthen the practices of current and future faculty in using evidence to enhance student learning, through effective, sustainable, and replicable programs preparing graduate students for undergraduate teaching in the arts and sciences.

This white paper describes findings and lessons learned from site visits to seven GSTAS grantees: Northwestern University, Cornell University, Stanford University, Columbia University, Princeton University, the University of California-Berkeley, and the American Historical Association (AHA). Our goal is to suggest both promising directions and continuing challenges for the role of research universities in enhancing the preparation of graduate students for effective and evidence-informed teaching. We argue that a key element of success in these programs was their treatment of the development of knowledge and practice in teaching, and the development of knowledge and practice in research, as both similar and synergistic. We also observe that, despite substantial differences in project design, the Teagle projects constituted a graduate-level version of "high-impact practice," such that participants experienced first-hand the kinds of instructional strategies supported by much of the scholarly literature they were reading. We suggest that, project successes notwithstanding, institutional and departmental cultures that devalue the instructional mission of the university, whatever its Carnegie classification, remain a significant challenge to scaling up efforts such as those described here. Finally, challenges notwithstanding, we conclude with recommendations for continuing to advance the long trajectory of change in the preparation of graduate students for effective, evidence-informed teaching.

Our analysis consists of four sections:

> A profile of the current landscape of U.S. graduate education, with emphasis on the strengths and weaknesses of their programs preparing graduate students to teach undergraduates;

> A thumbnail sketch of the seven GSTAS projects we examined and our methods for gathering evidence;

> Common project strengths and challenges relative to the accomplishment of GSTAS project objectives;

> Lessons learned and key recommendations for graduate student preparation programs in research universities.

The Current Landscape of U.S. Graduate Education

Research universities in the United States emerged in the latter part of the 19th century, initially supported exclusively by private funding. The Morrill Act of 1862 established public land grant institutions that would provide education "in the areas of agriculture and mechanics without excluding other scientific and classical studies" (Rhoten & Powell, 2011, p. 321). Both public and private research universities adopted dual priorities, emphasizing both college teaching in the British tradition, and advanced research in the German tradition.

In the last century and a half, much evidence indicates that America's research universities have become the preeminent institutions of their kind in the world, chiefly because of the breadth of their research performance (Graham & Diamond, 2004; Cole, 2010, 2011; Council of Graduate Schools & Educational Testing Service, 2010). As Cole comments, "What has made our universities the greatest in the world is not the quality of our undergraduate education – as important as that is – but our ability to fulfill one of the other central missions of leading universities: the production of new knowledge through discoveries that change our lives and our world" (2011, p. 27). Among the discoveries Cole cites are computers, lasers, the Google algorithm, antibiotics, the measuring of public opinion, and many others.

The research university community and its stakeholders rely on measures of achievement and productivity that focus almost exclusively on scholarly accomplishments or applications (Lombardi et al., 2012; Rhoten & Powell, 2011): doctorates awarded; overall research and development expenditures; federally-sponsored research and development expenditures; patents and licenses; start-ups and spin-offs; scholarly publications, such as books, monographs, articles in refereed journals, and citations; faculty recognition and awards, especially number of members in national academies and Nobel and other prize winners. By these measures, American research universities have earned top rankings: "80% of the top 20 universities in the world are in the United States. American universities make up 75% of the top 50 and roughly 60% of the top 100" (Cole, 2011, p. 27). Despite emerging challenges to their preeminence (competition from other universities, adequacy of funding, changes in market demands, etc.), their research resources, quality, impact, and prestige – and the incentives and rewards for faculty research performance – assure their continuing international leadership.

Responsibility for doctoral training, chiefly in Ph.D. degree programs, rests nearly exclusively with the research university community. The predominant model is the discipline-focused, research-driven-apprenticeship – the one in which most faculty have been trained and socialized, the one which typically drives the norms and values

of department cultures, and the one which they believe is appropriate for their graduate students if the world-class level of U.S. academic research is to be sustained (Goldie & Dore, 2001).

This model has much to recommend it. It promotes core values of the academic community: "meritocracy, organized skepticism (necessary questioning of claims to fact and truth), free and open communication of ideas, free inquiry, academic freedom, competitiveness, and autonomy" (Cole, 2011, p. 27). U.S. Ph.D. graduates are held in high regard for their excellence in research and scholarship, whether in higher education systems or other industries. They assume most faculty positions in research universities, sustaining the quality of scholarly training and contributing to the continuation of the professoriate itself. They also assume significant leadership roles across many employment sectors in which they serve. Large numbers of Ph.D. graduates indicate the importance and relevance of their doctoral training, and their satisfaction in academic and other careers for which that training prepared them (Nyquist & Wulff, 2000).

Over the past two decades, however, this model of Ph.D. training has been subject to growing criticism. Citing findings from opinion surveys of large numbers of doctoral students and research university stakeholders (Nyquist & Woodford, 2000; Nyquist & Wulff, 2000; Goldie & Dore, 2001; Austin, 2002; Austin & Wulff, 2004; Diaz et al., 2009; Council of Graduate Schools & Educational Testing Service, 2010; Cassuto, 2015), and disappointing data about undergraduate learning (Arum & Roksa, 2011; Keeling & Hersh, 2012), the critics argue that doctoral training "doesn't adequately meet the needs and demands of a changing academy and the broader society" (Nyquist & Wulff, 2000).

Commonly-cited deficiencies include the following:

Inadequate recognition of and preparation for multiple careers, whether in or outside the academy. Research universities tend to prepare graduates for faculty positions in research universities, even though the vast majority will work as faculty in other higher education institutions or in other career lines. Research universities "overproduce" Ph.D.'s for a stagnant or shrinking job market (Jaschik, 2016), misdirecting financial resources that could be focused on other institutional aims.

Scant preparation for the breadth of faculty roles in most higher education faculty positions. The near-exclusive emphasis on scholarly research in the preparation of doctoral students leaves little attention to teaching, service, outreach, or mentoring activities, all important roles for most faculty members. A consistent theme of the literature is that "overly specialized research training leaves future faculty ill-equipped to perform other faculty roles, especially teaching" (Goldie & Dore, 2001, p. 2).

Insufficient preparation in the scholarship and practice of teaching and learning. This criticism is levied both in general, and in relation to specific preparation for effective teaching in different types of higher education institutions, whose students may vary widely in their academic preparation. TA training programs are limited in the preparation they provide. As one study concludes, "Few...teaching development activities...have emphasized helping prospective faculty members learn the skills they will need, such as working with a diverse population of students, constructing a course, advising and mentoring students, employing a varied pedagogical repertoire, and assessing student learning" (Goldie & Dore, 2011, p.21). While innovations in teaching development programs have been occurring in some research universities, including programs such as Preparing Future Faculty (PFF), expanded training for teaching assistants, and projects promoting applications in the scholarship of teaching and learning (SoTL) (DeNeef, 2002; Condon et al., 2016), the innovations are often sporadic, small-scale, or short-term.

Lack of mentoring and advising for graduate students about career goals and options, future faculty work, and socialization in academic departments. Faculty feedback on graduate student performance, beyond dissertation research efforts, is limited. Ann Austin, among others, urges regular, ongoing faculty advising as well as "systematic self-reflection" by graduate students, so that "attention [is given] to the life and work of a faculty member, differing cultures and institutional types in higher education, ways faculty handle challenges and life styles, possible ways to link teaching and research expectations, and norms and values of a specific discipline or field" (2002, p. 116).

The indifference or outright hostility of the culture(s) of most academic departments to other models of doctoral training. Departments are notoriously resistant to changes that might enable significant attention to teaching preparation, applied research projects, professional socialization, or engagement across disciplines. The commitment to the traditional model of doctoral training remains strong because of the perceived success and positive impact of scholarly research on society, the extent to which research engagement reflects key values of the professoriate, and the significant rewards and incentives for faculty research accomplishments. Decision criteria for tenure, promotion and compensation continue to be heavily weighted in favor of achievements in scholarly research.

Project Designs and Study Methodology

The Teagle Foundation's Graduate Student Teaching in the Arts and Sciences (GSTAS) initiative was a direct response to these criticisms of the professional preparation of graduate students. The Foundation's Request for Proposals invited research universities to develop programs "through which graduate students in the arts and sciences prepare for teaching careers, with continued emphasis on helping graduate students engage—and use in their own teaching—new and emerging practices and research that can help bring undergraduate learning to the highest possible level."

The core objectives of the GSTAS initiative were to engage graduate students with evidence-informed teaching principles and practices; cultivate a community of practice among both graduate students and participating faculty; and support project expansion and sustainability.

The seven projects we investigated reflected four different types of project design.

Type I: Leadership by a university teaching/learning center

Cornell University developed teaching certificate programs in the university-wide Center for Teaching Excellence (CTE) introducing graduate students to "high-impact" teaching, scholarship of teaching and learning (SoTL), and assessment of student learning. Predicated on a "teaching-as-research" instructional model, the most comprehensive of these programs included a summer institute, monthly seminars in the fall semester, two for-credit pedagogy courses, a spring symposium and poster session for dissemination of students' SoTL projects, and the opportunity to lead a teaching workshop session for other graduate students.

The project also included substantial dissemination of the graduate students' work in a variety of venues. In-person dissemination has included presentations by participating graduate students to their home departments and conference presentations through the Center for the Integration of Research, Teaching, and Learning (CIRTL), the Professional and Organizational Development Network (POD), and the Association of American Colleges and Universities (AAC&U). Written dissemination has included Volume 1, Volume 2, and Volume 3 of a Classroom Research Working Paper Series, with Volume 4 forthcoming, and the book Doing Research to Improve Teaching and Learning: A Guide for College and University Faculty (Williams 2014).

Cornell's project also included a workshop and seed money for Directors of Graduate Study interested in developing complementary programming within their departments. Project activities were led principally by the Center for Teaching

Excellence, but with substantial design, delivery, and dissemination support from Cornell's Center for Community Engaged Learning and Research (CCELR), the Office of Academic Diversity Initiatives (OADI), the Graduate School, and the recently-established Cornell chapter of the Center for the Integration of Research, Teaching, and Learning (CU-CIRTL). Ongoing programming for graduate students in Cornell's Center for Teaching Excellence continues to reflect commitment both to high-impact practices and "teaching-as-research" in their instructional development and improvement.

Princeton University launched a year-long seminar on "Scholarly Approaches to Teaching" for stipend-supported faculty and graduate students from over a dozen arts and sciences departments, with content developed and chiefly delivered by staff from the McGraw Center for Teaching and Learning. Participants engaged in critical discussions of a wide cross-section of scholarship in the fields of learning and pedagogy, and completed "assignments" requiring them to prepare or revise a variety of written teaching-related products, such as statements of teaching philosophy, draft course syllabi and assignments, rubrics, CVs, and teaching portfolios. Whole-group seminar meetings, always interdisciplinary, were complemented by breakout sessions with varied groupings, sometimes based in a single discipline or cluster of related disciplines. Seminar and breakout sessions frequently engaged participants in the types of research-supported learning activities they were reading about, including new technologies for online learning.

Many "alumni" from the Teagle seminar were subsequently appointed to ongoing positions or activities at Princeton related to development of teaching effectiveness, such as leadership of the orientation program for new graduate Assistants in Instruction (AIs). Since the conclusion of its Teagle grant, Princeton has continued to offer the seminar as the McGraw Teaching Seminar on Scholarly Approaches to Teaching and Learning. Going forward, it appears likely that the seminar will be converted to a transcripted non-credit one-semester course; as of the time of this writing, the deans of the Graduate School had approved the proposal for such a course, and it was en route through the University's course approval process.

Columbia University aimed to promote an inquiry-based approach to teaching, grounded in scholarship of teaching and learning, and engaging graduate students in a hands-on, interdisciplinary exploration of emerging technologies. The project was led by a first-ever collaboration between the Graduate School of Arts and Sciences (GSAS) Teaching Center, which provides pedagogical support for graduate students in arts and sciences programs, and the Center for New Media Teaching and Learning (CCNMTL), which supports Columbia faculty in using technology effectively in teaching. The first project component consisted of an immersive four-day "Summer Institute" for approximately 50 graduate students emphasizing learning activity design and digital technology integration in undergraduate courses. The Institute

included "field visits" with Columbia University and Barnard College digital technology professional staff to develop digital and media project assignments for course use. A substantial limited-access project website was developed to support graduate student recruitment and project participation.

The second project component was a year-long "Teaching Fellows Peer Observation Program" in which five to six pairs of graduate students from different departments participated in a series of workshops on peer evaluation of teaching; implemented innovative assignments in their respective courses; observed, evaluated, and reported on one another's instructional performance; and shared their projects with their home departments. Since the initial implementation of its Teagle project, Columbia has expanded and reorganized its infrastructure for professional development of both faculty and graduate students, subsuming both the GSAS Teaching Center and its Teagle programming, the latter now institutionally-supported. The new Center for Teaching and Learning continues to offer both an Innovative Teaching Summer Institute and a Peer Teaching Consultant program.

Type II: Leadership by a department or division

Northwestern University focused on discipline-specific preparation of graduate students to teach undergraduates. Northwestern's Department of History launched an academic year workshop series on teaching and learning history, collaboratively developed and led by a History faculty member and a History graduate student teaching coordinator, with advice on both the content and the delivery of the workshop from the Searle Center for Teaching Excellence and the American Historical Association. Seminar sessions featured discussions of scholarship in history pedagogy, speaker and panel presentations, and discussion of specific instructional strategies. Fellowships for 25 History graduate students at varying stages of their degree programs supported their workshop participation and their preparation of a variety of written products – a statement of teaching philosophy, syllabi for two courses, a sample assessment strategy, and an outline or text version of a lecture. Although designed primarily for graduate students, sessions drew faculty participants as well.

The project also included a Faculty and Student Advisory Group (FASAG) chaired by The Graduate School's Associate Dean for Academic Affairs, with membership not only from History but also from the departments of English, Philosophy, and Mathematics, charged with exploring the "exportability" of the History Department model to other departments. As of this writing, and with the support of nearly 90% of its graduate students, the History Department is piloting in 2015-16 a new course in History pedagogy modeled on the Teagle workshop; it is optional in the first year but part of the requirements for the Ph.D. program beginning in 2016-17.

Stanford University located its Teagle programming in the Division of Literatures, Cultures, and Languages (DCLC), a multi-disciplinary cluster of humanities studies. The core of the project consisted of graduate student teaching apprenticeships, in which two graduate students collaborated with a faculty member to develop and teach a humanities course. Teams shared responsibility for varying activities in the creation and delivery of courses from start to finish, with students typically carrying out greater responsibilities than they would have as TAs. The apprenticeships were complemented by a year-long workshop series – "The Plenum" – engaging faculty and graduate students in conversation about recent literature on teaching and learning in light of their practical experience as teaching teams. Stanford's Teagle grant supported stipends for all faculty and student team members, including a graduate student program administrator, and funding for support staff and ancillary services. As the grant-supported project neared its conclusion, the Vice Provost for Graduate Education agreed to fund project continuation and appointed a tenured faculty member to serve as the next director.

Type III: Leadership by a disciplinary association

The American Historical Association (AHA), not surprisingly, took a discipline-specific approach to the preparation of graduate students for effective, evidence-informed teaching. It established an expert team of national and international leaders in the scholarship of teaching and learning in history, to serve as consultants both to the AHA and to departments of history at selected universities. It offered several sessions on undergraduate history pedagogy, many of which were led by members of the expert team, for graduate students, faculty, and Directors of Graduate Studies at the 2014 and 2015 AHA national conferences; video recordings of several of these sessions are available on the AHA website. The expert team and AHA staff also served as consultants to the history departments of GSTAS grantees Northwestern University and the University of California-Berkeley on the development and implementation of their own Teagle-funded projects.

The AHA is continuing the Teaching and Learning Networking event as a regular part of its annual meetings and planning the development of teaching resources on the AHA website. Teagle project activities are also informing plans for conference sessions and a pre-conference workshop in 2017 to be offered by the International Society for the Scholarship of Teaching and Learning in History (HistorySoTL), which recently became an official affiliate of the AHA. As of this writing, AHA staff were beginning to develop another campus-based pilot program to enhance graduate student preparation for evidence-informed teaching of history, which they anticipated would include online elements such as webinars.

Type IV: Leadership delivered through a blended structure

The University of California–Berkeley infused research on "how students learn" into a variety of existing and new programs preparing Graduate Student Instructors for effective teaching, supported by a collaboration between the Graduate Student Instructor Teaching and Resource Center (GSI-TRC) and multiple academic departments, and in the case of the History Department, with consulting assistance from the American Historical Association. Berkeley's project was multifaceted, including the development of a workshop on how students learn as part of an existing teaching certificate program offered by the GSI-TRC; inclusion of Teagle-developed materials in Berkeley's annual summer Preparing Future Faculty program; incorporation of research on student learning into an annual seminar for faculty members on teaching with GSIs; establishing a new award for GSIs on Excellence in Enhancing Student Learning; and introduction of expert faculty presentations on how students learn in the fall and spring teaching conferences for new GSIs.

In addition, UC-Berkeley was unique among the GSTAS institutions in that, consistent with UC system-wide policy, all departments with graduate programs already had in place a departmental graduate course on pedagogy required of all first-time Graduate Student Instructors. Consequently, a signature element of UC-Berkeley's Teagle project involved the redesign and delivery of this required course by pairs of faculty members and GSIs in 16 academic departments, to incorporate significant content and instructional practices from the "How Students Learn" initiative. The Department of History was one of these participating departments, and its redesign process included a consulting visit from staff and the expert SoTL team convened by the American Historical Association. While the GSI Teaching and Resource Center was thus the principal center of gravity for Berkeley's project, the project design also resembled Stanford's project with faculty and graduate students in specific disciplines working together to design and teach a course, and included engagement with a disciplinary association for one department. Most of the activities undertaken in Berkeley's Teagle project are being sustained in some form, as described on the How Students Learn resource page on the GSI-TRC website.

Our analysis of these seven projects is based on information from the following sources:

Formal interviews, focus group meetings, and informal conversations with 150 project participants, chiefly during site visits to each of the projects;

Observations of one or more project events (typically workshop sessions, seminars or symposia) at each university and at the AHA 2015 Annual Meeting;

The original grant proposals, all interim reports, and all available final reports prepared by the seven project teams for the Teagle Foundation;

Project websites, some of which included graduate student posters, blogs, and other products;

All pertinent Teagle Foundation documents and correspondence.

Interviewees by affiliation

Institution	N
American Historical Association	*7*
Columbia	*14*
Cornell	*24*
Northwestern	*13*
Princeton	*23*
Stanford	*28*
UC-Berkeley	*41*

Interviewees by role

Role	N
Graduate students	*67*
Department faculty	*37*
Directors of Centers (primarily teaching and learning)	*21*
Senior academic administrators	*13*
Department/division chairs and Directors of Graduate Study	*10*
Professional association staff	*2*

In the analysis which follows, we synthesize information across all seven projects rather than treating each project individually. The analysis also situates the findings from our field work in the larger context of the literature on higher education and the preparation of doctoral students for faculty roles; see the References below for a selected bibliography of these materials.

Common Project Strengths and Challenges in Relation to the GSTAS Objectives

ENGAGEMENT OF GRADUATE STUDENTS WITH EVIDENCE ABOUT EFFECTIVE TEACHING AND LEARNING

Graduate students engaged thoughtfully and productively with the scholarly literature on evidence-informed teaching. The GSTAS initiative fostered consistent and engaging discussions about evidence-informed teaching principles and practices among graduate students, and between graduate students and faculty. Conversations occurred routinely in formal seminars, collaborations involving course design and delivery, the preparation of graduate student products, and informal contacts. Participants engaged ideas from sources such as *How Learning Works* (Ambrose et al., 2010), *What the Best College Teachers Do* (Bain, 2004)*, How People Learn* (Bransford et al., 2000)*, Historical Thinking and Other Unnatural Acts* (Wineburg, 2001)*, and *Qualitative Research for Education* (Bogdan & Biklen, 2003). Discussion topics varied, including outcomes-based course design; active and learning-centered teaching approaches; differences in learning styles; the "teaching as research" and "design research" paradigms; and direct and indirect assessment of learning outcomes. As with any body of scholarship, the literature on teaching and learning was received with a healthy degree of skepticism; claims were not accepted at face value, but assumed to be contestable.

Participants assigned high value to these discussions, whether on general or discipline- specific topics, finding the literature intellectually stimulating and engaging ("eye opening," many said). In the words of one graduate student, engagement with the SoTL literature "helped me see data in a different way, and to know that I could use that data to improve my teaching the next time around. I learned about the iterative process of using data for improvement." Their readings and discussions had a substantively positive effect on knowledge and attitudes toward teaching; as one interviewee said, these experiences "unmasked every one's passion for teaching," and significantly enhanced expectations about the value of faculty preparation programs.

Programs provided long-term professional development, not short-term TA training. GSTAS programs were conceptualized as professional development across faculty roles, not simply TA preparation. As one faculty member observed, "Being a good teacher is linked to being good in all faculty roles." Another commented, "Students will be far more marketable and successful in their professional roles if

they have this kind of training. I want students to have this competitive edge of being trained as a whole professor." A graduate student said, "This program is not just a way to help students get academic jobs – it's umbrella training for grad students to become more involved in their fields." One project addressed an additional aspect of professional development: reflection on larger questions of professional responsibility. These questions included: "Why do professionals in our field do what they do? To what extent is effective, evidence-based teaching part of both the professional role and civic obligation of faculty in our discipline?" Discussions of these kinds of questions, both on and off campus, were energetic and continuing.

Projects provided more limited opportunities to learn about and practice assessment. As indicated above, projects introduced a variety of potential sources of evidence to inform teaching: findings from scholarly literature about effective/high impact teaching practice; methods for conducting systematic research on student learning in the context of one's own teaching ("teaching-as-research" or scholarship of teaching and learning [SoTL] theory and practice); and approaches to assessing student learning. Of these three "domains" of teaching evidence, assessment received the least attention. In nearly all projects, the principal emphasis was on the "input" side – how students learn, what students *should* learn, and effective pedagogies in specific fields. The exception to this pattern was one project that engaged students in conducting their own "teaching as research" inquiries on the impact of specific teaching practices on their students' learning. All of the projects referenced assessment in their programming, but there was limited attention to assessment strategies and practices that can help instructors determine, routinely and systematically, what students actually learn in relation to specific outcomes established by the instructor(s) or the department as a whole. It is likely that outcomes assessment found less priority than it might have because of the sheer time complexity involved in developing program (input) products.

DEVELOPMENT OF EVIDENCE-INFORMED TEACHING PRODUCTS, PRACTICES, AND PHILOSOPHIES

Projects supported graduate students in developing high-quality teaching products. Projects were designed to engage participants in developing and discussing a wide variety of teaching-related products, some of which could be used during the course of the project (depending on the participant's teaching or assistantship assignments). These included statements of teaching philosophy; course syllabi; course teaching materials (assignments, handouts, group projects, exercise sheets, practice tests, quizzes, etc.); applications of media and digital tools, such as blogs, web sites, and online resources ; discussion questions or presentations; rubrics and feedback questionnaires; and teaching-focused articles prepared for institutional and public dissemination.

In many projects, graduate students consolidated these materials into teaching

portfolios in anticipation of job interviews and future faculty teaching practice. There was virtually universal support among participants for the professional value of these teaching products and for the process of developing them.

Projects enhanced teaching proficiencies and practices, both for graduate students and, depending on project design, for faculty. In varied ways, all GSTAS projects enhanced the evidence-informed teaching practices and skills of individual participants. These practices included determining appropriate course learning goals and expectations for student achievement; selecting among varied types of active learning techniques; using different kinds of pedagogies for different types of courses, students, or institutions; knowing how to provide feedback to students on their academic performance; designing course activities and assignments that dovetail with intended learning outcomes; and introducing digital and media tools and technologies for course assignments and program information sharing. Project impact on participant teaching practices and skills varied according to project design and the extent to which participants had the opportunity to apply the ideas they were engaging to actual practice, which also varied by project. But in every project, at least some of the participants had the opportunity both to practice general teaching proficiencies and to pilot some innovations; as instructors, they held small group and panel discussions, role played, debated, developed films and videos, wrote scripts, performed rhetorical and topical analyses, created web sites, blogged, maintained diaries, and lectured.

Projects enhanced graduate students' confidence in their preparation to teach well. Graduate students consistently reported an enhanced sense of confidence in their teaching preparation and proficiencies, resulting from their development of teaching products, their perceived successful implementation, and the positive feedback they engender. Many said that their Teagle project experience gave them a sophisticated and nuanced language for talking about teaching principles and practices. Many faculty and administrators shared the students' perception, with one faculty leader saying, "students are more self-confident...believing that they can do a lot of different things [well]." Students found or expected that this enhanced confidence would serve them well not only in job interviews but in their new positions as early faculty members.

There was variation across and within projects in the extent to which participants could apply teaching products and practices. For a variety of reasons – some institutional, some individual – some participants had opportunities to use the products and practices they were developing during or immediately following their Teagle project participation, but others did not. For example, two GSTAS projects featured collaborations between faculty and graduate student teams working to develop or revise courses, an opportunity that generally was perceived as highly valuable. However, the extent to which the contributions of the graduate students in

each team actually made their way into the courses as they were being taught varied considerably. Status, role, and power differentials, and differences of opinion over course objectives, content, assignments, or selection of teaching approaches, made for some unpredictability in translating plans into practice.

Variation in opportunities to apply GSTAS principles or practices was also institutionally- or departmentally-driven. Some institutions and departments offer – or require – more teaching or TA experience than do others. Even within institutions or departments that did offer teaching opportunities, some participants didn't happen to have had teaching or TA assignments during the period of their GSTAS project participation. Moreover, even among those who did, the courses they were teaching or assisting might not have been appropriate for the products or practices they might have wanted to pilot – or the faculty member they were assisting may not have been interested in the graduate student's proposed innovations.

Nevertheless, a number of participants – faculty and graduate students alike – did have the opportunity to apply what they were encountering in their GSTAS projects, whether they were teaching or assisting within their own institutions or serving as adjunct faculty at another institution. When this happened, participants were enthusiastic about the chance to connect theory and practice (in the words of one graduate student, "We were actually putting the readings into practice in our own teaching!"), and they described with great specificity the ways in which they were restructuring learning goals, assignments, and the use of class time as a result of their project participation. A faculty participant depicted the Teagle program as "continuing professional development" even for seasoned faculty members.

OBJECTIVE 2: CULTIVATION OF COMMUNITIES OF PRACTICE

COMMUNITY OF PRACTICE FOR PARTICIPATING GRADUATE STUDENTS

Graduate students developed strong teaching-focused ties with one another. The strongest sense of belonging to a community of practice (CoP) existed among graduate student participants. They usually knew each other well and had energetic conversations about teaching in seminar sessions and in other project activities. Their connections with one another, across academic fields and stages in their programs, were palpable. As one student said, "Through the seminar, people came together and realized common issues transcending their disciplines. They felt cohesive as a group." Another said the project "relieved [participants] of the 'shame' of giving attention to teaching." Many students mentioned that their conversations about teaching and learning extended well beyond program meeting times – not just in the hallways of their departments but during social gatherings as well. A few even mentioned connecting with program alumni via email to learn about how they were using what they had developed during their program participation.

Graduate students strengthened their connections with faculty project participants.

For the most part, projects fostered a strong sense of CoP between project graduate students and project faculty. Because both structured and informal communication opportunities were offered, students felt comfortable talking with project faculty in general, and talking with them about teaching in particular, not just about research. They had "permission to be interested in teaching" and a language to talk about it. Moreover, many indicated that project participation mitigated the sense of hierarchy that often characterizes faculty-graduate student relationships - that they "had become team members rather than subordinates." One student said, "At Teagle meetings, we are all equal players, giving advice to one another." Another said that "Having open dialogue...between graduate students and faculty is new for me, contributing to a sense of community."

There were some exceptions to this pattern, however. Some graduate students wished for a greater number of faculty participants. Others hoped for more informed and consistent faculty participation in project activities, suggesting that faculty would benefit from preparation for their project roles before the inception of projects. For example, one graduate student said that "When faculty members [do] attend [project sessions], they are not [always] invested and have a very narrow view...Faculty [don't seem to] think or talk much about teaching...sometimes they tune out." Participants in projects that engaged faculty and graduate students in collaborations to design, modify, and/or team-teach courses sometimes indicated that some prior professional development for faculty on collaborative teaching would have enhanced the experience. Nevertheless, the predominant view among students was that faculty, especially those who were team-teaching undergraduate courses or supporting the development of student projects, were consistently engaged in Teagle activities, certainly beyond what they would have been had they not participated in the Teagle programs.

Projects created opportunities for teaching-focused feedback. In a variety of ways, GSTAS projects created new opportunities for feedback on teaching-related products and teaching performance, primarily for graduate students but sometimes for faculty participants as well. These opportunities were highly valued by project participants. Many graduate students indicated that, apart from teaching evaluations from students, they normally receive little specific, systematic feedback on their roles as TAs, even from faculty members they are assisting. Even departments that already enjoyed a reputation for "good teaching" were not necessarily characterized by policies or practices supporting effective teaching, such as standardization of expectations about the roles of TAs, careful faculty supervision of TAs, or the development of teaching preparation programs for faculty. Teagle projects supplied what departments generally did not. Different projects enabled feedback in different ways, from careful reviews of teaching-related products, to a formal peer observation program, to faculty-graduate student team-teaching where the graduate student and the faculty member both provided and received feedback. In particularly productive

graduate student- faculty interactions, students sometimes felt that they had become "change agents," effecting changes in the perceptions, values, or even teaching practices of selected faculty.

Projects widened the community-of-practice circle for graduate students. Depending on project design, many graduate students learned about other sources of university support for effective and evidence-informed teaching – primarily in teaching and learning centers – thus enlarging the community of practice for those students. "As a first-year graduate student you can feel very disconnected, and it's hard to find all the resources and [know] who to talk to and what's available and how to integrate that. The take-aways [in the Teagle project were about] things I can use in the future – not just knowing who to talk to, but just that they *exist*. This broadened my horizons about what can be done." A number of graduate students indicated that they expected to seek out similar resources at the institutions that hired them after they had completed their graduate programs: "I plan to look out for those other people who care about teaching, and to find them – and it doesn't have to be in my department."

Both graduate students and faculty developed enhanced appreciation for interdisciplinary conversations about teaching. For those projects that were not housed within a specific department, participants were often surprised and galvanized by the insights into teaching and learning conveyed by interdisciplinary conversation. Faculty and graduate students alike identified a number of unanticipated benefits to interdisciplinary conversations about teaching and learning, with perhaps the most frequently-mentioned benefit being the opportunity to re-encounter what it is like to be a "novice" in one's own field – the vantage point, of course, of most undergraduates, even those who may be majors in their instructor's discipline. A graduate student indicated that "interdisciplinary engagement is alerting me to what I need to know from *other* fields in order to teach about the implications of *my* field." A faculty member said, "I was unsure how [the seminar] would work with people coming from all different disciplines… but I've really appreciated reflecting with so many different people from different fields." Engagement with academics in other fields also prompted participants to consider new teaching strategies that may be common in other fields but not their own; this was particularly powerful when an institution's project offered participants the chance to experience that teaching strategy for themselves.

COMMUNITY OF PRACTICE FOR PARTICIPATING FACULTY, DEPARTMENTS, AND OTHER UNITS

Project faculty developed a stronger sense of community of practice. A strengthened sense of CoP was also articulated by participating faculty, in relation both to project graduate students and to other project faculty. Faculty indicated they learned useful things about teaching, found participation "a great way" to get to know graduate students (this was especially true for new faculty members), and sometimes consulted with students for their perspectives on teaching issues. Several faculty indicated that they had grown more informed about the needs of their graduate students, were more aware of their expectations, and were more open to student input and preferences in course-related decisions, notwithstanding differences that could and did arise.

Some faculty members reflected that collaborative work on or conversation about teaching enriched their sense of efficacy in mentoring graduate students, a role that many faculty already value. One faculty participant in a project that involved co-teaching with graduate student participants said that the project provided "the only occasion I've had to see my students teach. So that's going to really help me when I'm writing letters of recommendation for them as they are graduating. Now I can address both their scholarship *and* their teaching – that will really help those letters stand out." A project director noted that, in recruiting faculty participants, "the opportunity to be mentoring graduate students was appealing to faculty – more so than having a faculty seminar on teaching." Similarly, a department chair said that in encouraging faculty participation, he emphasized the way the Teagle project formalized and enhanced the faculty-graduate student mentoring relationship. The expansion of both the intrinsic and instrumental rewards of faculty mentoring of graduate students may be a hook upon which to hang future efforts to encourage conversations about teaching and learning in research-focused institutions.

Some faculty also experienced a stronger sense of community of practice with other faculty participants. One faculty leader described teaching-focused conversations among project faculty as a "communal digestion of knowledge." Another faculty member said, "Participation in the seminar was like co-therapy – there were helpful discussions across discipline and faculty career lines. A sense of community emerged among the participants." A third commented, "It's comforting to be among peers who really care about teaching and think about it a lot."

Projects widened the community-of-practice circle for some faculty. Different project designs offered different kinds of opportunities for faculty members to find support for their teaching interests beyond their immediate project partners. Some projects alerted faculty to potential staff partners and resources in various kinds of teaching and learning centers that either they hadn't known about before, or that they hadn't fully appreciated: "I've known about the [teaching and learning] center, but have felt a little de-coupled. This project has strengthened my sense of

connection – they really are helpful resources."

In two projects, multiple administrative units were involved in preparing project participants to use a variety of evidence-based instructional approaches and technologies. These academic administrative offices and institutional centers provided services, financial resources, visibility, and leadership support for projects, frequently fostering effective collaborative relationships and communication with participating project departments. Like their graduate student counterparts, faculty appreciated the opportunity to connect with these resources. Further, some projects – the AHA project in particular - offered opportunities to connect with faculty at other institutions: "The conversations I've had with other people through the AHA or around the AHA about pedagogy have been terrific. So I feel very engaged with some people in my discipline around pedagogy."

It was difficult to engage additional faculty or departments. All the institutionally-based projects included some kind of feature designed to stimulate interest in the project within the participants' departments, or among other departments that were not yet participating. For example, graduate students were expected to make some kind of presentation about their project work to their home departments, or modest programming was developed for department chairs or Directors of Graduate Study. While these "expansion" activities were generally carried out, they did not appear to spark the level of interest or demand that they were intended to generate.

OBJECTIVE 3: SUPPORT FOR PROJECT SUSTAINABILITY AND SCALABILITY

SUSTAINABILITY: PROJECT CONTINUATION AMONG GRANT RECIPIENTS
Project designs gave priority to sustainability. Project sustainability was not an afterthought; every grant proposal included specific strategies for project continuation once Teagle funding had ended, and project teams carried them out. These strategies addressed critical issues including the continuing need for leadership, commitment of adequate time among competing priorities, skepticism about and resistance to faculty preparation programs in many department cultures, and the need for an organizational infrastructure to support future programming.

Projects sought to leverage market incentives. The competitive market for faculty positions in many fields provides ready incentives for the development and continuation of faculty preparation programs focused on teaching. Interviewees saw participation in the Teagle program as "adding value" for graduate student marketability. As one faculty member observed, "We know that most of our students won't get jobs at R-1 institutions, but we think students should be good teachers even if they do. We want to help them succeed not only in *getting* a job, but also when they are actually *in* their job." A student said, "I think that teaching is a very important part of [an academic] job. Participating in the Teagle program was essential, not just for getting the credential but for actually having the skills." Another student

indicated, "I think [Teagle project participation] will be a great advantage going into the market. It's on my CV and none of my competitors will have it on theirs."

Declining enrollments in many fields, such as the humanities (Jaschik, 2016) provides an additional incentive for better teaching and attention to student needs, both typically addressed in faculty preparation programs. As one faculty member said, "Social sciences and humanities, in particular, in order to survive, have to reach various audiences, particularly undergraduate audiences. We have to be good teachers to attract student enrollments."

Projects invoked institutional priorities. While this occurred in varying and project-specific ways, most grantees found ways to connect the GSTAS initiative to larger institutional priorities and sought support from senior leadership in doing so. In one university, the Teagle project was linked explicitly to intended learning outcomes both for graduate students and for undergraduates. In another, the Teagle project became part of a larger institutional priority to strengthen resources for effective teaching for faculty and graduate students alike. Still another connected the Teagle project to a priority initiative in the graduate school focused on graduate student professional development. The senior leadership of the professional association saw its Teagle project as intimately connected to the future of the discipline and the larger context of the state of graduate and undergraduate education in the humanities. The invocation of institutional priorities not only provided impetus for project initiation, but also grounds for project continuation.

Projects engaged senior leadership. Every project also engaged senior leadership, though again in varying and project-specific ways. Graduate school deans often facilitated collaboration between project leadership and other units of the institution. Some senior leaders assisted with recruitment of faculty participants or department chairs. Some provided opportunities for discussion of the institution's Teagle initiative at various regularly-scheduled gatherings of faculty leaders. All contributed in some way to project sustainability, whether through allocation or re-allocation of funding, reorganization of structures, or extending or expanding appointments. The eloquence of some graduate school deans about the purposes and accomplishments of their institution's Teagle project was impressive. Several also linked their Teagle projects to a recent or impending accreditation effort. Senior leaders provided vision, visibility, and resources, all of which were vital to project continuation.

Projects sought to "right-size" and target budget requests. The nature and scope of ongoing funding needs varied considerably across kinds of projects; however, as project directors gained experience with project management, they recognized that some kinds of project activities required time but little money, while others required more funding. They turned to a variety of sources for institutional funding, including academic departments, Offices of Deans and Graduate Studies, centers of teaching and learning, media and technology centers, and senior or central administration

offices, such as offices of vice provosts, provosts, and vice presidents. Projects also employed a variety of strategies to sustain programming with institutional dollars, including combining resources across multiple units, redirection of existing dollars, and reductions in stipends or non-compensation expenditures.

Projects promoted transplanting, grafting, and cross-fertilizing. Sustainability also requires new initiatives to find an institutional home with structural support. This occurred in different ways, but it always occurred. Two projects are transplanting their Teagle initiative into graduate courses. In the words of one of the project directors, "In a sense, a class is a solved administrative problem—the room gets booked, scheduling is easy, everybody's incentives are clear, and you know who will be in the room every day. Organizing twelve workshops of various sizes for different constituencies … took a lot more energy." And, while the Teagle Fellows appreciated the community spirit that this helped to inculcate, they complained that sometimes the constant stream of visitors disrupted what would otherwise have been a sustained conversation with a fixed group of people. Other projects are grafting various elements of their Teagle projects into their teaching and learning centers, sometimes by enriching programming they were already offering, and sometimes by offering a new programmatic option. The AHA is following a similar track, both enlarging the scope of some things they were already doing, and offering new programming.

Cross-fertilization occurred as well, primarily by graduate students who were Teagle project participants or "alumni" serving as leaders of orientation programs for teaching assistants, and integrating some of what they had learned about evidence-informed teaching into the content of these programs. This often meant more engagement in thinking and talking about teaching with graduate students who were not program participants, to the mutual benefit of both.

Projects drew attention to institutional incentives. All the projects prompted discussion about the larger structure of incentives for participation in programs intended to advance evidence-informed teaching in research universities. Several projects were beginning to consider, or move forward on, changes in selected academic policies in support of this goal. For graduate students, these included requiring or encouraging graduate students to successfully complete teaching preparation activities on campus, at national conferences, or online; setting consistent expectations for graduate student/TA teaching performance; regularly providing feedback to TAs on their teaching; encouraging and recognizing TAs for using varied teaching approaches in their courses. For faculty, there was renewed discussion about the importance assigned to teaching expertise in interviews for faculty positions, and about weighting teaching more in faculty promotion and tenure decisions.

Institutions and individuals must find and fund the time. A manageable and supported time commitment for project participants was essential both to initial

project success and to long-term sustainability. As one faculty member said, "Faculty and graduate students are so busy, you can't just add this to everything else [they] are already doing." Financial support was essential for most of the graduate student participants and for project directors, and was important, even if not essential, to everyone else. Graduate student fellowships or stipends compensated for the opportunity cost of Teagle program participation in lieu of grant-funded research or summer school teaching. Support also took the form of compensation for team teaching of undergraduate courses; course releases for faculty; and inclusion of courses as part of regular faculty teaching loads. Financial support for faculty, students, and staff carrying out administrative or project leadership responsibilities was usually provided through Teagle grant money, and program continuation as described in project synopses above typically required some combination of new institutional resources and scaled-back expenditures (smaller stipends, shorter programs, fewer participants, etc.). What remains to be seen in all of these projects is whether the institutional support required for program continuation will be sufficient to fund the time commitment required both for program leaders and program participants.

PROJECT EXPANSION TO OTHER PARTICIPANTS, UNITS, AND INSTITUTIONS
The Teagle initiative generated a diverse array of project models. The multiple approaches to fostering graduate student preparation for evidence-informed teaching represented in the GSTAS initiative offer a welcome variety of options for departments or institutions interested in enhancing the professional preparation of their Ph.D. candidates. Reflecting on prospects for project expansion to additional departments within her institution, an administrative leader commented, "We need to work with what's there; the imposition of a model won't take hold. It's better to offer several models and ask departments to consider what will work for them." As for project expansion to other institutions, we noted in our individual site visit reports that project designs often played to current institutional strengths, ranging from support for teaching with technology, a penchant for cross-unit collaboration, or exceptionally robust programming for teaching assistants. The diverse and imaginative ways that projects were conceptualized and situated not only provides a variety of existing options for consideration, but can spark the development of still other models likely to leverage distinctive institutional strengths.

Individual and departmental project participants were diverse. The array of departments and disciplines collectively represented in the Teagle GSTAS project was impressive. Our interviewees included historians, mathematicians, musicologists, physicists, philosophers, engineers, political scientists, linguists, economists, environmental scientists, sociologists, biologists, and instructors in half a dozen different languages, to name but a few. Moreover, both graduate student and faculty participants represented different generational cohorts, from first-year students to those on the cusp of completing their dissertations, and from adjunct instructors in

their second year of teaching to senior faculty nearing retirement. The institutions, too, were very different from one another. From the palm trees of Palo Alto to the protests outside our window in Berkeley, from the traffic noise of America's largest city to the tree-lined serenity of one of its best-known college towns, the universities that pursued these projects spanned the spectrum of U.S. R-1 institutions, not only in geographic location but in character. The broad appeal of programming to enhance evidence-informed teaching bodes well for scalability.

Many institutional and department cultures remain indifferent or hostile to investment in teaching. Almost every interviewee across all seven projects indicated that faculty members in elite research universities typically do not value programs to enhance the teaching of undergraduates. Here is but a small sample of comments from participating graduate students:

> "There is not much incentive to even think about teaching, let alone improve it."

> "A punitive ethos [about teaching] exists; there is no regard for teaching."

> "The Teagle program is fighting against the culture of 'research first and only;' it helps relieve the stigma of focusing on your teaching."

> "A lot of faculty want us to want *their* job - but a lot of us want a different job."

> "It's the nature of grad school itself – what gets you the degree is your dissertation, not your teaching evaluations."

> "In a place like [this], there's this perverse status economy – if you're really brilliant, the institution recognizes that by liberating you from the burden of teaching."

> "A lot of faculty see [involvement with the Teagle program] as a waste of time that could be better spent getting your research published. Or they offer surface support but aren't interested in what the students are actually learning from their projects."

A few students indicated that they were being careful not to disclose their project participation to their thesis advisors or research supervisors. One institution discontinued the requirement of a letter of support from a student's faculty advisor as a condition of project participation, to avoid putting students into an awkward or professionally-compromised position. These dynamics suggest that the criteria by which research universities have long been evaluated, as described in Part I, continue to shape both institutional cultures and, for the most part, individual professional values, making the expansion of GSTAS-like projects an uphill climb.

Project expansion may be limited by the dynamics of self-selection. At both the individual and the unit level, as is typically the case when innovations are being

piloted, participants represented a "coalition of the willing." Without exception, and despite the cultural conundrums described above, each of the visionary, energetic, and talented project leaders (described in more detail below) had made a decision to bring their considerable gifts to bear on the effort to enhance the educational experience of graduate students at their institution. The senior leaders at those institutions both recognized and cultivated the connection between the GSTAS initiative and the strategic interests of their organization.

Participating faculty were exceptional in already sharing many of the values at the heart of each project. The AHA's team of expert faculty not only believed in but generated evidence to inform effective teaching. The faculty who developed, revised and delivered courses in partnership with graduate students were interested in both their own and their graduate students' professional development. The faculty who attended seminars and plenary sessions or who served as ambassadors within their departments thought of effective undergraduate teaching and learning as both intellectually intriguing and inherently important.

So, too, did many of the graduate students who elected to participate. Some indicated that the primary reason they were pursuing the Ph.D. in the first place was to be able to teach undergraduates – "I'm just constitutionally more inclined to teaching" – so they began their graduate education with pedagogical interests already firmly established. Others "discovered" how intellectually engaging teaching preparation could be through positive experience in their TA orientation, and wanted more. Importantly, faculty participants sometimes unwittingly reinforced these selection effects. As one faculty member who was a regular presenter in his institution's GSTAS project said, "If I know that a graduate student is already interested in teaching or is thinking about jobs in liberal arts institutions, I make sure to tell them about Teagle."

What this means, of course, is that graduate students who aren't yet persuaded of the value and vitality of evidence-informed preparation for teaching won't necessarily even encounter, much less choose to pursue, available opportunities. The other implication of this approach to graduate student recruitment is the unspoken assumption that only those undergraduates attending liberal arts institutions need what well-prepared early-career faculty can bring to the classroom.

Among those projects that included significant departmental involvement, the participating departments were also distinctive. Some already had an established reputation for good teaching and for supporting graduate students who wanted to improve their teaching abilities. Some reflected larger disciplinary commitments to pedagogy as part of the professional role of faculty in the discipline; this was particular true for departments of English or various foreign languages. Some had directors of graduate studies who were interested in expanding placement options for their graduate students, and saw excellent preparation for teaching as one way to do

that. And a very few had departmental leaders who saw a connection between the teaching of their graduate students and the learning of their undergraduates: "My motivation for [participating in the Teagle project] is how important it is for grad students to develop as good instructors, and also [because of] the impact on our undergraduate program. Being a TA is more than a form of economic support for the TA – it's also a way of connecting the grad program and undergrad program. We had some bad experiences with poor TAs, and [our] undergrads should have a high-quality experience with their TAs."

Self-selection poses a daunting challenge to scalability. Compared to the scope of Ph.D. education at each institution, the Teagle projects were relatively small to begin with. At one university, a thriving summer institute was available to 50 students per year out of the more than 1800 enrolled in as Ph.D. candidates; at another, an engaging seminar on teaching in the discipline was offered in one department out of nearly 60 with Ph.D. programs; at a third, faculty-graduate student teaching partnerships represented but a tiny fraction of courses offered. The teaching-focused programming in the professional association, both in terms of the number of the opportunities and the number of faculty and graduate students who elected to take advantage of them, served as a grace note in the symphony of the annual meeting.

If pilot project participation is determined largely by the participants' pre-existing interests and commitments, and if those individuals or departments that have those interests and commitments tend to be both small in number and exceptional, then it is difficult to expand beyond the coalition of the willing. One faculty interviewee, reflecting on the challenge of engaging new departments, put it this way: "If a department saw itself as already doing a pretty good job with teaching, they said 'Why do we need this?' And if a department didn't care much about teaching, they said the same thing."

Tenure, promotion, and compensation policies provide few incentives to invest in teaching. Compounding the challenges of organizational culture and self-selection is the structure of incentives embedded in existing tenure, promotion, and compensation policies. Research universities seldom significantly reward excellence in undergraduate teaching and advising; what was notable was that the Teagle projects brought the institutional reward structure into sharp relief for many participants. Although these policies were not addressed directly in Teagle projects, a number of faculty and administrators discussed the need to adjust existing policies to "incentivize" colleagues about the value and benefits of better teaching.

It was also notable that a number of the faculty participants mentioned ways in which their current professional status had "liberated" them to participate in their institution's Teagle initiative; they were able to stand outside this structure of incentives and rewards. Some were adjunct faculty who were not tenure-track, so they didn't worry about perishing if they didn't publish. Some had recently been

promoted, and consequently felt they had more flexibility in setting their professional priorities. One faculty member said he felt free to participate in his institution's Teagle initiative only after he'd received signals that he'd "cleared the research bar" in his progress toward tenure, which "gave [him] the freedom to focus on undergraduate education – that was the part that really needed attention." Finally, some were senior faculty who were already at the highest rank, and could exercise near-complete autonomy in deciding where to invest their professional energies. The structure of incentives in elite research universities continues to pose challenges to scaling up even highly-successful projects, as each of these Teagle-funded initiatives proved to be.

Lessons Learned and Key Recommendations

Adroit project leadership. Interviewees indicated that committed, collaborative, skillful, and savvy leadership was critical to program and project success. Project leaders stimulated support for project activities and for the values represented in the programming. They were sophisticated in the ways they thought about their projects, not only in terms of content, but also in terms of how they were conceptualized and how they were situated in the larger context of their institutions. Every project also involved new, or newly-energized, partnerships, requiring a high level of collaborative proficiency for each project leader. Every project also required some adjustment in project design after the first year of implementation, and the flexible and imaginative adaptation by the project leaders, in combination with the willingness of Teagle staff to accommodate proposed changes when accompanied by a persuasive rationale, were also key to project success.

Extensive and highly-effective support from outstanding graduate student assistants. Nearly all the project leaders used Teagle funding to hire exceptional graduate students to provide administrative support which, according to the project leads, was indispensable to project success. Moreover, the opportunity for deep engagement in implementing a significant professional development program led many of the graduate student project assistants to consider seriously a career shift to faculty development as their primary occupational goal. This was an unanticipated but very real benefit to the Teagle initiative.

Seed money. Teagle funds were perceived as critical to project success, supporting teaching-related activities that otherwise would not have been funded. Resources were attributed primarily to compensation, because the principal project cost was time - the time that leaders spent to develop and deliver programming, and the time that participants spent in completing it. As noted above, stipends and other funding support for graduate students were especially important, since they typically do not have access to funds beyond their TA salaries and benefits. With institutional budgets already fully committed elsewhere at the time these projects were being initiated, seed money to design, implement, and evaluate the program innovations represented in each project was critical to the ability to launch and continue project activities. It was much easier to make the case for reallocation of institutional dollars to support program sustainability once the merits of the program had been established with the benefit of external dollars.

Collaboration. For the six university projects, whatever the project's leadership model – Center-based, department/division-based, or hybrid – collaboration between project leadership and other university administrators and centers always contributed to project continuation. In particular, every project was characterized, though in different ways, by collaboration with one or more institutional centers for teaching and learning. In several projects, the center staff served principally as consultants, assisting project leadership with developing content and resources for program participants, and, in one case, also developing and administering a comprehensive evaluation plan. In three projects, though, centers were the principal locus or a co-partner of project activity.

While some department faculty valued center involvement more than others, all the project leads and most participants valued the expertise and contributions of center staff, particularly on general issues pertaining to teaching and learning. A number of faculty seemed pleasantly surprised by the value of what teaching and learning centers had to offer, particularly with respect to educating even seasoned faculty about the existence of a scholarly literature on teaching and learning. Graduate students repeatedly said that the support provided by their institution's teaching and learning center was vital, not only to their immediate preparation for effective teaching, but also to their future success as teachers; they expected to seek out similar resources in whatever institutional setting they found themselves once they were launched as faculty members. In other words, the "community of practice" that existed between project leadership and other teaching-focused entities in their universities created opportunities for and commitment to community of practice among participating graduate students.

CHARACTERICS OF SUCCESSFUL PARADIGMS INTRODUCED IN PROJECTS

Projects recalibrated the relationship between research and teaching, treating them as synergistic rather than divergent. It is a common assumption among faculty and graduate students alike that one can either devote time to teaching or devote time to research; a belief in an inevitable and intractable time tradeoff is why some graduate student interviewees expressed reluctance to even acknowledge to key faculty in their departments the fact that they were Teagle project participants. The conceptual underpinnings of the Teagle projects themselves, though, challenged this either/or thinking. Across all the projects and in several different ways, faculty and graduate students alike came to recognize potential synergies between the knowledge and proficiencies required for excellence in research, and the knowledge and proficiencies required for excellence in teaching. This message was conveyed in different ways by different projects, but it was a core element in all of them.

One project had adopted the "teaching-as-research" model of the national Center for the Integration of Teaching, Research, and Learning (CIRTL), which "involves the

deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and outcomes of students and teachers" (CIRTL Core Ideas: Teaching-as-Research). Another approached teaching from an inquiry-based "design thinking" perspective, in which an instructor identifies a problem, develops goals or strategies, assesses impact, and provides feedback. Still another characterized its program as "scholarly approaches to teaching," described by one participant from the natural sciences as "similar to what you do in a lab - use research to develop a hypothesis, try it out, and not just once - if you actually were in a lab, your professor would tell you to try it again for a year!" For its part, the AHA's project focused largely on the scholarship of teaching and learning both in its conference programming and in its consultations.

Project participants got the message. Our interviews were replete with comments from graduate students, faculty, and project leadership alike expressing growing appreciation for the synergy between research and teaching. One project leader noted, for example, that the dissemination of research is a form of teaching, even when the audience consists of other experts in the field, making the boundary between research and teaching more permeable than it might appear at first glance. At the same time, evidence-based teaching draws on a faculty member's expertise in systematic and sustained inquiry. A graduate student commented that Teagle project participation "prompted thinking about how to combine research expertise with teaching, using the skills of a researcher, not just the substantial knowledge, in a way that helps us improve [teaching]."

A faculty member indicated that the project "made me start thinking about my teaching more in the way I think about my research – the Teagle program really emphasizes a scholarly approach to teaching….[Some sessions] started with the most basic questions, like how to lead a good class discussion. Now I know what the data say about this – I know how important small group interaction is. We had another session on the function of the lecture, what it can communicate and what it can't communicate. I could share data on what students actually learn through lecture - and faculty are very persuaded by data." Insights like these suggested the beginnings of a shift in the assumption that both faculty and graduate students must choose between excellence in research and excellence in teaching.

Project activities engaged participants in a graduate-level equivalent of "high-impact practices." In his widely-disseminated work High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter, George Kuh (2008) argues that some kinds of educational experiences are more likely than others to promote deep engagement, and thereby foster deep learning, for undergraduates. What high-impact practices like learning communities, internships, collaborative projects, and capstone experiences offer to undergraduates, the Teagle projects for evidence-informed teaching preparation offered to graduate students.

The findings presented in Part III provide ample support for this conclusion. While some projects emphasized some of these elements more than others (particularly those that were university-based), as a group they reflected a compelling paradigm for deep, engaged learning among Ph.D. students. Project participants, especially graduate students, demonstrated strong commitment and high morale, and engaged consistently in project activities. The communities of practice that engaged participating graduate students, and to a lesser extent participating faculty, certainly constituted relationships characterized by extended interaction about substantive matters. Whether through the actual practice of teaching, the development of purposeful, high quality teaching products, or both, participants had numerous opportunities to integrate and apply knowledge; as one interviewee said, "We were actually putting the readings into practice in our own teaching."

Moreover, many project sessions were structured to give participants an opportunity to experience the learning principles and practices that the readings were introducing, up to and including the way a seminar room was set up to facilitate small group interaction. Opportunities for self-reflection were provided by assignments asking participants to develop or revise their statements of teaching philosophy. There were also provided, though perhaps more implicitly, numerous occasions and venues for dissemination of the participants' work. There is no better way to consolidate one's learning than to speak or write about what one actually learned, and the numerous presentations, web postings, and publications emerging from these projects did just that. Graduate students who have experienced deep, engaged learning through high-impact professional development opportunities are better positioned, and better equipped, to create analogous opportunities for the undergraduates they will eventually teach.

RECOMMENDATIONS FOR FUTURE PROGRAMMING AND FUNDING

In this white paper, one of our goals has been to identify challenges to research universities in enhancing the preparation of graduate students for evidence-informed teaching responsibilities. We observed these challenges – many of which have been documented in the literature on doctoral education – in each of the GSTAS projects. In examining the obstacles that surfaced with respect to each of the objectives of the GSTAS initiative, we found four principal themes emerging:

- The need to counter the mistaken assumption that faculty must choose between excellence in research and excellence in teaching

- The need to expand project participation beyond self-selected individuals or departments, despite indifferent or hostile department culture(s)

- The need for adequate resources of time and money

- The need to provide ongoing institutional home(s) for project activities

Even as we identified these challenges, we also documented many promising practices for addressing them. In reflecting on both, we are struck by some important parallels between the effort to initiate, expand, and sustain these graduate student preparation programs, and the effort to initiate, expand, and sustain student learning assessment in undergraduate instruction. Assessment has been dogged by the same concerns that the GSTAS projects have had to reckon with – constraints on time and funding, lack of an ongoing infrastructure of support, and individual and departmental perspectives that often ranged from indifference to hostility. But over time, institutions have been finding ways to circumvent these challenges. Serious institutional attention to assessment has had both a "bottom-up" and "top-down" quality to it; on the one hand, small but dedicated numbers of grassroots faculty began to see instructional value in the effort to assess student learning and use results for improvement, while, on the other hand, senior administrators felt some urgency to respond to the growing insistence of regional accreditors on meaningful and ongoing assessment efforts.

In the early years, faculty assessment leaders were advised to "start small and grow," and they did just that. It was not unusual for fledgling institutional assessment initiatives to be relatively small, grant-funded pilot projects, and for project leaders to recruit as broadly as possible across departments, divisions, and faculty ranks. Assessment projects have frequently involved collaboration – across departments, across units of the institution, and thanks in part to the Teagle Foundation, across institutions. Some professional associations have developed resources to support assessment work within their disciplines. As faculty have gained experience with assessment, they often have found their imaginations captured by the intellectual and practical puzzles involved with gathering evidence of student learning; assessment can be a surprisingly regenerative undertaking. Many successful assessment programs have framed assessment as a form of inquiry into student learning, relying on conceptualizations similar to those reflected in the Teagle GSTAS projects. And some institutions have introduced references to assessment – as evidence of commitment to undergraduate teaching, or as departmental or institutional service – into their criteria for tenure and promotion (Kuh et al., 2014).

The gradual institutionalization of assessment offers markers for the way forward in enhancing graduate student preparation for evidence-informed teaching. The institutional patterns and practices that helped assessment to take root were nascent in the GSTAS projects we evaluated. While these projects were small in the context of their institutions, they loomed large in their impact. There is merit, and there is promise, in supporting the projects that have been launched, and in planting new projects with a diversity of participants and in a diversity of institutions. Our funding recommendations below assume that, whatever the design of future projects, they

will be grounded in scholarship and will foreground the connection between excellence in research and excellence in teaching. The recommendations also assume that project design will reflect the principles of "high-impact practice" identified above.   Funding to support these recommendations could be provided by the Teagle Foundation, public agencies, research universities, associations, non-profit organizations, or other stakeholders.

CONTINUING SUPPORT FOR EXISTING PROJECTS

- *New funding to strengthen the institutionalization of the GSTAS initiative in current participating universities and the professional association.* All project participants are continuing programming originally funded by Teagle. However, most are expected to use in-house funds to continue some rather than all aspects of their programming. Additional funds, perhaps offered on a matching basis, could sustain valuable programming among these original GSTAS participants. These funds could also be used in support of direct assessment of learning outcomes for program participants as well as undergraduate or graduate students taught by participants, since much of this work has not been completed, is complicated, and very likely requires additional funding support.

- *New funding to build networking opportunities for current participating research universities and the professional association.* Building networks is expensive and time-consuming, but has potential payoffs in the creation or strengthening of faculty preparation programs in the research university community or in professional associations. Support for many options could be worthwhile, e.g., in support of annual international, national, or local conferences across departments/disciplines or colleges/institutions; the development of electronic systems and products; the creation of a larger set of consultants; or the preparation of new training programs. Moreover, some projects have developed methods and technology for virtual collaboration and dissemination that could support this direction.

- *Intentional diffusion.* Earlier we noted that in several projects, Teagle graduate students were playing key roles in other programs intended to support teaching assistants, often housed in teaching and learning centers, and that these students would frequently infuse ideas they had gleaned from their Teagle project participation into their leadership of TA orientations and other programming. The Teagle Foundation and others could fund intentional diffusion efforts of this kind, bringing evidence-informed teaching principles and practices featured in the GSTAS projects into existing programs for graduate student and faculty

development. Expansion of existing TA training programs could be an especially valuable effort, given their existing scope and support. Professional associations could be helpful partners in this effort, too.

EXPANSION TO OTHER UNIVERSITIES AND PROFESSIONAL ASSOCIATIONS

- *Funding for GSTAS projects in other elite research universities.* The GSTAS project evaluated in this report provided funding to six prestigious research universities, previously classified by the Carnegie Foundation as R1 institutions. A recent classification of research universities by the Carnegie Foundation identified 84 institutions in a new "Comprehensive Doctoral" category, e.g., those with humanities, social science, STEM, and professional doctoral programs, including a smaller set of large, well-funded, prestigious research institutions. Additional support for GSTAS projects in a wider circle of these institutions will help test the utility of the models created in the GSTAS initiative while promoting valuable change in doctoral education.

- *Funding for GSTAS projects in additional universities that offer doctoral education but that are not included in the Comprehensive Doctoral classification.* In the classification of "Doctoral/Professional" universities, the Carnegie Foundation identifies 121 universities that offer accredited doctoral programs, especially in professional fields, whose graduates often teach in public or private universities, liberal arts colleges, or community colleges rather than prestigious research universities. An initiative that creates or strengthens faculty preparation in these kinds of institutions may yield new models and/or ensure the enhanced professional development of graduates often likely to teach in multiple kinds of higher education institutions.

- *New funding to carry the GSTAS initiative to multiple professional associations.* Evidence documents the success of the GSTAS initiative in one professional association in the humanities field – history. Expanding support to other disciplines in the humanities, social sciences, sciences, or arts fields whose professional associations demonstrate interest and leadership in faculty professional development programs could provide opportunities to a large group of doctoral students and faculty with a relatively small investment of funds.

- *Funding for the Preparing Future Faculty Program (PFF).* PFF is a longstanding, effective doctoral training program sponsored by the Council of Graduate Schools (CGS). PFF graduate students in research universities learn evidence-informed teaching practices, complete supervised teaching internships in higher education institutions, and are

mentored in faculty roles by faculty in their home universities and their internship sites. Teagle and CGS have successfully partnered in developing, funding, and delivering alternate GSTAS activities. Extending that partnership to the PFF program could provide a synergy of leadership and resources in support of faculty preparation programs for doctoral students assuming positions in many types of higher education institutions.

Whatever the project design or funding support for future efforts to enhance the preparation of graduate students to teach the next generation of undergraduates, we are certain of this: These projects will strengthen the vision and leadership capacities of the faculty and administrators who carry them forward, inspire and engage the current and future faculty who participate in them, and lay the groundwork for improved student learning in the colleges and universities where these faculty members will teach.

References

Ambrose, S. A., Bridges, M. W., Dipieto, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching.* San Francisco, CA: Jossey-Bass.

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses.* Chicago, IL: University of Chicago Press.

Austin, A. (2002). Preparing the next generation of faculty: Graduate school as socialization in the academic career. *Journal of Higher Education 73* (1), 94-122.

Austin, A., & Wulff, D. H. (Eds.). (2004). *Paths to the professoriate: Strategies for enriching the preparation of future faculty.* San Francisco, CA: Jossey-Bass.

Bain, K. (2004). *What the best college teachers do.* Boston, MA: Harvard University Press.

Bettinger, E. P., Long, B. T., & Taylor, E. S. (2016). When inputs are outputs: The case of graduate student instructors. *Economics of Education Review.* Retrieved from http://dx.doi.org/10.1016/j.econedurev.2016.01.005.

Bogdan, R. C., & Biklen, S. K. (2003). *Qualitative research for education: An introduction to theories and methods* (4th ed.). New York, NY: Pearson Education Group.

Bransford, J., Brown, A. L., Cocking, R. R., & National Research Council. (1999). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Cassuto, L. (2015). *The graduate school mess: What caused it and how we can fix it.* Boston, MA: Harvard University Press.

Cole, J. R. (2010). *The great American university: Its rise to preeminence, its indisputable national role, why it must be protected.* New York, NY: Public Affairs.

Cole, J. R. (2011). The great American university. *Bulletin of the American Academy of Arts and Sciences 64 (3)*, 27-35.

Condon, W., Iverson, E. R., Manduca, K. A., Rutz, C., & Willett, G. (2016). *Faculty development and student learning: Assessing the connections.* Bloomington, IN: Indiana University Press.

Council of Graduate Schools and Educational Testing Service. (2010). *The path forward: The future of graduate education in the United States.* Report from the Commission on the Future of Graduate Education in the United States. Princeton, NJ: Educational Testing Service.

Diaz, V., Garrett, P. B., Kinley, E. R., Moore, J. F., Schwartz, C. M., & Kohrman, P. (2009). Faculty development for the 21st century. *EDUCAUSE Review 44* (3), 47-55.

Denecke, D. D., Kent, J., & Wiener, W. (2011). *Preparing future faculty to assess student learning.* Washington, DC: Council of Graduate Schools.

DeNeef, A. L. (2002). *The Preparing Future Faculty program: What difference does it make?* Washington, DC: Association of American Colleges and Universities.

Golde, C. M., & Dore, T. M. (2001). *At cross purposes: What the experiences of today's doctoral students reveal about doctoral education.* Retrieved from http://eric.ed.gov/?id=ED450628.

Graham, H. D., & Diamond, N. (2004). *The rise of American research universities: Elites and challengers in the postwar era.* Baltimore, MD: Johns Hopkins University Press.

Hutchings, P., Huber, M. T., and Ciccone, A. (2011). *The scholarship of teaching and learning reconsidered: Institutional integration and impact.* Stanford, CA: The Carnegie Foundation for the Advancement of Teaching.

Jaschik, S. (2016). The shrinking Ph.D. job market. *Inside Higher Ed.* Retrieved from https://insidehighered.com/news/.

Keeling, R. P., & Hersh, R. H. (2012). *We're losing our minds: Rethinking American higher education.* New York, NY: Palgrave MacMillan.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter.* Washington, DC: Association of American Colleges and Universities.

Kuh, G. D., Jankowski, N., Ikenberry, S. O., & Kinzie, J. (2014). *Knowing what students know and can do: The current state of student learning outcomes assessment in US colleges and universities.* Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment (NILOA). Retrieved from http://www.learningoutcomesassessment.org/documents/2013%20Survey%20Report%20Final%2010-20.pdf.

Lombardi, J. V., Phillips, E. D., Abby, C. W., & Craig, D. D. (2012). *Annual report: The top American research universities.* Tempe, AZ: The Center for Measuring University Performance.

Nyquist, J. D., & Woodford, B. J. (2000). *Re-envisioning the Ph.D.: What concerns do we have?* Seattle, WA: Center for Instructional Development and Research. Retrieved from https://depts.washington.edu/envision/resources/ConcernsBrief.pdf
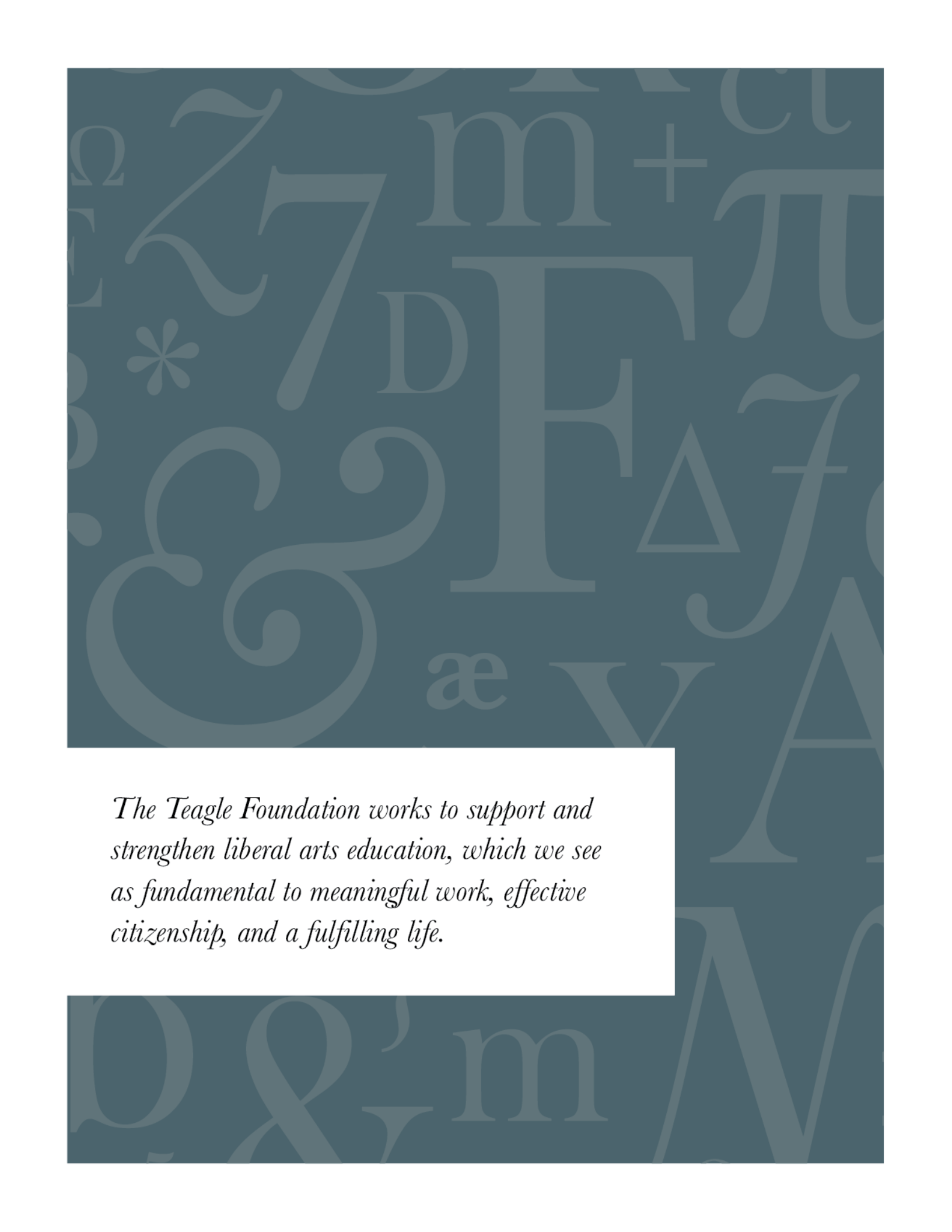
Nyquist, J. D., & Wulff, D. H. (2000). Recommendations from national studies on doctoral education. Seattle, WA: Center for Instructional Development and Research. Retrieved from https://depts.washington.edu/envision/project_resources/national_recommend.html.

Rhoten, D., & Powell, W. W. (2011). Public research universities: From land grant to federal grant to patent grant institutions. In D. Rhoten & C. Calhoun (Eds.), *Knowledge matters: The public mission of the research university* (pp. 319-345). New York, NY: Columbia University Press.

Shulman, L. S. (2004). *The wisdom of practice: Essays in teaching, learning, and learning to teach.* San Francisco, CA: Jossey-Bass, Inc.

Williams, K. M. (2014). *Doing research to improve teaching and learning.* New York, NY: Taylor and Francis.

Wineburg, S. (2001). *Historical thinking and other unnatural acts: Charting the future of teaching the past.* Philadelphia, PA: Temple University Press.

The Teagle Foundation works to support and strengthen liberal arts education, which we see as fundamental to meaningful work, effective citizenship, and a fulfilling life.