Preparing Future Faculty: A Framework for Program Design and Evaluation at the University Level

By Kate Winter, Julia Kent, and Ryan Bradshaw

COUNCIL OF GRADUATE SCHOOLS

Summary

Programs intended to prepare future faculty for careers in academe and beyond benefit from intentional alignment of their intended goals, activities, and metrics for assessing outcomes. Following a few basic steps can significantly advance these efforts. This framework provides information about the evidence needed to understand program impacts, as well as tips from prior Preparing Future Faculty (PFF) programs for collecting and analyzing data for program evaluation.

Suggested citation:

Winter, K., Kent, J., & Bradshaw, R. (2018). *Preparing Future Faculty: A Framework for Design and Evaluation at the University Level*. Washington, DC: Council of Graduate Schools.

Designing and Evaluating Effective Preparing Future Faculty (PFF) Programs: A Pressing Need

While many doctoral students aspire to faculty positions, many of those who do secure faculty appointments teach at a university very different from the one where they received their graduate training. A student who received a PhD at a Research-Intensive (R1) institution may find a position at a liberal arts college, community college, or master's focused institution. In fact, almost three-quarters of the approximately 20 million undergraduate students in the U.S. are enrolled at non-doctoral universities (Denecke, Michaels, & Stone, 2017; NSF, n.d.; Okahana & Kinoshita, 2018). To prepare current doctoral students to be successful in their careers and to ensure the quality of undergraduate education, universities must take steps to prepare future faculty for teaching roles (Gaff, Pruitt-Logan, Sims, & Denecke, 2003; Pruitt-Logan, Gaff, & Jentoft, 2002; Wulff & Austin, 2004). The Council of Graduate Schools has taken action to support this idea since 1993, developing Preparing Future Faculty (PFF) initiatives with a wide range of university partners and organizations.

To increase the likelihood that resources invested in such programs have a positive and lasting impact, it is important for universities to design thoughtful programs and to assess their success. To this end, this resource is intended to inform the development, implementation, and assessment of Preparing Future Faculty (PFF) and similar programs. It is designed to be useful to graduate deans and other university leaders, faculty who teach graduate students, staff who develop and deliver future faculty programs at universities (such as staff members in Centers for Teaching and Learning), and graduate students interested in the design and evaluation of PFF programs.

About PFF

The Preparing Future Faculty (PFF) initiative, to prepare graduate students for faculty careers, was launched in 1993 as a partnership between the Council of Graduate Schools (CGS) and the Association of American Colleges and Universities (AAC&U). The program grew out of a recognition that doctoral students aspiring to faculty careers needed preparation for all dimensions of a faculty member's role—teaching, research and service—and that current models for doctoral education focused on research to the exclusion of other responsibilities.

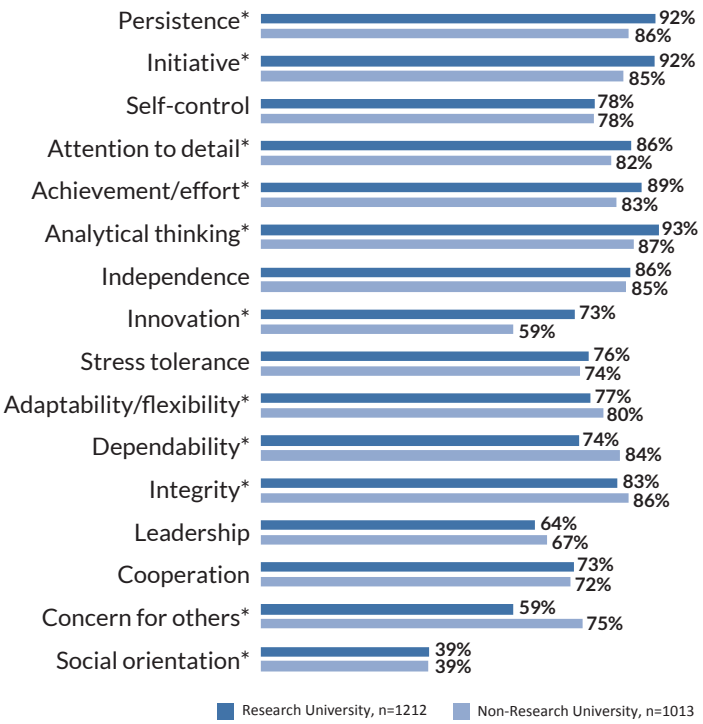
During a decade of grant activity, from 1993-2003, CGS worked with university partners to expose graduate students to a variety of different teaching contexts, to help them develop as researchers and scholars, and to offer them opportunities to pursue university service. PFF evolved into four distinct program phases, with support from the Pew Charitable Trusts, the National Science Foundation, and the Atlantic Philanthropies. During this time, PFF programs were implemented at more than 45 doctoral degree-granting institutions and nearly 300 partner institutions in the United States. As of 2010, 97% of respondents to a survey of PFF universities described their PFF or PFF-like programs as being "active" or "somewhat active" (CGS, 2011).

After the initial four phases of grant funding, the Scholarship of Teaching and Learning (SoTL) changed the landscape of higher education pedagogy: increasingly, future faculty were expected to use evidence-based teaching strategies and to assess the learning of their undergraduates. In 2010, CGS was awarded a grant from the Teagle Foundation to explore the preparation of future faculty to assess student learning. Between 2012-2015, with support from Teagle and the Alfred P. Sloan Foundation, CGS engaged seven awardee institutions and 19 affiliate institutions in a new initiative, Preparing Future Faculty to Assess Student Learning (PFF ASL). The goals of the project were to help graduate students enhance their strategies for teaching and learning and to integrate learning assessment into their teaching practices. Institutional partners adopted strategies such as creating communities of practice and retreats, developing university-wide conferences and meetings, delivering workshops and seminars, pursuing undergraduate course reforms, and developing online modules and resources. In 2018, CGS conducted an evaluation of the PFF ASL program, inviting grantees to reflect on lessons learned through a survey, interviews, and a one-day convening.

What Skills do Future Faculty Need to be Successful?

Recent data from a CGS survey administered to PhD alumni three, eight and fifteen years post-graduation found that PhDs working for colleges and universities across the broad spectrum of institutional types identified teaching as a primary work activity as compared to those working at Research Universities (Okahana & Kinoshita, 2018). Further, those reporting teaching as a primary responsibility placed greater emphasis on certain types of skills than those at Research Universities (Figure 1). Across the sixteen skills measured in the survey, there were variations in the perceived importance by institutional sector. Faculty at postsecondary sectors outside research universities placed higher importance on the traits of dependability, concern for others, and social orientation (Figure 1). This finding suggests that doctoral students aspiring to faculty careers may benefit from greater formal teaching preparation as well as exposure to teaching in different types of institutions.

Figure 1: Percent responding "Extremely Important" or "Very Important" to survey item "How important are each of the following attributes/skills in successfully performing your work in this job?"



* Statistically significant difference, p<0.05

Reprinted from: *Closing Gaps in our Knowledge of PhD Career Pathways: How Well Did a Humanities PhD Prepare Them?*, by H. Okahana & T. Kinoshita, 2018.

The skills that doctoral students develop in PFF programs may also transfer to other careers if their plans change down the road. Increasingly, the ability to teach (effectively convey ideas to diverse audiences) and to assess the outcomes of one's teaching (analyze feedback and modify one's conveyance strategies accordingly) are seen as a useful foundation for many careers. For example, all of the 19 "attributes employers seek on a candidate's resume" detailed by the National Association of Colleges and Employers (NACE, 2016) can arguably be developed and/or demonstrated through participation in PFF and similar programs (Top 10 attributes provided in Figure 2).

Figure 2: Attribute (Top 10 in order of demand)

1. Leadership
2. Ability to work in a team
3. Communication skills (written)
4. Problem-solving skills
5. Communication skills (verbal)
6. Strong work ethic
7. Initiative
8. Analytical/quantitative skills
9. Flexibility/adaptability
10. Technical skills

Modified from: The National Association of Colleges and Employers *Job Outlook* 2016 (NACE, 2016)

Principles Guiding Design and Evaluation

Gleaned from our program evaluation and the convening, the following principles are designed to help graduate deans, PFF program directors, faculty and graduate students design and assess programs effectively. While programs differ in their goals and structures, the eight principles outlined here are relevant to a range of program types and to graduate students in all broad fields of study.

1. **Model evidence-based teaching and learning in graduate student teaching and professional development.** Preparing Future Faculty programs provide excellent opportunities to model evidence-based teaching and learning for graduate students. PFF programs should not only help graduate students understand how the Scholarship of Teaching and Learning (SoTL) improves undergraduate learning; *they should use SoTL principles in the design and assessment of their own curricula*. Graduate students should, for example, understand the intended learning objectives of their PFF program; complete activities and assignments that tie back to these learning outcomes; and receive timely feedback that allows them to make improvements to their teaching practice. Our Assessment Framework provides guidance on incorporating this "backwards design" principle into the program development and assessment plan.
2. **Create cohorts of graduate student learners.** A number of student participants in PFF ASL programs spoke vividly about the value of learning in communities of fellow graduate students. These communities served not only as support networks; they also appeared to socialize students into the professoriate. Beyond what they learned as future teachers, students spoke of finding personal meaning in helping others learn and of feeling a sense of belonging to a profession. A cohort model may therefore provide an important balance to the sense of isolation that many advanced doctoral students experience.
3. **Make diversity a priority when developing and assessing programs.** There is growing evidence that diverse environments improve the learning of all students. The principle of Learning through Diversity is a cornerstone of the Center for Integration of Research, Teaching and Learning (CIRTL) program (CIRTL, n.d.). When designing a PFF program, it is valuable to include diverse participants among students, staff and faculty. In our framework for assessment, we encourage universities to track their success in recruiting a diverse cohort of graduate students and faculty to participate in PFF programs. A lack of success in this area may point to a need to evaluate whether PFF and similar opportunities are easily accessed by students who have families, paid work commitments, or other obligations.
4. **Give students a leadership role in developing and evaluating PFF programs.** PFF students and alumni who were offered administrative roles reported rich learning experiences. These experiences gave them a deeper understanding of the purposes of PFF, and helped them to apply principles of learner-centered design to their own graduate training. These experiences also appeared to give students leadership and administrative experience that enhanced their confidence as they began their faculty appointments.
5. **Pay attention to timing and sequencing of PFF opportunities.** Graduate students benefit from careful timing of PFF experiences. One PFF ASL participant noted, for example, that she wished she had received some preparation before she started teaching instead of after she had already begun. Currently, there is insufficient research on the optimal timing of graduate student preparation. However, universities can avoid overwhelming students by paying close attention to the timing, duration and nature of preparation, and should consider multi-phased assessment.
6. **Seek multiple levels of institutional commitment to improve the likelihood of program sustainability.** Programs are unlikely to be sustained over time without commitments from university leadership, faculty, graduate deans, and a variety of campus partners. Because many PFF programs have been launched with external funding, they are at risk of being scaled down or eliminated when grants conclude. Our evaluation framework therefore provides metrics of institutional impact that can help program leaders and graduate deans demonstrate broader impacts of programs on universities and their students and in doing so, make a stronger case for ongoing institutional investments.
7. **Consider engaging in partnerships with other universities.** A number of program directors and deans who participated in the PFF ASL workshop indicated that belonging to a group of institutions pursuing similar goals enabled them to raise the profile of their own campus's efforts and to leverage one another's strengths. We

recommend that programs track external partnerships with other universities—whether these are two- and four-year institutions that provide teaching opportunities for students, or other doctoral institutions that provide a professional development network for graduate schools— so that these can be considered among a program's broader impacts.

8. **Pay close attention to disciplinary differences when developing and assessing programs.** A "one-size-fits-all approach" may not be appropriate to PFF programs that include both science, technology, engineering, and mathematics (STEM) and humanities students. These may require somewhat different learning objectives, activities, and assessment tools.

Framework Tools

The following information and tools reflect core principles of evaluation design, and are informed by evaluations of the CGS Preparing Future Faculty to Assess Student Learning (PFF ASL) projects that were funded by the Alfred P. Sloan and Teagle Foundations (2012-2015). The evaluation included phone interviews in Spring 2018 with a subset of PFF ASL awardees, survey data in Summer 2018 from invitees of a Washington, DC convening, and presentations and discussions from the convening. The October 18, 2018 convening, hosted by CGS, brought together a distinguished group of scholars, deans, and program leaders to discuss promising practices, the kinds of evidence needed to understand program impacts, and challenges to implementing programs and to collecting and analyzing data for program evaluation. This framework applies to faculty preparation across diverse disciplines, including the arts, humanities, and social sciences, as well as STEM.

This approach calls for the refinement of the end goal first, then the establishment of the evidence that will demonstrate whether the goal is met, and finally the development of the content, delivery, and activities that are predicted to result in that evidence.

This document is intended to assist PFF leaders in modeling what their programs provide to their participants regarding curriculum development and monitoring and evaluating their students' learning outcomes. As such, the sections include recommendations for developing programs through backwards design and monitoring program implementation, outputs, outcomes, and sustainability. As with classroom outcomes, it is vital that PFF programs assess whether their participants are having the intended experiences and demonstrating the desired outcomes in knowledge and skills acquisition and attitudinal and behavioral change. Inviting PFF participants to see what happens 'behind the scenes' of program assessment is recommended, as participants who were exposed to this modeling expressed high levels of appreciation and growth from the experiences.

The Scholarship of Teaching and Learning (SOTL) and the field of program development both promote so-called "backwards design" in developing curriculum or programmatic interventions (McTighe & Wiggins, 2012). This approach calls for the refinement of the end goal first, then the establishment of the evidence that will demonstrate whether the goal is met, and finally the development of the content, delivery, and activities that are predicted to result in that evidence. In program development and evaluation, these connections are frequently visually represented through a program logic model (W. K. Kellogg Foundation, 2004). As with SoTL, all program and assessment elements must be aligned to support learning and reliable learning outcomes assessment (Wulff, 2005).

Impact Categories of PFF Programs at the University Level

Five broad impact categories were adapted from the NSF *Framework for Evaluating Impacts of Informal Science Education Projects* (Friedman, 2008), as they accurately represent the categories of impacts most frequently sought by PFF projects. Three additional categories were added. Impacts are the intended or unintended outcomes of the activities and deliverables of a project and they can be at the level of the direct participant (future faculty, in this case), other stakeholders such as participating faculty members, or the undergraduate students taking courses from participants. Other impact levels include the department, college, or university in which the program is taking place. For each of these categories, we provide examples of evidence of impacts and strategies for collecting and analyzing this evidence. Table 1 provides additional detail about types and sources of evidence.

Table 1.

Impact Category	Basic Definition: Measurable demonstration (evidence) of…	Data Collection and Analysis Approaches
Awareness, knowledge, or understanding of future faculty	Baseline scores of and change in awareness, knowledge, understanding of a concept, phenomena, theory, or application of student learning outcomes assessment and connections to pedagogy	Self-report surveys or assessment instruments administered before and/or after participation in programming, analyzed as a descriptive snapshot or compared from pre- to post-scores; Observation of levels demonstrated through teaching practices, whether in the classroom, developed course materials, or assessment of student learning, analyzed as a descriptive snapshot or compared from pre- to post-scores; Focus groups or interviews with participants and/or stakeholders about their perceptions, collected and analyzed at the mid-point or end to ascertain reflections that will inform future iterations of the program
Engagement or interest of future faculty	Baseline scores of and change in engagement/ interest in a concept, phenomena, theory, or application of student learning outcomes assessment and connections to pedagogy	
Attitude and confidence of future faculty	Baselines scores of, change in, or exercise of attitude toward or confidence with a concept, phenomena, theory, or application of student learning outcomes assessment and connections to pedagogy. Although similar to awareness/ interest/ engagement, attitudes refer to changes in relatively stable, less malleable constructs such as empathy for diverse learning styles, appreciation for the role of culturally responsive pedagogy, attitudes toward approaches to teaching and assessing student learning outcomes, and leadership in promoting learning outcomes assessment.	
Behavior of future faculty	Baselines scores of, change in, or exercise of behavior related to assessing student learning outcomes and connections to pedagogy	
Progress toward degree and career placement of future faculty	Baselines scores of, or change in, doctoral student progress toward degree completion and placement in careers post completion	Institutional data demonstrating GPA, credits earned each term/year, retention in program, and graduation, analyzed per term or annually; Post-graduation surveys, national clearinghouse, or career services records
Learning outcomes of undergraduate students	Baselines scores of, or change in, undergraduate student course GPA, progress toward degree completion, graduation, and career placement	
Institutional	Baselines scores of, or change in, approaches to assessing undergraduate learning outcomes, collaborations across different programs and campus units related to preparing future faculty to assess student learning, and external partnerships (with community colleges, etc., where participants engage in teaching)	Departmental or college-level records about assessment practices, collaborations, and more

Adapted from the NSF *Framework for Evaluating Impacts of Informal Science Education Projects* (Friedman, 2008)

Types and Sources of Evidence

Evidence comes from observable and self-reported data sources and includes both qualitative and quantitative data. Qualitative observed data might be narrative descriptions of observations of classroom behaviors, while quantitative observed data might be the frequencies of occurrence of various instructional strategies observed. Observed data could also come from analyzing course syllabi, materials for activities, or assessment instruments, from tracking participation at events, or from reviewing event documentation and materials, etc. Self-report data comes directly from participants via surveys, interviews, or focus groups. Data might come from quantitative responses to scaled closed-ended items or qualitative responses to open-ended items about perceptions, attitudes, awareness/knowledge, intended behaviors, and confidence engaging in different activities or utilizing various skills. Combining data from multiple sources, and including both qualitative and quantitative data, typically yields the most reliable evidence of program impact.

It is important to note that the learning outcomes of the future faculty participants should be conceived of and analyzed separately from the learning outcomes of the undergraduate students they are being trained to assess.

Assessment of starting points (baselines), end points, and calculation of changes from pre- to post-participation are most frequently determined through scores on survey instruments, tests of awareness, knowledge, or perceived skills and confidence, observations of skill use or behaviors, or interviews and focus groups with participants. Various instruments have been created and tested by prior PFF, CIRTL, and other faculty development efforts. Analysis of evidence may be descriptive in nature, intended to combine available qualitative and quantitative data sources to describe program activities and outcomes in a correlational manner, or experimental. Experimental designs seek to test the efficacy of an intervention by comparing outcomes of participants to those from a control group that does not participate in the intervention using randomized controlled trials or quasi-experimental designs.

It is important to note that the learning outcomes of the future faculty participants should be conceived of and analyzed separately from the learning outcomes of the undergraduate students they are being trained to assess. In other words, while PFF programs are intentionally working with future faculty to prepare them to assess undergraduate student learning, goals should be set for the future faculty participants' learning outcomes. Programs must then assess whether the future faculty learning outcomes are being met or whether the program needs modification.

Examples of PFF Activities

Based on the intended impacts, PFF programs develop and implement activities and resources for their future faculty participants. These range from online or face-to-face learning modules that cover the fundamentals of learning outcomes assessment, student learning theories, culturally responsive pedagogy, and measurement approaches to working with participants to develop rubrics to use in their classrooms. Because the ability to know whether and how students are learning is context-specific, each discipline may approach the preparation of teaching and assessment materials differently (Van Driel & Berry, 2012). Programs frequently develop activities to assist future faculty in increasing their knowledge, skills, and confidence with aspects of the teaching role through mastery experiences, vicarious experiences, and verbal persuasion (Bandura, 1977). Mastery experiences are direct experiences in the target environment engaging in the activities or behaviors to be "mastered." Vicarious experiences involve shadowing or observing role models or learning about the experiences of others. Verbal persuasion refers to the influence role models, mentors, and influential peers have on one's self-perception of ability. Many programs incorporate mentoring from faculty members, who work with their assigned future faculty mentee on aspects of undergraduate student learning outcomes assessment. Campuses may need to offer faculty development opportunities to ensure that faculty are prepared to contribute in this capacity. These efforts also help increase the capacity of existing faculty members to assess and act on undergraduate student learning outcomes. Involving future faculty in leadership roles to help coordinating aspects of the PFF program is an excellent approach to creating valuable learning opportunities for participants. Additionally, creating communities of future faculty, who are developing skills and confidence in teaching and learning theories and practice together, builds a sense of belonging to the profession and

Involving future faculty in leadership roles to help coordinating aspects of the PFF program is an excellent approach to creating valuable learning opportunities for participants.

supports a sense that assessing student learning outcomes is an integral part of teaching—not an "add on" or a check-box to satisfy external quality assessments. More information and examples can be found in Denecke et al. (2017).

Implementation and Monitoring

Once backward design has identified the intended program outcomes, the kinds of evidence needed to assess their attainment, and the appropriate activities and content delivery to attain them, it is crucial that program leadership monitors implementation. Not only should programs be creating and delivering content and opportunities for skills development as proposed (i.e., activities and outputs), but they should also be monitoring and documenting these efforts so that program outcomes may be understood in context. Without information about the implementation of a program, it is impossible to determine whether poor impacts are a result of the program not working (theory failure) or of the program not being implemented fully (Stame, 2010). Similarly, if a program does result in the desired impacts, without data about implementation, it is challenging to replicate successful programs. This level of monitoring focuses on the general products and deliverables of the program, all within the context of the college or university in which they are taking place. Specifically, this monitoring tracks and counts events, participants at events, characteristics of participants, materials or modules developed, etc., and informs the development of interventions as needed to ensure that the program is implemented as intended with regards to content, quality, timing, and duration. These project "outputs" differ from the "outcomes" discussed above in that they are the deliverables and direct products of the project activities that are intended to result in the project outcomes (Table 2).

Table 2.

Output Category	Basic Definition: Measurable demonstration (evidence) of…	Data Collection and Analysis Approaches
Materials developed	Number, type, and quality of: training materials developed to promote and assist undergraduate learning outcomes assessment; Assessment instruments developed for assessing undergraduate learning outcomes; Resources developed to support faculty in working with graduate students on assessment of undergraduate student learning outcomes	Descriptive counts and statistics by category from program records
Doctoral participation and engagement	Number and type of doctoral student participants, including demographic diversity and their field representation; Attendance and participation records; Perceptions of program value	Descriptive counts and statistics by category from program records; Self-report perceptions from participants collected through short surveys administered after events or near the end of participation
Faculty participation and engagement	Numbers and type of faculty engaged (either as leaders, participants, or allies of program), including their demographic diversity and their field representation; Attendance and participation records; Perceptions of program value	

Table 2. continued

Output Category	Basic Definition: Measurable demonstration (evidence) of...	Data Collection and Analysis Approaches
Undergraduate student participation and outcomes	Number and type of undergraduate students in courses taught by future faculty participants, including demographic diversity and their field representation; Courses taken and scores; Persistence in STEM majors	Descriptive counts and statistics from institutional (registrar) records; data provided by faculty on course performance measures; Data on progress and retention of undergraduates in majors (departmental data); etc.
Campus visibility and reputation	Number, type, and quality of outreach and marketing activities and resources; Awareness/ endorsements by leadership (deans, etc.)	Descriptive counts and statistics from program and institutional records such as website, website analytics, social media presence, social media metrics, etc.)
Sustainability	Investments of institutional funds and/or staff support to sustain the program beyond external funding	Descriptive counts and statistics from program and institutional records; Integration of PFF initiatives in strategic planning

Evaluation

Evaluation involves various purposes and goals, but is always grounded in the use of evidence to understand whether activities are having (or had) the desired impact, and if not, what changes are recommended. The types of evaluation include: "front-end evaluation," which provides baselines and/ or assessment of needs before a project begins; "formative evaluation," which determines the preliminary impacts of an effort and guides mid-course corrections to program activities; "remedial evaluation," which is a hybrid of formative and summative evaluation toward the end of a project intended to support targeted efforts to meet program goals before it is too late; and "summative evaluation," which is the reflective overarching assessment of what the project did and achieved once it is finished. Types of data collected and approaches to data analysis are shared across these types, with the biggest differences being the timing of data collection and analysis, and the purpose of the evaluation findings. The key purposes of program evaluation are to understand whether it had the desired effects and whether it was cost effective.

Evaluative research in higher education utilizes social science and education research methodologies, which are summarized in the *Common Guidelines to Education Research and Development* (Institute of Education Sciences; U.S. Department of Education & National Science Foundation, 2013). The *Common Guidelines* set forth appropriate expectations for standards of evidence and methods, based on the type of research. For early stage and foundational research type evaluation projects, mixed-methods approaches that lean qualitative but combine qualitative and quantitative data from participants are common and appropriate. These projects typically seek to establish basic evidence that a new approach to training or development results in the desired outcomes, without determining whether it does so more effectively than any other approaches (i.e., 'proof of concept'). For design and development research evaluation projects, mixed-methods approaches are also common and appropriate. These studies typically fall on the cusp between 'proof of concept' and testing relative impact and efficacy. Impact and efficacy studies that are ready to test the impacts of interventions as compared to some other approach or "business as usual" lean quantitative and frequently follow the evidence standards specified by the What Works Clearinghouse (WWC, 2017). These standards require experimental designs with specific intended outcomes, populations, and co-variates.

While many federally-funded grant programs now require external evaluators to ensure independent assessment of project activities, outputs, and outcomes, many campuses have in-house talent capable of conducting robust evaluative research. These experts may be faculty in the College of Education or in College of Arts and Sciences departments such as Psychology or Sociology, and administrative staff in the Office of Institutional Research. Many national resources

also exist to support program evaluation, or faculty or staff in a Center for Teaching and Learning.

Sustainability

As programs are developed and implemented, it is important to consider how effective activities or resources might be sustained. For example, what kind of outcomes and impacts—and the evidence of them—will be compelling to campus leaders responsible for budget allocations? Monitoring implementation details, including staffing and resource requirements and the number of participants served and other stakeholders positively impacted (e.g., faculty and/or undergraduate students), in addition to the evidence of impacts, will support the case for sustaining proven practices. Collecting these data as the program progresses will facilitate these efforts when external funding nears its end. Likewise, developing programs that can be built and tested using external funding and then integrated into existing structures increases the likelihood of activities continuing past the initial seed funding. For some graduate schools, this may mean developing new activities into doctoral programs as integral elements, whereas for other institutions this may mean creating new certificate programs or other stand-alone models offered within departments. Regardless of the structure, the program value should be apparent to future faculty, ensuring doctoral student interest in the resource. We recommend that the dean take an active role in brokering partnerships across the institution to ensure faculty and doctoral programs are invested in maintaining PFF resources.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Center for the Integration of Research, Teaching and Learning. (n.d.). *Core Ideas: Learning-through-Diversity.* Retrieved November 29, 2018 from https://www.cirtl.net/about/core_ideas/learning_through_diversity

Council of Graduate Schools. (2011). *Preparing Future Faculty to Assess Student Learning.* Washington, DC: Author.

Denecke, D., Michaels, J., & Stone, K. (2017). *Strategies to Prepare Future Faculty to Assess Student Learning Strategies to Prepare.* Washington, DC: Council of Graduate Schools.

Friedman, A. J. (Editor). (2008). *Framework for Evaluating Impacts of Informal Science Education Projects.* Arlington, VA: National Science Foundation.

Gaff, J. G., Pruitt-Logan, A. S., Sims, L. B., & Denecke, D. D. (2003). *Preparing future faculty in the humanities and social sciences: a guide for change.* Washington, DC: Council of Graduate Schools and the Association of American Colleges and Universities.

Institute of Education Sciences; U.S. Department of Education, & National Science Foundation. (2013). *Common Guidelines for Education Research and Development.*

McTighe, J., & Wiggins, G. (2012). Understanding By Design® Framework. *Alexandria, VA: ASCD.* https://doi.org/10.1207/s15326985ep2403

National Association of Colleges and Employers (NACE). (2016). *Job Outlook 2016: The Attributes Employers Want to See on New College Graduates' Resumes.* Retrieved November 29, 2018, from http://www.naceweb.org/career-development/trends-and-predictions/job-outlook-2016-attributes-employers-want-to-see-on-new-college-graduates-resumes/

National Science Foundation. (n.d.). *National Survey of College Graduates.* Retrieved November 29, 2018, from https://www.nsf.gov/statistics/srvygrads/

Okahana, H., & Kinoshita, T. (2018). *Closing Gaps in our Knowledge of PhD Career Pathways: How Well Did a Humanities PhD Prepare Them?.* Washington, DC: Council of Graduate Schools.

Pruitt-Logan, A., Gaff, J. G., Jentoft, J. E. (2002). *Preparing future faculty in the sciences and mathematics: A guide for change.* Washington, DC: Council of Graduate Schools and the Association of American Colleges and Universities.

Stame, N. (2010). What doesn't work? Three failures, many answers. *Evaluation, 16*(4), 371–387. https://doi.org/10.1177/1356389010381914

Van Driel, J. H., & Berry, A. (2012). Teacher professional development focusing on pedagogical content knowledge. *Educational Researcher, 41*(1), 26–28. https://doi.org/10.3102/0013189X11431010

W. K. Kellogg Foundation. (2004). Developing a Theory-of-Change Logic Model for your Program. In *Logic Model Development Guide: Using Logic Models to Bring Together Planning, Evaluation, and Action*, (pp. 27–34). Battle Creek, MI: Author.

What Works Clearinghouse (WWC). (2017). What Works Clearinghouse™ Standards Handbook (Version 4.0). Retrieved from https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_standards_handbook_v4.pdf

Wulff, D. H. (2005). *Aligning for learning: Strategies for teaching effectiveness.* Boston: Anker Publishing Company, Inc.

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

About CGS

The Council of Graduate Schools (CGS) is an organization of approximately 500 institutions of higher education in the United States and Canada engaged in graduate education, research, and the preparation of candidates for advanced degrees. Our mission is to improve and advance graduate education through advocacy in the federal policy arena, research, and the development and dissemination of best practices.

www.cgsnet.org