Partners in Creating Student-Centered Learning: Case Study of the Derek Bok Center for Teaching and Learning at Harvard University

Tamara J. Brenner, Adam G. Beaver, Marlon Kuzmick, Pamela Pollock, and Robert A. Lue
Derek Bok Center for Teaching and Learning, Harvard University, United States

Written for The Routledge International Handbook of Student-Centered Learning and Teaching in Higher Education

Abstract

Centers for Teaching and Learning (CTLs) are well-positioned to support instructors in implementing evidence-based teaching strategies such as student-centered learning. CTLs play a valuable role in helping instructors mediate between the disciplinary imperatives that they bring to their teaching, knowledge about effective practices that promote student learning, and students' hopes and expectations for their education. This chapter provides a case study of one teaching and learning center, the Derek Bok Center for Teaching and Learning at Harvard University, describing the impediments they have identified to instructors using student-centered learning, and how the Center helps faculty and graduate student instructors infuse student-centered learning into the curriculum. The Center collaborates with faculty to design their courses and create meaningful learning experiences for their students. Instructors benefit from the perspective of the Center's undergraduate fellows, who provide feedback on newly designed assignments as well as classroom culture. Additionally, the Center helps instructors reflect on and deepen their knowledge of teaching. Collectively, the Center's offerings enable instructors to develop a range of teaching practices that prioritize student engagement, motivation, and learning.

Introduction

Above and beyond mastering the content of different disciplines, university graduates need to know how to learn, to be ready to adapt to the challenges that await them, and to be able to retrain themselves in emerging fields of knowledge across the duration of their careers and their lives. In other words, universities should be sites in which students not only learn a body of content, but also develop a set of skills and an awareness of how best to develop their own

mastery in any field. If university graduates have learned how to learn, they will be able to apply their knowledge and skills to new situations, develop new insights, and connect disparate ideas. They will not be discouraged by how little they know, but motivated to seek new knowledge and learn from and collaborate with others. What types of teaching and learning might happen at universities in order to facilitate these outcomes over the long term?

Student-centered learning prepares students to be independent learners who are ready to tackle life's challenges. At its core, student-centered learning prioritizes practices that emphasize students' acquisition of transferable skills and knowledge; elements of student choice and autonomy; collaboration between students; active learning; and a focus on metacognition and the learning process (Weimer 2013, pp. 59-195; O'Neill & McMahon 2005). Student-centered learning is often contrasted with lecture-based approaches that emphasize content delivery; instead of primarily lecturing, the instructor serves as a facilitator of learning. Rather than focusing on the *topics* that an instructor will cover, student-centered learning is motivated by what the students will do and learn, both inside and outside of the classroom. When faculty adopt more student-centered approaches, students benefit in a variety of ways. Students exhibit deeper learning, as well as greater mastery of the material; they are more motivated; and they become more independent, more self-regulated learners (Weimer 2013, pp. 28-55; Freeman *et al*. 2014; Pintrich 2003).

Centers for Teaching and Learning (CTLs) serve as an excellent resource to support instructors in implementing evidence-based teaching strategies such as student-centered learning. CTLs, which are found on many university campuses, aim to foster excellence in teaching among faculty, graduate students, and other instructors. The goals of CTLs typically include creating a culture of teaching excellence, supporting faculty needs related to teaching, and advancing initiatives in teaching and learning (Austin & Sorcinelli 2013; Beach *et al*. 2016, pp. 28-30). CTLs commonly support instructors through workshops, individual consultations, intensive seminars or institutes, and publications and resources (Austin & Sorcinelli 2013; Beach *et al*. 2016, pp. 75-83; Lee 2010, pp 26-29). In a 2005 survey, educational developers at a majority of CTLs identified teaching for student-centered learning as their top priority (Sorcinelli *et al*. 2006, pp. 72-73). Additional key activities of CTLs include new faculty development, integration of

technology into teaching, active learning, assessment of student learning outcomes, and course and curricular reform (Beach *et al*. 2016, p. 53). Each of these areas provides opportunities to support faculty in developing student-centered learning.

The first CTLs in the United States were created in the 1960s and 1970s to share expertise about effective teaching with current and future faculty, and to provide ongoing support for faculty to grow and reflect as teachers (Schumann *et al*. 2013; Ouellett 2010). Since the 1990's, the number of colleges and universities with a CTL has grown substantially. A 2018 estimate identified 1184 CTLs in the United States, which represents approximately 30% of degree granting institutions (Wright 2019; National Center for Education Statistics 2019). Notably, the number varies by institution type; a 2010 study found that three quarters of doctoral and research institutions had a CTL (Kuhlenschmidt 2011). Internationally, the prevalence of CTLs varies widely; in some countries, CTLs are rare, while in others, nearly every university has a faculty development program and participation is mandatory (Fink 2013). Many CTLs draw their consultants and directors from the ranks of their universities' professional academic staff, while others are run primarily by faculty members, often with dual appointments (Lee 2010, pp. 23-25). In either case, CTLs and their programming tend to reflect the expertise and interests of individuals who possess both experience teaching in higher education and knowledge of effective pedagogy.

Here, we describe a case study of the Derek Bok Center for Teaching and Learning at Harvard University, discussing the ways in which one CTL enables and supports student-centered learning through a variety of programs and approaches. The Bok Center was founded in 1975 primarily to support faculty and graduate students by videotaping their teaching and pairing them with a trained consultant with whom they could review the video, reflect on their teaching, and gain an appreciation for the student point of view. The key insight behind these video consultations—that instructors are best able to grow and develop as teachers when they have the space and the tools with which to reflect on how students experience their teaching—is still at the core of all of our work with university teachers at every stage, from new graduate student teachers to more senior faculty. Over the years the programs and services we provide to support that mission have grown and evolved. The Bok Center offers a robust slate of professional development opportunities for graduate students and faculty, ranging from pre-term teaching

conferences focused on fundamentals for new teachers to high-end, bespoke support for course and assignment design in partnership with faculty. In addition, the Bok Center's Learning Lab serves an incubator that supports innovative approaches to teaching and learning: new courses, new methods for presenting material to students, and new media for students to use as they develop and deliver their ideas. Through these many activities, we encourage instructors to adopt student-centered practices, ranging from backward design, to active learning, to assignments that promote student autonomy and real-world application. Here we frame the activities of the Bok Center in response to the main challenges to student-centered classrooms that we have identified in our work.

The challenge of creating student-centered classrooms

While there is growing evidence regarding the efficacy of student-centered learning, it is hardly the dominant mode of teaching in higher education (Stains *et al.* 2018). We have identified four impediments that prevent many instructors from creating truly student-centered classrooms: 1) instructors' lack of knowledge (and lack of incentive to acquire knowledge) about student-centered learning, 2) the complicated question of instructors' authority and role in the classroom, 3) instructors' tendency to underestimate the importance of disciplinary transparency, and 4) a lack of robust and timely student input into instructional design and classroom practice.

Lack of knowledge

Across the U.S., pedagogical training for graduate students and faculty is uneven, and consequently, many new university faculty members do not feel adequately prepared to teach (Tanner & Allen 2006; Lattuca *et al*. 2014). In spite of the voluminous research pointing to the importance of teaching in the formation of academic careers, PhD programs by and large focus heavily on the formation of disciplinary research skills with little or no concomitant focus on pedagogical training. While an increasing number of graduate programs offer some type of training for graduate student instructors, the content varies widely, from a focus on policies and logistics, to classroom management, to strategies for delivering course-specific material (Schussler *et al*. 2015; Tanner & Allen 2006). Nor do things improve once these graduate students become faculty, at which point it may be even less common for them to visit each others' classrooms or to discuss pedagogy (i.e. as opposed to curriculum) in departmental or

faculty meetings. Consequently, in the absence of formal training or professional development, instructors rely on their own experiences–as students, teachers, and researchers–to inform their teaching practices (Oleson & Hora 2013).

Instructor-centered classrooms remain the norm less because instructors prefer them than because they have not considered, or do not know where to access support for, alternative approaches that would be more student-centered. Many faculty and graduate students experienced instructor-centered teaching when they were undergraduates, and may have a narrow view of what constitutes effective teaching—a state of affairs that seems likely to endure so long as PhD students continue to receive only minimal training with regard to teaching as they enter, and climb, the ranks of the faculty.

Even when instructors are aware of student-centered learning, inertia is a powerful force against change. Instructors may be hesitant to alter their teaching strategies, given the required time and effort and a fear that changes will not be well received by students. There is also the perception that student-centered learning takes more time than a traditional lecture, and that instructors have less control over their classes, both of which would tend to decrease the amount of class time devoted to "content coverage"—something which many faculty tend to think is already in short supply. Overcoming these barriers, and the extra effort required to infuse student-centered learning, starts with awareness and then requires support to overcome the initial hurdles student-centered learning may present.

Instructors' Authority and Role

Student-centered learning requires a change in the balance of power in a classroom, an idea that concerns many instructors (Weimer 2013, p. 88). In a lecture-based class, the instructor maintains a feeling of control—over the timing, the content, the learning objectives. When students collaborate on activities during class, rather than taking notes on a lecture, unexpected challenges are likely to arise and derail an instructor's plans. If students are involved in constructing their own knowledge, or are invited to participate in making decisions about the course, faculty may worry that their contribution to the class will be marginalized or rendered invisible.

This concern may seem unwarranted to anyone who appreciates the extent to which effective facilitation requires precisely the kind of mastery on which faculty pride themselves. But it is important to remember the strength of what might be called the "narrative impulse" among professional academics. Above all else, faculty are extraordinarily talented at collecting data, organizing it into interpretive schemes, and constructing explanatory narratives which put it into context and explain its significance. It is how they win grant proposals; it is how they produce peer-reviewed publications; it is how they earned their faculty positions. It can be easy to overlook how universally faculty experience this storytelling drive because the precise contours of how they create interpretive order out of empirical chaos varies so greatly from one division of the university to another. In the humanities and many of the social sciences, faculty typically work in the inductive mode. That is, they begin their stories with "found" data—the documents already in archives, the literature already published by authors, and the votes already cast or purchases already made by their fellow citizens—and attempt to arrange them into a plausible order, moving gradually from the more specific to the more general as they surface patterns and principles. In the more experimental social sciences and in the STEM fields, by contrast, faculty narrate their research primarily in the deductive mode: having articulated a debatable axiom, they generate new data with which to test their generalizations against specific evidence. Yet both trajectories—inductive and deductive—fundamentally entail the narrativization of the process of discovery. (This is true even—or perhaps especially—in the sciences, in which the messy record of trial-and-error experiments is quite consciously smoothed over into a narrative of intentionality and success by the time the paper is published (Jahren 2016, p. 20).)

This remarkable ability on the part of faculty to reduce the external world into mental order, so essential to their research (and to developing the initial concept of a course), poses a significant challenge in the domain of teaching. In fact, it may be the one truly legitimate objection to the message, frequently touted by research-intensive institutions, that faculty research enhances rather than detracts from the quality of their educational programs (Prince *et al*. 2007). The irresistible urge to arrange, organize, and curate the experience of the (research) audience can be exactly the impulse that leads faculty to arrange, organize, and curate student agency *out* of their courses. Insofar as the scholarly publication constitutes a significant model for faculty as they

assemble their teaching materials, is natural for faculty to "stack the deck" of their syllabi to tilt students towards the habits of mind, interpretive schemes, and arguments which they have decided are the most important. It would be just as irresponsible, faculty often assume, to expose students to unanalyzed data or mistaken interpretations as to leave the data unanalyzed or to cite dubious research in one's own publication. Yet from the perspective of a teacher—particularly of one who wants to help students learn to interpret results and to separate more compelling arguments from less compelling arguments *for themselves*—it is curious to think that students can develop their abilities to process and sort uncurated information without having experienced the "behind the scenes" aspects of the scholarly process, or having been asked to read "bad" as well as "good" texts.

Lack of disciplinary transparency

An additional challenge is that the instructors with whom we partner often suffer from the so-called "curse of knowledge" with regard to the disciplinary conventions active in their courses (Brown *et al*. 2014, p. 115). It is at least a consequence, if not in fact the intended purpose, of graduate education that graduate student and faculty instructors enter the profession having naturalized the norms of their scholarly fields to the extent that they may no longer even recognize their disciplinary specificity. It is easy, particularly as a professor, to take for granted which lines of inquiry are considered valuable, or which kinds of evidence are considered valid—let alone what peer review does (or does not) guarantee, what the purpose of different kinds of scholarly writing might be, or how to read and interact with the various genres of material that might be on the syllabus. In our experience, it is striking how rarely such norms and conventions are articulated, at least in the written components of a course (i.e. syllabi and assignment prompts). While the existence of explicit learning objectives is not necessarily a guarantee of disciplinary transparency, it is at least a reasonable proxy—and a recent study of one social science department at Harvard found that a mere 25% of faculty's syllabi articulated any learning objectives.

The apparent reticence of faculty to name and explain the disciplinary conventions active within their courses poses a significant challenge to student autonomy. Undergraduates—particularly those who are in their first few years of the curriculum—not only are not familiar with most of

these conventions, but in fact may not even realize that such conventions exist. This communication gap serves to disempower students, in much the same way as one might be disempowered upon being told to join a card game without being told the rules governing play: even those students who do their best to engage actively in the game, hunting for patterns in the dataset comprised of their fellow players' behavior, are left in the dark as to whether the patterns they have observed are accurate reflections of the rules or mere coincidence. (Is it safe to assume that play *always* commences to the left of the dealer? Or have I merely seen too few games to have encountered a scenario in which it would begin to the right?) This kind of uncertainty about disciplinary norms breeds passivity: it is hard, or even frightening, to activate one's agency without a sure source of data.

Lack of robust and timely student input

Faculty typically design their courses without direct student input; in doing so, they make numerous assumptions about their students' identities and prior knowledge, about how their students might encounter or react to various course components, and about what types of assignments will be most meaningful to them. There are at least two reasons for this suboptimal state of affairs. The first is that faculty and students arguably enjoy less sustained contact with each other now that at almost any time in the history of the modern university. Though many campuses retain the outward trappings of the fully residential academic community, in which faculty and students might bond outside of the classroom as well as within it, in fact a significant percentage of faculty and students have withdrawn from each others' lives beyond the classroom in noticeable ways—whether because of the rise of commuter campuses, or the increasing pressures on faculty to focus on research and publication to the exclusion of their pastoral contributions to their institutions (Kim & Rury 2011; O'Meara & Braskamp 2005; Fitzpatrick 2011). The second reason for students' relative absence from the process of course development has to do with the timing of our existing feedback mechanisms. Once a course is in flight, faculty often do not receive feedback from students about their experiences until end-of-semester course evaluations. While this summative feedback can be helpful in informing revisions for the next iteration of the course, it arrives too late for the instructor to make adjustments for current students. To develop truly student-centered courses, faculty would benefit from including student perspectives both during the instructional design process and throughout the course.

Programs and Solutions

At the Derek Bok Center for Teaching and Learning, we employ four primary strategies to address these challenges to student-centered learning: 1) collaborating with faculty to design their courses using backward design, 2) incorporating undergraduates into core aspects of our work with instructors, 3) offering training to instructors about evidence-based teaching, and 4) creating opportunities for instructors to become reflective practitioners.

Partners in course design

Consultations—which provide instructors an opportunity to meet one-on-one with a staff member for advice on any aspect of their teaching, from questions about inclusive teaching to reflections about course evaluations—have long been a key activity at CTLs (Lee 2010, pp. 26–27). In the past few years, we have expanded the focus of consultations beyond their original focus on classroom practice to include course and assignment design; as a result, the majority of our collaborations with faculty now begin well in advance of the term. Working with faculty to craft the activities that students do inside and outside of the classroom affords us an opportunity to directly help faculty implement more student-centered practices.

Backward Design and Transparency

In working with faculty to overcome several of the above challenges—including disciplinary opacity and over-narrativization—we have found that the most effective tool is a modified process of backward design (Wiggins & McTighe 1998, pp. 7–19). We tend not to speak with our faculty clients as directly about "learning outcomes" or objectives as we might among our staff, recognizing that many faculty are wary of such terminology. By beginning our work with carefully framed discussions of instructors' goals—which might take the form of reflecting back at them the goals which we are able to intuit from their existing practices, or of asking "what would you want a student to say five years from now?"—we are able to move relatively quickly to the design of their capstone assignment, which is where we find we are able to get faculty to articulate their desired outcomes most effectively. After all, the kind of project which a student ought to be able to submit on the final day of a course is, by definition, almost always a good proxy for the instructor's objectives.

As we work with faculty to discern the content and modality of their ideal capstone assignment, we are able to use the details of the design process as a means to talk about questions about student agency and the ways in which students can be supported in their learning. It is here that we make some of the most progress on the problem of disciplinary opacity, simply by building transparency into assignment prompts, in-class lectures and activities, and course materials. It is often the case when faculty arrive at our Center concerned about their students' failure to master their (unarticulated) disciplinary norms that *their* default solution has been to provide students with more *examples* of compelling student work rather than a clearer *rubric* illuminating the *principles* by which students may demonstrate their mastery. This is, to continue the analogy from above, equivalent to teaching (or failing to teach) a novice how to play a card game simply by dealing more hands. By working with faculty to reduce the number of sample topics found in their assignment prompts while increasing the explicit guidance about how to ask a meaningful question or how to locate pertinent evidence, we are using the relatively uncontroversial process of "copy editing" in order to increase the transparency of their teaching. In the process, we frequently find ourselves involved in fascinating conversations with faculty, as they begin to recover the ability to see their own disciplines in the way that their students might. More than once, after turning them inwards and inviting them to reflect on their own values and assumptions, one of our faculty partners has admitted that they probably wouldn't know how to complete their own assignments.

Once we have developed a capstone assignment prompt with a faculty collaborator, it becomes easier to map the preliminary skills and content-acquisition which the capstone will require throughout the semester, designing authentic and well-aligned formative activities and assignments. It is at this point that we are able to work most successfully with faculty on relaxing their inclination to curate, narrate, and circumscribe the range of possible interpretations to which they expose their students. One of the most obvious ways we do this is by encouraging faculty to step back from their assumptions about how class time "ought" to be used. Rather than think in terms of lecture periods and discussion sections, for example, we ask them to think about open expanses of time which might be filled with a diverse array of instructional methods more active than a traditional lecture (Berrett 2019). Yet even in courses that may take a more

conventional lecture format, we aim to find ways to grant students a role in determining what happens during class time. Incorporating assignment modalities that allow for student "crowdsourcing," such as discussion forum-like exercises in which each student uploads a "found" example or illustration of a course concept (e.g. "submit a film clip demonstrating irony") can give students more agency. Faculty might then use one or more student submissions as the basis for the next day's lecture, interacting with and commenting on what a student has brought to the table rather than on examples pre-selected by the faculty member. We may also recommend more explicitly compilatory technologies, like the KnightLab's timeline.js tool (https://timeline.knightlab.com), in which students collectively assemble a repository of dates/facts/texts/examples of course concepts. Again, the faculty member may choose to comment on excerpts from this student knowledge base and include follow-on assignments in which *students* must select a subset of their peers' work and reflect on the interpretations that one might extract from it.

The general principle behind all such crowdsourcing exercises is simple, but often overlooked: even ostensibly "novice" students almost always know more about the *existence* of a concept or phenomenon than their instructors suspect that they do. What they tend *not* to know prior to enrolling in a course are the specialized vocabularies and frameworks which would allow them to make arguments about what those concepts or phenomena *mean*, why they are *important*, and whether or not they are *useful*. Here is where faculty, and the disciplines they represent, have the greatest potential to add value to their students' capacity to understand the world around them.

Creative assignments

In recent years, our faculty have begun to look beyond traditional assignments as a means of motivating student learning. In lieu of an essay or a final exam, students might instead undertake a creative assignment, perhaps involving new skills and new types of media, in which students apply key ideas from the course. The Bok Center's Learning Lab partners with faculty to develop these new types of assignments, which are designed to encourage student agency.

As students are often not prepared to work in media such as the podcast, the short film, the infographic, or many of the other forms our faculty are exploring in their courses, the Learning Lab provides support, very much analogous to the support our Writing Center offers students

undertaking academic writing assignments. We lead workshops where students learn the skills necessary for new types of assignments, and offer hackathons where students can complete course projects under the guidance of Bok staff and fellows. The Learning Lab gives us the ability to support not merely the design of an assignment prompt, but to be much more deeply involved in the entire arc of a student's experience of learning in a class, as the students work with our CTL to undertake and complete course assignments.

We work with a wide range of courses and assignments—from courses in which students interview members of the local community about issues of social justice, to courses in which students improve their ability to communicate about science with a broad audience. Crucially, we work with faculty to design new ways for students to metacognitively reflect on their experiences, not merely helping them gain new knowledge about the world, but helping them *know that they know,* and to know *why* their knowledge matters. Whether through podcasts or oral presentations or reflective writing or art projects, our faculty clients are presenting their students with opportunities to attain not only cognitive learning objectives, but social, emotional, and ethical learning objectives as well.

Undergraduate Perspectives

A crucial premise of student-centered learning and inclusive teaching is that teachers understand who their learners are. Therefore, in recent years we have begun working directly with undergraduates at our CTL. A large number of undergraduate fellows now collaborate with us, lending their perspectives to improve the design of learning experiences and environments, and gaining valuable professional development at the same time.

The Learning Lab Undergraduate Fellows, or LLUFs, comprise the single largest group in the Bok Center community, with 40-50 students working with us each year. The LLUFs test and co-design assignments and activities ranging from 3D modeling to oral presentations, from data visualization to photography. Then, once the courses we support are in flight, the LLUFs are optimally prepared to help the students of these courses as peer tutors and leaders of workshops and hackathons.

The LLUFs play a number of important roles in the design process. In part, they function as usability testers. As we prototype a new video module for a flipped classroom, the students

watch the video and give us feedback; as we design a podcasting assignment, they try it out so we can learn whether it is technically feasible and pedagogically sound. The students' feedback is invaluable, especially because we are supporting faculty who are trying new types of assignments and curricular experiences. The LLUFs help us understand how long a particular step in an assignment or group activity might take, and they provide insight about what students find exciting and what they find boring. As the LLUFs test newly designed assignments, they uncover logistical and technical flaws that we had overlooked.

The role of undergraduates as usability testers at a CTL is fairly unique, and the involvement of students has produced new and important effects. For instance, the usual cycle of improvement in the teaching and learning space is yearly: an instructor teaches a course, receives student evaluations, perhaps meets with consultants at the CTL, and then tries again the following year. With the LLUFs, we are able to iterate weekly or even daily, and faculty are able to engage in at least one low-stakes iteration with "test students" before they deploy new activities on students in a real class, for real grades.

What has become clear as we work alongside the students is that far from being "testers" alone, they are colleagues and collaborators. Frequently they move from giving feedback on the feasibility of an assignment to offering thoughtful and insightful ideas about how we might redesign it.

The Learning Lab gives our student fellows a leadership role in crafting their own learning experiences alongside our Center's staff and faculty clients. If students are interested in new media, they are able to assist us in helping faculty to explore these new media; if they are interested in assignments that connect course material to their everyday lives, they are able to brainstorm ways of accomplishing this with faculty.

In our work with the LLUFs, it has become clear that our student body is invested in developing new modes of teaching and learning not merely for the sake of the new or because digital media are in vogue. Rather, they are invested in classrooms and courses and assignments that are more inclusive of the entire student population. They seek ways of knowing and modes of skill that will enable them not merely to describe the world around them with precision, but to change it.

Beyond the work of the LLUFs, the undergraduate perspective is also built in to our programming for graduate student teaching fellows. A select group of undergraduate fellows receives special training and mentoring so that they may serve as Undergraduate Pedagogy Fellows (UPFs), working to develop seminars, workshops, and materials designed to help Harvard's instructors create more inclusive classrooms and activities for their students. For example, the UPFs have created a workshop that uses both narratives and numbers to introduce instructors to the multiplicity of Harvard undergraduate identities. Using examples of "microaggressions" and "hot moments" in the classroom, UPFs help instructors understand how power and privilege operate in the classroom, and how new instructors can both deal with such moments when they arise and design learning environments that help to prevent such moments from occurring in the first place.

An additional cohort of undergraduates, the Undergraduate Culture and Communication Consultants, work directly with international graduate students on their English language, teaching, and cross-cultural skills. The undergraduates advise graduate students on classroom dynamics and the expectations that undergraduates bring to the classroom. In all of these programs, the undergraduates serve as informants about the student perspective, and are part of our mission to promote dialogue between groups and build intergenerational community around teaching and learning.

Training

A number of studies have shown a correlation between professional development for faculty and graduate students and increased use of student-centered pedagogies (Lattuca *et al.* 2014; Manduca *et al*. 2017; Derting *et al*. 2016). Our training of graduate students provides an example of how a CTL can provide sustained guidance about effective teaching practices. We partner with many departments to support disciplinary pedagogy courses for students early in graduate school, and we lead workshops and seminars at the Bok Center for graduate students at all stages of their careers. Seminars are organized around major categories designed to support graduate students at every stage: foundations, methods and classroom practice, equity and inclusion, communication and language, and professional development. These seminars help graduate students be more student centered and audience-focused in their teaching, whether they are learning about the foundations of teaching in their disciplines or taking a public speaking

seminar on how to engage their audience. Our seminars and other trainings are also tailored to specific disciplinary contexts; we have programs specifically for STEM students, for example, and also provide course-based or department-based training. All of our trainings themselves model student-centered learning, in that they are tailored specifically to the needs of the group, and they explicitly cover topics like active learning, metacognition, and student motivation.

Opportunities to become a reflective practitioner

Lastly, we believe that becoming a reflective practitioner enables instructors to overcome the obstacles to student-centered learning that were described above. We hope to instill in faculty and graduate students alike the ability to reflect on their teaching, assess what is working and what is not, and make iterative improvements. We support this goal through both individual consultations and communities of practice.

Core teaching consultant methods, employed at teaching centers everywhere, include video consultations and class observations (Lee 2010, pp. 26–27; Krupnick 1994). Video is a key way that we help graduate students become student-centered teachers across all of our programs, whether they are recorded doing a practice teaching or presentation in a seminar offered by the Bok Center, or in their actual class. Video has been used throughout the Bok Center's history (as it started as a video lab) to help teachers think about how students are experiencing their classrooms. Most departmental pedagogy courses, which were developed in collaboration between the Bok Center and departments, require graduate student Teaching Fellows (TFs) to have their class observed or videotaped. Especially with video consultation, when the class is videotaped and the TF sits down to watch it with a consultant, the main focus is on being able to see how the undergraduates are experiencing the class. Video is a particularly effective way for TFs to put themselves in the shoes of their students and reflect on what is really happening in the classroom. It can be difficult to imagine how students are experiencing a class in the moment, but watching the video later, with the help of a consultant, enables teachers to step back and see their classrooms and their students in a different way. Additionally, these consultations help instructors begin to imagine other pedagogical choices that might lead to greater student engagement and investment.

Another way that instructors become reflective practitioners is through participating in communities of practice. Our programming provides opportunities for instructors to engage in communities, whether in a six-week seminar, or in a year-long program, or a journal club. One example of a sustained community of practice that we convene and support is the Pedagogy Fellows, an interdisciplinary community of graduate students who are invested in teaching and are trained in effective pedagogy in order to serve as peer teaching consultants. The program serves two purposes: 1) to provide all graduate students with resources that support them in their roles as teachers, and 2) to provide the cohort of fellows with a professional development opportunity to participate in a community of practice. The group consists of 24 fellows based in departments, whose main responsibilities include developing and supporting departmental pedagogy courses and serving as peer teaching consultants; and 6–8 fellows based at the Bok Center, who serve as teaching consultants at large and develop projects to support graduate student teachers across disciplines, including leading seminars or workshops and creating resources in their own areas of expertise. The fellows meet regularly with Bok Center mentors as a large group to learn about a particular pedagogical topic, and in smaller disciplinary groups to discuss their work and build the cohort. By serving as teaching consultants and observing their peers teaching, either in person or on video, Pedagogy Fellows are constantly reflecting on how a range of teaching practices affect learning. Furthermore, as part of the Bok Center training, Pedagogy Fellows reflect on how disciplinary norms inform teaching practices in their own departments, heightening awareness of their own pedagogical choices.

Our STEM journal club creates community among faculty and graduate students in the sciences. The journal club explores recent STEM education research, examining studies related to many facets of student-centered learning in science classrooms, ranging from teaching metacognition to enabling student choice in laboratory activities. This community of practice allows instructors to reflect on ways to connect evidence-based strategies with their own teaching.

Conclusion

While implementing student-centered practices can be challenging for many reasons, as described above, CTLs are excellent partners in this endeavor. The types of programs and activities typically offered by CTLs—such as consultations, workshops, and communities of practice—help instructors reflect on their own teaching and learn about effective strategies to

enable student learning. At the Bok Center, our constellation of programming enables instructors to better understand and implement student-centered learning. Our partnerships with faculty have led to courses with greater disciplinary transparency and to assignments that invite greater student engagement and autonomy. Moreover, our partnerships with students allow undergraduates to share their perspectives with faculty and graduate student instructors, helping to create more inclusive classrooms, with relevant, meaningful course activities.

Our CTL has institutional support for a relatively large staff and a studio dedicated to multimodal course assignments, as well as funds to pay student fellows. Nonetheless, many of the principles and activities described here can be employed, or adapted, by CTLs of any scale. Consulting with faculty about backward design and offering seminars to graduate students do not require extensive resources. While leading workshops on podcasting or virtual reality might be out of the scope of many CTLs, we also design and support a wide variety of activities that require minimal technology—from oral communication to drawing assignments. In the absence of funds to pay student fellows, one could imagine the possibility of students receiving course credit for participating in professional development activities at a CTL.

As is fairly evident, the Bok Center has evolved from its simple classroom observation roots. We are now positioned in the university akin to an interdisciplinary research center; a place that both supports foundational skills development while also enabling faculty and students to explore and discover new approaches. This has allowed us to engage faculty on an entirely voluntary basis and without the need for mandatory programming. When faculty are offered a supportive context to improve and explore new teaching approaches, they avail themselves of this opportunity the same way they do when it is offered to support their research. Of course, we have benefitted from the increased emphasis on teaching that the last decade of university presidents and deans have communicated to the faculty at nearly every opportunity. It is this slow sea change in the way that teaching is integrated with other scholarly activities that enables the Bok Center to build on a growing interest in CTL engagement among faculty.

Our ultimate goal is ambitious: to support an educational system that creates independent learners who are ready to tackle life's challenges. Transformation is slow. We often encourage

instructors to make gradual changes to their courses—for example, to implement one new student-centered activity at a time, rather than entirely revamping their course. While we reach more and more instructors each year, many faculty at our institution have not yet interacted with our CTL. We will continue to identify strategies to reach a broader range of instructors, and we will continue to advocate for broader implementation of student-centered practices. Nonetheless, we feel encouraged by the growing community of faculty, graduate students, and undergraduates that we are supporting.

References

Austin, A.E. & Sorcinelli, M.D. (2013) The Future of Faculty Development: Where Are We Going? *New Directions for Teaching and Learning* 2013(133), pp.85–97.

Beach, A.L., Sorcinelli, M.D., Austin, A.E. & Rivard, J.K. (2016) *Faculty development in the age of evidence: Current practices, future imperatives*. Stylus Publishing, LLC, Sterling, VA.

Berrett, D. (2019) How One Instructor Stopped Himself From Lecturing Too Much. *The Chronicle of Higher Education*, Retrieved from https://www.chronicle.com/article/How-One-Instructor-Stopped/245495 on 17 January 2019.

Brown, P.C., Roediger III, H.L. & McDaniel, M.A. (2014) *Make it stick*. Harvard University Press, Cambridge.

Derting, T. L., Ebert-May, D., Henkel, T. P., Maher, J. M., Arnold, B., & Passmore, H. A. (2016) Assessing faculty professional development in STEM higher education: Sustainability of outcomes. *Science Advances* 2(3), e1501422.

Fink, L.D. (2013) The Current Status of Faculty Development Internationally. *International Journal for the Scholarship of Teaching and Learning* 7(2), 1–11.

Fitzpatrick, K. (2011) Swimming in unchartered waters: Understanding and developing the faculty role in residential education. *The Journal of College and University Student Housing* 38(1), 70–79.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences* 111(23), 8410-8415.

Jahren, H. (2016) *Lab Girl.* Alfred A. Knopf, New York.

Kim, D., & Rury, J.L. (2011) The Rise of the Commuter Student: Changing Patterns of College Attendance for Students Living at Home in the United States, 1960–1980. *Teachers College Record* 113(5), 1031–1066.

Krupnick, C.G. (1994) The uses of videotape replay. *Teaching and the case method*. (Barnes, L., Christensen, C., & Hansen, A., eds) Harvard Business School Press, Boston, pp.296-303.

Kuhlenschmidt, S. (2011) Distribution and Penetration of Teaching-Learning Development Units in Higher Education. *To Improve the Academy* 29(1), pp.274–287.

Lattuca, L. R., Bergom, I., & Knight, D. B. (2014). Professional Development, Departmental Contexts, and Use of Instructional Strategies. *Journal of Engineering Education* 103(4), 549–572. http://doi.org/10.1002/jee.20055

Lee, V.S. (2010) Program Types and Prototypes. In *A Guide to Faculty Development: Practical Advice, Examples, and Resources*. (Gillespie, K.J., Robertson, D.L., & Associates, eds) Jossey-Bass, San Francisco CA, pp. 21–33.

Manduca, C. A., Iverson, E. R., Luxenberg, M., Macdonald, R. H., McConnell, D. A., Mogk, D. W., & Tewksbury, B. J. (2017). Improving undergraduate STEM education: The efficacy of discipline-based professional development. *Science Advances* 3(2), e1600193.

National Center for Education Statistics (2019) *Characteristics of Degree-Granting Postsecondary Institutions*. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/coe/indicator_csa.asp on 15 March, 2019.

Oleson, A., & Hora, M. T. (2013). Teaching the way they were taught? Revisiting the sources of teaching knowledge and the role of prior experience in shaping faculty teaching practices. *Higher Education* 68(1), 29–45.

O'Meara, K., & Braskamp, L. (2005) Aligning faculty reward systems and development to promote faculty and student growth. *NASPA Journal* 42(2), 223–240.

O'Neill, G. & McMahon, T. (2005) Student-centred learning: What does it mean for students and lecturers? In *Emerging Issues in the Practice of University Learning and Teaching.* (G. O'Neill, G., Moore, S. & McMullin, B. eds) AISHE, Dublin, pp. 27-36.

Ouellett, M.L. (2010) Overview of Faculty Development: History and Choices. In *A Guide to Faculty Development: Practical Advice, Examples, and Resources*. (Gillespie, K.J., Robertson, D.L., & Associates, eds) Jossey-Bass, San Francisco CA, pp. 3-20.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology* 95(4), 667.

Prince, M.J., Felder, R.M., Brent, R. (2007) Does Faculty Research Improve Undergraduate Teaching? An Analysis of Existing and Potential Synergies. *Journal of Engineering Education* 96(4), 283–294.

Schumann, D.W., Peters, J. & Olsen, T. (2013) Cocreating Value in Teaching and Learning Centers. *New Directions for Teaching and Learning* 2013(133), 21–32.

Schussler, E. E., Read, Q., Marbach-Ad, G., Miller, K., & Ferzli, M. (2015). Preparing Biology Graduate Teaching Assistants for Their Roles as Instructors: An Assessment of Institutional Approaches. *CBE-Life Sciences Education* 14(3), ar31–ar31.

Sorcinelli, M.D., Austin, A.E., Eddy, P.L. & Beach, A.L. (2006) *Creating the future of faculty development: Learning from the past, understanding the present*. Jossey-Bass, Bolton, MA.

Stains, M., Harshman, J., Barker, M.K., Chasteen, S.V., Cole, R., DeChenne-Peters, S.E., Eagan, M.K., Esson, J.M., Knight, J.K., Laski, F.A. & Levis-Fitzgerald, M. (2018) Anatomy of STEM teaching in North American universities. *Science 359*(6383), 1468-1470.

Tanner, K., & Allen, D. (2006). Approaches to biology teaching and learning: On integrating pedagogical training into the graduate experiences of future science faculty. *CBE—Life Sciences Education* 5(1), 1-6.

Weimer, M. (2013) *Learner-centered teaching: Five key changes to practice*. Jossey-Bass, San Francisco.

Wright, M. (2019) How Many Centers for Teaching and Learning Are There? *POD Network News* pp.1–2. Retrieved from https://podnetwork.org/content/uploads/Wright_PNN_NoCTLs_Jan2019_update2pdf.pdf on 1 June 2019.

Wiggins, G., & McTighe, J. (1998). *Understanding by Design.* Merrill Prentice Hall, Upper Saddle River, NJ.