



# Excellence in Mentoring Undergraduate Research

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Council on Undergraduate Research

# CHAPTER 5

## Supporting Faculty Development for Mentoring in Undergraduate Research, Scholarship, and Creative Work

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"Our [faculty] mentorship of undergraduate research is 'favored' and 'well received' by deans, but not well funded."

"We [faculty members] are coming up with ways to fund student engagement in undergraduate research, but are not getting funding or credit ourselves."

"I think it's [mentoring undergraduate researchers] a good idea and definitely worth doing, but all parties [faculty and students] need to be better compensated and recognized."

The statements above represent comments from faculty members across institutions and disciplines in a three-year study focused on understanding the faculty experience in mentoring undergraduate research (UR). This multi-institutional research was supported through Elon University's Center for Engaged Learning Excellence in Mentoring Undergraduate Research Seminar. Our efforts centered

on the faculty perspective as a means of providing better support and recognition for faculty mentorship in developing, implementing, and assessing UR. As part of our collaboration, we sought to provide a more comprehensive portrait of faculty mentors in undergraduate research (Lunsford et al. 2016)—one that would identify the factors that enabled and inhibited faculty members' engagement in mentoring UR (Baker et al. 2015); and explore the sources of institutional support for faculty mentors of UR (e.g., stipends, travel funding), specifically how the labor of mentoring undergraduate researchers, scholars, and artists was represented in tenure and promotion policies (Baker et al. 2016). We gained an even greater appreciation for the importance of discipline through this research, and thus engaged in two targeted studies to focus on the understudied context of the arts (or creative works) in UR (Ihas 2017). Taken together, these studies revealed that faculty members, mostly through organizational citizenship behaviors (Eagan et al. 2011), support the high-impact practice of UR as mentors with little to no supports or recognition for their efforts. This is an alarming issue facing institutions of higher education that needs to be addressed given the prominence of UR experiences across institution types and, increasingly, disciplines (Eagan et al. 2013; Linn et al. 2015).

In this chapter, we summarize findings from our collective research efforts, offering insights from complementary studies. First, we take an institutional perspective with the goal of realigning resources and rewards to support faculty mentors. Second, we take a disciplinary perspective by first acknowledging the challenge of characterizing UR in the arts, followed by a discussion of how to better support the faculty members who serve as mentors. Third, we focus on the individual faculty mentor perspective to highlight how institutional leaders might better support faculty participation in UR. Each section concludes with corresponding recommendations to improve practice across these levels.

## **More than Good Citizenship: Realigning Resources and Rewards to Support Faculty Mentors**

To increase participation in UR, colleges and universities have directed tangible resources and rewards to undergraduate researchers, scholars, and artists. Examples of these resources include providing students with small grants to cover project costs, summer stipends and housing, travel funds, honorary designations on diplomas and transcripts, and awards for outstanding presentations or performances. Few institutions direct concomitant resources and rewards to faculty mentors whose intellectual and affective labor is critical to the success of undergraduate students. Our content analysis of the institutional websites of Council on Undergraduate Research (CUR) members revealed that among institutions with Centralized Offices of Undergraduate Research, 75 percent supported students with stipends, grants to cover research expenses, and travel funds. Just over 25

percent of those institutions provided faculty with material resources such as stipends, travel grants, or research funds to support their work as mentors (Linn et al. 2016). To be sure, websites may not reveal all the resources available to students and faculty, but as the virtual face of an institution, they function as a critical element of institutions' values that reaches both external and internal constituents (Meyer 2008).

To build sustainable, comprehensive UR programs, institutions might consider resources and rewards to engage mentors beyond those faculty members committed to mentoring as part of "good organizational citizenship behavior" (Eagan et al. 2013). As Swift (2012, 24) argued, "Undergraduate research can be treated either as a kind of professional hobby or as a pedagogical practice to be added onto faculty members' existing responsibilities."

Fortunately, a growing body of research exploring the perceptions of faculty about the conduct of mentoring and its impact on their workload can guide the work of undergraduate research program directors (URPDs) and other institutional decision-makers as they seek to design support and reward structures for faculty mentors (Baker et al. 2015; Behar-Horenstein et al. 2010; Buddie et al. 2011; Cooley et al. 2008; Dolan and Johnson 2010; Eagan et al. 2011; Hensel 2006; Potter et al. 2009; Schwartz 2012; Zydney et al. 2002). Passing broad, quantitative studies that traverse several disciplines and institutions as well as fine-grained qualitative studies of faculty at particular institutions can provide a body of research that reveals relatively consistent patterns regarding the most and inhibiting factors that affect faculty members' willingness to mentor undergraduate researchers, scholars, and artists.

The affective and relational dimensions of mentoring seem to serve as primary motivating factors for most faculty who choose to undertake intensive work. Based on their analysis of survey data from 71 faculty at a primarily undergraduate public university in Georgia, Buddie and Johnson (2011) concluded that the two most important benefits gained by mentors in their work with undergraduate researchers, scholars, and artists were enjoyment and the satisfaction of preparing students for graduate school. This finding is in line with those of Dolan and Johnson (2010), who studied a molecular science research group that included undergraduates and postgraduates at a Midatlantic research university. The faculty head of the research group developed the "more sustained and intimate relationships" developed with undergraduates in her lab as a key influence on her decision to serve as mentor (Dolan and Johnson 2010, 550). Other studies have concluded that faculty are motivated to mentor undergraduates because of the significant emotional and relational support reaped from such activities (Elder and Trapp 2010; Potter et al. 2009; Zydney et al. 2002).

Baker and colleagues (2015) revealed that a lack of time is the inhibitor most widely cited as a deterrent to mentoring undergraduate researchers, scholars, and artists, but faculty characterize the time-intensive nature of UR in

ways. Across multiple studies, faculty members reported that their involvement in UR is not reflected in a course-load reduction or release time (Baker et al. 2015; Buddie and Collins 2010; Schwartz 2012; Zydney 2002). Moreover, the additional time required to work with underprepared students emerges as a concern. Faculty in the study of Behar-Horenstein and colleagues (2010) described students' skill levels as a critical challenge, particularly noting the additional time involved in working with students who are English language learners. Conversely, Eagan and colleagues (2011) observed that faculty who had a higher perception of the intellectual abilities of undergraduate researchers had a higher probability of serving as mentors. Presumably, students with higher skill levels require less of the mentor's time, or the mentor's time is invested in helping the student engage in more intellectually challenging or productive tasks. In a related vein, faculty who responded to the survey by Buddie and Collins (2011) expressed frustration that, after they had invested time to prepare and train undergraduates, the students graduated before they could complete their projects. Beyond the time invested in working with novice researchers, scholars, and artists, administrative details can consume time that faculty mentors would like to devote to other tasks. For the faculty members in Dolan and Johnson's (2010) study, the time required to garner funding to support undergraduate researchers in their labs represented a significant and frustrating investment of their time and energy. Other administrative tasks related to UR that faculty members can find burdensome are paperwork related to employment and payroll management if students work for wages or stipends; requests for lengthy, specialized nomination forms for student grants and awards; and complex assessment protocols.

The lack of flexible resources to support undergraduate researchers, scholars, and artists can also deter faculty mentorship. For example, a college or university's UR program may designate funding to support students pursuing summer projects but may not make similar resources available for work during the academic year. Small grants may be awarded to students to cover the expenses involved in undertaking projects, but there may be no institutional resources to support students' travel to conferences, workshops, or festivals so they can share the results of their work with wider audiences and gain presentation experience. Funding may be available to support independent projects carried out by advanced students, but a faculty member who has integrated an UR project into a first-year course may have no means of covering the cost of printing posters so the students can participate in a campus-wide symposium. Other moments of frustration can occur when faculty encounter inflexible, drawn-out IRB procedures that are unfriendly to undergraduate researchers who may be undertaking research with human participants in a one-semester course or on a more compressed timeline than is typical for graduate students and faculty, when information technology policies make it difficult to purchase or maintain laptops to be used by undergraduate researchers in fieldwork; or when campus symposia or annual UR celebrations privilege one type of presentation format, such as posters. In their work on "What Faculty Need

and Want" in relationship to UR, Downs and Young (2012, 28) note that "we won't get too far in talking about faculty as a single entity." UR resources and support structures that are too narrowly and too rigidly designed are likely to serve only a limited subset of faculty mentors well, leaving other faculty unmotivated and underresourced.

Finally, the lack of formal faculty reward structures, including consideration in promotion and tenure (P&T) policies, deter faculty from mentoring undergraduate researchers, scholars, and artists. The summer 2011 issue of *CUR Quarterly* focused on the role of UR in P&T, with several authors (Hernandez Jarvis et al. 2011; Rohs 2011; Vaughan 2011) describing the role of UR in faculty evaluation processes on their campuses. Chapdelaine (2012) reported on a survey conducted by CUR and Paul. Of the 42 institutional members of CUR that responded to survey questions about UR and P&T, only 12 percent indicated UR was strongly emphasized in their institution's guidelines. Chapdelaine's content analysis of faculty handbooks at 32 colleges and universities that primarily serve undergraduates revealed that 63 percent of the institutions did not mention UR in their P&T documents. Our content analysis of the websites of postsecondary institutions with offices of undergraduate research provides further evidence that UR mentors do not see the value of their work reflected in formal faculty evaluation processes (Baker et al. 2016).

As colleges and universities continue to work on expanding students' access to high-impact experiences (Kuh 2008), including UR, the success of such efforts depends very much on the engagement of faculty. Further research and practice will, no doubt, continue to illuminate how best to support and reward faculty with enduring track records as mentors as well as how to engage more faculty in UR. Recommendations for action are offered below.

## **Recommendations for UR Program Directors and Institutional Leaders Seeking to Support Faculty Mentors**

### **Don't Fix What Isn't Broken—Celebrate Success**

Since one of the primary motivators/rewards of faculty members serving as mentors lies in the affective and relational experience of seeing students succeed (Baker et al. 2015), colleges and universities should invest in opportunities for students to disseminate their work publicly. Campus-wide symposia or celebrations of UR are long-standing features of many UR programs, and their importance should not be underestimated. Although presentations/performance at campus-wide symposia or regional and national conferences serve as important learning occasions for students, such public venues also serve as critical sites where mentors witness and celebrate the results of their work and share in their students' successes. Such public occasions powerfully reinforce the affective and relational rewards of mentoring.

stability of UR opportunities for students hinges on appropriate and support structures for a diverse faculty (Baker et al. 2015). An effective mechanism for faculty to articulate their concerns, needs, and ideas is essential in providing such support structures. URPDs and other decision-makers can only from the service of a strong faculty advisory board to provide guidance suggestions about developing and enhancing programs to meet the needs of faculty in diverse disciplines. The input of a faculty advisory board also shape how campus conversations unfold regarding the impact of UR on time, curricula, and teaching loads as well as P&T processes.

### ively Rethink Curriculum and UR

ns about how the limited resource of faculty time is deployed in the ser- UR are multifaceted, involving teaching loads, the preparation (or lack f) of students, and administrative responsibilities. No simple solutions ex- viewing UR as separate from traditional curricular structures exacerbates e crunch experienced by faculty. One way to rethink the relationship be- UR and the curriculum is to embed rich research, scholarly, or creative ts into coursework in both general education classes as well as classes for i. Advocating for such a model, Shanahan (2012, 69) notes, “faculty with- assignment time or other adequate support for mentoring UR can provide ch experiences for students within their teaching loads.” Alternatively, in- ons may wish to explore what Paul (2012, 141) calls a “diversified enroll- economy” in which high-impact, low-enrollment courses are balanced by : or discussion classes with larger enrollments. Paul points toward curric- music schools as a productive model for deliberate decision-making about ocation of the critical resource of faculty time to achieve desired learning nes through diversified experiences over the trajectory of a student’s entire ional career.

ethinking the relationship between the curriculum and UR to ensure that irst- and second-year students are involved in UR can also lead to students re better prepared to work more independently in labs, archives, field sites, s, clinics, and community organizations as upper-class students. Addition- nbedding UR in coursework for first- and second-year students means that r have the opportunity to work with students over several years, rather than semester or two as the student nears graduation. Such an approach can help ite the concern of faculty that underprepared students require an inordinate nt of mentoring within a short time frame.

### ite Conversations about P&T

irweather (2002, 27) argued, “The principal expression of academic values faculty work lies in the promotion and tenure decision.” If colleges and uni- es value UR as a HIP for students, then it must be included in P&T process-

et al. 2016). As stakeholders at Purdue University discovered in 2015, however, discussions about revisions to P&T policies should be undertaken with due de- liberation. When Purdue’s Board of Trustees moved to make mentoring under- graduates a requirement for P&T, the Faculty Senate publicly expressed its dismay that the board had acted unilaterally, even though many members of the Faculty Senate had well-established track records as committed mentors (Jaschik 2015). Because P&T decisions are multifaceted, with external reviewers, departments, units, and campus-wide committees all evaluating a candidate’s portfolio, clear, consistent policies that are regarded as fair and appropriate by all decision-mak- ers are critical. Campus leaders committed to UR should be initiating discussions about revisions to P&T policies.

While P&T policies that include the work of mentoring undergraduate re- searchers, scholars, and artists are being developed, vetted, and implemented, faculty members, URPDs, and other institutional leaders should also be working to ensure that documentation of UR mentorship can be represented in P&T port- folios. Campus-wide awards for outstanding mentors are one such form of doc- umentation; such awards have the additional benefit of raising the profile of UR across campus. At the University of Missouri, Kansas City, every faculty member who has mentored a student presenting work at the Symposium of Undergraduate Research and Creative Scholarship receives a thank-you letter from the deputy provost. Such letters can be included in P&T portfolios as well as in nomination packets for teaching awards. URPDs might consider maintaining databases and records that allow them to retrieve information for mentors about the numbers of students that have mentored through the years and any awards or recognitions accorded to those students.

### “Good Citizens” and More

In the nearly two decades since the Boyer Commission called for research-based education as the pedagogy of the twenty-first century, institutions of higher ed- ucation have devised ingenious programs and invested substantial resources in supporting undergraduate researchers, scholars, and artists. Research funds, travel grants, transcript designations and awards, and wages and stipends are among the most common support structures available to undergraduate students. But if UR is to be part of the next 20 years in higher education, institutions will need to give serious attention to how faculty mentors might be similarly supported. The good citizens among the faculty on every campus will continue to mentor the next generation of researchers, scholars, and artists. Student success serves as a suffi- cient return on investment of the time, intellectual energy, and emotional labor of faculty mentors who are inclined toward altruistic behavior that privileges the greater good. But the majority of faculty will need to see their mentoring efforts registered in formal reward structures, including P&T, and will need access to flex- ible resources to sustain their work.



UR is a HIP (Kuh 2008) that requires coordination across multiple levels. In this section, we offered relevant literature and corresponding recommendations at the institutional level, and we next turn our attention to the disciplinary level by focusing specifically on the faculty mentoring experiences and challenges in the arts.

## Mentoring Research in the Arts: Emerging Horizons and Opportunities

In this section, we examine research and mentoring in the arts by elaborating on the meanings and intricacies of research and mentoring in the arts. In addition to providing insights into the mentoring practices of elite performing artists, we advance knowledge and understanding of the emerging research and mentoring methodologies in the arts from U.S. and international perspectives.

### Research in the Arts

The misalignment between the intellectual work of scholars and artists and the traditional research methods valued by natural and social scientists also overshadows the mentoring models enacted by faculty and students engaged in UR. For the study described here, we interviewed two faculty members and three undergraduate students who had participated in traditional research projects in the arts. We found that, although there were benefits for students—such as learning about the role of research in their disciplines and society, seeing themselves as researchers for the first time, and refining their professional goals—there were challenges for faculty members in the arts who supervised research activity in ways uncommon in disciplines where research is more customary (as opposed to creative works).

The dominant model of research in the arts in the United States is described as one that blends theory and practice by allowing students to “combine academic learning with professional work in a setting that is akin to [both] the scientific laboratory and to space for public performance” (Crawford et al. 2011, 23). This model seems to be seeking to institute acceptable research methods in the arts around the establishment of “research equivalent” to sciences and humanities. In contrast, most European countries and Australia have the tendency to “broaden the definition of research” (Gillies 1997, as cited in Biggs and Karlson 2011, 5).

Borgdorff (2007), a widely cited philosopher and music theorist from the Netherlands, attempted to clarify when art practice counts as research. He elaborated on three types of research in the arts: (1) research *on* the arts (e.g., reflection on artistic process from a theoretical distance), (2) research *for* the arts (e.g., insights on instruments and materials used in the artistic process), and (3) research *in* the arts (e.g., artistic practice itself as an essential component of both the research process and the research results). Borgdorff proposed a compelling definition of research in the arts that distinguishes art practice as research from art practice-in-itself as follows:

Arts practice qualifies as research if its purpose is to expand our knowledge and understanding by conducting an original investigation in and through objects and creative processes. Art research begins by addressing questions that are pertinent in the research context and in the art world. Researchers employ experimental and hermeneutic methods that reveal and articulate tacit knowledge that is embodied in specific artworks and artistic processes. Research processes and outcomes are documented and disseminated in a appropriate manner to the research community and the wider public. (2)

In regard to assessment of art practice as research, this definition may be a starting point for researchers in the arts, faculty mentors of research in tenure committees at institutions, and agencies awarding research grants.

### Undergraduate Research in the Arts

At the core of the changes that the Boyer Commission report, *Reinventing Higher Education: A Blueprint for America's Research Universities*, suggests the recommendation that the universities should “make research-based the standard” (1998, 15). The findings of the follow-up survey, known as *Facing Undergraduate Education: Three Years After the Boyer Report* (Boyer Commission 2002), suggested that research universities had made considerable headway in many aspects of undergraduate education as proposed by the 1998 report. For example, when it comes to UR, those opportunities still appear to be much more available to students in the natural sciences and engineering than in other disciplines. The report suggested that the research-based learning needs to be more available to students in social sciences and humanities and that “arts students must engage in creative activities” (Boyer Commission 2002, 6)—recognizing first time, “creative activities” as a separate form of research.

The terms *creative activities*, *creative works*, and *creative inquiry* are all interchangeable synonyms for research in the arts, since using the term in connection with the arts remains counterintuitive to many faculty, researchers, and students. It is possible that this ambiguity contributed to the late arrival of high-impact practice into the undergraduate education in the arts in the United States and to the relatively recent establishment of the Arts and Humanities within CUR in 2009.

At the same time, the reform of European higher education, initiated by the Bologna Process of 1999, prompted the granting of master's and doctoral degrees to students in the arts, a practice that was uncommon in Europe prior to the process. Because conducting research and publishing its outcomes is in the master's and doctoral degrees, this shift in European universities launching a going discussion about what constitutes legitimate research in the arts and the practice of making art counts as research. Unlike in the United States, researchers in the arts embraced research methods within traditional qualitative and quantitative research methodologies, European artists and scholars, and

by the Australians, turned to establishing new methodologies that are based on artistic practices. However, what research in the arts actually entails, particularly at the undergraduate level, is still not clearly defined by either U.S. or European higher education governing bodies. This may be part of the reason why research in the arts at the undergraduate level is only slowly gaining momentum.

### **Exemplary Mentoring Model in the Arts**

Not only did the Boyer Commission's *Reinventing Undergraduate Education* place "research-based learning" at the heart of teaching and learning, it also emphasized the importance of "a mentor for every student":

Essentially the same techniques of tutorship have been practiced at the undergraduate level in areas like art and music, where individual performance is watched, corrected, assisted, and encouraged . . . This kind of mentoring needs to be emulated throughout universities. (2002, 17)

Biographical descriptions of many well-regarded artists reveal that their artistic and creative developments were marked by a close mentoring relationship with an individual willing to invest expertise, time, and energy into growth and maturation of protégés. Therefore, it is worthwhile for those who mentor developing artists to examine good examples of this important relationship.

In an exploratory, qualitative study, Ihas (2017) examined the mentoring practices of a remarkable string pedagogue, Dorothy DeLay, who cultivated an impressive number of elite violin performers during her tenure at the Juilliard School of Music. This case study identified the building blocks of mentoring practices in the arts and provided insights into the transmission of mentoring practices in music.

The results revealed that DeLay mentored her students using a broad range of career and psychosocial mentoring functions that were delivered with the utmost attention to students' individual strengths and careful guidance toward students' socialization into the field. She acted as her mentees' coach and career manager, roles associated with what Kram (1988, 25) calls the "career function" of mentoring. In the words of one participant, "she filled out the application form for Young Concert Artists. She [even] paid the application fee." Additionally, data analysis illustrated that DeLay provided counseling on private matters and friendship—behaviors linked to what Kram calls the "psychosocial function" (1988, 33) of mentoring. One participant described his feelings when he played a concert during the bombardment of his hometown:

I played a recital while I knew that bombs started flying toward my hometown. I was distraught, and so, when I arrived home, the phone rang, and it was Miss DeLay. And [she] just talked for a few minutes, but it showed that she really cared and she was involved in the lives of her students—and on every level, not just playing level.

The most illuminating finding of this study is that the broad range of mentoring positions (such as role-modeling functions, psychosocial functions, and functions that capitalize on the strengths of individual students)—combined with an intentional socialization into the field—seems to be an important mechanism in the development of elite performing musicians. This finding is consistent with several theoretical models of talent development, including Jaros Subotnik's (2010, 213) Developmental Trajectory of Talent Development Academic Setting, which proposed that, beyond expertise, there is a realm of talent and that the transition into this realm "relies more exclusively on the tutelage of mentors and the other gatekeepers to impart to their protégés the knowledge and ability to network."

Research in the arts is an emerging movement that often struggles with common terminologies and serviceable research methods within quantitative and qualitative research methodologies. The purpose of the above discussion is to expand readers' knowledge of research methodologies in the arts from research and international points of view, with special attention being given to mentoring research movement that is primarily concerned with leading research practice and that manifests itself in two forms: research-led and research-aided practice. Transmitting explicit and tacit knowledge from one generation of artists to another seems to be the oldest and the most prominent strategy used in the arts, but knowledge of the elements that compose good mentoring practices is still limited to anecdotal accounts.

## **Recommendations: Supporting Faculty Mentors and Artists**

### **Embrace and Celebrate Research in the Arts**

Studies by Healey and Jenkins (2006) and Jenkins, Healey, and Zetter (2006) suggest that disciplinary cultures affect the conception and nature of research in the arts disciplines began to take on a more tangible form only in the past decade (Borgdorff 2007) yet still struggles for recognition as "legitimate" research within traditional quantitative and qualitative research methodologies (Bennett, and Wright 2011).

As previously discussed, several higher education reports (such as the Boyer Commission 1998, 2002) recommend that research-based learning should be a pedagogical standard in all higher education disciplines. In addition, the number of other reasons for the inclusion of research in undergraduate curricula in the arts such as the well-documented benefits of UR on students' cognitive, academic, and social development (Eagan et al. 2013; Linn et al. 2015). More engaging faculty and students in UR has the potential to "increase complex [the] wonder of things" (Thompson 2006, 3), and research in the arts can emphasize continuities among different types of arts (Arlander 2011, 319) by embracing research as a pedagogical practice in the arts may provide

and students with additional funding specifically awarded for research projects and with additional opportunities to showcase outcomes of their research projects. Faculty in the arts certainly want their students to experience these benefits and opportunities.

### **Explore Emerging Research Methodologies That Are Unique to the Arts**

Research in the arts is an emerging movement that often struggles to find common terminologies and serviceable research methods within quantitative and qualitative research methodologies that are commonly used in the natural sciences, social sciences, and humanities. Scholars on research in the arts suggest this can occur because artistic discovery is inextricably bound with artistic practice, whereas the research protocols of well-established research traditions are rarely concerned with conducting research through practice.

As previously discussed, several emerging research methodologies unique to the arts exhibit a capacity for discovery of new knowledge, which is a primary goal of any legitimate research. These methodologies received considerable attention among researchers and scholars in the arts, particularly in Europe and Australia, and can collectively be classified as an emerging research methodology known as Practice as Research (PAR). Learning about PAR through reading literature that is available for each art discipline, attending workshops on research in the arts, and engaging in and exploring research methodologies unique to the arts firsthand may greatly contribute to a deliberate articulation of nondiscursive forms on new knowledge through the creation of art, which not only can greatly enhance faculty and students' academic experiences but also can enrich their creative outputs.

### **Accept Mentoring Research in the Arts as an Integral Part of Teaching and Learning**

A compelling source of information for faculty interested in mentoring UR is found in Temple, Sibley, and Orr's *How to Mentor Undergraduate Researchers* (CUR 2010, 21). In addition to summarizing key traits that undergraduate mentors need to foster such as forwardness, persistence and repetition, emotional honesty, and recognition and location of alternative mentors, this book provides a brief summary of mentoring practices needed for the successful mentoring of UR in the fine arts such as the need to guide and evaluate students' original creative processes to ensure that the "learning process is genuine."

Successful mentoring practices in the arts include a broad range of career and psychosocial mentoring practices delivered with the utmost attention to students' individual strengths along with the careful guidance toward students' socialization into the field. Such an approach to mentoring asks for the inclusion of mentoring practices in every aspect of life in the academy, including UR.

## **Preparing Faculty to Mentor Undergraduate Scholars**

Faculty members are increasingly exhorted to mentor undergraduates, done either by administrators in liberal arts institutions, who see such activity core to their institutional mission, or by administrators at research-oriented institutions, who may seek to broaden diversity initiatives (Baker, Lunsford, and 2017). An internet search reveals numerous websites at institutions such as Brown College (n.d.) and University of Washington (n.d.), which have mentoring guides and handbooks for faculty members who work with undergraduate researchers. Despite this apparent plethora of information, the assertion Richards and colleagues (2014, 3) that "mentorship remains a hidden pedagogy of undergraduate education" remains true.

### **Benefits for Faculty Members**

There is a developing literature that points to benefits for faculty members who participate in UR mentoring. Scholars have found that faculty members who mentor undergraduate researchers improved their teaching, appreciated the insight into research questions, and reported higher job satisfaction (Johnson and Karukstis 2009). Faculty who mentor undergraduates have been found to experience positive outcomes such as personal satisfaction, fulfillment, networking, friendship, support, and reputational gains for talent development (Johnson 2007). Behar-Horenstein and colleagues (2010) and Johnson (2010) reported that faculty members who supervised UR perceived three benefits: increased scholarly productivity, professional rejuvenation, and remaining current in one's field of inquiry. Similarly, Evans and Witkosky found that involvement in mentoring UR encouraged faculty to maintain their own research efforts.

More recently, we conducted a series of studies on faculty engagement in UR (Lunsford et al. 2016; Baker et al. 2015, 2016). Findings indicated that faculty members who engaged as mentors were indeed more active scholars than faculty members who did not serve as UR mentors. These mentors published more papers, presented at more conferences, reported more funded research activity, and attended more summer institutes and other professional development activities (Baker et al. 2015). This study, in concert with the other studies previously mentioned, converge to suggest a causal effect; however, that effect is not yet proven. These studies try to make the case that engaging undergraduates in research leads to more scholarly productivity. However, it might be that faculty members with a higher level of scholarly activity simply may have more opportunities to mentor undergraduates to participate in research.

Finally, two issues of *CUR Quarterly* have featured faculty engagement. The June 2004 *CUR Quarterly* focused on "Creating Time for Research," and the December 2003 issue included eight essays that took up the challenge



support for UR. Successful UR programs often emphasize the need to provide faculty with professional development experiences to expand their repertoire of mentoring practices (Flores, Darnell, and Renner 2009; Morris, McConaughay, and Wolffe 2009; Pyles and Levy 2009). The need to provide training for faculty members to mentor students from underrepresented populations in postsecondary education is particularly acute (Scisney-Matlock and Matlock 2001). Yet, if there are such benefits and encouragements for faculty members to mentor students, then why is mentoring still a “hidden pedagogy”?

## **Recommendations for Becoming an Effective Faculty Mentor**

There is limited preparation about mentoring undergraduate researchers for faculty members other than relying on their experiences. Thus, faculty developers and faculty members may improve their mentoring practices in three ways: developing an explicit mentoring pedagogy, building mentoring into their research experience, and engaging in inclusive mentoring practices.

### **Develop a Mentoring Philosophy**

Most guides and handbooks provide information about expectations and checklists for mentors and mentees rather than information about the pedagogy or process of creating an effective relationship. Yet faculty members will likely mentor others in the way in which they themselves were mentored—great if they had good mentors, not so great if they did not have them. Indeed, Lunsford (2014) found that scientists tend to emulate their doctoral advisers and supervisors if they received great mentoring or else sought to “make-up” for the lack of mentoring they perceived. Unfortunately, a significant minority of faculty members come to the academy without the experience of having a mentor (Thomas, Lunsford, and Rodrigues 2015). It is also clear that there are elements to good mentoring that involve creating a positive culture and environment where frequent mentor-like activities take place (Nakamura, Shernoff, and Hooker 2009). Yet, a lack of explicit learning about mentoring practices contributes to the “hidden pedagogy” problem (Thomas, Lunsford, and Rodrigues 2015; Nakamura et al. 2009).

The Entering Mentoring curriculum of the Wisconsin Program for Scientific Teaching is an evidence-based pedagogy developed by faculty members with support from the Howard Hughes Medical Institute to provide training for mentors in STEM (Handelsman et al. 2005). Faculty members and graduate students can customize a curriculum or use pre-made curriculum in astrophysics, biology, chemistry, engineering, field biology, mathematics, multidisciplinary fields, physics, and psychology. The curriculum focuses on guided discussion about these themes: establishing expectations, maintaining effective communication, assessing understanding, fostering independence, addressing diversity, and dealing with

ethics. Thus, there is attention to the process of mentoring as well as to details. The curriculum's key points related to diversity are for faculty members to increase their self-awareness of their own biases or prejudices, examine their approaches with individuals who have diverse learning styles and backgrounds, and take concrete ways to implement engagement with their diverse mentees and improve their multicultural competency.

It is also important that mentors have a basic understanding of how relationships develop and what activities matter at the beginning, middle, and end of the relationship (Lunsford 2016; Lunsford and Baker 2016). Establishing rapport and trust is important at the beginning of the relationship. At the beginning of the relationship, faculty members might seek to identify common areas of interest, and experiences. Collaboration matters during the middle stages of the relationship. During this period, faculty mentors and their mentees would together on research and scholarly activities. Ending stages often are neglected and also important. Faculty members might have a discussion with their mentees about how they might stay connected or involved or if it is time to move on to other activities and relationships. One recent adaptation of the Entering Mentor curriculum is the University of Arizona's AWARDSS Mentor Training for Faculty who mentor student researchers. The culmination of the University of Arizona training is the development of a mentoring philosophy.

### **Learn from Disciplines That “Build In” Mentoring**

Certain aspects about mentoring are universal, yet the content varies by discipline. There are important structural differences in disciplines that relate to mentoring (Biglan 1973). Team-based research is more common in some disciplines whereas more solitary work is characteristic in other disciplines. These structural differences also relate to funding and are reflected in the location of many units for UR. For example, faculty in natural and physical sciences often have disciplinary cultures that support and encourage mentoring of undergraduate researchers (Lunsford et al. 2016). Faculty members can borrow from disciplines to create scholarly teams, learning communities, or weekly reflective share meetings, even in those disciplines characterized by individual work

### **Develop Inclusive Mentoring Skills**

An overwhelmingly white and mostly male professoriate is tasked to mentor increasingly diverse student body (NCES 2015; Ochoa et al. 2015). Faculty members, even those from diverse backgrounds, may need assistance to develop mentoring skills and processes that are inclusive of diverse student populations.

Scholars report that inclusive approaches include promoting a sense of belonging, recognizing threats to participation in research as perceived by students and helping students learn an often new and foreign academic language (Ochoa et al. 2015). These scholars recommend that faculty members can be inclusive by developing trust through transparent interactions and conversations with st

making genuine, open invitations to participate in research; and conveying high expectations for the work to be learned and completed.

The study described here of mentoring undergraduate research in the arts suggests two opportunities if faculty members and administrators also take more inclusive disciplinary and interdisciplinary views of mentoring undergraduates in UR. First, mentoring undergraduates is at the heart of pedagogy for faculty members in the arts. For example, a colleague in the fine arts observed that a professor in the arts, over a long career, teaches every day in a one-on-one relationship that makes mentoring relationships more likely to develop. Thus, there is much opportunity for faculty members in other fields to learn from mentoring practices in the arts.

Second, although mentoring has a long-standing place in the arts, the idea of UR is an emerging movement. Thus, faculty in the arts might benefit from increasing their awareness of the methodologies and practices used by faculty mentors of UR in other disciplines. For example, the previously mentioned PAR approach is one such "new" methodology.

Third, interdisciplinary research provides a fruitful location in which to situate UR opportunities for faculty and students alike. Specifically, interdisciplinary research could provide a means of creating UR opportunities for students (and faculty) in disciplines with research traditions that are less conducive to mentored UR. Such opportunities have the potential to create a team-based approach to UR. Further, interdisciplinary research also aligns well with the goals of capstone experiences and courses. As engaged learning becomes more the standard in undergraduate education experience, a more integrative approach may be necessary for the sake of efficiency.

## **Conclusion: The Faculty Perspective in UR**

The faculty mentor experience in UR is situated at the institutional, disciplinary, and individual levels. Thus a more complete examination of those experiences is required, as well as analysis of the needed corresponding supports as a means of achieving outcomes at the institutional and individual levels. More flexibility is crucial in models of mentoring, particularly in fields such as the arts and humanities, in rewards and recognitions, and in institutional structures and available supports. The role played by non-tenure-track faculty and contingent faculty in serving as mentors in UR also must be noted. Although not the focus of the research described here, we did engage with contingent faculty members and learned that they mentor regularly in UR with even fewer supports than their tenure-track colleagues. If higher education institutions continue to employ contingent faculty and rely on those contingent faculty members to support student experiences, resources also need to be made available to them.

As the research in this chapter revealed, faculty members spend a great deal of time and energy supporting undergraduate students in research experiences. Both institutions and students benefit from that engagement. Although affective,

relational outcomes are associated for faculty members, administrators, c  
leaders, and faculty developers should engage in conversations with faculty  
bers to ensure appropriate supports, resources, and recognitions are avail  
aid and encourage faculty members' continued engagement in this high-  
practice for years to come.

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