

Undergraduate research can be central to a high-quality college education. The findings are clear - students who engage in traditional mentored undergraduate research experiences (UREs) report diverse learning gains (Bauer & Bennet 2003; Russell et al. 2007; also reviewed in Lopatto, 2010). A growing body of evidence suggests that course-embedded research (CER) can provide benefits similar to those from UREs: students report gains in learning and analytical skills, refine their appreciation of the research process, and develop increased confidence in their abilities as researchers (Brownell et al. 2015; Hensel, 2018; Linn et al., 2015).

The current issue of PURM highlights the role of mentoring in course-embedded research (CER). We note that the term “course-embedded research (CER)” is intended to be inclusive of course-based undergraduate research experiences (CUREs), but also course-based inquiry that may not fit all criteria of the CURE model (*sensu* Auchincloss et al., 2014). Although mentoring has been suggested to be central to the benefits students realize from undergraduate research (Linn et al., 2015; Shanahan et al., 2015), its role in CER is not yet well explored. Several of the papers in this issue address this gap, and other contributions provide additional, unique insights related to CER. For example, few studies have examined the ways in which mentoring relationships in UREs/CER impact mentors (but see Dolan & Johnson 2009; Goodwin et al. 2021; Marshall et al. 2021; Pukkila et al. 2013), although faculty, early career researchers, graduate students, and undergraduate students may occupy both mentor and mentee roles. Two papers in our issue reveal insights on how mentorship influences mentor development. First, peer-leaders involved in a modified CURE course and an undergraduate research mentoring group from Pace University share their views on the impact of participating in research dissemination outside the classroom (Farshi et al.). Second, Sadika et al. provide perspectives from senior undergraduate and graduate student research coaches within the First Year Research Experience (FYRE), an example of course-embedded research at the University of Saskatchewan.

In large part because of calls to engage undergraduate students in practice (American Association for the Advancement of Science, 2010; Boyer Commission on Educating Undergraduates in the Research University, 1998; President's Council of Advisors on Science and Technology (U.S.), & United States, 2012), science, technology, engineering, and mathematics (STEM) disciplines were early adopters of course-embedded research (in particular, via CUREs). Two papers in this issue add significant contributions to the literature on CER in STEM. Cohen et al. provide insights into the ways STEM faculty adapted their CURES to remote instruction during the COVID-19 pandemic. Such insights are not only timely in this moment, but also provide useful advice for supporting diverse student populations through hybrid or remote CURE instruction. McCarter and Loudon address an important but rarely discussed concern with undergraduate research – confirmation bias. In their work, they advise research mentors about best practices to avoid bias in undergraduate data collection.

Course-embedded research is improving access to undergraduate research experiences for students in two ways: across disciplines, as faculty in more fields engage with the model, and as a vehicle that can increase diversity, equity, and inclusion for students in undergraduate research (Bangera & Brownell, 2014). Contributions in this issue that highlight disciplinary diversity include reflections from a mentored first-year seminar in developmental psychology and the learning sciences at Clark University (Budwig et al.), and a perspective on the importance of instructor mentoring in a history course with embedded research (Leonard & Ayers). The issue includes two contributions that examine the importance of mentoring in CER for students from historically underrepresented groups. Johnson and Makki highlight the benefits of CER as a first-year Black-identified student and the challenges of mentoring CER as a Black-identified professional, including reflections on how student demographics and course framing influenced her teaching and mentoring. DeVita et al. report findings from a CURE program that aims to open access to high-impact learning opportunities for community college students in North Carolina.

As we edited this issue, we identified several potentially rich avenues for future scholarship on course-embedded research. First, as previously noted, few studies overall have assessed gains and costs for mentors in this context. The undergraduate peer mentors, graduate students, postdoctoral researchers, and faculty who mentor course-embedded research are engaged in effort that requires substantive time, energy, and intention, which also contributes to their learning and professional development. There is similarly broad opportunity for work exploring the application of mentoring frameworks, practices, and models in course-embedded research. Importantly, because CER has been recognized as a strategy for increasing equity and inclusion in undergraduate research (Bangera & Brownell, 2014), there is essential work to be done examining the role(s) and outcomes of mentoring in CER with respect to diverse student populations. Finally, we encourage the development of additional novel and creative CER models that intentionally incorporate mentoring, to expand access to undergraduate research for students across levels and disciplines.

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