

Good for What Ails Us

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Why a whole issue of JoSoTL for undergraduate research? We've known it's good for us for at least 25 years and depending on how you define it, more like 2,500. Weren't Plato and Socrates doing this?

Yes, but they didn't have to deal with fickle enrollments, impatient trustees, and credit hour regulations, which could drive anyone to hemlock. In the time since then - in fact, just in the time since many of us were in college ourselves - higher education has faced new crises that challenge our ability to sustain undergraduate research. For one, there's the explosion of student debt; nine years ago, the total for U.S. college students crossed a *trillion* dollars total, and since then it's added nearly a trillion more. This makes it hard to defend anything that looks pricey, or boutique.

More troubling than the cost of higher education is the social injustice. Like other high-impact practices, undergraduate research has a bad track record for equity. Students from historically underserved populations - ethnic and racial minorities, first generation, and Federal Pell Grant eligible - have enjoyed disproportionate benefits from experiences like learning communities, service learning, and research with faculty, but they've also been less likely to participate.

As shown in this volume's deep analysis of National Survey of Student Engagement (NSSE) and Faculty Survey of Student Engagement (FSSE) data by Jillian Kinzie and Allison BrckaLorenz, "Undergraduate Research as a Hallmark High-Impact Practice," the problems of inequity continue. "The combination of gaps in entering expectations for UGR and participation for racial-ethnic minoritized student groups is an alarm bell that has been ringing for a while in our data, and has been raised as a concern in others' research (Collins et al, 2016; Haeger et al, 2016; Hernandez et al, 2018). Given the wealth of evidence showing the positive association between UGR and outcomes for minoritized students, we must use expectations data and participation rates to signal, measure and address where we are falling short."

So, expensive, hard to scale, and stubbornly prone to the perpetuation of racism and classism. This has been the rap against higher education in general, and HIPs like undergraduate research in particular. The opening piece in this special issue tells us - alarmingly - that the charges still stick.

Yet the readers of JoSoTL know perfectly well that undergraduate research is a good thing, and many of us have led workshops on it. Where we need help is in making it more equitable, more scalable, and then making the benefits so transparent that even our external stakeholders insist on getting more. The findings from Kinzie and BrckaLorenz provide a clear, up-to-the-minute diagnosis, showing down to the disciplines and demographic groups exactly where we need to do better.

To that diagnosis, the rest of the issue presents potential therapies. These benefit from some serious scholarship and research methodologies, applied over a decade or two of work across our institutions. With help from organizations like the Council for Undergraduate Research, the National Science Foundation, the National Institutes of Health, and the Association of American Colleges and Universities, faculty have been sharing ways to put research experiences earlier in the curriculum, into higher enrolled courses that serve a broader spectrum of students. The College Board has played an important role too, creating new Advanced Placement courses called Capstone and Research that emphasize innovation over rote memory, skills over content.

And the result, as this special issue demonstrates, is that both our incoming students and our new faculty are readier than ever to recast undergraduate research as the means to today's most urgently sought-after ends, namely equity, affordability, and quality.

Equity

In “Creating More Inclusive Research Environments for Undergraduates,” Heather Haeger and her colleagues at California State University, Monterey Bay, begin with a crucial gap identified by Kinzie and BrckaLorenz, looking at students who seem to plan for research experiences but then don’t follow through. The university’s longtime support for undergraduate research is a model for the rest of the California State system, and shows that ethnic and racial gaps can indeed be closed with sustained attention, and a nuanced sense of inclusiveness not as a binary condition, but as a continuum. But they haven’t solved it all: “Despite the success of these efforts, transfer students were still less likely to engage in research and a significant population of students believe that research would benefit them in their education and career goals, but are not able to participate. These findings point to the need for the creation of more opportunities and stronger outreach to lower-division, community college and recent transfer students.”

That’s a lapse addressed head-on in “Undergraduate Research Communities for Transfer Students: A retention model based on factors that most influence student success.” Donna Chamely-Wilk and her colleagues at Florida Atlantic University and elsewhere describe a long-term, consortial approach for STEM retention that relies on research experiences that begin at community colleges and then continue at the universities. The key, they found, was peer support and mentorship, a theme developed extensively in “Mentored Research: Increasing the Reach of a High-Impact Practice” by Jenni L. Redifer, Derick Strode, and Cathleen Webb. The program design they call *tiered mentoring* shows how student collaboration across class standings, and in fact down to high school, improves participation rates for first-generation college students.

Judging from this volume, that willingness to experiment with radical redesign may be most important of all. The article titled “Supporting Biomedical Research Training for Historically Underrepresented Undergraduates Using Interprofessional, Nonformal Education Structures” delights in throwing out assumptions. What the authors call enrichment took different forms at different participating institutions, but share a handful of common characteristics like peer mentorship, reflection, and an emphasis on non-formal, low stakes interaction. Community colleges and universities participated equally in the experimentation, facilitated by the large-scale, consortial approach of a major National Institutes of Health (NIH) grant.

Readers who don’t have access to a BUILD warchest as referenced in the article can start smaller, but will still clearly benefit from a willingness to mix things up. See in particular “Undergraduate Research as System: Mapping the Institutional Landscape of a High Impact Practice” by Laura E. Cruz and colleagues from Penn State University and University of Southern Indiana, which shows how rigorous system mapping at even a single institution can reveal gaps and misapprehensions about undergraduate research. At an even smaller scale, Kevin Clark and his colleagues at Indiana University Kokomo show in “Undergraduate Research Across the Psychology Curriculum: A Case Study and Program Assessment” the difference we can make with the introduction of just one course.

Affordability

This special edition of JoSoTL shows a couple of ways undergraduate research can address higher education’s crisis of affordability, while beating its own reputation as too expensive to sustain at scale. The first, and more intuitive, argument is in course-based undergraduate research experiences (CUREs).

In “Undergraduate Research Embedded Across Course Levels and Types Through Scaffolded Projects,” Sara Z. Evans and Jocelyn Evans investigate the effects of “embedding undergraduate

research in courses across a variety of formats: a freshman interdisciplinary honors course, two different special topics courses in criminal justice made up of 5-15 undergraduate students focused on testing criminological, multiple directed study projects with graduate students, and a 30-40 person upper-level criminology research methods course.” If we’re going to beat the related problems of scale and affordability, this will be how. They open with a candid account of the obstacles of such embedding, commenting on the demands added to faculty workload. But by incorporating CUREs through such a range of disciplines, class levels, and section sizes, they provide ample evidence it can be done.

Those with more modest aspirations - or just less institutional pull - might start with CUREs by looking at Kathy Ritchie’s article “Using Institutional Review Board (IRB) Protocols to Teach Ethical Principles for Research and Everyday Life: A High Impact Practice.” She found that the simple, elegant addition of Institutional Review Board protocols added a measurable layer of research-related gains to her courses - not just in terms of persistence and completion, but of deep learning. “The IRB process could incite frustration and stress to students who are on a timetable and have not experienced such a sometimes legalistic, negotiated process of decision making and professional correspondence. However, these types of decision-making processes are common in professional settings and using the IRB process to mentor students may lead to a better understanding of working with teams and other professional groups, giving them insight into how to effectively navigate such professional dilemmas, as well as a way to sharpen professional demeanors and communication skills.” This is powerful, portable learning, on the cheap.

The second angle on affordability depends on understanding a primary cause of student debt defaults, which is attrition. In its 2018 study on student debt default, the Brookings Institution found that excluding the for-profit sector, the default rate on student loans *tripled* for non-completers, 15% versus 5% for those who graduate (Scott-Clayton, 2018). Completers have better financial acumen, higher paying jobs, and the momentum and self-efficacy to come out fine. But those who come to college, accumulate debt, and then drop out without a degree are financially worse off than the ones who never tried, and just got a job after high school. For these students the national completion agenda is also a financial lifeline.

Five years of institution-level tracking at the University of Central Florida (“Tracking and Assessing UR Campus-wide: Demographics, Academic Success, and Post-Graduation Plans”) clearly connect undergraduate research to student completion. Kimberly R. Schneider and colleagues found a 14.5-point difference in four-year graduation rates between research-involved students and the general population, 58% vs. 43.4%. This suggests that research is the kind of ideal intervention that improves both learning and completion, without adding time to degree. Similar findings are shared by Robin Cresiski et al. in “Undergraduate Research at a Teaching-Oriented College: Seniors’ Perspectives and Approaches to Consider,” set at a “highly diverse, open-access campus.” “For seniors who participated in UGRs, a significantly larger proportion graduated by summer after reaching senior status or re-enrolled in the next fall (95.4%) compared to their peers who did not participate in UGR (88.3%), $\chi^2(1) = 8.66$, $p < 0.01$, $\phi = 0.07$. The overall persistence boost is 7.1% for UGR participants against UGR non-participants (see Table 3 Column 4). The trends hold true for all subgroups examined, including minority, first-generation, and low-income students. A significantly higher proportion of students who participated in UGR persisted or graduated than their UGR non-participants, regardless of race and ethnicity, first-generation status, and low-income status.”

Like so much of what we do - there are powerful implications for equity and social justice. “Can Undergraduate Research Participation Reduce the Equity Gap?” uses data from a pair of institutions in the University of Wisconsin system to support the field’s longstanding claim that undergraduate research - like other HIPs - reduces gaps in graduate rates along racial and ethnic lines.

Such findings add another moral dimension to the affordability argument, and the clear methodology gives the rest of us a way to try this at home.

Quality

Marbled into the public concerns about college equity and affordability is the suspicion that we're really not worth it at any price. Whether they say so out loud or not, these critics are right if we think of college as the place where you learn what's already known. There is literally no need for graduates who can recite findings without questioning them, or adding to them.

Among all the high-impact practices named by George Kuh and others, research is the single most direct counterpoint to the conception of college as mostly memorization. Boiling that down - illuminating it as a set of particular interventions and teaching techniques - is in the interest not just of undergraduate research advocates, but of the whole higher education sector. In "A Taxonomy for Developing Undergraduate Research Experiences as High-Impact Practices," Abbey E. Fischer et al. provide "a layered taxonomy, with milestones of increasing engagement, that establishes what sets a HIP undergraduate research experience apart from other HIP experiences and what distinguishes good practices from high-impact teaching." These characteristics are visible, measurable, and repeatable. They show up in two other contributions to this issue, both related to the highest quality marker of all, regional accreditation. In "QEP is HIP: A Case Study Implementing an Institution-Wide Undergraduate Research Community of Inquiry for a Small, Private College Setting," Piedmont College shows how such transparency can lead to successful completion of a Quality Enhancement Project. And in "Leveling Up an Award-Winning UR Program: A Case Study from Furman University," the authors take us through the next step, showing how another Quality Enhancement Plan (QEP) process kickstarted undergraduate research featuring mentorship, reflection, and assessment.

So, equity, affordability, and quality. These are the themes and messages from this collection that can help us connect undergraduate research to the urgent work of higher education as a whole, presenting ourselves to leadership and the public not as one more problem to solve, but as a ready solution for the ones we have.

Colleges and universities originated when knowledge was harder to come by - before we had the printing press, let alone the web. College was where you picked up esoteric material you couldn't find anywhere else. Our inherited structures assume content is the most important kind of learning. To this day, our courses and curriculum are mostly lists of topics. Our older libraries were designed as warehouses for books, and some of them still look like it. The default classroom layout remains rows of chairs facing a lectern, whose very etymology means the instructor will stand behind it reading out loud. These days few would call that good teaching, but we're still looking for a successor paradigm with the same staying power. What should college mean, in a millennium where knowledge itself is literally everywhere, no longer cloistered, forbidden, or hidden? We're still about knowledge, but in a different way, no longer tasked with simply preserving, curating, and transmitting what's already known. Instead, we need to be *mostly* about creating more of it.

The journal issue you are about to read shows us that future, as it's emerging today. To live up to this conception of college means rethinking tools like the comprehensive exam, and even test proctors, and getting closer to an older, apprenticeship model of education. We need our students to know, but we also need them to understand ways of knowing, and to have a firsthand grasp of how knowledge grows. Experience with faculty conducting original research gives students the chance to internalize different epistemologies, understanding through disciplinary lenses concepts like evidence, ambiguity, knowing, and truth. In other words, we're going for a familiar "learn by

doing” ethic, but increasingly what we need our students doing is the learning itself, by asking them questions no one knows the answer to.

We also want graduates who can understand current events and civic decision making deeply, and with enough breadth of understanding to know what’s knowable, and when they’re being snowed.

There’s a lot of upside here, for faculty as well as students. For decades, our professors have been told the twin obligations of teaching and scholarship are mutually reinforcing, but they’ve had a hard time getting it to work. Instead, faculty positions - especially on the tenure track - can feel like two competing full-time jobs. But bringing students into disciplinary research punches a hole in the wall between the demands of classroom teaching and publishing. People can pass ideas back and forth, and breathe. For students, participation in research makes the degree evergreen, a self-renewing way of understanding the world, and continuing to learn about it.

There’s a lot at stake. The institutions of higher education are under new scrutiny for good reason: we’re too inequitable, too expensive, and too complacent for our own good. We can no longer justify our shortcomings on the strength of a degree conceived as a container for four years of static received wisdom.

The issue you’re reading is a blueprint for a better model, not just of teaching and learning, but of college itself.

References

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