

Building New Knowledge with Undergraduate Students: Institutional Incentives and Faculty Agency

Kelebogile Zvobgo, Paula M. Pickering, Jaime Settle, and Michael J. Tierney
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Abstract

Undergraduates today face a more demanding and competitive labor market than their parents' generation. In response, some pursue double majors to signal breadth to potential employers and improve their job prospects. Some also realize that a strong signal of workplace readiness is having in-demand skills acquired through independent and collaborative research. In this article, four professors at an undergraduate-focused public university share experiences working with undergraduates on research, with a focus on the "supply side" of student research training and mentoring. We shed light on how institutions can support differently-situated faculty, facing different career incentives and constraints, to integrate undergraduates in research. We also address the limits of what is possible for faculty-student research and suggest some ways to overcome them.

I. Introduction

Undergraduates are under pressure to do more in college today than their parents' generation. The labor market is more demanding and competitive (Rogers 2021). In response, students pursue double majors to signal breadth of knowledge to potential employers and to improve their employment and earnings prospects (Del Rossi and Hersch 2008). Some also participate in research to expand their skills and convey to employers that they are prepared to join the workforce. For example, among a range of workplace-relevant skills, data science is increasingly important for political science majors (National Academies of Sciences Engineering, and Medicine 2018; Williams et al. 2021).¹ Now more than ever, students need in-class and out-of-class hands-on experiences.

One vehicle for growing substantive knowledge and data and methods training among undergraduates is through mentored research with faculty, which doubles as a high-impact practice for improving student retention and satisfaction (Gregerman et al. 1998; Jacobi 1991; Jordan-Zachery 2004; Kuh 2008). In addition, as detailed in the call for papers for this special issue, "a more competitive environment in and out of the university has created pressure for undergraduates to engage in projects that go well beyond a class exercise."²

While these points emphasize the "demand side" of undergraduate research training, this article focuses on the "supply side," specifically how colleges and universities can encourage and support

¹Data science is the fastest growing second major among Government majors at William & Mary.

²For the full call for papers, visit: [cambridge.org/core/journals/ps-political-science-and-politics/announcements/call-for-papers/call-for-papers-special-issue-on-undergraduate-involvement-in-research](https://www.cambridge.org/core/journals/ps-political-science-and-politics/announcements/call-for-papers/call-for-papers-special-issue-on-undergraduate-involvement-in-research).

faculty to offer students research opportunities. We also share different models of faculty-undergraduate collaboration that help both sides get the most out of the experience.

We are four faculty members at an undergraduate-focused public university, at different stages of our careers – one assistant professor, one associate professor, and two full professors – and with different institutional responsibilities. We all work with undergraduates on research, primarily through our respective labs. Importantly, we have perspectives gleaned from institutional roles that help us understand the bigger picture of undergraduate research. Between us, we bring experience directing undergraduate labs; directing undergraduate academic programs; and leading centers that support collaborative research between faculty and students.

Our range of positions allows us to shed light on how institutions can support differently-situated faculty, facing different career incentives and constraints, to integrate undergraduates in research. We also address in this article the limits of what is possible for faculty-student research and we suggest some ways to overcome them.

II. Institutional Background

William & Mary, a top-ten U.S. university for undergraduate teaching according to the most recent *U.S. News and World Report*,³ provides a rich ecosystem for faculty-student research, with an estimated 80 percent of students conducting research with faculty by their senior year.⁴ Central to this ecosystem is our institutional form: we are an undergraduate-focused institution, with few departments offering graduate degrees. Our own offers a B.A. in Government. A number of us also contribute to interdisciplinary programs in International Relations, Public Policy, and Data Science. So when we work with students on research, it is typically with undergraduates.

But beyond *institutional form* is *institutional culture*: at our university, we believe that undergraduates are exceedingly capable of contributing to scholarship and serving as collaborators. There are several “agents” of the university that purvey and support this belief, including the Charles Center for Academic Excellence, the Global Research Institute, the Reves Center for International Studies, and the Social Science Research Methods Center. Each provides funding, training, seminars to present research in progress, or other resources to faculty and students to work together on research, both on campus and in the field.

The Global Research Institute is a university-wide center that supports faculty-student teams that conduct collaborative work on global issues ranging from nuclear proliferation to foreign aid effectiveness to transitional justice. The institute was created to catalyze, incubate, and scale research that can be sustained through external funding. While a multidisciplinary institute, for historical reasons, it disproportionately supports research teams from the Government Department. Services include start-up funding for new faculty who commit to working with undergraduates, a student innovation funding window, assistance identifying funders, direct funding for student and faculty field research, collaborative space, seminars, and support to disseminate research findings.

³For more, visit: news.wm.edu/2022/09/12/wm-remains-top-public-university-for-alumni-giving-in-u-s-news-rankings.

⁴Read more here: wm.edu/research/studentresearch/index.php.

The institute currently supports ten labs, but also makes seed investments in student or faculty ideas that have the potential to attract external funding.

Another example is the Social Science Research Methods Center. The center offers space conducive to brainstorming and lab meetings, facilities to secure expensive equipment, a computer lab where networked experiments can be programmed, and a suite that facilitates the collection of data in social psychological experiments or through focus groups. Additionally, the center sponsors the Omnibus Project – a student subject pool that operates every semester, with approximately 400 subjects, and allows faculty and students to collect data from an online survey and in the lab. In the decade since the Omnibus Project was founded, dozens of students have collected data for honors theses and independent projects at a minimal cost (the faculty directors' time and financial support for the student research assistants (RAs) who manage it.)

Our own department provides modest, competitive funding awards directly to students, largely through the generosity of our alumni who have made donations for this purpose. We are able to offset the costs for students to present at professional conferences like the annual meeting of the American Political Science Association. Several other entities on campus also provide funding directly to students to complete and present independent research projects, such as the Charles Center, the Global Research Institute, and the Arts & Sciences dean's office.

Whatever institutional support exists to facilitate undergraduate research would be for naught without the individual actors who do the work: faculty and, of course, students. There is likely a selection effect at work: we hire faculty who signal interest and ability to work with undergraduates on research. This is amplified by the interactions we have with each other. Senior faculty who have experience engaging undergraduates in their research encourage junior faculty to do likewise. Senior faculty also provide frameworks and advice for doing so.

III. Norms and Incentives Supporting Faculty-Student Research

On the one hand, this ecosystem creates permissive conditions for faculty-student research; faculty members can find a variety of support mechanisms. However, the culture also makes it hard *to not do* these things (especially for pre-tenure faculty). If a faculty member's research does not lend itself to collaboration that can be scaled, as in the research labs we describe in the next section, then this presents a potential problem for such faculty. (For example, research that is theoretical, formal, interpretivist, or in a language not taught at the university is hard to do with undergraduates.) But because we, ourselves, conducted research as undergraduates, we are committed to mentoring them in a research context and have devised ways to work with them on some, if not all, aspects of our research.

Specific incentives translate our institutional culture into tangible benefits for faculty who conduct research with undergraduates. One set of incentives is informal, including public praise from colleagues, administrators, and students. Because undergraduates need more training than methods curricula typically provide, faculty working – and especially coauthoring – with undergraduates must provide additional training. Positive feedback helps sustain our extra time and effort. Still, over the years, a number of faculty have worked with students who only need entry-level skills to

get involved, such as conducting content analysis of text, categorizing legislative proposals, building sample frames, or collecting documents. Then, some students move up the research “value chain.”

Moreover, William & Mary has pushed to increase access to research opportunities, and to make access more equitable, in line with the argument advanced by Kuh (2008) and Murray (2017: chapter 8). In addition to groups who have been historically underrepresented in undergraduate research – women, students of color, and students with disabilities (Murray 2017: chapter 8) – our institution emphasizes the value of working with military veterans, neurodiverse students, and first-generation college students

Intrinsic rewards are rarely enough, however, so we also have designed a number of extrinsic incentives. One major incentive is the availability of funding specifically for mentored and collaborative undergraduate research. This motivates faculty to pursue projects where student assistance would be beneficial and where students can extend their mentor’s research. One example is specific funds allocated to supporting minoritized students, as with the W&M Scholars Undergraduate Research Experience (WMSURE) program.

A second major incentive is our department’s Directed Research program. On the initiative of one of this article’s authors, our department created a variable credit-bearing course that allows faculty to be formally recognized for their teaching and mentoring of student research outside a traditional classroom. Some faculty do enough work with undergraduates that their fourth course each year is their work with students. Other faculty earn a teaching release after they have accumulated enough credits over time by teaching through research.

A third incentive is rewarding faculty for research conducted with students. Our merit, tenure, and promotion policies explicitly value faculty mentorship of student research. And while there is no formal rule valuing coauthorship with students above coauthorship with peers, we do have an informal norm valuing faculty coauthorship of research with students. Along with this norm is the recognition that working with undergraduates involves mentorship, which can reduce research productivity. We note that our department norms and practices are rare; in other contexts, mentoring undergraduate research is undervalued in tenure and promotion processes (Hoyt and McGoldrick 2017).

The result is that most faculty in our department – 82.4 percent – have engaged undergraduates in research that led to a publication, according to an August 2022 poll ($N = 17$, out of 32 full-time faculty, 28 of whom are in tenured or tenure-eligible positions).⁵ Nearly 60 percent of faculty responding have coauthored a peer-reviewed article with a current or former undergraduate. The same percentage have co-presented with an undergraduate at a conference, while just under half (47.1 percent) have coauthored a non-peer-reviewed publication.

⁵Faculty who responded to the survey may be more likely than faculty in the department to engage undergraduates in research. As mentioned in the discussion, we plan for a more comprehensive departmental survey.

IV. Models for Organizing Faculty-Student Research

A healthy ecosystem encourages diversity. This biological analogy suggests that a thriving undergraduate research ecosystem (the combination of institutional structure, culture, and incentives) should facilitate a diverse set of means and approaches that correspond to individual faculty goals. In our department, there is not a one-size-fits-all model to foster faculty-student collaboration. Faculty can implement a collaborative model appropriate to their research interests, methods, and work style.

Still, our labs share the following “essential characteristics” (Lopatto 2009: 25). Most fundamentally, faculty provide the structure. For example, students interested in development finance are encouraged to work with AidData, while students interested in human rights are encouraged to work in the International Justice Lab or the American Bosnian Collaboration. For both faculty and students to get the most out of collaboration, alignment of substantive interests is vital. Also common to our labs, students read prior academic research; work independently and on teams with peers; have opportunities to share their work in written and oral formats; and receive pay or course credit for their work.

Another important commonality among the lab models below is inclusive recruitment. Students who have decided to attend our institution because of the undergraduate research opportunities we offer are likely to approach us. But we know that awareness of these opportunities and their value is not equally distributed across a first-year class: students from socioeconomically disadvantaged backgrounds, or who are the first in their family to attend college, may be less likely to enter college with the intention to do research and may feel uncomfortable approaching professors. Racial, gender, and personality differences also affect the likelihood of a student reaching out to a faculty member (Becker et al., 2021). Moreover, these same traits can also affect how visible a student’s aptitude for research is to a faculty member: we have all had the experience of being impressed (and surprised) by the quality of a paper from a student who is generally quiet in class.

To ensure we do not reproduce inequities in our models for undergraduate research, we take proactive steps to recruit as widely as possible. One of our department colleagues created a “Guide to Undergraduate Research” that is posted on the department website, where students can read about different research opportunities and how faculty members select students. We advertise openings for research as widely as possible and to students at early stages of their learning, using various campus listservs and via announcements in class. Our current research students also spread the word within organizations that serve students from groups historically excluded from academia.

The Ad Hoc Model

Perhaps the most conventional model for faculty-undergraduate research is the ad hoc model, where faculty recruit RAs to work on a specific project they have already initiated and for which they could use student assistance, generally at an early stage of the research. Often, RAs complete a specific task, such as a preliminary literature review, data collection, or data coding. This helps them get direct experience with research, build skills for specific tasks, and contribute to a faculty member’s portfolio. It can also provide a foundational experience for students to become more deeply involved in scholarship, including through participating in the faculty-mentored labs we

describe below. One of our colleagues, Ron Rapoport, worked with undergraduates in this way over his four-decade-long career and today can count a dozen former students who are themselves professors. RAs can be hired with funding from a grant or awarded academic credit through the directed research option.

The Lab Model

A number of Government faculty mentor and collaborate with students on research through labs, which take on different forms depending on the faculty member and the nature of the research. These labs vary on a number of dimensions: the stage at which they recruit students, the duration of the typical student's involvement, the parts of the project life-cycle students work on, and the extent to which the students are working on projects outlined by the principal investigator (PI) versus projects driven by students' particular interests.

For example, the International Justice Lab aims to recruit students as early as their first year and offers paid opportunities “to engage in research at all stages: theory building, research design, data collection and analysis, fieldwork, and writing,” as they advance in the lab.⁶ The “ideal trajectory” for students is to support the PI's existing research in their first year, then collaborate on a research paper with the PI and one or two of their “cohort mates” in their second and third years, and, finally, conduct independent research (e.g., for an honors thesis) in their fourth year. Throughout, students are socialized into the political science discipline and profession, including through regular lab-organized talks by faculty guest speakers. Multi-year opportunities like this produce “distinct personal, professional, and cognitive outcomes” for experienced student researchers, relative to novices (Thiry et al. 2012: 260). The International Justice Lab is especially concerned with recruiting, training, and retaining a diverse body of social scientists, both those who will pursue academic careers and those who will pursue careers in policy, nonprofits, and industry (Becker et al. 2021). Linn et al. (2015), among other scholars of teaching and learning, find that students from groups historically excluded from higher education generally benefit most from faculty mentorship.

Another variation of the lab model uses course credit to incentivize students. In one example, research conducted by students in American-Bosnian Collaboration is embedded within a long-standing community engagement project in Bosnia that seeks to promote intercultural competence (Kasumagić-Kafedži et al., forthcoming).⁷ This project provides opportunities for undergraduates to engage in cross-cultural, community-based research overseas (Leadbeater et al. 2006). Because it was co-founded by a Bosnian and an American to meet the educational needs of youth in a post-conflict community, the research is driven by problems in the local community. The research is student-led, and students are engaged in every stage of the project life-cycle of collaborative research. Students are carefully selected, typically in their second or third year. They take a semester-long course, participate in summer teaching and data collection, and enroll in at least one semester of for-credit Directed Research. Students are mentored in the classroom and in the field by the lab director, Bosnian partners, and lab alumni. Following community-based research practices, the American-Bosnian Collaboration prioritizes accessibility to local community members, posting coauthored papers on its website. Only selected research receives the attention needed for peer-reviewed publications.

⁶For more on the International Justice Lab, visit: internationaljusticelab.org.

⁷For more on the American-Bosnian-Collaboration Project, visit: wmbosniaproject.wordpress.com.

Student Agency

Our labs vary substantially in terms of whether and when students design some aspect of a research project (Lopatto 2009: 25). For some AidData projects, for example, students work toward the research director's vision. But there are then opportunities for students to be "upgraded" to collaborators, where students demonstrate specific ownership over parts of a particular project and, where appropriate, are coauthors. For students involved in multi-year projects, they are trained to pose workable research questions and diligently use reproducible social science methods in pursuit of a significant finding (Lopatto 2009: 25).

Research at Scale

The Global Research Institute hosts multiple labs that are sustained through external funding from private foundations or federal agencies (e.g., NukeLab, the Digital Inclusion and Governance Lab, and the Teaching, Research, and International Policy Lab),⁸ but only one lab has "scaled" to the point that every year it generates hundreds of research opportunities for students, dozens of research reports and peer reviewed articles, analyses for non-governmental organizations, international organizations, and government agencies, and datasets that are public goods for researchers, journalists, and citizens. It also generates millions of U.S. dollars in research funding and indirect costs that are used to seed new research endeavors.

AidData was created in 2003 when an undergraduate student and three faculty members decided to write a book that built upon the student's honors thesis and their own previous research. This led to a grant from the National Science Foundation (NSF) to build a better project-level dataset (Hicks et al. 2008), which led to hypotheses about the impact of aid transparency on development outcomes (Tierney et al. 2011) and, then, to a revolution in geo-coding and engagement with the policy community. Many of the lab's signature research products are conceived, executed, and coauthored by faculty members who collaborate with current and former students. A recent idea from an undergraduate student led to the creation of the world's most comprehensive dataset of Chinese development finance projects and has been used and cited in hundreds of peer-reviewed articles (Dreher et al. 2022).⁹

The type of student involvement at AidData has varied over time and across different projects. AidData currently supports eight PIs at the Global Research Institute, and all of them have different relationships with the undergraduates on their teams. Some employ a highly-differentiated division of labor, where students specialize in a single task for a semester or year, such as geo-coding, translation, or sector coding. In other cases, faculty work intensively with one or two students to write policy reports, book chapters, or journal articles. Typically, the students who coauthor and present research start by collecting and categorizing data. Almost all students working for AidData are paid from external grants and contracts.

Research Products

The preferred ends of knowledge vary among faculty members. For junior faculty, one especially important end is peer-reviewed journal articles and books. All of the authors of this article have published peer-reviewed research with current or former students and, in some cases, public-facing

⁸A list of all 10 labs at the Global Research Institute can be found here: wm.edu/offices/global-research/research-labs/index.php.

⁹See Schneider (2020) for a detailed case study of AidData and its links to the policy community.

work in outlets like *Foreign Affairs*, *Foreign Policy*, and *The Washington Post*, leveraging existing professional contacts.¹⁰ But the incentive to leverage faculty-student collaborations to create research outputs is more pronounced for pre-tenure faculty.

Students are unlikely to know the value of the end products of their research. The importance of different types of outputs likely varies alongside the wide range of post-graduation opportunities that students desire. Certainly, students who aspire to enroll in a Ph.D. program are most eager to pursue a publication stemming from their undergraduate career. Not coincidentally, this is the type of student with whom we have been most successful in “carrying a publication over the finish line,” after a student’s graduation, as it is often challenging to sustain a collaboration with a student once they have started working full time in a setting where publication is not incentivized.

But unlike for faculty – for whom unpublished or non-peer-reviewed work might not be valued – students likely benefit from simply completing a project that generates knowledge. To this end, the Social Science Research Methods Center has created a digital archive, where students can submit their work in an indexable format so that both scholars and members of the public can find it through a Google search.

Even projects that do not result in publications are valuable to students. Many of our students and alumni report that their ability to talk about their research experiences in internship or job interviews has been beneficial. Describing their collaborative research experience can signal to potential employers their ability to successfully work in a team, often with teammates from diverse backgrounds, on complicated problems. Independent and collaborative research experiences convey initiative, motivation, and perseverance. And looking further down a student’s professional trajectory, Murray’s extensive review (2017: chapter 4) suggests that there are cognitive, affective, relational and longer-term career benefits of doing undergraduate research. Describing these benefits to students is one way to encourage them to engage in research when course credit is not possible or funding is not available, though these types of incentives are likely, at least in the short term, to disadvantage students from marginalized backgrounds.

V. Challenges

Norms, incentives, and models notwithstanding, there are challenges and limitations to working with undergraduates on research.

Student Recruitment and Retention

One challenge is recruitment and retention, especially for faculty who intend to coauthor publications with students. Research is a long, iterative process. To be successful, faculty must “[identify] the right students: individuals who have both the interest in and [...] the stamina for this type of work” (Zvobgo 2022, 742).

¹⁰A reviewer asked how we identify journals that might be open to articles coauthored with students. None of us target specific journals based on the identity of our coauthors, but on whether the substantive questions and empirical methods we use in a particular project would be a good fit for a particular journal.

Faculty Career Stage

In addition, at many undergraduate-focused universities, it is junior faculty who have the most active and varied research agendas, and thus have the most potential opportunity to work with students at different skill levels on research. Younger faculty may also seem less intimidating or more relatable, lowering the barriers for students to pursue a potential research opportunity. However, these same faculty are also the most time pressured in the pace of their research output. All four authors agree that working with undergraduates typically slows down the research process.

Collaborating with undergraduates involves more training and/or more intensive mentoring than with graduate students or with peers; it often stretches an already-long research, writing, and publishing process. This suggests that the “safest” time for faculty to coauthor with undergraduates may be after tenure, or at least when tenure seems secure. That said, a large number of RAs can make otherwise impossible projects possible. One of this article’s coauthors credits her lab with her ability to conduct lab experiments that drove an important arm of her research agenda. So, perhaps junior faculty need to be strategic in their decisions about working with undergraduates, including students when the potential payoffs are high and excluding them when the potential payoffs are low.

Funding

Securing external funding is a challenge for research in general, but it is often even more challenging to obtain for collaborative research that substantially involves undergraduates. Internal funding is also competitive and often only partial, particularly for research overseas. There is no easy solution here: faculty often must submit multiple grant applications yearly, on top of their other responsibilities. We recognize that, at our institution, we benefit from the efforts of our colleagues over the past 40 years to create pots of seed funding from alumni donations and from our two most recent Deans who provided unusually large start-up packages that have been used to launch research labs. Both these features have helped to strengthen the competitiveness of our external grant applications. More broadly, we applaud the NSF’s efforts to better support the integration of students into research by recognizing the inclusion of undergraduates into funded projects as a way to have a “broader impact.”

External Evaluation

Our department’s most recent external evaluation praised the faculty for offering undergraduate research opportunities and characterized students’ work with faculty as a “very strong suit” for the department. As mentioned earlier, this is significantly due to informal norms and institutional incentives. However, the department leaves it up to individual faculty in their tenure and promotion narratives to explain to external reviewers – who may not have experience working with undergraduates on research – this work’s importance in our institutional setting. This may create unevenness in assessments. As a remedy, the department could communicate to external reviewers its support of faculty-undergraduate research and explain the commitment necessary to do it.

VI. Discussion

In sum, our university type, efforts to develop an ecosystem through formal incentives and informal norms, and the initiatives of our department's professors and students have encouraged faculty to engage undergraduates in research. That said, our institution and department could do more to support faculty-student research collaboration, particularly assisting faculty who feel overextended or lack sufficient funds, and students who need greater access to opportunities.

As a first step in developing recommendations to address challenges to faculty-student research, we plan to gather data through surveys that will be sent to department faculty, students, and alumni. These surveys will more systematically capture the level of undergraduate involvement in research, the nature of research involvement, faculty and student perspectives on the benefits and challenges of collaborative research, and suggestions for enhancing future opportunities.

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