The 2021–22 Psi Chi president’s theme by Dr. Ngoc Bui focused on promoting networking and mentorship experiences within Psi Chi, particularly for undergraduate students who may be the greatest beneficiaries of these experiences. One way to foster these mentorship experiences is through student mentored research, which typically involves a faculty researcher overseeing and/or including undergraduate student involvement in the research process, whether that be faculty- or student-led. Moreover, these student mentored research experiences can be incredibly useful for those who are seeking graduate school (Koch, 2008).

Although it is well-known that graduate schools are generally looking for student applicants with research experience as an undergraduate, it can be rather challenging for students to obtain such experience (Hughes et al., 2019). For instance, a willing faculty member may be overloaded with other work demands or not have the resources wherein to involve undergraduate students in research. Similarly, an undergraduate student may not realize how important research experience is or may simply not know how to get involved. Compounding things further, student mentored research may seem incredibly daunting to both faculty and students as both struggle to meet demands placed on them from other sources (e.g., teaching, coursework, graduate students). Rob is at a university that is almost exclusively teaching-focused, Jenny's faculty position involves both teaching and research, and Kimberli’s university is a Tier-1 research institution with graduate student demands. As such, we have written this editorial in the hopes to aid faculty in undergraduate student mentored research by sharing some insights that each of us have discovered in our own unique faculty positions.

**Rob Wright: Research Mentoring at a Teaching-Focused University**

Situated near Grand Teton and Yellowstone National Parks, Brigham Young University-Idaho (BYU-Idaho) is a large private undergraduate student-focused institution that exclusively develops and practices innovative teaching with no graduate or research programs. The Psychology Department boasts a vibrant ~1,700 psychology majors with three separate emphasis areas: general psychology, health psychology, and I/O psychology. In 2015, I established the health psychology emphasis and currently supervise the ~500 declared student majors. I also recently received the Early Career Award from Rocky Mountain Psychological Association for student mentored research with these students who have often received awards of their own. Although most of our graduates do not pursue graduate school education, a substantial subgroup (~30%) is at a disadvantage with little to no research experience. Despite our creation of a required Experiencing Research course where groups of students conduct a research study, our semester time constraints (14 weeks) and sheer volume of students make it difficult for majors to experience the research process that most graduate schools find attractive. In this context, establishing my small research lab devoted to the field of health psychology has been a process requiring time, effort, and collaboration. However, I have a deep appreciation for mentored student research ever since I was an undergraduate student myself at Utah State University where I conducted my own senior honors thesis study that received a grant and was later published in the *Psi Chi Journal of Psychological Research* (Wright et al., 2007), which had a large impact on my success in graduate school. As such, despite the difficulties, I felt it was immensely worth it because I have benefited from and inherently enjoy the mentorship relationship and process. Below, I describe three elements that I think were critical to the success of my small research lab in providing student mentored research experiences at an exclusive teaching-oriented institution.

First, I established the need for a small research
Student Research Mentoring | Wright, Treadwell, and Hughes

lab by collaborating and being assertive with the department and university administration. This took time and patience. Naturally, as a newcomer to BYU-Idaho without tenure, I was hesitant to ask for things that I felt I needed. However, with the guidance of good colleague mentors, I developed a rationale for lab space, equipment (e.g., blood pressure machine, bioelectric impedance scale), and personnel (e.g., paid student research assistant). Although I was nervous about asking for these resources, I was amazed to receive many of them. I am convinced that two primary factors worked in my favor: my arguments were justified by statistics I had gathered (e.g., student interest) and the timing was appropriate (e.g., resources were available).

After that initial granting of requested resources, my research lab has been an active source of student research mentoring of around 20 undergraduate students each academic year, with most of those going on to graduate school.

Second, I developed eligibility criteria for interested students. No matter how you do it, student mentored research is challenging, time-consuming and limited by space. Thus, I focused on inviting those students who meet my stipulations including: (a) asking me about opportunities (good indicator of future success), (b) completion of Research Methods (necessary for basic research skill development), and, most importantly, (c) exemplary performance in my Health Psychology course (good indicator of matching interests). These criteria are helpful in protecting the research team from being “infected” by a student who is not motivated, helpful, or positive, which can greatly detract the research team (this has happened before). Timing is important too, as I have found that I need to consider who I will invite to join my lab the next semester as early as the middle of the semester prior (Week 7), before registration opens. Otherwise, my student availability is restricted to those who may not be as conscientious or committed, two critical student characteristics in a research setting. Moreover, without graduate student human resources, it is incredibly important to have a lead research assistant (such as the paid position I requested) who is motivated, punctual, hard working and excited about conducting research. As a faculty member with limited time, it is essential to have a student leader who fits these characteristics, as I will often ask this student to organize the group, remind me of upcoming deadlines, and participate in advanced research procedures (e.g., data analysis).

Third, determining the tasks and focus of my research lab has been of upmost importance. Early on, I allowed students to bring their own ideas for potential exploration. Although that approach has merit, challenges emerged due to the time restrictions of a single semester. As such, I now provide my team with some scaffolding, such as a health psychology-related study that is ongoing, where we collect, analyze, and publish on data across multiple semesters. This model allows students to join the team at different stages of ongoing research efforts. Generally, this has worked well, though several students have expressed interest in remaining on the research team for multiple semesters and that can work too. As I make adjustments to our lab projects, I have found it important to be forward-thinking so that I am considering changes the semester before I intend to implement them. Importantly, I try to have some type of a goal or deliverable each semester for the team to work toward from the outset of the semester. These have ranged from oral/poster presentations at local (BYU-Idaho), regional (Rocky Mountain Psychological Association), and national (American Psychological Society) venues to academic publications in journals (Psi Chi Journal of Psychological Research) and even presentations given to my current courses I teach (this is especially useful when no other option seems available).

Finally, publication of student mentored research can be rather daunting, particularly as a seasoned faculty researcher may become frustrated with the mentorship process of an inexperienced undergraduate student. However, I have found a wide-range of options that have made these feasible and rewarding for both myself and the student. One option involves a highly motivated student approaching the faculty with their own idea, then conducting the study under supervision of the faculty researcher and completing a majority of the manuscript preparation. One such student approached me and we conducted a study on a topic that was outside of my research lab but involved other student research assistants (Moon et al., 2017). On the other end of the spectrum, undergraduate students can join the faculty member under an existing research program spanning several semesters and publish with the lead researcher. One example comes from a three-part intervention study we conducted over multiple semesters to address perceived barriers to eating healthy foods (Wright et al., 2021). Of course, there are many variations between these two options that involve the student researcher more or less, which has been more common and feasible for me with
my limited resources. For instance, a few student researchers joined my team after learning of my current research examining technology use and student health, which we examined together in two recent studies (Wright et al., 2018; Wright et al., 2020). As one may note from these example publications, undergraduate-friendly journals like the Psi Chi Journal of Psychological Research are incredibly helpful, though a wide range of journals can be successfully solicited. Thus, from my experience, I would suggest undergraduate that student mentored research can be done at teaching-focused universities, especially as professors (a) establish the need for a small research lab, (b) develop and enforce criteria for students to join the research lab, and (c) provide a clear goal or research experience for the research team to accomplish, including the difficult, but attainable goal of publication.

Jenny Hughes: Research Mentoring at a Small Liberal Arts College

Agnes Scott College is a historically all-women’s college in metropolitan Atlanta. It is a private liberal arts college with just over 1,000 undergraduate students, and the College recently started several new master’s programs. For the past few decades, the most popular undergraduate major at the College has been psychology, and according to departmental records, 60% of the majors go on to graduate programs. Among national liberal arts colleges, the U.S. News and World Report (2022) designated Agnes Scott as #2 Best Undergraduate Teaching for the second year in a row. The College is unique in that faculty are expected to have robust research programs, in addition to being exceptional instructors. This can be challenging without having doctoral students, but there are things that can be done to have a successful lab with undergraduate students (Hughes, 2014). For example, since starting in 1998, I have worked with 245 students in my lab and about half of those students worked with me for more than one semester. Some even worked with me for three or four years. Besides my individual research, I have published 37 papers and two chapters with students as coauthors. In addition, my students and I have presented 311 papers at research conferences.

In 2014, I wrote a paper for the Psi Chi Journal about a research model I use to help undergraduate students present and publish their research because that is one of our goals in our psychology department (see https://www.usnews.com/best-colleges/agnes-scott-college-1542/overall-rankings). In this editorial, I would like to highlight three things, mentioned in the article, that I do, which have been especially helpful when mentoring undergraduate students in my research lab.

First, I break down the research process into manageable steps, and after students complete each step, they have the components to make a quality research paper. My students often comment that this helps them learn the research process and makes it less overwhelming. I also have alums who tell me that they continue to use this method while in graduate school. I know that asking undergraduate students to write a paper with little guidance often results in papers that are rushed and poor in quality. As I mentioned in my 2014 paper, I include the following tasks:

(a) hypotheses and proposed statistical tests to be used; (b) articles and book selection and a justification of why they chose those articles and books; (c) summaries of the articles and books they read; (d) a title for the paper; (e) an introductory paragraph; (f) an outline of their literature review; (g) a literature review; (h) a method section; (i) statistical analyses and their interpretation of their analyses; (j) a results section; (k) a discussion section including a summary of their findings, how their findings compare with other research literature, strengths of their study, weaknesses of their study, and future research ideas; (l) references; and (m) an abstract (p. 222).

For each of these tasks, I check my students’ work. This reinforces that I have high expectations for the research produced. This is especially important to me because I expect that my students will present their work at conferences and also that some students will publish their work. I often recommend submitting to the Psi Chi Journal of Psychological Research.

Second, I select research topics that are part of my research areas (i.e., couples, positive psychology, and commuting to and from work). I develop a project that I want to do individually during the school year, and then the students work on smaller projects related to my project for a semester. We collect data as a group. This means that I benefit from the project by doing my own individual research, and I also mentor students during the process. Having weekly meetings with students helps to keep me on track with my own research.
Third, I have students with varying knowledge and experiences and also alums work in my lab. I often ask Psi Chi members, students who are not yet eligible to join Psi Chi but who have excelled in one of my courses, and alums to join my lab. This results in having students who work in my lab for multiple years. I ask each student to commit to at least a semester and they complete a project during the semester that is ready to present at a conference. If they continue for another semester, they often work to publish that work. Then if they commit to work in the lab again, they start a new project. When students return to work with me, I have them share their prior research experiences and help to mentor the other students, especially the students who are learning about research for the first time. Students are inspired by seeing that other students and alums have successfully presented and published their research from my past labs.

Kimberli Treadwell: Research Mentoring at a Tier-1 Research University

The University of Connecticut, the third public land-grant university established in 1881 and a Top 25 Public Research University as ranked in U.S. News and World Report (2022), actively engages undergraduates in research. Undergraduates seek resources at the Office of Undergraduate Research to connect with research mentors; the office awards funding of $500–$4,000 to over 200 students each year, totaling over $600,000 across 10 different funding programs for research support, research supplies, and conference travel. UConn students presented over 300 research posters at the two annual Frontiers in Undergraduate Research Exhibition this past year. An annual Undergraduate Research Mentoring Award (for which I have been nominated twice since tenure) highlights professors’ contributions in developing undergraduate research endeavors. My department, the largest major in the College of Liberal Arts and Sciences with 1,000+ majors, is consistently ranked in the top 15 psychology departments for total research and development spending by the National Science Foundation. A Department Participant Pool assists in recruitment, which I coordinate. I observe undergraduates from multiple majors serving a variety of roles across vastly diverse research topics in core areas including behavioral health, neuroscience, cognitive science, and social relationships to enhance their undergraduate experience. Specific goals outlined at the beginning of a semester, in the context of ethical treatment of humans (for me) or animals (for other colleagues) is the basis for a variety of skills, which vary based on the focus of the lab. Within this context I approach undergraduate research mentoring in a scaffolded semester-based approach.

January 19, 2022. I sit in the first research team meeting for spring 2022 with my undergraduate and graduate students as I overlook a snowy quad busy with students passing by. Each of the nine undergraduates sitting here for this graded independent study course referred to as “research team” first completed an online lab application, met with a graduate student in my lab to discuss lab projects, interest, skills, and overall fit for the lab, then met with me to define specific research goals and course credits at the end of Fall 2021. I am pleased to see them and we chat about winter break and open the semester with a team building exercise. The five seniors have been in my lab 2–7 semesters; one will complete her honors research project, one will complete their senior capstone research thesis, one is a project coordinator, and two are expanding their research skills to include data analysis and writing. Three have a conference poster presentation under their belt as coauthor in previous semesters, four have accepted conference presentations this spring, and two will convert their projects into manuscripts to submit in May. I review the syllabus with the team, describe the main focus of the research lab (cognitive learning approach to anxiety in adolescents), outline how each student will be exposed to all steps of the scientific method this spring (just not all within the same project), arrange for tours of the lab rooms and key distribution, and give updates on a grant submission. Each project coordinator (graduate or undergraduate student) reviews the status of the five research projects at varying stages of completion and each student’s role in their chosen project(s). All students sign up for a journal club presentation for ensuing meetings. The new undergraduate is assigned CITI ethics training, and the remainder start coordinating schedules for the upcoming week to review experimental procedures and data coding to ensure reliability that coefficients have not dipped over winter break. Requested lab hours are due on Monday to the lead graduate student who will create a master online team lab schedule. Any questions? Off we go.

What do these undergraduates hope to gain from research? What do I expect of undergraduates at this Tier 1 Research University (designated to only 2.5% of higher education) that evaluates
My graduate students serve as project coordinators and assist in supervising the undergraduates, with one taking the lead as lab manager. I am present at weekly meetings and also directly supervise research projects, with weekly individual meetings for undergraduates pursuing student-initiated research projects.

May 8, 2022. Our first-author undergraduate manuscript was rejected by the first journal and has been resubmitted to a second; we continue to write the second senior’s first-author paper targeting submission in fall. A graduate student’s first-author paper was accepted. Four senior undergraduates presented first-author research posters at international and regional conferences. Graduating seniors are heading to medical school, graduate programs in social work and clinical psychology, and jobs in education and counseling settings. Three rising seniors are returning to lab in the fall; two plan to collect data for their honors theses (one carved from a lab project and the other a separate IRB) and another is returning as a project coordinator. Both seniors and I will submit the IRB applications over the summer. A rising junior will return for her fourth semester as a project coordinator. Four new faces will join us in the fall to assist in the new grant-supported project. I will return for the joy of working with my students.

Conclusion
Throughout our collective experience, student mentored research has offered numerous benefits and advantages to us and our students that have made the effort worth it and enjoyable. We have encountered obstacles (e.g., limited resources, time constraints) in our unique respective efforts to engage in student mentored research but maintain that it has been a rewarding process for us and our students. As other faculty and students seek to engage in experiential research learning models, we hope our suggestions here can be helpful in making the process more gratifying for all involved. Because, when asked the reason behind why we continue to engage in undergraduate student mentored research, we simply respond, “because we enjoy it.”

References


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