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## **University Professorship Proposal “The Undergraduate Research Experience”**

Undergraduate student researchers are an essential part of the creation and transfer of new knowledge at the University of Utah. According to the 2016-17, 2017-18, and 2018-19 annual reports submitted by the University of Utah Office for Undergraduate Research, there have been steady increases over the last three years in the number of undergraduate students who have: applied for research and conference travel funding; given research presentations at local, regional, and national symposia and conferences; co-authored journal articles; attended presentations on topics related to undergraduate research; and received the Undergraduate Research Scholar Designation on their diplomas. Current data from this year indicate these trends are continuing in the same direction.

With this increase in interest in undergraduate research, there is a corresponding need for an increase in research training. Currently, training occurs primarily through presentations hosted by the Office for Undergraduate Research, departmental curricula in disciplinary methodology, and faculty mentors who guide students through specific research projects. Faculty mentors often lament, though, that undergraduates who are new to research lack basic research skills that are foundational to their success in a research context. These skills may include communicating with mentors and collaborators in a research setting, understanding research ethics, finding and dissecting research literature, and research writing. Without these skills, undergraduate students may be discouraged or prohibited from pursuing research opportunities in their discipline. In addition, students who are new to the university setting and/or from more diverse or underprivileged backgrounds, and who are thus also new to academic research, may not have a clear understanding of the role of research in higher education. From the faculty perspective, the time spent teaching undergraduate mentees these basic skills can be significant, and it is typically in addition to a faculty mentor’s normal teaching and advising load. This extra workload may even lead some faculty to shy away from recruiting undergraduates into their research programs. It is essential that the University embrace and support the recent increase in undergraduate research by providing focused training in basic research skills early on in students’ undergraduate study, thereby preparing them for success in direct research experiences with faculty in their disciplines later on. The objective of this proposal is to expand university training of basic research skills for a broader population of undergraduate students early on in their studies in a general education course. This project that will be conducted in collaboration with the University of Utah Office for Undergraduate Research, and it is aligned with the strategic mission of the University of Utah to promote student success, with particular emphasis at the undergraduate level.

The undergraduate years are well documented as a time of transition, and this is currently represented in the coursework offered by the university to help students transition from high school to college (e.g., EDPS 2600 Strategies for College Success; Learning, Engagement,

Achievement, and Progress (LEAP) program). However, there is no specific program or coursework to help students transition into the role of research mentee, despite considerable interest in such training from students and faculty across the university. Like other institutions in the Pac-12, the University of Utah's Office of Undergraduate Research currently funds semester-long research projects (i.e., Undergraduate Research Opportunities Program) and peer advisors (i.e., Undergraduate Research Leaders), and it regularly hosts hour-long presentations on research-related topics. These presentations are not required for all undergraduates, though, so they may be overlooked by many of the individuals who need them most – students who are brand new to the research experience. Other Research I universities (e.g., University of Wisconsin – Madison) have taken the additional step of offering an introductory-level undergraduate course in general research skills early on in undergraduate students' college careers. This coursework teaches students about the research side of the academy and prepares them for more informed and successful research experiences as they advance in their studies. Providing explicit education about the role of research in the university as well as the skills needed to engage in this research will increase the likelihood of successful research experiences for undergraduate student mentees, and enhance the research mentoring experience for faculty mentors.

The proposed project consists of three parts: 1. Host a workshop for faculty, research directors, and Office of Undergraduate Research staff in training of undergraduate research mentees, which will facilitate the second phase of the project.; 2. Develop an introductory-level undergraduate course called "The Undergraduate Research Experience" to be offered through the Educational Psychology Department; and 3. Host a one-day mini conference during Undergraduate Research Week in April of 2022.

1. **Workshop on Facilitating Mentee Training.** The project will commence with the hosting of a two-day workshop at the University of Utah called: *Facilitator Workshop: Learn to Implement Mentee Training* to be presented by staff from the Center for the Improvement of Mentored Experiences in Research (CIMER) at the University of Wisconsin-Madison. CIMER is nationally recognized for their research on mentor and mentee training, and they have developed workshop series to help attendees build and deliver research training. The proposed workshop would take place in Fall of 2020 and attendees would include myself, staff from the Office of Undergraduate Research, as well as directors from other units across campus that offer undergraduate research internships and programs (e.g., Chemistry Research Experience for Undergraduates; Genomics Summer Research for Minorities Internship; Huntsman Cancer Institute's PathMaker Cancer Research Program; Native American Summer Research Internship; Physics and Astronomy Research Experience for Undergraduates; Atmospheric Sciences Research Experience for Undergraduates). As stated on CIMER's website (<https://cimerproject.org/training-fer/>), the workshop covers areas of research trainee development, evaluation, and assessment, as well as sample research mentee curricula. The content covered in this workshop will be used to help develop the specific course for undergraduate research mentees described in #2 below, but it will also inform the design

and implementation of broader undergraduate research mentee training initiatives through the Office for Undergraduate Research and other units on campus.

2. **Course Development.** The second goal of this proposal is to collaborate with the Office for Undergraduate Research to develop a course called “The Undergraduate Research Experience,” which would be offered through the Educational Psychology Department in Spring 2021 and Spring 2022. The University of Utah would be the first institution in the Pac-12 to develop a general education course that focuses on training undergraduate mentees in both the role of research in higher education as well as basic research skills beyond discipline-specific methodology and content knowledge. The course will be designed to cover basic skills that will facilitate and enhance students’ subsequent research experiences across multiple disciplines. The course will be offered in hybrid format, with online modules and on-site discussion components. Within each online module, students will interact with the faculty instructor as well as with undergraduate students who are currently involved in research projects, and they will be introduced to relevant resources across campus. On-site class discussions will be co-facilitated by one of the University Research Leaders (undergraduate student research ambassadors and peer advisors) appointed through the Office for Undergraduate Research. Course modules will include the following topics:
  - a. *Role of Research in the Academy* – The beginning of the course will discuss the role of research in the academy and how undergraduate students fit into that role.
  - b. *Researcher Roles and Identities* – The second module will focus on how students’ multiple identities (e.g., personal, cultural, socioethnic) may merge with their developing role as a researcher, and the challenges this may present.
  - c. *Communicating with Faculty Mentors* – This module will discuss how to find faculty mentors, best practices for communication with mentors, and how to avoid and resolve conflicts with research collaborators.
  - d. *Research Ethics* – This module will raise awareness of ethical issues in research and how to recognize and respond to unethical behavior in research practice. Students will be introduced to University resources such as the Internal Review Board and the Office for Research Integrity and Compliance.
  - e. *Organization and Time Management Skills* – In this module, students will learn ways to maximize efficiency in the research setting.
  - f. *Reading within the Discipline* – This module will focus on location and dissection of research literature, with considerations of research language and article structure. Students will be introduced to research resources available through Marriott Library and the Eccles Health Sciences Library.
  - g. *Writing within the Discipline* – In this module, students will learn about how research-specific writing may differ from other forms of academic writing. They will be introduced to different forms, such as proposals, talks, posters, and formal articles, and they will learn about writing resources available from the University Writing Center.

- h. *Equity and Inclusion Awareness in Research* – This module will explore the benefits and challenges of individual differences in the research environment, with incorporation of strategies on how to support progress of self and others, navigate challenges, and contribute to diverse research teams.
- i. *Professional and Career Development Skills* – The course will conclude with a module that raises awareness of research-oriented careers and training, as well as students self-assessments of the skills, knowledge, and experiences they will need for their own chosen career paths. Students will learn about how to utilize the Office for Undergraduate Research and the University’s Career and Professional Development Center to facilitate their academic and career goals.

Feedback from students and University Research Leaders will be collected for the course in Spring 2021 and used to revise the course for implementation in Spring 2022. This course will also be proposed as a regular offering in the Educational Psychology Department curriculum in collaboration with the Office for Undergraduate Research, and it will be submitted for approval for a General Education designation in Behavioral Science.

- 3. **Mini-Conference on the Undergraduate Research Experience** – in collaboration with the Office for Undergraduate Research, a one-day mini-conference on undergraduate research training will be held during Undergraduate Research Week in April of 2022. Currently, the Office for Undergraduate Studies hosts the Undergraduate Research Symposium in April of every year; student researchers are given the opportunity to present their work in poster or talk format. We propose to expand this experience into a mini-conference by inviting three national experts in undergraduate research training to come to the University of Utah for a day to talk with faculty, students, and relevant research staff about trends, challenges, and opportunities in undergraduate research training.

**Budget:**

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|--|---------|
| 1. Mentee Training Workshop by CIMER in Fall 2020<br>(covers cost of workshop, materials for 20 attendees, airfare & lodging for workshop facilitator, plus incidentals) | \$9,000 |
| 2. Course  |         |
| a. Spring 2021   |         |
| i. 5hr/week stipend for 1 University Research Leader   | \$1,000 |
| b. Spring 2022   |         |
| i. 5hr/week stipend for 1 University Research Leader   | \$1,000 |
| 3. Mini-Conference in Spring 2022  |         |
| a. Airfare and lodging for 3 speakers  | \$3,000 |
| b. Honorariums for 3 speakers  | \$2,000 |
| c. Food, Room Rentals, Publicity, and Incidentals  | \$3,000 |

**Additional Resources:** Additional funding for the proposed project will come from the Office for Undergraduate Research and the Educational Psychology Department. We will also contact other relevant units on campus (such as those as potential workshop attendees under #1) as well as the Office of the Vice President for Research regarding their interest in supporting the proposed project.

## Undergraduate Teaching Experience: Evidence of Creativity and Success

I have over 20 years of experience in teaching and mentoring undergraduate students on research-related topics, and as an administrator I have worked to increase the focus on undergraduate research in my department and college.

1. **Undergraduate Teaching:** As a Professor in the Educational Psychology Department, I have developed and taught the undergraduate course EDPS 2030/3030 (Research and Inquiry in Education) for inclusion in the core required curriculum for students earning undergraduate degrees in education. In this course, teachers in training are introduced to the importance of research in education, how to find, understand, interpret, and apply educational research, and how to conduct their own action research projects to facilitate their future professional practice. Throughout the course, students practice reading primary research articles on “hot” topics in education while learning about different research methodologies; this sets the stage for deeper learning and better application of course content. This instructional approach was recently documented in a peer-reviewed chapter publication with two of my students:

Wei, W., Hudson, M. A., & Cook, A. E. (2019). Using primary research literature to teach critical thinking in pre-service teacher education. In G. J. Mariano & F. J. Figliano (Eds.), *Handbook of research on critical thinking strategies in pre-service learning environments*. (pp. 448-469). Hershey, PA: IGI Global.

Although students enrolled in EDPS 2030/3030 are not preparing to be researchers, they exit the class understanding the importance of research in K-12 education and how it fits into their roles as future practitioners. My average ratings for this course (across 5 sections) are strong (Course = 5.35, Instructor = 5.64), and my students frequently comment on my ability to make research interesting, understandable, and relatable:

*“Anne was absolutely phenomenal. I (unfortunately) came in slightly with a bad attitude about this class. I was positive that it was going to be too hard for me, the content too abstract for me to grasp, and that I would not feel confident-but I was so WRONG. Anne is fabulous at making her students ditch those bad misconceptions about research studies and papers, she presents content in the easiest way possible and relates everything into understandable content. I cannot say enough good things about Anne and this class.”*  
(Spring, 2016)

*“Dr. Cook was very good at teaching the course material. A lot of her teaching focused on applying concepts, terms, and other course materials to real studies and situations, which made it a more meaningful and effective learning experience. Each class consisted of lecture, discussion, and group work and I found it very beneficial. I really enjoyed coming to class and learned a great deal. Wish all my teachers taught this way, honestly”*  
(Spring, 2015)

*“Professor Cook found unique cases to help introduce information on research methods. Overall, she presented material in a way that made concepts memorable.”* (Spring, 2014)

*“1) I loved the fact that you were able to take a particularly dry subject and make it interesting. 2) I liked that all of the information was related to real life situations in the classroom.”* (Spring, 2013)

*“I loved how she combined several different styles of learning to approach content regarding “research and inquiry” (e.g., collaboration, individual writing, and direct instruction). Additionally she simplified the material, and highlighted the attachment that research has to education. Furthermore, its implications for how we will approach our practice”* (Spring, 2013)

2. **Undergraduate Research Mentoring:** I have mentored several undergraduate researchers in my own lab, including but not limited to mentorship of two Undergraduate Research Opportunities Program (UROP) students in the last two years. Both UROP students have successfully gone on to graduate programs, and one is working on publishing his UROP project in a peer-reviewed journal. Several students in my lab and I also collaborated on an invited instructional guide designed to teach novice students (i.e., undergraduates) about research in my specialty area:

Dean, S. C., Wei, W., Cook, A. E., & O’Brien, E. J. (2017). Teaching and learning guide for: Fundamentals of inferencing during reading. *Language and Linguistics Compass*. DOI: 10.1111/lnc3.12251

In Fall 2019, I participated in the Undergraduate Research Mentor Development Program offered through the Office for Undergraduate Research. I was excited to work with other faculty and graduate students from across campus to learn more about critical issues in mentoring undergraduate research trainees, I have already implemented some of the content from this program into my own advising practices this semester.

3. **Administrative Efforts to Enhance Undergraduate Research:** I served as Educational Psychology Department Chair from 2013-2019. During this time, I worked to expand the role of undergraduate researchers in our department. This is significant given that our department only offers graduate degrees; the majority of department faculty do not teach undergraduate courses and thus do not have regular exposure to undergraduate students. During my appointment as chair, there was a large increase in the number of funded UROP applications, honors theses, and undergraduate research projects across multiple labs in the department.

As Director of Student and Faculty Affairs in the College of Education from 2017-2019, I worked to expand our college’s annual graduate student research fair to include sessions and information booths for undergraduate researchers. These efforts more than doubled the participation in the event and served to highlight the important role that undergraduates play in research in our college.