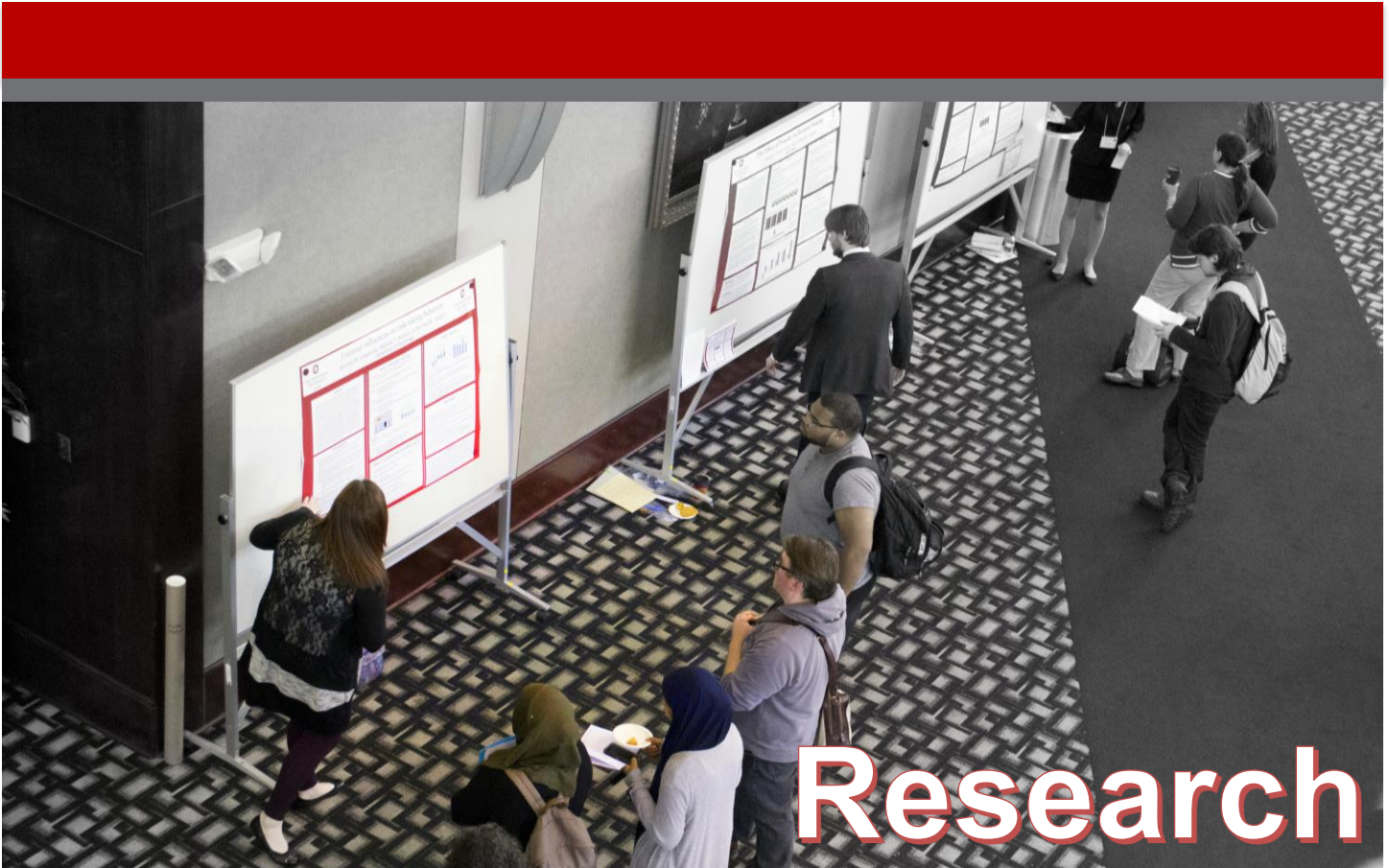




Teaching @ Newark

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As researchers ourselves, we understand the value of research for our own lives, and we want to encourage our undergraduate students to experience the fascination of getting involved in the ongoing investigation of our physical, ideational, social, and psychological universes. We may know intuitively that students should have the experience of getting lost in a long-term project, digging deeper into new discoveries and thinking creatively over how to express their findings and insights to others clearly and compellingly. But how do we get them involved, and what does a student who is not planning to become the next generation of us get out of the experience? This second issue of *Teaching @ Newark* looks at the benefits of mentoring research, the joys, challenges, and advice of expert mentors on our campus, and the many, many resources available to us throughout Ohio State.

M. Weiser

Benefits for Student Researchers

Ohio State has an Undergraduate Research Office in Columbus devoted to student researchers and their faculty mentors. Their comprehensive website is at <http://undergraduateresearch.osu.edu>. They open the site with a definition: Undergraduate research is *"an inquiry or investigation conducted by an undergraduate student that makes an original, intellectual, or creative contribution to the discipline."* Their list of benefits includes the following.

Educational benefits include:

- Working closely with a faculty mentor
- Learning about issues, methods, and leaders in students' chosen fields
- Applying concepts learned in coursework to "real life" situations
- Sharpening problem-solving skills
- Reading primary literature

Professional benefits include:

- Exploring and preparing for future careers
- Developing marketable skills
- Enhancing professional communication skills
- Collaborating with others and working effectively as part of a team

Personal benefits include

- Growing as a critical, analytical, and independent thinker
- Meeting challenges and demonstrating the ability to complete a project
- Discovering personal interests
- Developing internal standards of excellence

Teaching @ Newark is prepared by Elizabeth Weiser, Liaison for Teaching & Learning, with thanks to English major/writing minor Jessica Kennedy for her work on this issue.

Why Promote Research?

Undergraduate research helps not only you and your student but also your university and even your community.¹ Alumni that participated in in undergraduate research have been shown to give back more to their community and to the university.²

Undergraduate research experiences have been described as a "high-impact" learning practice that involve "students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions."¹ Nearly all students say learning about research made them more curious about the world, and 90% say that it was fun to work on hard problems.²

A Gallup-Purdue study of 30,000 college graduates in 2015 found six positive experiences "that strongly relate to whether they felt their colleges prepared them well for life and that might have bettered their chances of receiving their degrees on time." *Four of the six can be linked to an undergraduate research experience.*

Three experiences involve faculty support: (1) I had at least one professor...who made me excited about learning. (2) My professors...cared about me as a person. (3) I had a mentor who encouraged me to pursue my goals & dreams.

And three involved experiences: (4) I worked on a project that took a semester or more to complete. (5) I had an internship or job that allowed me to apply outside the classroom what I was learning in classes. (6) I was extremely active in extracurriculars.

The numbers of undergraduate researchers are increasing dramatically at Ohio State. According to the Undergraduate Research Office, just from 2013 to 2014 "overall enrollment for research credit increased by 20%." And at Ohio State Newark, students are funded to work with faculty in fields from music to ecology to English to psychology and beyond, they present locally and nationally, they co-author papers and write theses, and they contribute to what makes Ohio State a research institution.

¹ Mariani, Mack et al. "Promoting Student Learning and Scholarship through Undergraduate Research Journals." *PS: Political Science and Politics* 46.4, 2013, 830–835.

² TEDxTalks. "Preparing Students for the World through Undergraduate Research: Bethany Usher at TEDxGeorgeMasonU." YouTube. YouTube, 10 June 2013. Web. 03 Feb. 2017

Training student ecological researchers in Wild Coshocton

Shauna Weyrauch

Shauna Weyrauch, a lecture in EEOB for the past 13½ years, used to study frogs, but lately the ecologist has gotten students involved in her research by turning to a much cuddlier animal—bobcats. Shauna has turned an interest in wild cat ecology and conservation into a project that currently involves five undergraduates in real-world research.

With a Newark Campus Scholarly Activities Grant, Shauna initiated a long-term camera trapping study of bobcats in Coshocton County, Ohio. It is believed that the numbers of bobcats are increasing as the animal expands its distribution throughout southeastern Ohio. Bobcats are migrating from Pennsylvania, West Virginia, and Kentucky, reclaiming the land they once roamed on freely as abandoned farms and mines leave behind the kind of scrubby landscape perfect for these mid-sized cats.

Project Wild Coshocton uses 32 camera-traps, each with a 32GB memory card with the capacity to hold several thousand pictures. The cameras capture a photo of any animal entering their zone along trails in the county. Shauna's team then analyzes the photos captured, identifying species and recording them into a spreadsheet. These data allow Shauna to keep track of where and what is thriving in selected locations throughout the county. She determines not only where the bobcats are but where their prey are multiplying, allowing her to predict future bobcat locations.

Shauna started the project not only to help keep track of the bobcat population, but to also promote research among undergraduate students. She has a passion for the outdoors and wants to impart that to students who “strongly desire” education in nature. Students, she says, like to work on independent projects when they find a topic that interests and engages them.

She shares her information with the Ohio Department of Natural Resources Division of Wildlife, which is responsible for endangered species in Ohio, and this helps the students to know that they are contributing to an important project with real potential results.

She also sees it as her job to teach the students skills that they can use in the future, such as how to set up and use a spreadsheet to collect and arrange data, and, possibly, how to set up their own research and present their findings at conferences and public talks.

Finding and funding the students

Shauna typically describes her research project on the first day of her classes in introductory biology for majors, and as the semester goes on she always has students approaching her expressing interest in participating.

She currently pays one field assistant using a Newark Campus Faculty-Initiated Student Assistantship Grant (FISAG). Each weekend during the February-to-June field season the two of them head to Coshocton to check the cameras and collect the memory cards. On campus, Shauna has another four students enrolled in Independent Studies courses for credit, and these students analyze and catalogue those thousands of photos. In 2016 alone she captured 120,000 photographs of Coshocton wildlife, and each one needed its species and other information identified and entered into the extensive database.

While it takes time to train the students to identify predators, prey, and stray vegetation, Shauna is happy to spend it. “The students enable this project,” she says, noting that there would be no way she could otherwise analyze all her data. She is hoping to recruit more research assistants to the project, imparting her passions for undergraduate research, wild cats, and nature to ever more students.



“Student research is one of the most rewarding aspects of my job”

The Psychology Faculty

Psychologists **Melissa Buelow, Julie Hupp, Marilee Martins, Brad Okdie, Chris Robinson, and Jim Wirth** make up arguably the most active unit on campus in promoting undergraduate student research. What do they do and how do they do it? *Teaching @ Newark* asked them to describe their work.

Q: How do you get students to do independent research so early in their careers?

Marilee: I discuss my research with my Intro Psych students on the first day of class, and then tie in my research with the various topics of Intro Psych throughout the semester. I have pulled aside top-performing students from time to time to ask if they are interested in being involved in research, particularly those who show an interest in majoring in psychology. I also think it's important to share enthusiastically about my research, and let them know about other research studies that OSU-Newark students have been involved with.

Julie: As a department, we strongly encourage psych students at all levels to attend the Newark Research Forum to see what other psych students are doing. Also, near the time that students are registering for classes each semester, I make a general announcement to any interested psych students. I time it for a time when I'm handing back assignments. On these assignments, I usually make personalized comments to the best candidates for research involvement. The comments are things like 'I really hope you plan on getting involved in research soon,' or 'I think you'd be a great candidate to get involved in a research lab.' Once they're successfully working in my lab, I invite some students to consider completing a research thesis.

Brad: This is a great question and one that I, and the department of psychology, still struggle with. Students that work in my lab are typically high performing students in classes that I have taught. I usually invite them via email to meet with me to discuss working as a research assistant in my lab. We discuss what it is like in my lab and the potential benefits. Outside of this, student members of the Introspect Psychology Club and Psi Chi international honor society often go into freshman-level courses and discuss the benefits of being involved in research. We also have several events on campus at which we discuss research and/or

students discuss their experience with psychology research (e.g., Psychology Speaker Series, Spring and Fall Psychology Receptions, Student Research Presentations, GRE prep sessions). Outside of all of these venues, I also run a preparatory group that helps OSUN students with the process of applying to graduate school. In our group sessions, we discuss the importance of research for admittance to psychology graduate school. In sum, we do our best to make every student aware that research is happening in the psychology department and that they can be a part of it.

Q: How many students are working with you?

Melissa: Currently I have 11 students working in my lab. I do not currently have a thesis student, but I have several students who are working on developing their own independent projects. One student was a significant help in designing and implementing a study last semester, and two students are working on projects to begin in the fall.

Julie: I currently have four students active in my lab. One of them is completing her own thesis, and three are helping with my projects.

Q: What is the workload like as you work with student researchers?

Jim: I work with my Research Assistants every time they come in. Sometimes it's working on a task they've done before and other times we spend most of their research session learning something new. I like to help students problem-solve because that is what a lot of research is all about.

Brad: I am very selective over who works in my lab. This allows it to be mostly self-sufficient after training. I train my research assistants at the start of the semester on current projects and procedures and then throughout the semester if new projects

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arise. The beginning of the semester training is time-consuming but necessary for good experimental procedures.

Chris: I work more closely with grad school bound students. These students help me program experiments, analyze data, and they take an active role in disseminating data. Dissemination might be low-key, like a poster or talk at OSUN Research Forum, or might be more significant, like a national/international conference or manuscript.

Q: What resources have you used to help them?

Marilee: The Newark Campus Student Research Grant is a wonderful option for students, and I think this grant is very generous. For presentations, I have a poster template that I use - I think I got it from the Psychology Department in Columbus.

Melissa: Usually current thesis students meet one-on-one with incoming thesis students to discuss their 'real' experiences while working on a thesis (I don't attend those meetings so that there can be an open discussion). For new lab members, I always encourage them to talk with current lab members to get the 'real story' on what being a researcher is like. Oh, and of course, I always encourage students to submit research for presentation at the Midwest Psychological Association conference and OSUN forums each year.

Jim: I try to give students any resources they need. Sometimes it's examples, other times we apply for grants. It might be helping with submitting an abstract, and other time it's unique resources I have. Whatever we're working on or any goals students want to achieve, I help with the resources they need.

I'm Ready to Get My Students Involved . . . But How?

What kind of resources are available for the Newark faculty member who wants to involve her or his students in research? **This article is also available online, with live links, at <https://go.osu.edu/Bp8d>.**

In Columbus, the Undergraduate Research Office (URO) has a staff of four and an online system to pair up faculty and students, but here on the Newark Campus we take a more personalized approach. We do have a student research webpage, with a welcome from Andy Roberts, our research coordinator, at <http://newark.osu.edu/research/student-research-opportunities.html>. However, most faculty, like the psychology faculty we interview earlier, tend to talk about their own research in their classes and recruit students on an individual basis. What more can you do?

Before recruiting students

- Educate yourself about OSU research expectations at <http://www.undergraduateresearch.osu.edu/faculty/facultyfaqs.html>

Recruit students

- As the psychologists do, talk about your own research even in your intro classes. Let students see your passion for what you do

- Encourage selected students to come talk to you about research opportunities—most students don't envision themselves outside their student role until you show them what they can do
- Don't overlook your own colleagues in the search for students, along with the Honors students under the guidance of Associate Dean Virginia Cope.
- Keep in mind that there are two kinds of research opportunities: students can work with you on your own research, or you can mentor a student engaged in their own project. For some of us, particularly in the sciences, it is easier to envision undergraduate assistance in a project of ours. For others of us, more in the humanities, the work is less concrete and it's harder to hand off a part of it to an undergraduate. These students can be encouraged to work on their own project alongside you. There is funding available for both kinds of research.

Educate students

- The URO has a good introduction to research and the FAQ's students most ask at <http://www.undergraduateresearch.osu.edu/getstarred/whatisresearch.html>

Consider a contract

- It's important to establish ground rules for the project. The URO has a sample contract that can be modified and printed at http://www.undergraduateresearch.osu.edu/documents/URO_undergraduate_research_contract.pdf

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Consider a thesis

- Your upper-division student may ask you to advise them on writing an honors or non-honors research thesis. What does that entail? General information is available at <http://www.undergraduateresearch.osu.edu/nutsandbolts/thesis/index.html> while college- and department-specific guidelines are found here: <http://www.undergraduateresearch.osu.edu/nutsandbolts/thesis/guidelines.htm>

Find funding

- For a major research project, your student is eligible to apply for a number of Columbus-based grants, and they can access those sources here: <http://www.undergraduateresearch.osu.edu/participate/funding/index.html>
- They can also be funded through Newark's **Student Research Grants (SRGs)**, which aid students who need materials, equipment, even travel. According to former subcommittee chair Melissa Buelow, the average number of SRGs granted each year runs between 12 and 20, with a maximum grant of \$1,500. Information and application are available at <http://newark.osu.edu/research/funding-opportunities.html>
- For students working with you on a research project, Newark's **Faculty Initiated Student Assistantship Grant** awards you the faculty mentor \$2000 to pay for student assistance on a research project, which can include both wages and travel. Up to 10 grants are authorized for funding yearly. Information and application available on the portal or at <http://go.osu.edu/Bp8b>
- Students, such as the EEOB students mentioned earlier, often sign up for 1-3 Independent Study credits, offering them course credit instead of pay

Help with dissemination

At conferences

- Templates and advice for abstracts, posters, presentations, proposals are all here: <http://www.undergraduateresearch.osu.edu/nutsandbolts/index.htm> and as downloadable OSU branded templates for students here: <https://brand.osu.edu/presentations/#duplicate-of-resources>
- The Newark Campus Research Forum accepts posters and oral presentations for research that is either proposed or completed and awards cash prizes in all four categories for both first and second places. All information is available at Cmpus. A number of Newark students have very well presenting there. All information is at <http://denman.osu.edu/describe.aspx>
- <http://newark.osu.edu/research/research-forums/student-research-forum.html>

- The Denman Undergraduate Research Forum is held late March each year on the Columbus
- The National Conference on Undergraduate Research (http://www.cur.org/ncur_2017/) has hosted a number of Newark student researchers over the years.
- Regional, national, and international conferences in your discipline: an increasing number now include undergraduate research. Other sources are available at <http://www.undergraduateresearch.osu.edu/participate/forums/index.htm>

Through publications

- Many colleagues have co-authored papers in discipline-specific journals with their undergraduate researchers. Other options include:
- JUROS, the Journal of Undergraduate Research at Ohio State. In fact, the current editor-in-chief is a former Newark student still doing research with Karen Goodell. <http://juros.osu.edu/>
- A list of journals accepting undergraduate research is here: <http://www.undergraduateresearch.osu.edu/participate/journals.htm>

Newark Research Forum approaching

The Student Research Forum fills the Reese Center again March 8 from 1-4:00. The forum always brings out a variety of student projects on the Newark Campus. According to Nathaniel Swigger, the forum organizer, there are usually 10-15 poster presentations and 5-10 oral presentations. Participation varies from year to year, but the number of posters and oral presentations are going up at each forum. Proposal are due in mid-February each year, and participants have come from psychology, biology, ecology, and English, among others.

Students present not only completed research but also proposed, which needs not much more than a sound hypothesis and some context. Proposers tend to be second year students, whereas the third and fourth years tend to present completed projects. All student participants receive help from viewers and judges, including suggestions on how to move forward with their project. And Nathaniel adds, "Don't forget the fabulous cash prizes!"