



Vandals in Focus



2016 UNDERGRADUATE RESEARCH

University of Idaho

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EXPLORING THE WORLD OF RESEARCH



One of the formative experiences of an undergraduate education occurs through participation in research, scholarly activity and creative work. This is where students get to go beyond the simple acquisition of knowledge and explore how to construct the future. It's where students contribute their own emerging expertise while growing as thinkers and problem-solvers.

This report showcases some of the exciting work in which our undergraduates are engaged.

They are exploring ideas that matter in many

different fields. They're also practicing inquisitiveness, building self-confidence and cultivating an appreciation for teamwork. Research asks students to organize their thoughts and explore them with depth and focus. Many undergraduates realize for the first time that their disciplines are not static, but are constantly evolving. That's an exciting revelation that allows students to picture themselves contributing to a body of knowledge.

Undergraduate research opportunities — facilitated by faculty and staff at the leading edge of their fields — distinguish our leading, national research university.

Other institutions simply don't deliver this caliber of experience for so many students. At UI, mentorship from faculty experts can be incredibly rewarding. Our research-involved students enrich the learning of others, bring fresh perspectives and ask interesting questions that can provoke new insight.

My first contact with the world of research was as an undergraduate, working as a dishwasher in a research lab. I didn't make much money, but the experience was priceless. It demystified science for me, taught me that professors were interested and excited to work with undergraduates, and led me to find my own opportunities in research. At a comprehensive university like ours, the opportunities to get involved are nearly endless. Get involved, and see what you'll discover.

A handwritten signature in black ink that reads "Chuck Staben". The signature is written in a cursive, slightly slanted style.

Chuck Staben
President



Visit Vandals in Focus online for more stories about UI undergraduate researchers across majors and colleges, and a behind-the-scenes look at this project.

www.uidaho.edu/VandalsInFocus



'Zoot Suit' and Spirits to Boot



Student director brings scenes to life

For AnaSofia Villanueva, researching a scene from José Rivera's play "References to Salvador Dali Make Me Hot" inspired interesting connections. The play's rhythmic language and reoccurring Puerto Rican elements, for example, encouraged her to study the movement of the moon — and compare it to a lively rumba. Such connections are crucial to her work as a stage director.

Villanueva is a 30-year-old theater arts major in the University of Idaho College of Letters, Arts and Social Sciences. A senior from Portland, Oregon, she recently directed a scene from Rivera's play as part of the Society of Stage Directors Directing Initiative. The event is a regional competition put on by the Kennedy Center American College Theater Festival (KCACTF), a national theater program. Villanueva's stage production won in her region, making her a national finalist in the competition. As a result, she earned a trip to Washington, D.C., for the KCACTF National Festival in mid-April 2016. She says she's incredibly pleased to continue her work on producing Rivera's play.

"References to Salvador Dali Make Me Hot' is by far my dream production," Villanueva says. "It's got beauty and dance and spirits, but it also has this wonderful juxtaposition of life's stark realism, stark brutality. It's such an incredible message."

The play incorporates a Latino style of storytelling to tell the tale of a soldier's wife in 1990s California. Its diverse set of characters, all played by UI Theatre Arts students, includes a cat and a coyote who court one another, and the moon itself.

In order to prepare for the scene, Villanueva used the script to create a timeline. With it, she follows the lives of the characters while collecting context clues that establish the historical, political, economic and religious dimensions of the play.

"This is a process that often starts six months before rehearsal because it's incredibly research-based," she says. "Some of the best learning I've done, especially in terms of history, starts with a single play."

Villanueva's research covered a range of intriguing topics. One path found her studying the economy of Puerto Rico from the 1970s through the 1990s, while another lead her back to one of her biggest sources of inspiration: the 1981 film "Zoot Suit."

"The spirit in the film, El Pachuco, was masculine but graceful," she says. "That was part of the inspiration for the essence and movement of the moon."

Villanueva's dedication to research has presented her with many opportunities. The KCACTF National Festival in particular offers master classes, connections and high-quality productions. At the end of the day, however, Villanueva says that what she loves about theater and directing is being able to utilize a revolutionary art form while collaborating with others to present beautiful, powerful messages.

"No matter what, I need to be doing shows that I am passionate about," she says. "The things that you have joy in are the things that really make a difference."

WRITER:
Justin McCabe, a junior from Post Falls, Idaho, is majoring in English literature and minoring in history.

PHOTOGRAPHER:
Heather Woolery-Larsen, of Nampa, Idaho, is a senior majoring in studio art and creative writing.



Where there's Smoke, there's Fire Ecologists

UI student fights and studies fire

When Leslie Fowler visited the Disney Wilderness Preserve in Central Florida, she wasn't there for the sight-seeing. She was there to burn it.

"Fire's my passion," says Fowler, a University of Idaho senior double major in fire ecology and management as well as ecology and conservation biology. "It's the thing that interests me most."

The 22-year-old from Burley, Idaho, spent her 2016 spring break at the Disney Wilderness Preserve as part of a 10-person team sponsored by the UI College of Natural Resources. The students earned two college credits doing prescribed burning for The Nature Conservancy, which maintains the preserve. The prescribed burning was done to ensure that years of fuel buildup don't become a catastrophic wildfire.

"We're burning to meet ecological objectives," Fowler says. "On the Disney Preserve in particular, they have a lot of endangered species, like the gopher tortoise. We need to burn to make that habitat suitable for them."

In addition to experiencing the benefits of prescribed burning first-hand, Fowler has found leadership and training opportunities during her time studying fire ecology. She is particularly involved with the Association for Fire Ecology and is even national president of its student branch.

And on top of it all, Fowler is a wildland firefighter.

"I got interested in fire ecology after I started working for the Bureau of Land Management," she says. "I worked for the Twin Falls district out of the Burley Yard on a Type 4 Engine crew."

Luckily for Fowler, hands-on learning is a crucial aspect to fire ecology research. She is currently the undergraduate research intern on an interdisciplinary team conducting an exploratory study of the acoustics of wildland fire.

"We're thinking that maybe we can predict fire behavior or infer from the sounds that the fire's making what vegetation is burning," she says. "We're just working with little seedlings right now. They're like 3 years old, and it's very basic. But, you know, you have to start somewhere. Who knows what we could do with it in the future?"

In addition to her team projects, Fowler's personal research involves studying how soil is affected by a surface fire when various amounts of fuel and soil moisture are involved.

"Soil's not a really good conductor of heat," she says. "So I thought it would be cool to see the dampening effect that moisture has."

Fowler says her research is driven in part by a desire to bridge the gap between fire management and science.

"A lot of things in fire ecology right now aren't very quantifiable," she says. "That's why my research question is so unique. I'm quantifying the fuel on top with fire radiative energy and then I'm looking at the soil heating."

Fowler plans on pursuing a master's degree. She knows that wherever she goes, her future will always involve fire.

"That's the cool thing," she says. "In fire ecology, I found my people."

WRITER:
Justin McCabe, a junior from Post Falls, Idaho, is majoring in English literature and minoring in history.

PHOTOGRAPHS:
Courtesy of
Leslie Fowler

WRITER:
Emily Lowe, from
Kuna, Idaho, is a
sophomore majoring
in journalism.

PHOTOGRAPHER:
Irish Joy Martos is a
senior international
student from the
Philippines majoring
in psychology.

After an intense fire season swept over the Pacific Northwest last summer, a team of University of Idaho students got the chance to market and promote a computer simulation that helps people understand how to protect themselves and their homes from wildfires.

Harsh Patel, 21, came to UI from Eagle, Idaho. He is currently the group leader for marketing the simulation, Secure the Shelter, which was designed by UI faculty. The group received a \$5,000 grant and works through Vandal Solutions, a student-run business that allows College of Business and Economics students to gain real-world experience by using the skills they've learned in class.

Patel, a senior finance major, said his group practices marketing the product to different crowds.

Wildfires destroyed nearly 7.1 million acres of land in the western United States by mid-August in 2015. It was the earliest so many acres had burned in the United States in over 20 years, the National Inter-agency Coordination Center reported. This large fire season created a great opportunity to inform the public about what to do to protect homes and people from fires, Patel says.

"North Idaho was the perfect place to start a simulation like this," he says.

The simulation uses Samsung Oculus Rift glasses, which cover users' eyes and transport them into a virtual world. Inside Secure the Shelter, viewers are given different tasks. The simulation is broken down into four phases: fireproof the house, pack a grab bag, remove hazardous materials in the area and, finally, wait as the wildfire approaches. If the previous tasks were performed perfectly, the house will survive the fire.

Because Patel and his team have used the 3-D goggles so many times, getting the simulation done now is like clockwork. It isn't as easy for newbies, though.

"Seeing people use it from the outside is really funny," he says.

Less humorous are the challenges the team has faced along the way. Earlier this spring, Patel and his team went to the North 40 store in Lewiston to promote Secure the Shelter. While there, they realized people thought they were trying to sell a product instead of promoting something that is actually going to be free.

The biggest issue they have encountered is the generation gap. The simulation is easier for younger generations to use because they are more accustomed to using an Xbox controller, which controls the avatar inside the simulation. Patel explains that it's a struggle for older people to use and connect with the simulation.

Feedback plays a large role in what Patel's group does. Patel has learned that while younger users are interested in using the Oculus Rift glasses, they don't care about fire safety as much. Some older users struggle with using the 3-D technology, but they are interested in learning more about wildfire safety.

"We need to be able to find the balance when marketing," he said.

Being the Secure the Shelter team leader comes with a lot of responsibility. One night, Patel received a phone call from an accounting professor, asking for a website to be created by the next morning. He stayed up late designing one from the ground up.

"It's been a unique experience," he says. "It's been a roller coaster, but I've learned a lot from the experience."

Marketing Fire Safety

Student leads team promoting wildfire simulation



In Control

Engineering student designs wearable, brain-controlled device

Phillip Kearns is designing technology that could one day help people with prosthetics control their devices with their thoughts.

Kearns, a 21-year-old University of Idaho student from Lake Oswego, Oregon, is a junior double majoring in electrical engineering in the College of Engineering and physics in the College of Science.

Kearns began his research during a summer 2015 internship at Intel in Hillsboro, Oregon, with his mentor, prototyping developer

Andrew Lamkin. His goal was to use a computing system to receive brainwave signals from an electroencephalogram (EEG) biosensor to control other devices such as a digital camera.

The system Kearns is creating is an example of biosignal acquisition technology, which uses the body's electrical impulses to trigger devices. Kearns' system uses brainwave signals to control a camera, asking it to take pictures, videos or

time-lapse videos of anything the user is looking at. The system can also be activated with changes in the user's heart rate or with hand motions.

"The end goal was to demonstrate a proof-of-concept that utilized wearable computing, biosignal acquisition technology, and signal analysis in order to provide an intuitive, innovative and hands-free way to control a camera," Kearns says.

The device is no larger than a 50-cent piece and can be worn like a watch. When users first wear the device, the EEG can log and graph their mental and physical statuses over time, allowing users to adjust the sensitivity levels that trigger the device. Once that step has been performed, the controller can be activated in a number of ways: through specific types of brainwaves sensed by the controller, through hand motions sensed by the accelerometer on the device, or through the increasing heart rate signals transmitted from a remote heart-rate monitor.

Kearns' project also demonstrated that the device has the ability to be used with prosthetics. Near the end of his internship, Kearns and his mentor worked with a pair of high school students. The students had made a 3-D printed prosthetic hand, and Kearns connected the hand to a small electric motor and his EEG device, allowing wearers to use their brainwaves to tighten the strings on the fingers of the hand in the same way that our own tendons are used to grip objects.

Kearns hopes that one day his device will not only be used in the medical field, but also in everyday usage, such as being able to control the lighting in homes based on people's emotions, or used by pilots or drivers to operate vehicle electronics without taking their hands off the controls.

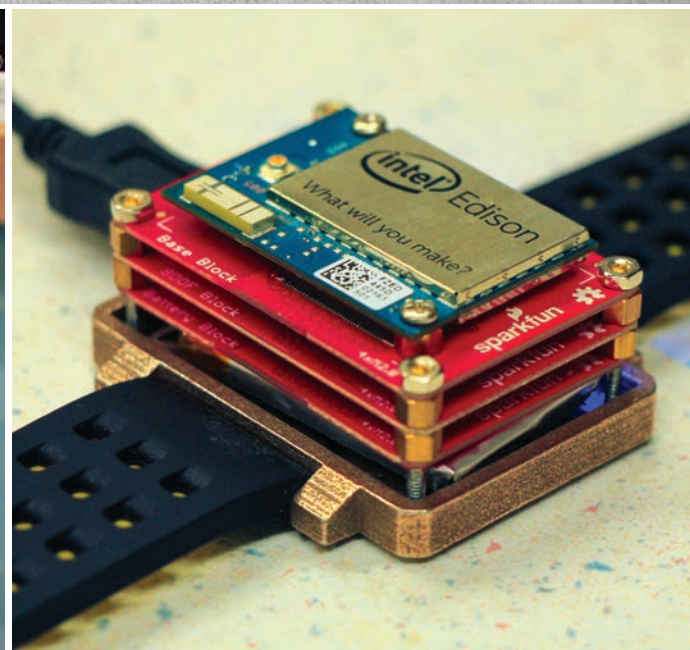
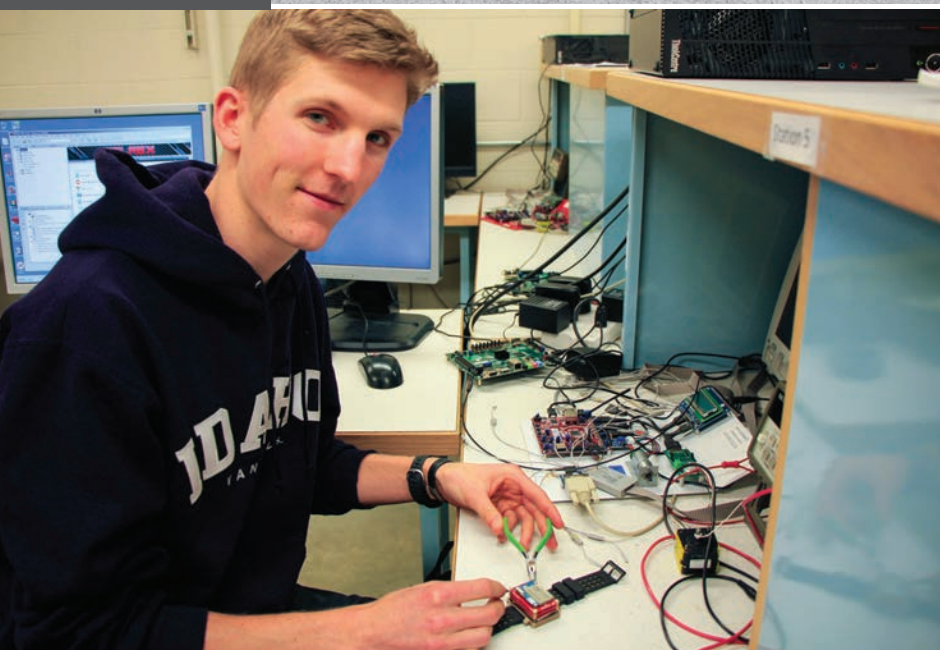
His research has been recognized on a national scale, too. This spring he was selected as an honorable mention for the prestigious Barry Goldwater Scholarship and Excellence in Education Program.

WRITER:

Morgan Ward, a junior from Fruitland, Idaho, is majoring in English and minoring in history.

PHOTOGRAPHER:

Yishan Chen is an international student from Kuming, China, and is majoring in physical education.





Animal Science through a Microscope

WRITER:
Charissa Chappell, a freshman from Twin Falls, Idaho, is an English major with a literature emphasis.

PHOTOGRAPHER:
Sri Sai Sampath Gouri is a freshman and an international student from India majoring in computer science.

Genetics research captures student's attention

Kimberly Davenport started college at the University of Idaho sure she wanted to be a veterinarian. But one class changed her path.

Raising horses and growing up in Moscow, Idaho, Davenport always knew that she wanted to study animal science at UI, but her focus changed from veterinary medicine to animal genetics when she began studying with Brenda Murdoch, an assistant professor in the College of Agricultural and Life Sciences.

Davenport was intrigued by the idea of using genome mapping to identify and understand an animal's genetics to improve products that come from livestock, so she approached Murdoch about becoming involved in her research project. Now the 21-year-old UI senior can't imagine doing anything else.

"I'm really glad that I had the guts to go talk to her about it," Davenport says. "I discovered that I liked the research side more than the actual medicine."

In the beginning, Davenport started by predicting the genetic traits of an offspring based on the parents' genetics, but then began to go more in depth. Now she can determine an animal's specific genetic markers. Davenport and her colleagues decide which animals should

be breeders, butchered or used for production of things like milk and wool. While Davenport and her team mostly focus on cattle and sheep, they have also genetically tested pigs, moose and goats.

This project has greatly benefited the cattle owned by the university. The research team extracted DNA from each cow and used testing to look at its genetic makeup. This allowed them to determine which cattle have better traits and will produce better offspring, live longer or make large quantities of milk, which in turn allows them to improve the quality of the herd.

Davenport has been so inspired by her professors and colleagues that she plans to continue her education after she graduates in May and get a graduate degree in animal science from UI.

"If my mentor wasn't so great, I probably wouldn't have considered doing research," she says.

Davenport plans to inspire her own students someday to go above and beyond just going to class and to join a research project. She wants to be a professor, lead research projects and share her love and passion for research with others.

"I see how great and inspiring my professors are, and that's how I want to be."



WRITER:
Charissa Chappell, a freshman from Twin Falls, Idaho, is an English major with a literature emphasis.

PHOTOGRAPHER:
Heather Woolery-Larsen, of Nampa, Idaho, is a senior majoring in studio art and creative writing.



Unexpected Inspiration

Chemistry major finds love of research, interdisciplinary opportunities

Senior chemistry major Jacob Dalton, 23, likes to say that everyone should be a chemist. He wasn't always so enthusiastic about chemistry, but one research project changed his mind.

During his first year at UI, Dalton, of Shelley, Idaho, considered declaring English as his major and becoming a writer, but remained unsure of what he really wanted to do with his life. While taking his general education courses, he discovered a new interest in the College of Science.

With no idea of what he would study or how to do research and with no previous research experience, Dalton approached his organic chemistry professor and asked to participate in a project. That opportunity has helped Dalton discover what he wanted to do with the rest of his life. He says he is glad that he got up the courage to take a chance and try something new.

Dalton's involvement in undergraduate research helped him to find a passion for science and research. He loves the hands-on experience that participating in an interdisciplinary research project gives him.

"People always ask, 'Is there a practical application for what we're learning?'" and research can help you answer that question," he says.

Dalton is participating in a cutting-edge interdisciplinary research project that is dedicated to discovering environmentally friendly ways to increase the chemical reactivity of clay.

Dalton and his colleagues began by modifying naturally occurring clay in the lab, and now are able to synthesize their own clay in a geology lab and modify it in a chemistry lab. By making their own clay, researchers can control and improve the different properties in the clay.

This project is distinctive in that two different disciplines are collaborating and cooperating to make new discoveries. Dalton is learning things about not only chemistry, but geology as well. He gets to use machines that are usually only used by geologists. Only a handful of researchers have even experimented with modifying clay and none of them have studied the subject as extensively as Dalton and the other researchers at UI.

"I think it's cool that we take something that you don't think about, like dirt or clay, and doing something useful with it," Dalton says.

Dalton loves research so much that he decided to make a career out of it. He will be completing his undergraduate degree at UI in May 2016 and will move on to complete his doctorate at University of California, Davis.

Storytelling in a Virtual World

Virtual Technology and Design student uses high-tech tools to educate

Oscar Rodriguez has always been a storyteller. He doesn't tell stories in a traditional way, though. As a student in the Virtual Technology and Design Program in the University of Idaho College of Art and Architecture, Rodriguez, 21, uses virtual tools, such as 3-D modeling software, Photoshop and other design technologies, to make a story come to life.

As a child, Rodriguez, who is from Jerome, Idaho, loved films and wanted to learn how he could create his own. He found his way to virtual technology and design during a visit to campus, before he became a student of the university.

"When I heard about this major, I just remember feeling like 'Yeah, I feel like I should be here, you know? This is the place for me,'" he says.

Now, being immersed in it, he's found that his major is full of possibilities. One of his current projects is an online game designed

to educate people on the effects salmon have on the ecosystem. Another project he worked on involved augmented reality, which simulates an image in the real world on a device, like a smart-phone, through a camera. Rodriguez, alongside his friend Kyle Weage, created a pop-up book that used special symbols on the pages of a physical book to activate virtual pop-ups.

"You can go into all sorts of fields from this," Rodriguez says. "A lot of people come in because they want to make video games or they want to make animated movies, but you learn along the way that you can apply this to all sorts of things."

Rodriguez says students in his program can apply what they've learned and the tools they've become familiar with not only to create designs, stories and games, but also to use their knowledge for more practical applications, such as medical simulations or architectural design. The need for Rodriguez's kind of work spans different fields and has many applications — especially in a world where jobs are changing as technology changes the world.

"Our professor has said before that they're kind of preparing us for jobs that don't exist yet," Rodriguez says. "We're sort of a special breed."

Not only is his work widely applicable, it has a lot to teach him, too.

"I learned how to tell a story, how to design and how to think," he says. "I've also been able to learn a lot about art as well, and I've been able to get better at painting and drawing. Everyone has different skill sets; some people are really good at modeling, others at animating — it's kind of a wide range of things."

His work is also designed to teach others, which means he learns about topics outside his major.

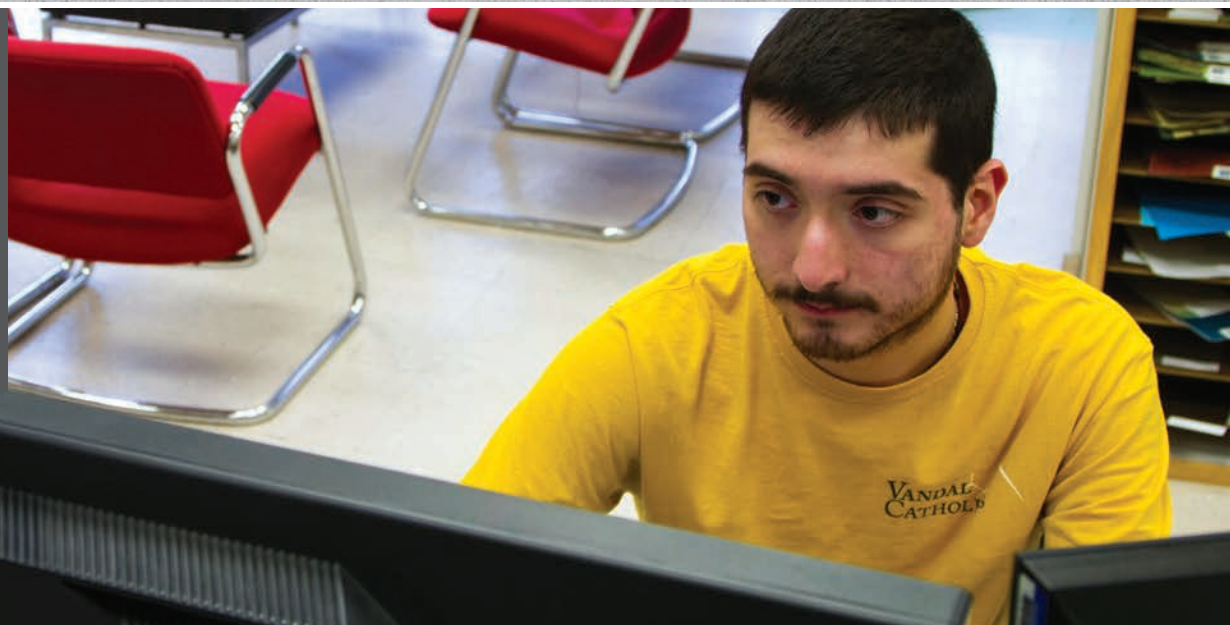
"When we start a project, we've got to research — we have to make sure we're up to speed with everything," he says. "If we have a client who wants us to do something science-related, we have to research all there is to know about that subject. We're essentially showing an audience, and if we don't understand, they don't understand."

Rodriguez's work focuses much on teaching, learning and reaching other people, and he believes the best way of doing this is telling stories.

"Humans are storytellers," Rodriguez says. "We have to find a way to tell the story."

WRITER:
Madison Billingsley, a junior from Covington, Washington, is majoring in creative writing and minoring in computer science.

PHOTOGRAPHER:
Kira Hunter, from Emmett, Idaho, is a junior majoring in biology and minoring in professional writing.



As a middle-class white woman from Boise, Emily Gehlken has never really faced discrimination. And if she hadn't changed her major to education, she may have never thought about how others see the world.

Gehlken, 20, is a senior elementary education major in the University of Idaho College of Education. She is part of a group of UI education students who meet outside of class to discuss their observations and experiences of diversity and the way people from different backgrounds interact. Their aim is to discover how to improve relationships among all the people on campus.

"The research isn't typical," Gehlken says. "We aren't testing people or gathering data. We write up our experiences and then explore them."

Instead of creating graphs and collecting data, Gehlken says the research the students conduct is based on observations of what they felt or saw happen.

For example, Gehlken describes a hypothetical scenario where a student goes into her education class. The teacher brings up a difficult topic of conversation, but because it is an unfamiliar and uncomfortable subject, the student decides to not partake in the discussion. What Gehlken and the group are hoping to learn is why situations like this happen and how they can be changed.

Gehlken previously majored in biology. When she switched to education she encountered some negativity.

"People think education is an easy major," she says, "but getting into the research discourse of it has been exciting."

Gehlken's research strongly ties into her major. It has made it immensely clear to her how important it is to help children develop an appreciation for diversity.

The biggest issue Gehlken says her group members encounter is the "common lack of engagement in diversity." Because they have seen this time and time again, their goal is to encourage an openness to the different backgrounds people have at UI.

Diversity can be a controversial topic. Gehlken explained it is completely normal and OK to not understand where someone is coming from, but it's important to remember that person's feelings are still valid.

The group hopes to publish the research they have done in hopes of informing people about what they have noticed and learned throughout their daily experiences.

"I wish there was one end-all-be-all answer, but there isn't," Gehlken says.

She believes the first step to fixing the problem of discrimination is to educate and make people aware of the common misconceptions there are for the many diverse students and faculty on campus.

"It goes all the way back to kindergarten. We know when things are right and wrong. We just can't be bystanders to it," Gehlken says. "We just need to figure out how to love people better as humans."

Dedicated to Diversity

Education student examines relationships with peers



WRITER:
Emily Lowe, from Kuna, Idaho, is a sophomore majoring in journalism.

PHOTOGRAPHER:
Madelen Johansson is an international student from Tibro, Sweden, and is majoring in interior design.

WRITER: Madison Billingsley is a junior from Covington, Washington, is majoring in creative writing and minoring in computer science.

PHOTOGRAPHER: Irish Joy Martos is a senior international student from the Philippines and is majoring in psychology.

Exploring the World with Technology

Computer science student uses skills to understand real-world phenomena

Peter Fetros works with the physical and virtual world to learn about technology and its uses. Both worlds are fascinating to Fetros, who has always enjoyed learning about and using technology.

"I just always liked technology and how it works," he says. "It's just so broad. There are so many different things to do in it, different things you can try and learn."

Fetros, 21, from Sacramento, California, studies computer science in the University of Idaho's College of Engineering. He is currently in his third year of a five-year program.

In this program, Fetros has learned to use NetLogo, which can be used to create games, art and simulations. NetLogo functions as both programming language and software, allowing for a very user-friendly programming environment. This software can create simulations that help visualize topics that range from the stability of an ecosystem to the spread of disease. Fetros enjoys working on these simulations, and is using NetLogo on his current research project at UI.

For this project, Fetros is working with two of his professors on the evolution of signaling theory: the way things communicate and how it came to be that way. One, James Foster, is a University Distinguished Professor of biology and computer science, while the other, Bert Baumgaertner, is an assistant professor of philosophy in the College of Letters, Arts and Social Sciences.

"Philosophy plays a huge part in our project specifically — how things interact and why they do that," Fetros says.

Signaling theory is all about communication. Researchers have studied it in the social sciences and philosophy, and now Fetros is examining it through computer science.

"We're looking at signaling theory using something called a Lewis Signaling Game," he says. "Basically how it works is there are two 'people' playing the game. One can see a world state and the other can't."

Without language or any prior agreements, one player has to get the other to take a certain action. Fetros and his professors want to see how their signaling system evolves using different rules for world states.

"My part of the project is writing a simulation so I can do this, but with millions of players millions of times," Fetros says.

Along with his work in the world of computers, Fetros works on physical projects. He particularly has an affinity for electricity.

"I've worked on all sorts of electrical projects," he says, "I'm finishing up a laser engraver right now, and I've made a solid state Tesla coil."

Fetros sees the applications for his work everywhere.

"Pretty much everything runs on some type of computer," he says. He notes that many of the things we use, like vending machines, use embedded systems, which are computer systems embedded in a larger mechanical system.

Fetros also encourages action for students who are interested in computer science, noting that some never apply for internships that could be beneficial.

"The worst thing that could happen is you don't get it," he says.



WRITER:
Charissa Chappell, a
freshman from Twin Falls,
Idaho, is an English major
with a literature emphasis.

PHOTOGRAPHER:
Heather Woolery-Larsen is
a senior majoring in studio
art and creative writing
from Nampa, Idaho.



The Voice of CALs Students

Agribusiness major helps his college understand what students want

Austin O'Neill, 20, came to the University of Idaho knowing that he wanted to help people all around the world improve their businesses. But the sophomore discovered he wanted to help fellow students as well.

O'Neill, a Stanwood, Washington, native and agribusiness major, says he chose UI because of its great programs, but found he loved the research opportunities too.

O'Neill first discovered his project while working as a student success intern for the Academic Programs Office in the College of Agricultural and Life Sciences (CALs).

O'Neill is participating in a research project to determine what CALs needs to make the college better. Specifically, he is helping the dean decide if creating a scholars' program for CALs students who have a GPA of 3.5 or higher would be beneficial to students. O'Neill says this project will improve not only this college, but the overall quality of the university itself.

"It's making a difference in people's lives and the college, and that gets me really excited," he says.

O'Neill is looking at current and previous Dean's Lists to see if the number of students coincides with the perceived need for a scholars' program. He is creating a survey that will be sent to CALs students to help with determining if a scholars' program is needed, as well as gather valuable insight into what UI students think about the university. The survey allows students to express their opinions about UI programs and how they feel they should be changed. This is a chance for students' voices to be heard, O'Neill says.

While this research project is only in its beginning stages, O'Neill has decided that he would love to participate in another research project next semester.

Though he is only a sophomore at UI, O'Neill is already considering his options for life after graduation. He originally intended to get a job working with an international marketing team after completing his bachelor's degree. Now he is also considering graduate programs to continue his education in agricultural economics.

"I want to help producers improve their productivity and business," he says.

Sequel Success

Student researcher gathers data on films for marketing project

Most people simply go to the movies to sit back, enjoy the film and consume large amounts of buttered popcorn. One University of Idaho undergraduate student, however, approaches the movie industry in an entirely different way.

Payton McGriff is a marketing major at UI, originally from Idaho Falls, Idaho. Before enrolling at UI, she attended Pacific Lutheran University, but chose to transfer not because of the business and marketing programs, but for the architecture program. However, after taking several business courses, McGriff decided that her true interests lay in social business and business marketing.

McGriff works on a research project headed by College of Business faculty members Sanjay Sisodiya, Steven Shook and Berna Devezer that investigates the success of movie sequels and attempts to determine the factors that lead to their success or failure, such as release date and content.

“The goal of the project is to create a more collective database of film resources that has not existed up to this point,” McGriff says.

McGriff contributes to this project by collecting data such as movie ratings, reviews and earnings figures on individual movies, and then entering that data into a larger database for the project. If there are any inconsistencies within the data, she also contacts

agencies and asks them how their research was conducted so that the inconsistencies can be resolved.

She was given the opportunity to join the research team because of her reputation among business faculty for being a hard worker. She previously worked as a teaching assistant for the marketing department and spent multiple semesters grading and assisting with clerical tasks within the department.

McGriff says her research experience has given her good exposure to real life challenges and research initiatives, which are important to finding a job after graduation. She also said that being involved in the research has taught her much about what field she sees herself working in after graduation; right now she is more inclined toward the hospitality section of rather than research.

She said this project was an amazing opportunity for her because research experience is valuable in marketing professions. Gaining experience in her expected profession is very important to her, and she greatly appreciates that she gets to be a part of the project.

“It is definitely rewarding, because it’s a great introduction into marketing research and data collection,” she says.



WRITER:

Lauren Orr is a freshman at the University of Idaho majoring in English (emphasis in professional writing) and psychology.

PHOTOGRAPHER:

Sri Sai Sampath Gouri is a freshman and an international student from India majoring in computer science.

In Touch with the Environment

Art student uses design skills to open eyes to microscopic pollution

Oil spills and air pollutants are familiar environmental problems, but most people don't usually consider that micropollutants also contaminate the planet. University of Idaho undergraduate Cydnie Gray, however, uses her artistic skills to promote environmental protection and conservation at a microscopic level.

Gray, 21, a senior art and design major in the College of Art and Architecture, hails from Rathdrum, Idaho, where she graduated high school with an interest in art. She will graduate from the university in fall 2016.

This spring, Gray took a graphic design class in which the students picked their own project topics. Her choice was the impact of microbeads on the environment.

Microbeads are tiny beads of plastic found in products such as facial cleansers and are used in place of naturally derived materials because they are cheaper to produce. However, as these microbeads leave household sink and shower drains, they are distributed into main waterways, contaminating wildlife and food resources.

Gray wanted to create a visually intriguing experience to help people learn about this complex issue.

"While researching microbeads and their impact, it took me over a semester to have a somewhat comprehensive understanding of what they are and what they do because there were hardly any visual ways to go about learning," she says. "If I just wrote a paper about what I'd learned, who would ever really read it?"

Gray rented UI's Ridenbaugh Gallery with a fellow student and constructed a hands-on exhibit discussing microbead pollution.

"By creating an interactive installation, I was bringing my research to the audience and encouraging them to take the rest of the experience into their own hands by participating," she says.

Since Gray herself is extremely passionate about this issue, at the end of the gallery exhibit, she set up a pledge board for each participant to sign stating that they would no longer use microbeads. To her surprise and delight, each person that entered the gallery signed the petition on the way out.

"It made me feel like other people were as passionate about it as I was," she says.

Gray wants to pursue experiential graphic design as a career, creating exhibits that spread knowledge and spur people to action.

"The more senses you can engage — sight, touch, sound — the richer the experience is, and there's a better chance of recall," she says.

WRITER:

Lauren Orr is a freshman majoring in English (emphasis in professional writing) and psychology.

PHOTOGRAPHER:

Madelen Johansson is an international student from Tibro, Sweden, and is majoring in interior design.





WRITER:
Emily Lowe, from Kuna,
Idaho, is a sophomore
majoring in journalism.

PHOTOGRAPHER:
Kira Hunter, from Emmett,
Idaho, is a junior majoring
in biology and minoring in
professional writing.

Research in the Wild

Student helps professor
researching carbon
sinks in Moscow
Mountain forest

Dana Andres, a University of Idaho undergraduate student from Colville, Washington, enjoys spending her time in the mountains. For the past year, she's studied the impact thinning trees might have on forests while enjoying the fresh air outdoors.

As climate change becomes an increasing concern for the future, UI students are working alongside Tara Hudiburg, an assistant professor in the College of Natural Resources Department of Forest, Rangeland and Fire Sciences, to examine how thinning trees impacts carbon in forests.

Andres, 21, is a senior majoring in ecology and conservation biology at UI who works with Hudiburg. She is the only undergraduate student that is helping with the research.

Research has shown thinning trees from forests will lessen wild-fire severity, but Hudiburg and her students want to see how it could affect climate change. Thinning forests is the removal of trees, typically the undergrowth of a forest, so less stress is put on the thriving trees.

They are studying whether removing dead trees releases less carbon into the atmosphere, or if leaving the trees there will absorb more carbon. Andres says if the dead trees act as carbon absorbers, or carbon sinks, this could potentially decrease the overall impact of greenhouse gas emissions.

"We are trying to see if they are valuable or not," Andres says.

Andres' role is to project the decay rates of the dominant tree species found in UI's Experimental Forest on Moscow Mountain: Douglas fir, Western red cedar and Western larch. She says since research predicts warmer and wetter winters, this could create a faster decomposition rate. The hypothesis is the dead woody debris will likely decay faster than in previous years, releasing the carbon into the atmosphere sooner.

The researchers have six plots of land designated for thinning. The dead woody debris will not be touched during the process, but live trees and dead standing trees will be thinned to see the effect on fire mortality and drought stress.

By using current climate change projections from the Moscow area, Andres will use that information to see if the dead wood will decay faster. Hudiburg will potentially use this data to determine how to thin the plots, which likely will take place this fall.

"Her goal is a resilient landscape," Andres says.

Andres grew up surrounded by forests and worked for the U.S. Forest Service for three summers.

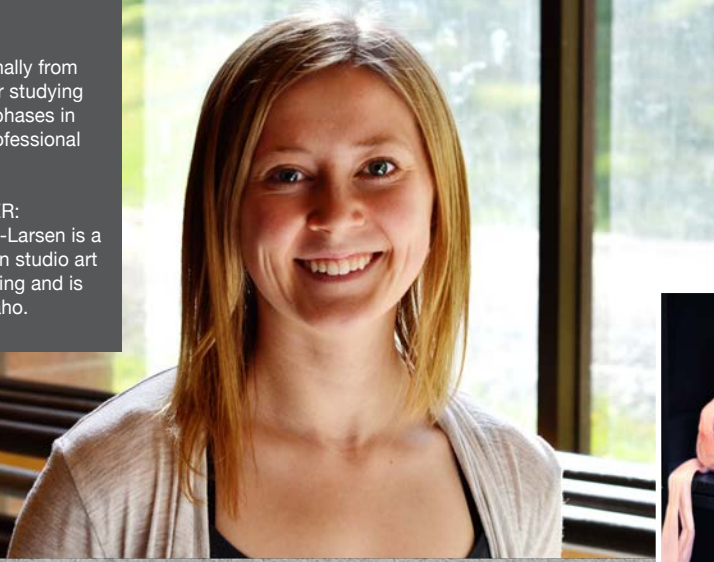
"It's great practice for what I hope to do in the future," Andres says.

Eventually Andres plans to become a wildland firefighter. She is benefiting from this project in more ways than one. Not only is it focused on her major and interests, but she will get to see the effect her research has on fighting future fires. She says it's just an additional perk that she gets to spend her time researching outdoors on the mountain.

"Everything has a function and is connected; trees, animals, plants, water, soil," Andres says. "When I'm in the mountains I feel connected to the world I live in."

WRITER:
Kit Stokes, originally from Boise, is a senior studying English with emphases in literature and professional writing.

PHOTOGRAPHER:
Heather Woolery-Larsen is a senior majoring in studio art and creative writing and is from Nampa, Idaho.



Dancing into the Sciences

UI student combines passion with research

When lifelong dancer Lauren Smith was first applying to colleges, choosing a school with a dance program was a must. She was drawn to the University of Idaho because it offered a Bachelor of Science in dance. That had Smith sold, and she moved from Coeur d'Alene to Moscow to find her new home in UI's College of Education as a double major in dance and exercise science.

"I love that both my programs are in the same department," says the 22-year-old, "because typically dance is a Bachelor of Arts, but here it's a Bachelor of Sciences."

UI's dance program requires students to take classes on topics like anatomy, biomechanics and motor behavior, making it stand out from many other programs in the country.

Mostafa Hegazy, a faculty member in the Department of Movement Sciences, first approached Smith in the spring of 2015 about conducting a research study after Smith was vocal in his class about the differences in movement between dancers and other athletes.

"I was raising my hand almost every day in his motor behavior class, saying things like 'That doesn't apply for dancers!' and Mostafa was very interested in that idea," Smith says, laughing.

Together, Smith and Hegazy came up with a study that they hoped would be useful for a range of people, not just dancers.

"We really wanted to find a way to make it relevant to both the dancer and non-dancer populations," says Smith.

The study, which they conducted on volunteer dancers and other athletes, focused on the differences in vertical jumping and landing between the two groups as well as comparing differences between two different landing styles.

During the research process, Smith and Hegazy measured participants' height and weight and covered their lower body joints with spherical markers that would track their movements. Participants alternated between vertical jumps and a drop from a bar onto force plates so that researchers could compare the jump landing and the drop landing.

After collecting data from all participants, Smith and Hegazy analyzed their results.

"We found that dancers were able to reduce their loading rates and adjust more easily to the novel exercise of dropping from a bar," she says. "Dancers also were able to manage differences between legs better, as well as decrease their overall ground reaction force when body weight is taken into consideration."

After their research was compiled, Smith and Hegazy submitted it at a conference in fall 2015.

"I first presented this study at the International Association for Dance Medicine and Science conference, which was a really fun experience," Smith says. "There were a lot of people with higher education degrees there, so having a poster presentation was a good way to ease into presenting at conferences."

Smith presented her findings again in spring 2016 at the American College Dance Association Conference.

Though this project is over, Smith has a few ideas she'd like to continue it with in the future. Currently, she is teaching a beginning modern dance class for UI and participates in Terpsichore Student Dance Organization, the university's club for dancers and dance lovers. After graduating in 2017, Smith hopes to do more performing and plans to move to Salt Lake City to become involved in the prestigious Repertory Dance Theatre there, and in the future wants to go back to school to obtain her master's degree and become a professor.

Exploring the Unexplored

Physics student studies unusual state of matter with industry partner

A University of Idaho physics student is working on research that might go into outer space one day.

Brice McLaughlin, a 27-year-old senior from Post Falls, Idaho, is working with Mike Taggett of Tern Research, a Moscow-based consulting company that currently focuses on material science research, to study the workings of Rydberg matter, a phase of matter in which atoms with certain excited electrons cluster together. This form of matter could one day be used to store hydrogen for space travel.

McLaughlin says he decided to attend UI was because it was close to home, and he was excited to study physics.

"I've always been fascinated by how the world works, and as I've progressed through my degree and continue to learn more and more, the more amazing and beautiful the world becomes," he says. "Physics has opened up a vast world of discovery and curiosity to me on a scale that I never before could have imagined."

WRITER:

Morgan Ward, a junior from Fruitland, Idaho, is majoring in English and minoring in history.

PHOTOGRAPHER:

Irish Joy Martos is a senior international student from the Philippines and is majoring in psychology.

McLaughlin found himself working with Taggett when David McIlroy, a UI physics professor, recommended him for the project.

The project seeks a foundational understanding of Rydberg matter and its potential.

"This is basic research," Taggett says. "Meaning that there isn't much known about it."

This allows McLaughlin to be on the verge of what may be an enormous help to science. The ability to store hydrogen in space could help with energy storage on Earth as well.

"It's fascinating to observe," McLaughlin says, "This process was first observed in the upper atmosphere on other planets in gas clouds."

Being able to work with the UI campus has been an amazing opportunity for McLaughlin and Taggett, giving them the chance to further study this tremendous unknown part of the scientific world.



Unearthing a long-buried artifact yields rewards far beyond the prospect of treasure. Rachel Falzon can tell you that artifact is also a story — and a chance to connect with the past and understand history.

Falzon, 21, a University of Idaho senior from Ferdinand, Idaho, is a dual major in anthropology and history, but her specialty is archaeology. She works at the university's Alfred W. Bowers Laboratory of Anthropology, a research lab within the College of Letters, Arts and Social Sciences. The lab is dedicated to analyzing artifacts and archiving information, and its current research revolves around Silver City, a mining site-turned-ghost town located in southern Idaho. Numerous excavations of Silver City have left many artifacts in the laboratory's care.

"We've been going through the artifacts that people excavated," Falzon says. "We're cleaning them, sorting them, measuring and weighing them, then putting them into the database so it's all digitized and easy to access. Then, they're going to be labeled and put into artifact boxes for further research."

To Falzon, the laboratory's work is crucial, not only for researchers interested in studying Silver City or similar locations, but also for anyone wishing to better understand how the past connects to the present. Even the smallest piece can provide an important insight.

"One of the artifacts we found in Silver City was a metal toy truck," she says. "It was really cool because it was complete. That's what someone played with. It isn't just some object; it's

something that was part of someone else's life. And it's become something more."

She also recognizes there are practical as well as personal benefits to be found in archaeology and anthropology. Falzon's work has provided her with valuable job-related knowledge on communication and networking, but she is most grateful for the varied experiences her studies offer.

"You're immersed in other cultures," Falzon says. "You get to see the world from a bigger, wider perspective. You're learning not just about your culture and what you believe, but you're also expanding your mind to what other people believe is possible."

Falzon says her passion for anthropology and archaeology is fueled by the close-knit communities that form within the field. Even the most tedious lab work is bearable with the motivation of fellow Vandals, and she finds her instructors particularly helpful.

"The professors here get to know their students on more than a teacher-student level," Falzon says. "They really want to try to make our lives great, and they really want to push us, too."

Falzon also pursues her interest in anthropology and archaeology outside of the lab. Recently, she displayed a presentation at the Northwest Anthropological Conference, and in the future, Falzon hopes to attend graduate school and work as a historic archaeologist. She's thrilled that her field offers countless opportunities.

Anthropology, Archaeology, Artifacts

Student explores hands-on history

WRITER: Justin McCabe, a junior from Post Falls, Idaho, is majoring in English literature and minoring in history.

PHOTOGRAPHER: Yishan Chen is an international student from Kuming, China, and is majoring in physical education.



You're Not Just an Undergrad

Research opportunities give students a chance to apply knowledge

Many University of Idaho undergraduate students have the opportunity to participate in their own research with the help of faculty such as Peter Fuerst, a UI assistant professor in the Department of Biological Sciences in the College of Science.

Originally from Cleveland, Ohio, Fuerst has been at UI for six years. In that time, he has given undergraduate students the opportunity to conduct research projects the same way graduate students at UI do.

He believes undergraduate students belong in the research labs. Although many undergraduates are still learning the basics of their discipline, they can make important contributions to research.

"They're bright and have a lot of motivation," Fuerst says.

Students interested in doing research might not be sure how to find opportunities, but shouldn't be afraid to seek them out. Fuerst says the best way to get into research is for students to search for faculty members in fields they find interesting. Then it's up to the students to show the faculty members how much they're interested by learning about the research, finding an aspect of research they are interested in and then meeting with the professor to discuss their work.

Training students costs professors their time, but Fuerst says it's worth it.

Currently, Fuerst and his team of six undergraduate biology and psychology majors are focusing on how to get "the adult nervous system to fix itself after it has been damaged." The developing nervous system in embryos and infants is able to fix itself much easier than an adult's, but Fuerst says the reason is unknown.

The students who work in Fuerst's lab, like those working on many other research projects with UI faculty members, get there in one of three ways. First, they can volunteer: It's a great way to gain the experience and necessary tools before partaking in an extensive research project. The university also offers research credit as a 400-level class in many fields of study. The final option is finding a research position that pays.



WRITER:
Emily Lowe, from Kuna, Idaho, is a sophomore majoring in journalism.

PHOTOGRAPHER:
Kira Hunter, from Emmett, Idaho, is a junior majoring in biology and minoring in professional writing.

"If students have to pay their way through college, we still want them to be able to get the experience," he says.

Other students receive grants for their work, whether through the Office of Undergraduate Research, other university programs or outside agencies. In Fuerst's lab and others on campus, some students are funded by the Idaho INBRE program, which offers a summer fellowship to students across the state.

Fuerst says each of his students initially learn one lab procedure extremely well, and then begin to learn other techniques. After a couple of years, the student is then able to train new undergrad students on the subject.

"The most important thing we can teach our students is how to ask the right questions," he says.

Many of Fuerst's students are graduating this spring, so he is hoping to find new students to train to continue on with the research. Students might think an undergrad will only be assigned to clean dishes, but it's much more than that.

"I want students to become more aware of their opportunities," Fuerst says.



ABOUT Vandals in Focus

The University of Idaho offers undergraduates exceptional opportunities to engage in

research, scholarly work and creative activities. Each semester, scores of students representing all disciplines at UI take advantage of these opportunities and work on faculty-mentored projects.

Through Vandals in Focus, the Office of Undergraduate Research is proud to showcase a sampling of these student projects selected from each college at UI.

I encourage current and future UI undergraduates to visit the Office of Undergraduate Research to learn more about getting involved in faculty-mentored projects. Participating in undergraduate research will enrich your academic experience and expand your horizons — get involved!

David Pfeiffer
Director, Office of Undergraduate Research

ABOUT the Office of Undergraduate Research

The Office of Undergraduate Research (OUR) supports student engagement in out-of-class research activities in all disciplines at the University of Idaho. OUR raises the visibility of undergraduate research, facilitates opportunities and helps students showcase their work.

OUR offers grants, information sessions and guidance for undergraduates, hosts the UI Undergraduate Research Symposium and works with faculty interested in mentoring undergraduate researchers.

Learn more at
www.uidaho.edu/undergradresearch



BEHIND THE SCENES

Vandals in Focus was created to showcase the remarkable undergraduate students at the University of Idaho and highlight the research and projects they are working on. Office of Undergraduate Research Director David Pfeiffer, who started the project, says it's important to show off the wide range of opportunities at UI and the students taking advantage of them.

It was also important to Pfeiffer that the creative talents of students be displayed in the work itself. Thirteen student writers and photographers created the stories in the Vandals in Focus print publication and website.

"I wanted this to be a student-driven publication," Pfeiffer said. "I saw this as an opportunity to provide a talented group of undergraduates with hands-on, out-of-class experience related to journalism and the process of producing a publication. It is an experience that our students may not have been able to acquire as undergraduates elsewhere."

Emily Lowe, a sophomore journalism major and a Vandals in Focus writer, appreciates the opportunity.

"What makes this work important to me is that not only am I gaining experience for what I plan to do in the future, but we get the opportunity to share what's important to other students on our campus," she said. "I think it's awesome that it's undergrad students writing and photographing what other undergrad students are researching."

Yishan Chen, an international student from Kuming, China, studying physical education, was a photographer for Vandals in Focus. He has found his work challenging in another way — he has had to learn new vocabulary as he meets students in areas of study outside his own. But he sees, as Lowe and Pfeiffer do, how important the work is.

"The students are very outstanding," he said. "They have done something very cool."

Chen is careful about how he shows his student subjects through his photography, to properly illustrate their work.

"I took over 80 photos," he said of one subject, an anthropology student studying artifacts in UI's Bowers Laboratory of Anthropology. "I have to make a decision about what kind of photos I am looking for."

Pfeiffer hopes that UI students and future Vandals will have this same sense of discovery as they explore Vandals in Focus.

"The intent of Vandals in Focus is not only to share some of the outstanding, student-driven research and creative activities taking place at UI, but also to help readers relate to the students conducting these activities," he said. "We hope to humanize research and show to other students that they too can get involved in these activities while at UI. Further, by highlighting student work from each college at UI, we want to give readers a glimpse of the wide spectrum of projects available to undergraduates at UI."

Pfeiffer is happy to be able to showcase brilliant undergraduates, but also recognizes the undergraduate writers and photographers.

"What has been particularly rewarding for me is that it is the work of student writers and photographers that made this publication possible," he said. "I am very proud of what our student team accomplished."

Writer: Madison Billingsley, a junior from Covington, Washington, is majoring in creative writing and minoring in computer science.