

WEST CHESTER UNIVERSITY

# RESEARCH, SCHOLARLY, AND CREATIVE ACTIVITIES ANNUAL REPORT



**ACADEMIC YEAR  
2014-2015**

**WCU**  
WEST CHESTER  
UNIVERSITY

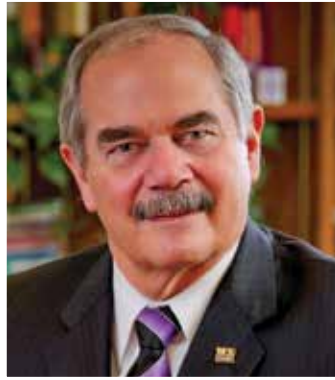
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*West Chester University, a member of the Pennsylvania State System of Higher Education, is a comprehensive public institution serving more than 16,000 students. Founded in 1871 as a teacher training school, the University offers more than 200 undergraduate and graduate majors ranging from the arts and sciences to professional preparation in education, business, and the health sciences. More information about WCU is available on the University's website: [wcupa.edu](http://wcupa.edu).*



## A Message from the President



Scholarly and creative activities are essential to a vibrant academic community. Indeed, students who participate in research are better prepared for their careers and report higher levels of satisfaction with their educational experiences.

Research is also a critical portal connecting the academy with the society it serves. From discovering better ways to improve children's learning outcomes to musical compositions that inspire, scholarship is fundamental to building a better world.

As a result, West Chester University is committed to encouraging faculty and students to expand the boundaries of the known, solve problems, and cultivate the creative process. This report provides a sampling of that work and the significant public and private sector investments that make it possible.

Whether in the arts and sciences or professional fields such as business, education and nursing, members of the WCU community recognize that all academic disciplines benefit from active research and scholarship. And so we have record numbers of faculty and students engaging in hundreds of scholarly and creative endeavors.

As I retire from WCU's Presidency this spring, I am proud of what our faculty and students achieve in laboratories, concert halls, and studios across campus. Each of these efforts is contributing to the economic and cultural energy of this learning community, the region and the Commonwealth.

Greg R. Weisenstein, Ed.D.  
*President*

## A Message About Research, Scholarship, and Creativity



Welcome to the second annual WCU research report. In the following pages, you will find examples from each academic college of research, scholarly, and creative projects conducted by our faculty and students. We are very proud of these accomplishments for many reasons.

### **Our faculty work very diligently.**

I want to emphasize this, because they conduct their teaching responsibilities and service obligations faithfully. They engage in scholarship to advance their own development and to contribute meaningfully in their fields of specialization, generating new knowledge. Faculty also take the extra time to mentor undergraduate and graduate students in research methods.

### **WCU students also work hard.**

They're taking classes and determining who they're going to be and what they're going to do for the rest of their lives. That's not easy. Many students want to apply what they're studying and learning in the classroom to real-world problems. They work with our faculty to contribute meaningfully to their profession, their university, and their community.

### **That's WCU research, scholarship, and creativity in action.**

Many faculty and students conduct scholarly activities that span many academic fields, because solving real problems or creating something new requires the effort of teams of specialists. In many instances, our faculty establish active partnerships with other professionals at WCU and at other academic, government, and industrial organizations to engage in research. You will see several examples in this report.

They are assisted in this process by the Office of Research and Sponsored Programs (ORSP), whose staff don't merely submit proposals to potential sponsors on behalf of WCU faculty. We facilitate the entire research development process by:

- Assisting faculty in looking for funding and support, internally and externally;
- Identifying potential collaborators at WCU and elsewhere;
- Identifying faculty mentors for interested students; and
- Assisting in proposal development, budget preparation, and even the management of sponsored projects.

Please explore and share in the celebration of our faculty and student research accomplishments.

Gautam Pillay, Ph.D.  
*Associate Vice President for Research and Sponsored Program*

## NIH Grant Supports Innovative Smartphone and Telepractice Technology to Safeguard Teachers' Voices



Elizabeth U. Grillo

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“No prior work has tested a telepractice model that uses a combination of real-time and store-and-access-later methods that are delivered totally online, with no in-person interactions.”

Among common U.S. occupations, **teachers have the highest risk of developing voice problems.** An estimated 60 percent of teachers develop voice problems during the course of their careers. Those at the highest risk are physical education and vocal music teachers.

“Yelling in noisy gyms or having to project your voice over pianos or other instruments can really strain the voice,” says Elizabeth U. Grillo, associate professor in the Department of Communication Sciences and Disorders.

To address the issue, in September Grillo was awarded a three-year, \$410,260 grant from the National Institutes of Health’s National Institute on Deafness and Other Communication Disorders. The grant’s focus is to incorporate smartphone technology and online telepractice methods for the prevention of voice disorders. With the assistance of both undergraduate and graduate students, Grillo will compare the effectiveness of her Global Voice Prevention Model (GVPM) when it is delivered online through academic computing software versus being delivered in-person. The app will collect daily voice measures to assess the prevention model’s effectiveness.

“This is the first research project to design and test an online telepractice model using an app for the prevention of voice disorders,” says Grillo. “No prior work has tested a telepractice model that uses a combination of real-time and store-and-access-later methods that are delivered totally online, with no in-person interactions.”

During the study, WCU physical education and vocal music student teachers will use a smartphone app to record and monitor their voices each day while teaching. Ultimately, Grillo hopes to refine the smartphone app so that speech-language pathologists can utilize it to remotely monitor their patients’ voices on a daily basis.

**The urge to reproduce is hardwired into the DNA of every living organism.** Understanding how, why, and when various organisms devote their energies to reproduction goes to the heart of fundamental questions regarding the evolution of a wide variety of plants and animals.

Funded by a three-year, \$213,000 National Science Foundation grant to probe these questions, Josh Auld, assistant professor of biology, and Allison Kolpas, assistant professor of mathematics, are collaborating on interdisciplinary research that combines computational mathematics and evolutionary biology.

The two are using both mathematical modeling and physical experiments to learn more about the reproductive behaviors of a freshwater snail species, *Physa acuta*. The snails are hermaphroditic: each individual is simultaneously male and female, and is capable of self-fertilizing if another mate—which they find preferable—is not present.

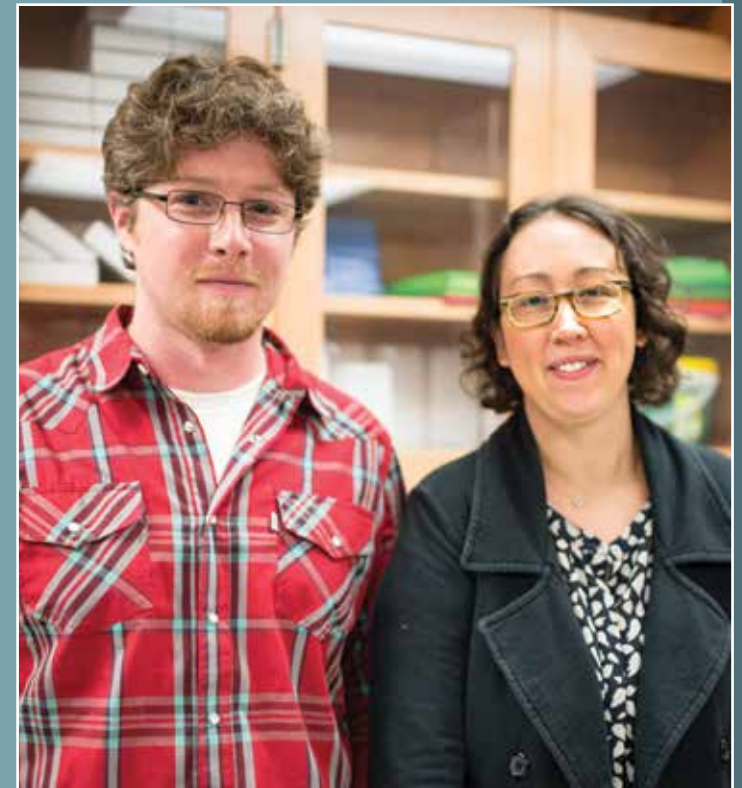
Working with more than a thousand snails, Auld is investigating how long sexually mature snails wait without the presence of a mating partner before self-fertilizing—and how that wait time is affected by the presence of such predators as crayfish, newts, and pumpkinseed sunfish.

Feedback from both the mathematical modeling and the physical experiments is helping refine each of those components.

“By simplifying complex phenomena into key variables and allowing us to conduct virtual experiments,” says Kolpas, “the mathematical modelling helps biologists like Josh better interpret their findings, identifies factors that we might not have considered, and suggests new experiments.”

Adds Auld: “The ultimate goal is to build a mathematical model that explains these reproduction factors as a general phenomenon, so that it could be applicable to other species as well.”

## NSF-funded Research on Hermaphroditic Snails Provides Clues on Reproductive Evolution



**Josh Auld and Allison Kolpas**

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## Bronze Statuettes Provide Unique View of Greece During Roman Rule

When we think of Greek statues, we normally picture marble sculpture, such as the Parthenon (formerly Elgin) Marbles now housed in the British Museum. However, according to Heather Sharpe, associate professor of art history, Greek bronze statues probably were just as widespread.

They only appear less prevalent today because so many bronze statues were subsequently melted down to make other objects ranging from bowls to cannons. However, smaller, four- to twenty-inch-tall bronze statuettes had better chances of surviving, and now provide unique glimpses into this ancient world.

Building upon her 2006 Indiana University doctoral dissertation, Sharpe is using her 2015-16 sabbatical to investigate bronze Greek statuettes—particularly those produced during the rarely studied late historical period of the first three centuries A.D., when Greece was under Roman rule.

“These bronzes were a typical votive offering, given to a Greek god or goddess at a temple or sanctuary when you would ask for something—you wanted a wife, bountiful crops, or to win an Olympic race,” says Sharpe, whose work is being funded by a WCU grant. “However, in Greece there was a significant shift during the Roman Empire, particularly beginning in the first century A.D., when religion apparently became more personal and such statuettes were used for religious purposes in private homes rather than public temples.”

Focusing on this shift, during the first half of 2016 she will be conducting research throughout Greece, including at the American School of Classical Studies at Athens, where she is a senior associate member. Her ultimate goal: to publish a book on Greek bronze statuettes.

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**Heather Sharpe**

## Does Exercise Improve Productivity, Both in the Classroom and on the Job?



**Ebru Isgin and Simon Condliffe**

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“As a measure of how well students are doing in the classroom, GPA scores are a reflection of student productivity.”

If you don't believe the Latin dictum “a sound mind in a sound body,” consider the preliminary results of an ongoing, multi-year study being conducted by associate professor Simon Condliffe and assistant professor Ebru Isgin in the Department of Economics and Finance. Of the 10,164 undergraduates between the ages of 18 and 23 enrolled at WCU during the spring 2015 semester, the average GPA of the 63 percent who exercised at the Student Recreation Center was 3.2, a quarter point higher than those students who didn't visit the center.

In addition, the more frequently students took advantage of the exercise facility, the higher their GPAs tended to rise. “The results appear to be very robust,” says Condliffe, who notes that exercise increases cognitive skills by releasing endorphins that intensify blood flow to the brain.

Condliffe, who teaches and researches healthcare economics, will continue tracking WCU students over time to see if any changes in their gym usage are reflected in changes in their GPAs. He also plans to ferret out differences based on gender and how many courses/credits students take—and hopes to identify possible mechanisms, such as behavioral incentives, that could help boost both student visits to the SRC and their GPAs, as well as enhance the university's student retention rate.

Condliffe's university-supported research has implications far beyond the academic world. “As a measure of how well students are doing in the classroom, GPA scores are a reflection of student productivity,” says Condliffe. “These results suggest potential ways to enhance workplace productivity with correctly structured incentives and wellness programs.”

# Taking the Stress Out of Teaching



**Sandra Kerr and Lisa Lucas**

Up to thirty percent of teachers rate their jobs as either very or extremely stressful, and stress is the top reason that teachers leave their profession.

“Teachers feel that we spend so much time on training, curriculum, and assessments but don’t do much to prepare teachers to handle the competing responsibilities and overwhelming, multiple stressors present today in this era of high accountability,” says Lucas, whose research is university supported.

In the fall of 2014, Lucas implemented “Learning to Breathe,” a mindfulness program that was created by Patricia Broderick, a former WCU professor. Lucas also has a personal mindfulness practice and has attended numerous retreats for education professionals who bring mindfulness concepts into preK-12 classrooms for both teachers and students.

When Lucas piloted Broderick’s program with student teachers, she says, “It definitely impacted their emotion regulation”—according to data analyzed by Sandra L. Kerr, professor of psychology.

Considering the impact of stress on current teachers and the importance of healthy emotion management skills in the teaching profession, Lucas believes that helping pre-service teachers develop methods for managing stress and negative emotions should be a top priority.

Lucas plans to offer her workshops annually to both WCU’s pre-service student teachers and the cooperating teachers who host them, and to publish a book that promotes her workshops’ techniques.

“Teachers feel that we spend so much time on training, curriculum, and assessments but don’t do much to prepare teachers to handle the competing responsibilities and overwhelming, multiple stressors present today in this era of high accountability.”

## **Teaching can be highly rewarding but also quite stressful.**

To reduce stress for both pre-service student teachers and in-service teachers, Lisa J. Lucas, associate professor of early and middle grades in the College of Education, offers professional development workshops on stress reduction and cultivating presence in the classroom.



**When Jean-Christophe Dobrzelewski was six years old**, a famous French soloist who was playing with Dobrzelewski's father—an orchestra conductor in Switzerland—allowed the young boy to blow into a trumpet for the first time. He has been doing so ever since.

"It's a majestic sound and a great mode of expression for me," says the associate professor of trumpet. "To be able to play every day and to inspire younger students to make music all my life has been so rewarding."

Dobrzelewski has performed as a classical trumpet soloist with orchestras around the world—including this past year in Aruba (with some of his WCU students), Costa Rica, and Brazil. His six-piece trumpet ensemble, Tromba Mundi, also performed before an enthusiastic crowd at Carnegie Hall in New York City. "It was a wonderful experience," says Dobrzelewski. "We performed four world premieres, and three of the four composers, including one from the U.S., one from Costa Rica, and one from Switzerland, were there."

This past year Tromba Mundi also recorded their third album, and as a soloist Dobrzelewski has recorded multiple albums for trumpet and organ and trumpet and wind ensembles.

At West Chester, he is also the founder and host of the West Chester University Annual International Trumpet Festival, the Northeast's largest such festival. Since 2006 it has grown into a two- or three-day event that draws up to 500 professional and amateur musicians. It includes master classes and recitals, as well as evening concerts in which internationally renowned soloists play with the student jazz and wind ensembles.

"It's really put our trumpet studio on the map," says Dobrzelewski. "Also, exposing our students to world renowned artists gives them more of an international mindset and inspires them to push themselves musically."

In 2017, for the second time, he also will chair the International Trumpet Guild Conference a five-day, 1,500-musician event in Hershey; and his 16-volume set of orchestral trumpet excerpts is recommended study material for New York Philharmonic trumpet auditions.

Finally, Dobrzelewski regularly performs throughout the community, including in nursing homes and prisons. "Part of our job as musicians," he says, "is to bring art and happiness to people who otherwise cannot access it."

## Using a Trumpet to Spread Music Around the World



**Jean-Christophe Dobrzelewski**

"We performed four world premieres, and three of the four composers, including one from the U.S., one from Costa Rica, and one from Switzerland, were there."

## Preventing Burnout in Forensic Interviewers of Abused Children

When a child is alleged to be an abuse victim, he or she is questioned by a forensic interviewer—an employee of a law enforcement agency, a prosecutor’s office, a child welfare agency, or a non-profit organization. The work, obviously, is intense, and can lead to excessive job dissatisfaction, burnout, and turnover.

Building upon her 2014 dissertation for her PhD at the University of Connecticut, Christina M. Chiarelli-Helminiak, assistant professor of graduate social work, is launching a national survey of forensic interviewers to determine how to prevent such burnout.

“Child welfare professionals in general burn out at high rates,” says Chiarelli-Helminiak. “Forensic interviewers do similar work, but research specifically related to them is limited.” Referring to her dissertation research, which surveyed forensic interviewers in nine Northeast states, she says, “Twenty-nine percent of those who responded said they were suffering from burnout. If a third of the workforce is saying that, ‘As a result of my job, I am experiencing burnout,’ that’s a real issue.”

With university support, Chiarelli-Helminiak will replicate and broaden her research by surveying forensic interviewers nationally.

“Often,” she says, “the focus is placed on forensic interviewers themselves: ‘You need to get counseling, exercise more or get a hobby.’ I am employing a more macro perspective to help organizations understand their roles in ensuring job satisfaction and preventing burnout.”

Among the positive factors her doctoral research identified: having diverse job responsibilities, so forensic interviewers are not constantly interviewing abuse victims or testifying in court; the flexibility to take a day off following an emotionally tough interview; and strong support from coworkers, administrators and family members.



**Christina Chiarelli-Helminiak**

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## Religion as the Key to Understanding Social Justice



Dean Johnson

“I believe our students need in-classroom opportunities to talk about how religion has functioned to create both positive and negative social change.”

**How can the teachings of veterans** of the black-freedom/ civil rights movement inform the teaching of religion and social change to students at West Chester University? How can WCU’s Department of Philosophy create a culture of religious literacy with a focus on social justice?

These are the questions that Dean Johnson, an assistant professor of philosophy who focuses on peace and conflict studies and the role of religion in social change, is currently exploring. “Religion is the key to social change,” says Johnson. “I believe our students need in-classroom opportunities to talk about how religion has functioned to create both positive and negative social change.”

Funded by Indiana’s Wabash Center for Teaching and Learning in Theology and Religion, Johnson has been interviewing civil rights elders to document teaching models that they have used—models that help students tap into their own religious commitments in order to better understand social change movements. His interview subjects have included: the late Vincent Harding, who helped the Rev. Martin Luther King Jr. draft his landmark “Beyond Vietnam” speech; Freedom Fighter Ruby Sales; and Gwendolyn Zoharah Simmons, assistant professor of religion at the University of Florida.

Johnson has also received WCU funding to revise the university’s religious studies program in order to make it more interdisciplinary and more rooted in promoting justice through religious literacy—including a greater understanding of other religions.

“My ultimate goal,” says Johnson, “is to help students understand that they have a role to play in civil society, and a major part of that is having a social responsibility to others.”



## Helping Law Enforcement Identify Emerging Designer Drugs



Monica Joshi

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“Forensic laboratories don’t always have funds to buy new instruments. They need to be able to get more information from the techniques they already have.”

Since 2011, there has been an explosion of designer drugs—so-called “legal highs” designed to avoid both identification and legal prosecution. To address this growing trend, Monica Joshi, associate professor of chemistry, is investigating the role of long-established drug detection and confirmation techniques in the face of the changing drug market.

Funded through a two-year U.S. Department of Justice and the National Institute of Justice grant, Joshi has been studying microcrystal tests—which forensic labs often use to identify drugs such as cocaine and heroin—coupled with infrared microspectroscopy for the identification of designer drugs.

“By coupling one method with the other, we hope to improve our ability to confidently identify these substances,” she says. This approach, she adds, would not require new technologies to ferret out these drugs: “Forensic laboratories don’t always have funds to buy new instruments. They need to be able to get more information from the techniques they already have.”

Joshi is also engaged in a long-running collaboration with the Pennsylvania Department of Corrections (DOC) to help detect drugs smuggled into state prisons and half-way houses. Since 2013, Joshi’s lab has analyzed about 300 samples of confiscated, suspected synthetic marijuana that the DOC’s marijuana-trained K-9 dogs failed to detect.

Previously, she has proven the effectiveness of ion mobility spectrometry to detect cathinones: synthetic versions of an amphetamine-like stimulant derived from the khat plant. She is now preparing to field test a similar method for the detection of synthetic marijuana.

**In terms of guidance regarding both career readiness and post-secondary education planning,** are rural school children at a disadvantage to their urban peers?

That's the question that Cheryl Neale-McFall and Eric Owens, both assistant professors in the Department of Counselor Education, have been investigating since January 2015 as the result of a one-year grant from the Center for Rural Pennsylvania. With a nationwide ratio of one professional school counselor for every 479 students grades 7-12, most schools far exceed the America School Counseling Association's recommended ratio of 250:1.

However, the West Chester researchers' hypothesis—which their preliminary data so far confirms—is that rural schools in particular tend to spend less per student on counseling services. Among the facets they are surveying statewide include the resources, in terms of staffing and technology, each district devotes to student counseling; how students' post-secondary needs are assessed; and how much value and importance counselors place on various post-secondary options, including two- and four-year colleges, technical training, the military and the workforce; and whether counselors follow national standards for regarding the information they provide their students.

Another focus is how much counselors emphasize STEM education. "Developing natural gas resources in the Marcellus Shale region represents significant career opportunities in Pennsylvania's rural communities for STEM students," notes Owens, the department's graduate program coordinator and a former school counselor.

The final goal of their analysis, says Neale-McFall, is to make policy recommendations to state legislators, the state Department of Education, and local school boards regarding "how to best assist school counselors in working with their students."

## Who Gets Better Guidance Counseling, Rural or Urban School Children?



**Cheryl Neale-McFall and Eric Owens**

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Ultimately, the goal of the analysis is to make policy recommendations on "how to best assist school counselors in working with their students."

## Linguistic Detective Work Plumbs History of Hispanic New Mexico

Standard American histories begin with the establishment of the thirteen English-speaking colonies, followed by a relentless push westward. For Israel Sanz-Sánchez, however, that focus on English-speaking people is inaccurate and unfair.

Sanz-Sánchez, associate professor of Spanish and linguistics and acting chairperson of the Department of Languages and Cultures, notes that Spanish colonization of what is now the United States slightly pre-dates English-speaking Jamestown.

Established as a remote outpost of the Spanish Empire in the late 1500s, Hispanic New Mexico has been home to Spanish speakers for more than 400 years. The area's relative isolation for decades from even the rest of Mexico, which was followed by a reconnection with Spanish-speaking Mexicans and then the U.S. acquisition of the territory in the mid-1800s, makes it an ideal language laboratory.

"My interest focuses on what happens when people speaking different dialects of the same language come into contact with each other," says Sanz-Sánchez, a native of Spain.

For a chapter in a forthcoming book to be published by John Benjamins Publishing Company, with university support he recently analyzed 325 private letters written in New Mexican Spanish between 1687 and 1936. His purpose: to determine how the usage of second-person forms of address—ranging from the formal "vuestra merced (your mercy)" to the much more familiar "tú (you)"—changed between 1687 and 1936. "It got progressively less formal after contact with English occurred," notes Sanz-Sánchez.

"These kind of changes," he adds, "are not just about language, but reflect adaptations to radical sociopolitical and cultural changes and connect us to history, culture, geography and identity. That's what makes this type of research so interesting."

"My interest focuses on what happens when people speaking different dialects of the same language come into contact with each other."



Israel Sanz-Sánchez



## Battling the Stigma Surrounding Obesity



Sharon DeJoy

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“We hope to move the needle in terms of how larger people are respected on campus.”

“Being a larger woman in this society sets you up for **discrimination**, which causes stress,” says Sharon B. DeJoy, assistant professor of public health and the College of Health Sciences health promotion program director. “If that happens to you constantly, your body loses its ability to respond to stress in a healthy way.”

The problem can be particularly acute for African Americans, Native Americans, and Latinos, who are more likely to be overweight than whites and, thus, could be discriminated against for both their skin color and their weight.

The results of such psychological stress can include increased blood pressure, anxiety, and depression and an increased risk of actually gaining more weight. Spurred by a survey that indicates ten percent of West Chester University students have been bullied or discriminated against because of their physical appearance, DeJoy has tasked students in her 2015-16 health promotion course on health marketing to develop and implement a social media campaign to improve the campus climate for such individuals. Both Dean Linda Adams’ office and the Office of Social Equity are funding the campaign.

During the fall semester, DeJoy’s students created a multi-media approach, including buttons, posters and social media messages. Among the winning messages, as voted upon by her students: *Be a leader and speak out against weight discrimination* and *#EndFatShaming*.

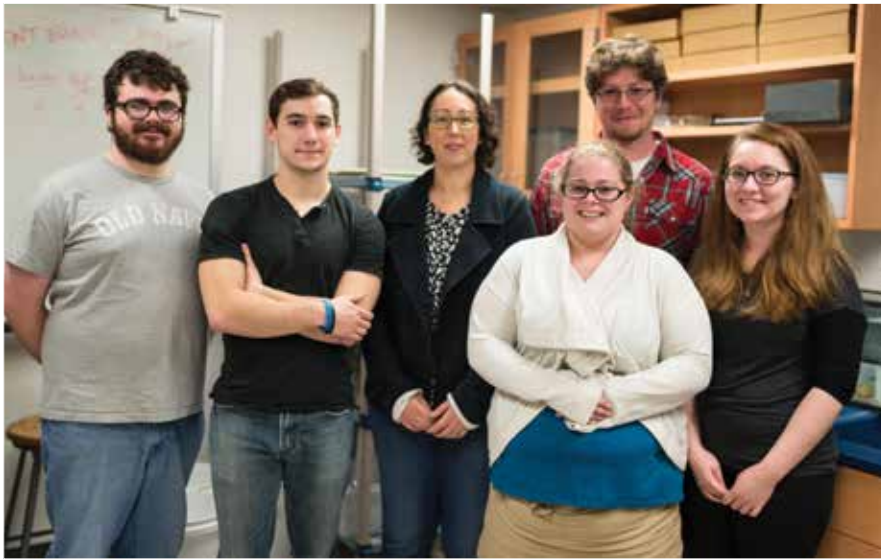
DeJoy will survey the attitudes of several large lecture classes both prior to and at the conclusion of the spring semester campaign to survey its effectiveness. “We hope to move the needle in terms of how larger people are respected on campus,” says DeJoy.

## Hands-on Research Teaches WCU Students Invaluable Lessons



“... if you  
stick it out, you start to see  
results and you get excited  
because you realize what you  
are doing is working.”

*Nicole Bishop*



Corin Stratton, Pablo Delis, Professor Koplak,  
Nicole Bishop (front), Professor Auld, and Devon Larason

“When you are involved in actual research, things don’t always go the way you want them to,” says **Nicole Bishop**, a senior biology major from Oxford, Pennsylvania. “But if you stick it out, you start to see results and you get excited because you realize what you are doing is working.”

Three days a week, including all day Friday, Bishop cares for, and conducts experiments involving, more than a thousand snails and their would-be predators: crayfish, newts, and sunfish. She does so in the laboratory of Josh Auld, assistant professor of biology. They are collaborating on a National Science Foundation-funded multidisciplinary research project that explores reproductive behaviors of freshwater snails.

“Whenever I am in the lab, I realize I am where I want to be right now,” says Bishop who ultimately plans to earn a doctorate in immunology in order to research and develop new vaccines and medications.

She also works with two other biology students, **Pablo Delis** and **Devon Larason**, as well as Allison Koplak, assistant professor of mathematics, and her undergraduate student researcher, **Corin Stratton**. A junior math major from near Lancaster, Pennsylvania, Stratton has refined the mathematical modeling that is a critical part of the research.

“In class you always end up with a nice solution or equation, but with this research some of the data cannot be fit into an exact formula, so we have to try alternative methods,” says Stratton, who also has created visual apps that have made it easier to communicate the modeling results with the WCU biologists.

Though his curriculum focuses on pure math, he believes the applied math nature of the project has enhanced his academic resume for graduate school. “I’ve always wanted to be an academic,” he says. “My plan is to stay in college until they start paying me”—as a university professor.



Seated (L-R)  
Emily Zborowski,  
Staci Sorrell

Standing (L-R)  
Johanna Hattier,  
Professor Grillo,  
Elizabeth Fedak,  
Jenna Brosious

Since last summer, **Brynne Fitzgerald**, a senior economics and finance major, has been assisting Simon Condliffe and Ebru Isgin, associate and assistant professors of economics and finance, respectively. Condliffe trained Fitzgerald to use sophisticated SAS software to crunch data and conduct regression analyses that enabled her to look at a variety of variables related to the positive impact of exercise on WCU students' GPAs.

"I've learned a lot, how to read and analyze data, read regression analyses and run a very well executed experiment with a lot of variables," says the King of Prussia, Pennsylvania, resident.

Previously, Fitzgerald assumed that after graduation she would focus on the hand-crafted handbag business she had already started. "But now all the jobs I am considering are analyst and research positions, and having a background in SAS is a big plus," she says.

**Amanda S. Flynn**, a senior pursuing a five-year dual accounting and economics degree, also coded a lot of the students' data. "This has allowed me to experience some of the material I've learned about in class in real life," says the South Fayette Township, Pennsylvania, resident, who this spring is doing an accounting internship with KPMG. "Data analysis is becoming more prominent in accounting, which is why this experience has been so great for me."

WCU faculty researchers also rely upon graduate students to further their research. **Jenna Brosious**, a communication sciences and disorders master's degree student, was one of two graduate students who confirmed that the audio recording capabilities of smartphones were of high enough quality to remotely monitor voice qualities. Brosious' work laid the foundation for Elizabeth U. Grillo, associate professor of communication sciences and disorders, to obtain a \$410,000 grant from the National Institutes of Health to assess the efficacy of an online voice disorder prevention program by a smartphone app.

Brosious, who hopes to become a medical speech-language pathologist, last November also did a two-hour poster presentation of their findings at the American Speech Language Hearing Association Convention in Denver. "It was a great opportunity to meet other researchers and to network," she says. "And the response to our research was awesome. A lot of people loved the idea of being able to remotely conduct a comprehensive evaluation of a patient's voice."



"This has allowed me to experience some of the material I've learned about in class in real life."

*Amanda Flynn*





"It was a cool way for me to work independently, and getting something accepted for publication before I graduate has been an amazing opportunity,"

*Shannon Boyle*

"Languages are such a living thing, they're not just words but reflections of changes in politics, religion and immigration."

*Gabriela Stephens*

Working with Dean Johnson, an assistant professor of philosophy who focuses on peace and conflict studies, senior **Shannon J. Boyle** co-authored an entry entitled "White Middle Class" in *The American Middle Class: An Economic Encyclopedia of Progress and Poverty*. The reference work for high school students will be published in Oct. 2016 by ABC-CLIO.

"It was a cool way for me to work independently, and getting something accepted for publication before I graduate has been an amazing opportunity," says Boyle, an English major from Stroudsburg, Pennsylvania who is also minoring in peace and conflict studies. Inspired by Johnson, she hopes to work for several years for a non-profit activist organization before pursuing graduate school.

**Sean Brady**, a senior from North Wales, Pennsylvania, performs microcrystal tests to identify illicit designer drugs for Monica Joshi, associate professor of chemistry.

This February, the forensic and toxicological chemistry major was scheduled to present a poster of their research at the annual American Academy of Forensic Science scientific meeting in Las Vegas, Nevada. "It's really great to be able to do that as an undergraduate," says Brady, who has been funded through Joshi's federal grant. "I'm incredibly excited."

Although forensic chemistry offers a multiple career options, Brady says his research experiences have opened another door for him: as a researcher. Says Brady, who ultimately wants to pursue a graduate degree: "It's possible I could teach at the college level and conduct research, as well as help other students pursue research—as Dr. Joshi has helped me."

Conducting undergraduate research had a seminal influence on another of Joshi's students, who recently was training to become a federal law enforcement agent.

"Working with a law enforcement agency of the U.S. Department of Justice has been my lifelong dream," says the WCU graduate, who for security reasons wishes not to be identified. "My drug analytics expertise really enhanced my resume and enabled me to outcompete other individuals seeking the same position."

Prior to earning her BA in Spanish and K-12 teaching certificate, **Gabriela Stephens** used a research award from the College of Arts and Sciences to transcribe 18th century Spanish-language documents from northern Mexico with Associate Professor of Languages Israel Sanz-Sánchez.

"Languages are such a living thing, they're not just words but reflections of changes in politics, religion and immigration," says Stephens, the daughter of missionaries who raised her on and off for the first 12 years of her life in Mexico. Today she is both a full-immersion Spanish K-5 teacher in the Kennett Square School District and a WCU a master's degree candidate in Spanish languages and cultures.

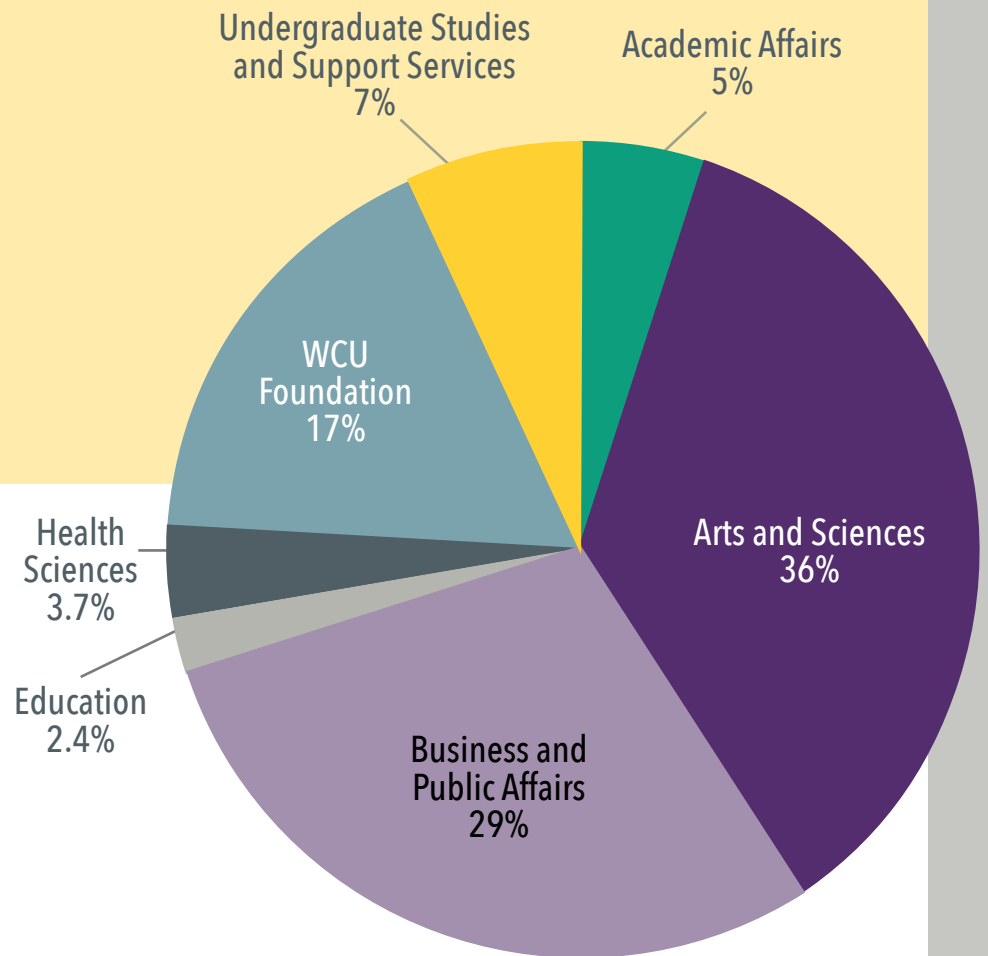
Greatly influenced by Sanz-Sánchez and her research experience, she says, "Where I am at now is merely a stepping stone to the future. I want to become a linguistics studies researcher at the university level."

# External Research Funding

FISCAL YEAR 2014-2015

College/Administration Unit	Submitted Proposals	Requested Funding
Academic Affairs	1	\$412,160
College of Arts and Sciences	34	\$2,948,717
College of Business and Public Affairs	5	\$1,879,159
College of Education	6	\$89,408
College of Health Sciences	7	\$948,526
College of Visual and Performing Arts	5	\$115,051
Student Affairs	2	\$60,000
President	1	\$5,000
Undergraduate Studies and Support Studies	3	\$624,634
Facilities	1	\$3,000,000
<b>Totals</b>	<b>65</b>	<b>\$10,082,655</b>

FUNDING BY COLLEGE/ADMINISTRATIVE UNIT



College/Administration Unit	Received Awards	Approved Funding
Academic Affairs	1	\$113,910
College of Arts and Sciences	15	\$813,763
College of Business and Public Affairs	3	\$663,679
College of Education	2	\$53,620
College of Health Sciences	5	\$82,756
Undergraduate Studies and Support Services	1	\$150,708
WCU Foundation	1	\$379,427
<b>Totals</b>	<b>28</b>	<b>\$2,257,863</b>



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