Research & Creative Activities

Winter 2014-2015

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE
GRADUATE SCHOOL

On the Cover

Cathy Casey, a student in the Department of Computer Science, demonstrates a humanoid robot to Miss Sophie Surheyao.

Today's scientific endeavors have come a long way since the days when (mostly male) scientists in white coats were isolated in laboratories with exclusive experiments. Today's scientists are publically sharing their knowledge and encouraging a new interest in science. This is because, socially, we have come to understand the impact science and technology have on our lives and how the everyday human experience can inform scientific pursuits. Human interactions with technologies have become a natural part of our existence, and our technology aims to mimic the natural. At the same time, we understand a higher degree of scientific and technical literacy is needed to function in our advanced society. This edition heralds the mutual interaction of research and the everyday, as well as the spread of new and advanced knowledge to the next generation of curiosity-seekers, innovators and creators.

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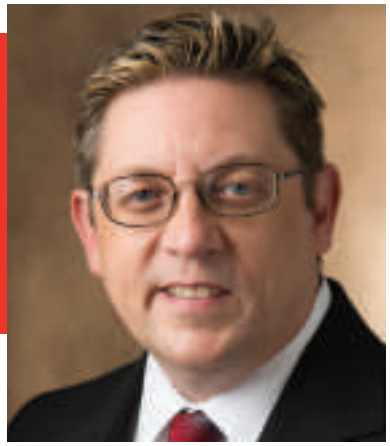
Dean's Message



The Worth of the University's Investment in Scholarship

As SIUE scholars, we all seek to add knowledge and innovation to our respective areas of study. Like Pythagoras' 2500-year-old theorem, a few of us, very few us, create memes that will have an impact far beyond the life of our genes.[1] Those few will add elements to our culture that will ripple into society with effects beyond our lifetime. However, whether we see it or not, every SIUE scholar creates ripples of influence that spread far and long into the future.

The ripple effect of my own work provides an example. As part of my scholarship, I have created ripples by bringing robotics competitions to SIUE. Thousands of middle school and high school students have participated in our local and regional robotics competitions since 2000. Through NSF-funded robotics projects with Dr. Sue Thomas and others, I know empirically that we have made a difference in many students' lives.

Apart from outcomes published in our papers, I know the influences continue in the everyday lives of my students. **Ross Mead**, who started as a high school participant in the SIUE robotics competition, continued as an undergraduate in my lab, and is now a PhD candidate working in robotics at the University of Southern California. He recently founded USC's regional robotics competition in the greater Los Angeles area, further extending the ripples that started with SIUE's $3000 investment in LEGO robotics kits for my 1998 Artificial Intelligence class. **Dr. Gary Mayer**, who worked with me as a graduate student, went on to earn his PhD in computer science from Arizona State University, and became an SIUE faculty member. He continues the ripple effect of the robotics work we started together with his own students. **Dr. Jenna Gorlewicz**, who as a student worked on SIUE's first autonomous golf cart competition, eventually earned her PhD in mechanical engineering from Vanderbilt University, and now as a faculty member at SIUE, mentors her students in projects on human-robot interaction. **Jeff Croxell** earned his master's in electrical engineering and contributed significantly to the growth of my robotics lab and outreach programs. He works now as an electrical engineer at a regional technology firm and continues the ripple effect though his mentoring of the St. Mary's Middle School robotics teams. There are others from my lab including **Jason Tennyson**, an electrical engineer at Apple; **Nisha Dharna**, a computer scientist at Monsanto; and **Cathy Casey** (pictured on the cover), a current student working with Dr. Steve Hupp and me, performing experiments with humanoid robots for the treatment of children with social anxiety disorder.

In this issue of Research and Creative Activities, you will read about the important and interesting work just a few of our scholars are performing. As you read, consider the significant impact of the ripples that they and all SIUE scholars are making, not only through their work, but through their student mentoring as well, for that is certainly worthy of our support and celebration.

Jerry B. Weinberg

Jerry B. Weinberg, PhD
Associate Provost for Research and Dean of the Graduate School

[1] Dawkins, Richard (1989), The Selfish Gene (2 ed.), Oxford University Press

Research Spotlights and News

Carolina Rocha Awarded Fulbright to Study Argentine Cinema in England

As SIUE looks to place a greater emphasis on global studies and become a more cosmopolitan university, Fulbright awards have provided opportunities for our faculty to seek and develop relationships with institutions and scholars abroad. Dr. Carolina Rocha, associate professor of foreign language and literature, has received the opportunity to travel to the University of Liverpool, where she will collaborate with internationally-known scholars in the field of film and Latin American studies.

The Fulbright U.S. Scholar Program, designed to increase mutual understanding between the people of the United States and the people of other countries, has awarded Rocha funding to travel to the U.K., where she plans to complete a book that studies the cultural impact of the tumultuous politics in Argentina from the years 1966-1976 on its national cinema. Having already published one book, several coedited volumes, and a number of book chapters and journal articles on Argentine and Brazilian film, Rocha will build on her extensive knowledge in a close collaboration with Dr. Lisa Shaw. Shaw's methodology in examining the relationship between the Brazilian government and the cinema industry, Rocha said, will allow her to further examine the way Argentine national cinema developed during a period when competing ideologies sought to reshape the Argentine nation. Rocha also plans to incorporate the knowledge she gains through her experience in the UK into the courses she will teach at SIUE in the future.

Patently Methodical: SIUE Pharmacy Professor Awarded Two U.S. Patents

The United States Patent and Trademark Office has issued two separate patents to Dr. Ronald E. Worthington, associate professor of pharmaceutical sciences. The two related inventions, "Bacteriocin Based Methods to Control Lactic Acid Bacterial Growth," (U.S. Patent No. 8,563,293) and "Bacteriophage Derived Methods to Control Lactic Acid Bacterial Growth," (U.S. Patent No. 8,679,821) utilize natural antibiotics to prevent the bacterial contamination that can occur in industrial production operations when lactic acid forms. Such contamination has proven a problem as bacterial resistance to antibiotics increases.

According to Worthington, commercial applications for both patents include use in the ethanol biofuel industry and beverage alcohol production, where lactic acid bacteria contamination can damage yields and profits. Worthington's first patent prevents contamination by employing synthetic genes which inhibit damaging bacteria. The second focuses on developing a microbial population in the host that destroys bacteria. This second patent includes claims for synthetic genes for the natural protein native nisin. According to Worthington, his study was the first to find that nisin as a native peptide contains antimicrobial activity.

"The bacteria that can become resistant to antibiotic drugs are in many cases the same bacteria that inhabit our digestive tract and serve a probiotic, healthy function," Worthington said. "That poses a health risk, just like antibiotic resistance in any other setting. The inventions inherent in both of these patents focus on attacking this problem. In essence, we engineered artificial genes to make proteins that are not resistant to current pharmaceutical drugs."

Jessica Harris, Historical Studies, Awarded Woodrow Wilson National Fellowship

Dr. Jessica Harris, assistant professor of historical studies, has been chosen to receive a 2014-2015 Junior Faculty Career Enhancement Fellowship Award from the Woodrow Wilson National Fellowship Foundation for her research on middle-class black women's struggle for civil rights in the early 20th century. In support of pre-tenure researchers and according to the Foundation literature, the Career Enhancement Fellowship aims to "increase the presence of minority junior faculty members and other faculty members committed to eradicating racial disparities in core fields in the arts and sciences." The award provides Harris a stipend to support dedicated research time, work with a chosen mentor and networking with other Career Enhancement Fellows.

Harris's book, "Before the Panthers: Black Women and the Struggle for Civil Rights in Oakland, California 1900-1940," is set to be, as she describes, "the first social and political history of black middle-class women in a western city prior to World War II." The book will contain Harris's perspective on important historical and intellectual debates, such as the efficacy of the social movements of small communities in the Northern and Western United States.

These communities, according to Harris, known as the "black women's club movement," suggest, "a more complex and longer tradition of activism" that would contribute to "the development and radicalization of Oakland's black freedom struggle in the decades following World War II." This topic exemplifies the sort of scholarship targeted by the Woodrow Wilson Career Enhancement Fellowship, as it stresses a commitment to "eradicating racial disparities in core fields in the arts and sciences."

Whammy!: SIUE's Harper Travels to New York International Fringe Theatre Festival

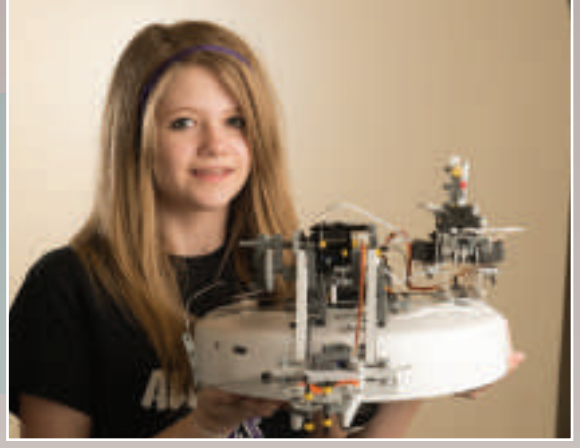
SIUE Associate Professor Charles Harper of the Department of Theater and Dance first assembled his playful, satirical piece, "Whammy! The Seven Secrets to a Sane Self," in 2009. Yet, since its initial premier in 2011 at the HotCity Theater in St. Louis, the piece has enjoyed national recognition. The dance/theater piece explores themes of obsession and self-help, and as Harper says, dives into "both the gurus who profit from the 'self-help movement' and the desperate, ordinary people who look to it for guidance."

Consisting of a series of "movement activities" performed by its ensemble cast, the visual performance ranges from what Harper calls, "behavior-based modern dance to a de-constructed 1960's Beach Movie party dance." Elaborating on story themes, Harper said, "These choreographed movement sections are punctuated by personal revelations and confessions. The play's spoken words are pulled from actual self-help books that deal with subjects such as depression, obsessive-compulsive disorder, sexual addiction and suicide."

Harper, the creator, director and a performer in the show, called upon other SIUE colleagues for the creation of Whammy! Former SIUE instructor Mikey Thomas served as choreographer and actor, while Dr. Jeff Skoblow, professor of English language and literature, and SIUE alumni Maggie Conroy, Greg Fenner and Anna Skidis filled out the cast. The stage was managed by SIUE alumna Kristina Cirone.

In summer 2013, Whammy! was performed at the New York International Fringe Theatre Festival, the largest multi-arts festival in North America. There it received strong reviews and recognition as a critic's pick by *TimeOut NYC*, which wrote: "This piece truly had me nearly in tears and laughing out loud moments later; it also left me thinking about the nature of psychology." Meanwhile, NYTheatre.com recognized the performance, writing: "Harper's piece is endlessly fascinating."

Robotics and Mentors Used to Build Interest in STEM Careers



In recent years, pre-college age students have expressed increasingly less interest in careers related to science, technology, engineering and math (STEM) fields. In 2013, a survey of 1,025 teens conducted by Junior Achievement USA and the ING U.S. Foundation, revealed a 15 percent decline in interest in STEM and medical fields from the previous year. Meanwhile, according to the National Math and Science Initiative, only 44 percent of the 2013 U.S. high school graduates were deemed ready for college-level math. For college-level science, the number dropped to 36 percent. A team of researchers from SIUE and the University of Southern California (USC) are honing in on middle-school age children and their self-confidence in science, knowing that "self-efficacy," or one's belief in his or her ability to achieve goals, can be an important factor in career-related choices. After school programs, such as robot-building competitions, have been shown to help boost kids' self-efficacy in science-related fields like computer science, mechanical engineering and math. Yet, one key element in many after-school programs related to science has not yet been well studied—the role mentors can play in supporting the development of a child's self-efficacy.

Mentorship plays a frequent and vital role in today's science curriculum. From peer tutors, to teachers, to professional role models, mentorship has long been recognized as a key factor in helping to raise students' self-efficacy in science. However, very little is known about which mentorship practices are most effective in boosting students' attitudes. The SIUE-led team of researchers proposed to contribute a deeper understanding of good mentorship practices in STEM education and how students respond to that mentorship.

The study, funded by the National Science Foundation's ITEST (Innovative Technology Experiences for Students and Teachers) grant program, is headed by Dr. Gary Mayer, assistant professor of computer science in the School of Engineering, but it represents the collaborative efforts of a multidisciplinary team from two institutions. Expertise was recruited from Mayer, Dr. Jerry Weinberg, associate provost for research and professor of computer science at SIUE; Dr. Stephen Marlette, associate professor of curriculum and instruction in the SIUE School of Education, Health and Human Behavior; Dr. Sharon Locke, associate professor and director of the SIUE Center for STEM Research, Education and Outreach; Dr. Susan Thomas, former psychology professor at SIUE; researchers from the Illinois Education Research Council; and, from USC: Dr. Maja Mataric and Ross Mead, a doctoral candidate. The team represented not only a cross-section of researchers who had the right combination of expertise and interest in science education, and they hailed from institutions surrounded by local schools with diverse and underserved student populations.

The ITEST idea emerged from past research by Weinberg and Thomas that explored whether robotics might help raise girls' confidence in STEM fields. Their study found that robotics competitions could raise girls' self-efficacy, and results suggested that mentoring could play a role in enhancing the students' self-perceptions in science. However, the researchers knew little about the types of mentorship most effective in raising STEM self-efficacy. Did it matter if the mentoring employed self-efficacy enhancing techniques, or was it enough to use general best practices? Might there be other factors, such as sex, race or ethnicity, that moderate the impact of mentorship? Understanding each aspect of mentoring and how it contributes to self-efficacy, the research team argued, is vital in making the best use of it in STEM-related activities.

With robotics as a core element, the study culminated in spring 2013, when Mayer oversaw 435 Latino, African-American and Caucasian seventh- and eighth-grade students from underserved schools in the St. Louis and Los Angeles areas as they competed in Botball®, a robotics competition organized by the KISS Institute for Practical Robotics (KIPR). Combining the excitement of competition with an opportunity for personal expression through robot design, the Botball competition annually holds 13 regional U.S. tournaments, as well as international competitions. Over the course of a season, students involved in Botball work together to design, build and program a robot that will meet a particular challenge. Teachers and mentors work with students to prepare for the competition and lead them into the final tournament. Unfortunately, according to Locke, although teachers play a critical role in the process as team mentors, there is currently only limited mentor training available for Botball addressing how to successfully guide a team and be a good mentor.

Thus arose the opportunity to perceive how various types of training could affect mentorship practice and, in turn, examine how mentorship strategies influence students' self-efficacy. A key focal point of the project was forty-five K-12 teacher mentors who each worked with groups of eight to ten students. The ITEST research team split the teachers into four groups: those who received no mentor training; those who received training in general best practices in mentorship; those who received training in mentor strategies specific to self-efficacy; and those who received a combination of general best practices and techniques specific to self-efficacy. The team also analyzed student Botball participants' attitudes about pursuing science courses and careers and their expectations for success in STEM areas, using questionnaires to measure the students' self-efficacy throughout the process.

By examining the impact of various mentorship groups, the team not only sought to track the rising confidence of students as they trained for and competed in Botball, but they also attempted to delineate the effects of various mentorship

practices. While overall mentor group differences were not found, the research group did determine that some teachers had positive mentor practices to which the students responded. For instance, students of those mentors who engaged in positive mentor practices (such as: encouraging students during difficult tasks, giving students helpful feedback, helping students believe they could accomplish the tasks, and helping students to appreciate all team members' contributions) made more gains by the end of the study in student self-efficacy, STEM achievement-related choices, and STEM expectations for success than those students whose mentors did not engage in positive practices. Furthermore, the team determined that the relationship of prior STEM self-efficacy and post STEM self-efficacy was stronger for Caucasian students than for minority students (i.e, African American and Latino/Latina students) which indicates that there may be greater opportunity to affect STEM self-efficacy in minority students compared to Caucasian students.

Based on the results of their explorations, the team is developing a mentor-training package that could be used in all robotics programs and be generalized to other STEM activities. According to Locke, the study could be applied across STEM disciplines. "The materials will fill a gap in resources on mentoring, and because they are research-based and not specific to robotics, they will be broadly useful for other mentoring situations such as academic Olympiads or math competitions," she said. Through developing models of mentoring for STEM activities and constructing supporting materials, the ITEST team hopes to provide a variety of techniques that allow STEM educators to make the best use of mentors—a powerful tool in providing students with the confidence they need to advance to STEM careers.

Graduate Student Research Briefs

Toward a Universal Test-Bed for Variable Friction Touchscreens

Touchscreens on electronic devices have evolved dramatically in recent years, allowing users to gain an increasingly sensitive experience with once unresponsive screens. However, much remains to be learned about how to improve the sense of touch as a means of interacting with technology. In Spring 2014, Karl Katumu, a graduate student in the Department of Mechanical Engineering, worked with his advisor, Dr. Jenna Gorlewicz, assistant professor of mechanical engineering, to create a test bed to aid in the development of better touchscreens. This project works toward a new class of touchscreens called Variable Friction Touchscreens (VFTs) that will allow users to "feel" new perceptions of friction, texture and other tactile sensations.

The test bed will allow experiments on the vibration of these touchscreens, which creates these perceptions related to friction such as "slippery," "sticky" or "bumpy," to be conducted. Together with his advisor, Katumu will build a design test platform that allows the team to test various vibration phenomena on these touchscreens. The challenge arises in creating a platform that provides the most flexibility and capacity for testing different vibration phenomena. Katumu hopes that the model test bed will be able to support multiple configurations that will advance our understanding of how vibration can be refined to match many types of human sensory experience.

SIUE PhD Students Engage in Projects to Help Solve Energy Issues

Two School of Engineering PhD candidates, Xiaopeng Li and Wei Wu, researched technological advances in power conversion systems. These projects sought to find new ways to harvest and recycle energy and enhance the power recovery capacity of renewable energy sources. In Li's study, a piezoelectric curved energy generator, known as the thin layer unimorph driver (THUNDER), showed encouraging signs for harnessing energy from the daily activities, such as through vibration. In such instances, piezoelectricity, a power source that harnesses electrical charges accumulating in certain solid materials, captures the alternating current that is generated from a device's vibration and re-uses that energy to continue powering the device. Li worked to discover ways to optimize the power output from this small generator to be used by low-voltage and AC-current devices.

Meanwhile, Wu has co-published a conference paper from the 2014 ASME national meeting with her advisors, Dr. Andy Lozowski, associate professor of computer engineering, and Dr. Fengxia Wang, assistant professor of mechanical engineering. The paper, "Improved Rectifier Circuit with Backward Diodes for Low Power Source Harvesting," addresses how to use a semiconductor that exploits the characteristics of diodes, electronic components with two terminals that conduct current differently, to better convert energy from low-power sources. Harvesting energy from these sources using common diodes is impractical at best, and at times impossible. This is due to the relatively high threshold voltage required for most diodes. Ms. Wu's project examined how the use of backwards-flow diodes which have an ultra-low threshold voltage can help improve the harvesting efficiency for low-power sources.

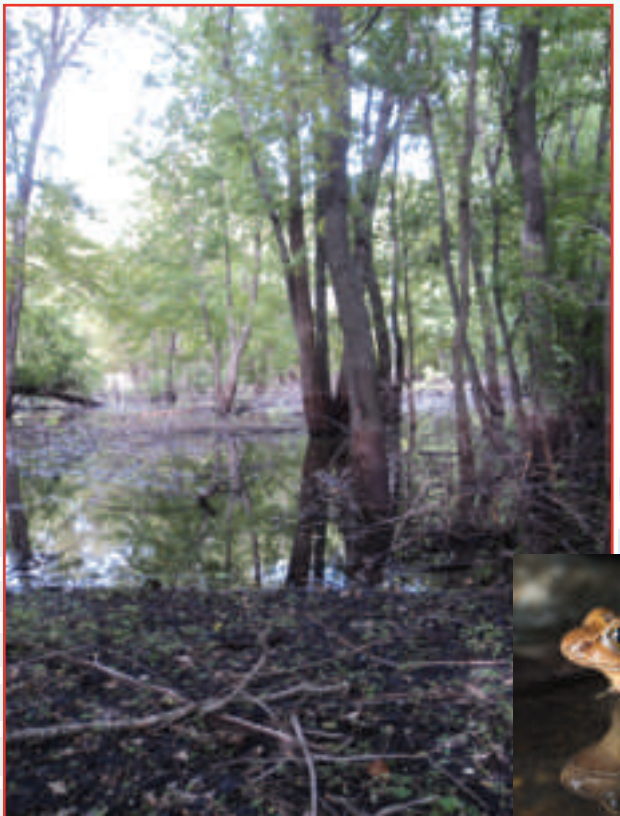
Evaluating the Success of Bottomland Forest Restoration in the Upper Mississippi Valley

Bottomland forest in the American Upper Mississippi Valley has been vastly diminished in the centuries since Euro-American settlement. In recent decades, however, there has been renewed interest in restoring bottomland forest (BLF), which provides vital ecosystem services, such as enhanced water quality, nutrient cycling and wildlife habitat. The U.S. Army Corps of Engineers began restoring portions of BLF in the early 1990s, planting species such as oak and pecan to quickly develop wildlife habitat while allowing volunteer seeders, like silver maple, ash, elm and cottonwood, to begin passive colonization. In fall 2013, Lindley Ballen, a graduate student in biological sciences, received an SIUE Research Grant for Graduate Students to explore the success of such projects.

Ballen proposed to track changes in vegetation structure, composition and health to measure the progress of redevelopment efforts. She chose nine sites at various stages of restoration (1- 23 years) throughout the Upper Mississippi Bottomland region, and she chose two mature forest sites as comparison. Her hypothesis was that the sites would largely be on track toward their restoration goal: approach the nature of an old growth forest that supports diverse vegetation species. Her study will produce an overview of how these restoration projects develop over time, offering a picture of restoration success or failure. It is hoped that this research can provide information about tree species that are best able to support large-scale restorative efforts in bottomland forests.

Assessing Negative Anthropological Effects on Vernal Pools without Federal Environmental Protection in Missouri and Wisconsin

Vernal pools are small seasonal wetland areas often formed by rain and snow melt. These are essential for the development of amphibian species, which need the pools for breeding and the surrounding territory for foraging as adults. Such temporary but essential wetland areas face threats from the loss of natural buffer zones due to agricultural development, urban growth or other factors. With the decline of vernal pools, amphibious species are at risk, and with them, an important link in the chain of ecological diversity.



A landmark U.S. Supreme Court Decision of 2000, Solid Waste Agency of Northern Cook County vs. the U.S. Army Corps of Engineers, downgraded these pools from protected federal wetlands under the Clean Water Act to areas left to states' protection. Julianne Epplin, graduate student in the Department of Environment Sciences, is exploring how two states, Missouri and Wisconsin, have implemented protections of vernal pools. In this, she determines the locations and extent of the wetland areas using information from the National Land Cover Database, supported by the U.S. Geological Survey. With this information, Epplin assesses the risk that animal species face by examining threats to vernal pools and their surrounding crucial habitats. It is hoped that this data may provide a stronger picture of how the two states have performed in protecting seasonal wetlands, and thus inform state policy surrounding habitat conservation.

Plants in Space?:

NASA-Backed Project Explores Microgravity Environments for Plants

"From a plant's point of view, gravity is a critical piece of information about where it is in the world—light is usually up, and water and nutrients are usually down—but a plant in space is missing that sense."

- Dr. Darron Luesse, professor of biological sciences

What if humanity could travel to farther reaches of outer space, or colonize the hostile environments found there? How might plant life thrive in non-gravity environments? What if we could genetically engineer plants to dramatically increase our crop yield per acre? Outcomes such as these may eventually be found through the work being conducted now in the lab of Dr. Darron Luesse, professor of biological sciences.

NASA has taken an interest in the possible breakthroughs of Luesse's experiments, conducted through a project led by Ohio University and supported by nearly $400,000 in grant funds. Luesse and Dr. Sarah E. Wyatt of Ohio are exploring questions about how gravity affects the complicated process of environmentally-regulated plant growth and development.

While animals can alter their environments or move to new ones, plants are immobile, and instead will often change how they grow in a way that best suits available resources. Because one of the most important and informative aspects of an environment is gravity, this force plays a role in nearly every aspect of a plant's development. On earth, this can be seen in the growth patterns of seedlings. When a seed germinates underground without light, it has only gravity to guide its growth in the direction of likely resources. Adult plants also respond to gravity, as can be seen in the angle that branches emerge from the main shoot. Through a process called gravitropism, plants may change their growth in response to a change in the direction of gravity, for example when wind causes a plant to fall over. Shoots will immediately begin to grow towards the new upward direction, while roots will grow down.

According to Luesse, "From a plant's point of view, gravity is a critical piece of information about where it is in the world—light is usually up, and water and nutrients are usually down—but a plant in space is missing that sense. They don't do as well in this environment. We want to learn specifically why this happens, so that we can potentially address, through genetic engineering or growth practices, how to grow healthier plants in space." Not only that, but understanding this process can perhaps provide opportunities for biotechnology to enhance crop species and agricultural output here on earth.

The key to understanding Luesse's work lies in the genes of the unassuming *Arabidopsis thaliana*, or thale cress plant. This plant, unheralded outside the scientific community, ("You can't eat it and you can't smoke it…" Luesse points out) has been heavily researched, he says, "due to its short life cycle, small size, abundant molecular tools and most importantly, its small, sequenced genome." Rather than simply observe how plants grow under different gravity conditions, knowledge of the genome's sequence allows researchers to predict which genes (and the corresponding proteins) are involved in, and how they are contributing to, overall plant development with and without gravity.

By using the sequence of an entirely known genome, like that of *Arabidopsis*, scientists can identify all of the potential genes and predict the proteins that can potentially be made from those genes. While genes provide the instructions for making proteins, it is the proteins themselves that are active in cells, catalyzing reactions and directing growth and development. By understanding each protein's function and when it is used, scientists can determine which specific proteins are involved in a cellular process and how they may regulate it. According to Luesse, his project begins by focusing on the question of which proteins are used by the plant to sense gravity, but also hopes to address the question of what each protein does. "Basically," he said, "we are asking which proteins a plant chooses to produce when it is living in a microgravity environment, and how that decision differs from plants growing in regular gravity conditions. The proteins that are present in one sample, but not the other, or are present in different amounts, represent the interesting topics for future research."

Finding the reasons why one sample differs from another, what specific proteins do for a plant, or why a plant produces or halts production of a protein under certain gravity conditions, Luesse said, may lead to new agricultural practices or targets for genetically engineering plants that would allow them to grow closer together here on Earth. Perhaps the tiny seeds of *Arabidopsis* could eventually allow humanity to feed more people. Perhaps we will begin to understand how to best grow plants on other planets. Through the research of Dr. Darron R. Luesse, these things, and others, seem possible.

Mentored Student Research

Do plants know which way is up? As it turns out, they do. If you lay a plant on its side (even in the dark), its shoot will change direction and start growing up, and its root will grow down. This process is called gravitropism. Graduate student Elisa Morales received a research grant from the SIUE Graduate School in spring 2014 to understand how this process works. To unravel the truth, she is working with a specific mutant version of the plant Arabidopsis thaliana that displays altered gravitopism (with the goal of determining which genes the plant uses to perform this response). This plant, known as *gravity persistent signal 5* (*gps5*), is considered to be hypergravitropic because it continues to curve its growth beyond the point where normal *Arabidopsis* stops. By determining which signaling pathways are altered in the *gps5* mutant, Morales hopes to understand how wild-type *Arabidopsis* utilizes those same signals to regulate gravitropism. Working under the mentorship of Dr. Darron Luesse, Morales has already sequenced the entire genome of the *gps5* mutant and identified five candidate genes that may be regulating the mutant's odd response to gravity. It is hoped that knowledge gained from this work will eventually inform agricultural practices, selective breeding, and genetic engineering, leading to crop plants that grow taller instead of wider, and, in turn, higher yields.

Water Management, Waste Reduction, Greener Spaces:
SIUE Engineers Work with Federal, State, Local, and Industrial Partners on Green Infrastructure Projects

Individuals and communities in the U.S. are increasingly asking for simple, practical solutions that promote a modern, yet sustainable, lifestyle. The need to address challenges that accompany today's global climate change, population increases, commercialization and aging infrastructure requires that societies develop innovative ideas and broad collaboration. In the SIUE School of Engineering, researchers are advancing projects that focus on making changes to advance our infrastructure with "green" designs.

Urban Stormwater Management

The St. Louis Metropolitan Sewer District (MSD) is the nation's fourth largest sewer system, covering 525 square miles with 9,600 square miles of sanitation and stormwater systems. While serving 1.5 million people, the MSD experiences challenges with overflow and water management. Urban development can further exacerbate the city's water challenges when vegetation is removed and replaced with impervious surfaces, sending stormwater into ditches, culverts and sewer pipes. Such problems cause runoff that picks up and carries a wide variety of pollutants into our local streams and rivers, adversely impacting watershed health and ecosystem integrity.

The state of Missouri has developed a long-term plan to incorporate green infrastructure approaches to control stormwater runoff, and the city of St. Louis is working in some of its poorest neighborhoods to test new strategies. Green infrastructure (GI) planning is a sustainable, environmentally-friendly, and cost-effective way to manage water in the city. Good strategies can lead to the reduction of heat, decreased flood risk, improvements in water and environment, and overall human well-being. Typical GI strategies might include reducing flow into the sewer system with rain gardens and absorbent soils, as well as low-impact drainage techniques. Furthermore, green infrastructure strategies can help beautify neighborhoods by adding plants and green spaces to the urban landscape.

Leading the way among SIUE researchers working with local municipalities to study green infrastructure is Dr. Jianpeng "Jim" Zhou, professor of civil engineering. Zhou directs multiple projects, funded by the US-EPA, the non-profit East-West Gateway, private companies, and the city of St. Louis. These projects combine the expertise of SIUE researchers with local government and non-profits to create solutions for urban water management in the greater St. Louis area.

One major initiative, funded by the US-EPA and conducted with co-investigator Dr. Susan Morgan of Civil Engineering, includes Zhou's current project, "Community-Rooted Green Infrastructure for Urban Water Improvements." Zhou and Morgan are studying innovative water-management techniques in communities built by Habitat for Humanity.

The project builds on the MSD's efforts to reduce stormwater flow into municipal sewers. The team monitors flow at particular sewer entry-points to assess the effectiveness of the green infrastructure, which includes rain gardens, planter boxes and rain barrels.

In addition, the team developed outreach events to local residents to educate them about the green infrastructure on their properties and how to maintain it. It is the team's hope that increased knowledge and community engagement will promote the widespread use of green infrastructure.

In a complimentary project, Dr. Laurent Ahiablame, adjunct lecturer in the Department of Civil Engineering, is evaluating the environmental, social and economic benefits of the green infrastructure applications. The project examines financial, regulatory and logistical facets of GI strategies, providing benchmarks for measuring the success of these projects. Results of Ahiablame's study will aid the St. Louis MSD in understanding the short-term and long-term returns on incorporating GI models into city planning.

By providing an analysis of the GI models' overall effectiveness in social and financial realms, Ahiablame is also illustrating how each element of a green infrastructure system, including people, sites and neighborhoods, are connected to the city's watershed health and community welfare.

"We all live in a watershed, and the benefits of GIs should be considered not only at the individual sites, but also at the watershed scale," Ahiablame said. "What we do in our own home would affect everyone around us and downstream."

Reducing Waste in the Construction Industry

While reexamining our civil infrastructure can ease urban water management and damage from environmental factors, looking closely at human and business processes can reduce industrial waste. The construction and demolition sector is the largest contributor of waste globally. Dr. Marcelo Azambuja, assistant professor of construction, specializes in construction management and supply chain management. Working with industry partners, Azambuja looks at how process models, decision support systems and lean construction practices can create "greener," lower-waste processes.

In recent years, Azambuja has worked with the construction industry to develop and assess managerial approaches that reduce waste and create more streamlined practices. His current study, initially supported through SIUE's Seed Grants for Transitional and Exploratory Projects (STEP), focuses on the development of an affordable cloud-computing tool to enable real-time information exchange about the construction project and reduce waste. Azambuja's team includes faculty members in the Department of Mechanical and Industrial Engineering and undergraduate students in the Department of Computer Science. The team is currently working with a mechanical contractor to implement the new tool, and to track and manage the installation of parts as they make their way down the supply chain.

In further work, Azambuja is investigating the design of "reverse logistics networks," seeking to reduce waste by developing complex process models at different stages of the construction lifecycle. These processes also aim to optimize economically- and environmentally-sound solutions for the recovery and re-use of raw materials. In this he is working with colleagues from Heriot-Watt University in Scotland and the Universidade Federal do Rio Grande do Sul in Brazil.

Mentored Student Research

The Illinois Water Environment Association (IWEA) presented graduate student Azadeh Akhavan Bloorchian with the 2013 Best Technical Presentation Award.

Akhavan Bloorchian presented "Survey of Green Infrastructures for Sewers Overflow Reduction in Metropolitan St. Louis" during the spring 2013 Water Conference (WATERCON) in Springfield, Ill. While working toward a doctorate in environmental engineering, she is a research assistant within the SIUE Department of Civil Engineering. For her accomplishment, Ms. Bloorchian was honored at the annual IWEA Awards Banquet Monday, March 17, 2014 at the Abraham Lincoln Presidential Museum-Library in Springfield.

"I was always interested in water resources," Akhavan Bloorchian said. "While working on research with my advisors, Dr. (Jianpeng) Zhou and Dr. (Susan) Morgan, I got more interested in green infrastructure and stormwater management."

"Green infrastructures are important as part of a sustainable approach to stormwater management. Installing them helps with decreasing the amount of runoff flow to combined sewer systems, resulting in less overflow." The National Great Rivers Research and Education Center (NGRREC) funded Akhavan Bloorchian's project.

"Azadeh's work provided valuable information about the status of green infrastructure application in the metropolitan St. Louis area," said Zhou, professor and chair of the SIUE Department of Civil Engineering. "Findings from her project benefited a few other green infrastructure research projects that SIUE civil engineering faculty members work on. "Her work fits the current effort to reduce combined sewer overflow in St. Louis for the protection of the Illinois, Missouri and Mississippi rivers."

A native of Tehran, Iran, Akhavan Bloorchian earned a bachelor's in natural resource engineering at the Isfahan University of Technology in Iran. She achieved a master's degree in environmental pollution at the Tehran Science and Research Campus of Azad University. She earned another master's in civil engineering from SIUE in 2013.

Water Management, Waste Reduction, Greener Spaces

Seeding Improvements on Highways

While urban areas face obstacles associated with overtaxed drainage systems, other environmental challenges are met on open roads and highways. Erosion can easily occur on roadway embankments due to unmanaged water flow across impervious surfaces or temporary construction. To alleviate the erosion impact of construction along highways, state agencies are required to implement temporary plant seeding strategies.

The Illinois Department of Transportation (IDOT) publishes guidelines that set standards for materials and workmanship for all transportation infrastructure construction work in Illinois. This large volume titled "Standard Specifications for Road and Bridge Construction" includes Clean Water Act-mandated erosion control practices, and it suggests a mixture of perennial rye and oat seed for temporary ground cover seeding.

Unfortunately, according to Mark Grinter, assistant professor of construction, these seed varieties are cool season grasses not well-suited to all seasons and locations in Illinois. In 2013, Grinter and his team received a grant from the Illinois Center for Transportation (ICT) to study alternative seed varieties and make recommendations for improving the standard specifications. The project explores how different varieties may be best employed according to geographic location and time of year. Grinter's team, which includes Dr. Peter Minchin, associate professor of biological sciences, Dr. Susan Morgan, professor of civil engineering; Dr. Bill Retzlaff, professor of biological sciences; and biological sciences graduate student Irene Weber, is testing sites ranging from extreme southern Illinois to the state's northern tier. Thanks to a cooperative agreement with University of Illinois research farms and SIUE's own campus facilities, the researchers have established seed plots at four locations throughout the state. In nearly 3,000 plots, the team is analyzing seed mixtures for germination, growth rates and optimal soil coverage in all four seasons.

While the team is still analyzing results from recent seasonal shifts, Grinter says that it is already clear that the IDOT standard mixture is not the best performing variety. The team looks forward to recommending varieties that will decrease the environmental impact of construction work in Illinois.

In a similar project, Dr. Abdolreza Osouli, assistant professor of civil engineering, is leading a team of investigators who are assisting IDOT to compile and evaluate post-construction best management practices to control or retain stormwater runoff. After road construction, surface run off may contain contaminated material due the presence of chemicals, oils, grease, nutrients and metals on road surfaces. Osouli's team will research how to indirectly control the spread of pollution by reducing the volume of stormwater runoff.

Many states have incorporated best practices in managing stormwater runoff. These can include biofiltration (the use of living materials to filter pollution, as above); control of water infiltration into the soil; the use of retention ponds; the use of detention basins that temporarily hold and control water flow; or velocity-reducing stormwater runoff systems. Methods often vary according to the needs of the particular area, its climate, soils and water table.

Attempting to better control runoff and pollution, the Illinois Environmental Protection Agency is changing requirements for construction permits related to water pollution control. These permits are in conjunction with the National Pollutant Discharge Elimination System (NPDES) and will require new and more rigorous methods by the Illinois Department of Transportation.

In order to best understand practices most suitable to Illinois highways, IDOT has awarded Osouli and team a grant to survey national best practices and test their viability for use on Illinois highways post-construction. The team, which consists of Osouli; Grinter; SIUE civil engineering chair Dr. Jianpen Zhou and adjunct faculty member Dr. Laurent Ahiablamet; and Dr. Timothy Start, faculty of civil and environmental engineering from UIUC, will inventory best management practices throughout the country. The team will review and test various best management practices, and review their performance monitoring data. The team will also prepare reliable cost estimates for installing and constructing various practices. Finally, recommendations and guidelines will be provided to IDOT to cost effectively manage stormwater runoff at the site with these practices.

In all these projects, SIUE researchers are driven to rethink the core infrastructures of our daily lives. By reimagining the systems and processes that underscore our civil and commercial infrastructures, these investigators innovate ways to make it easier to create a more environmentally-friendly and sustainable society.

SIUE Maintains Close Relationship with Local Watershed Nature Center

In 1990, a pair of citizens dedicated to the stewardship of nature lobbied the city of Edwardsville, Ill., to transform an abandoned sewage lagoon into a nature preserve. John and Kay Kendall provided seed funds to establish the preserve, and pulled together community members and colleagues to donate time, money, labor and other efforts to the Watershed Nature Center. The Watershed is currently owned by the city of Edwardsville and managed by a non-profit board, the Nature Preserve Foundation. Thanks to the early commitment of the Kendalls, other community members and the city, the Watershed has become a thriving nature center with healthy community engagement and a strong connection to SIUE.

The late John Kendall was a professor emeritus of music and is credited for bringing the first Suzuki program to SIUE and to the United States overall. The Kendalls' passion for music was matched only by a commitment to conservation. The Kendall legacy initiated a long-term relationship between SIUE faculty members and students, who have volunteered by working on habitat restoration, giving workshops, writing grants, contributing to newsletters and serving on the board.

Of course, the Watershed embodies the allure of a flourishing ecosystem for SIUE researchers. In recent years, professors like Dr. Richard Brugam, distinguished research professor of biology, have used the Watershed to educate and to research with students. Under Dr. Brugam's mentorship in 2013-14, students conducted year-long studies on the water quality of the WNC ponds.

The Watershed ponds receive city storm water run-off, and the wetland ecosystem can actually help "clean" this water of pollutants. However, the run-off can also affect the Watershed's overall health. Street run-off may contribute higher levels of nutrients, like phosphate, that lead to the blooming of algae and other microorganisms whose decay deplete water oxygen levels—an effect called eutrophy. Jessica Loethen worked with Brugam to examine the effects of phosphate pollution on the ponds. Tests conducted by Loethen and Brugam indicated high phosphate levels, suggesting that run-off created a eutrophic environment.

In a further study about the impact of runoff, Amanda Deardeuff worked with Brugam to study the ponds' levels of zooplankton, tiny microorganisms that are an important base in the food chain. The species composition of zooplankton can indicate pond health, as they are affected by pollution and fish predation. After measuring zooplankton samples, Deardeuff and Brugam discovered a large number of Rotifer species, suggesting strong fish predation. The strength of the Rotifer species shows that many types of fish, from the smallest to the largest, live in the ponds. These could then support other animal species, such as heron and otters. Considering these indicators, the team determined that the run-off had minimal impact on the pond's species diversity.

These and other collaborative research projects represent a simple cross-section in the nearly 25 years of interaction between SIUE and the Watershed Nature Center. Commitment by the community to build a natural sanctuary has thus led to an enriched setting for nature-lovers and an opportunity to further our knowledge about watersheds in general.

Fructose and Your Metabolism:

How High Fructose Levels Can Derail Health Effects of a Low-fat Diet

It has been estimated that 11 percent of all cases of heart failure in men and up to 14 percent in women are due to obesity. Since the physiological links between these conditions are still not fully understood, the impact obesity has on heart disease is difficult to predict, and it can be therefore harder for doctors to identify people at risk for heart disease. Researchers and doctors are still exploring dietary factors that contribute to obesity and the development of heart disease and diabetes. Do nutrients like fructose interfere with benefits of weight-loss? Questions such as these have led Dr. Joshua Wooten, assistant professor of kinesiology, to study how these three major health concerns might be linked.

One of his focus areas is high-fructose consumption. It is now estimated that about 35 percent of the average American diet consists of fat, although, according to 2005 U.S. Government dietary guidelines, adults should only get about 25-30 percent of their daily calories from fat. Yet, a more surprising issue is the rising level of fructose consumption, which now stands at 12-15 percent of the average American diet. Fructose, used as a sweetener, is one of the most common ingredients in packaged foods nationwide and has recently become a major concern for public health advocates. It is found in food commonly deemed unhealthy, but it also occurs naturally in fruits and vegetables. Soft drinks are among the more obvious culprits, since they contain large amounts of high-fructose corn syrup. As these easily-accessed items have become increasingly more common in the U.S. diet, fructose intake has risen dramatically.

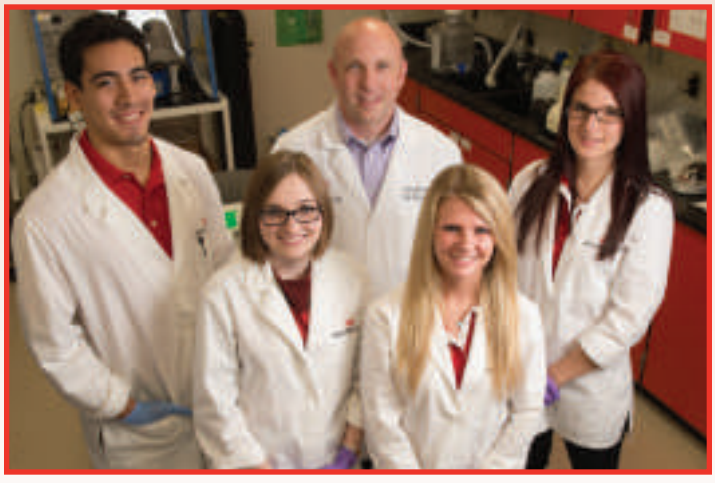
The potential dangers in high-fructose consumption, according to Wooten, include not only obesity but also liver and heart disease. He states, "We're interested in examining how the liver deals with high-fructose consumption and how it may impede weight loss-related health benefits." He hypothesizes that the combination of a high-fat and high-fructose diet leads the liver and heart to store more fat, increasing the risk for both type 2 diabetes and heart failure. Wooten also believes that when a person sustains high levels of fructose consumption, the rate of weight loss will decrease, even if one lowers his or her fat intake.

In one experiment, Wooten explored the impact of high-fructose consumption during weight-loss in order to understand how fructose affects fat and carbohydrate metabolism in the heart and liver. While it is often assumed that a lower-fat diet will result in a higher rate of weight loss, high-fructose consumption may hamper this process. Wooten and his team gave two groups of obese mice each a low-fat diet, while measuring and their rate of weight loss over six weeks. The difference in the groups' diets, however, came from the amount of fructose dispensed: one group received a 20 percent fructose drinking solution to match the national human average, while the other was given regular drinking water. According to Wooten, initial results revealed that "continued high-fructose consumption during weight loss resulted in 42 percent higher circulating triglyceride levels when compared to mice consuming regular drinking water." Essentially, significantly more fat was circulating in the body and more stored fat was found in the livers of high-fructose mice over their water-drinking counterparts.

According to Wooten, "When too much fructose is ingested over several weeks, the liver becomes overwhelmed and begins to become insulin resistant. The primary job of insulin is to stimulate the uptake of circulating glucose (sugar) into cells. Insulin also regulates release of lipids or triglycerides (fat) into the blood stream. When the liver becomes insulin resistant, the release of triglycerides into the blood stream increases. Furthermore, the excess fructose is converted into triglycerides and stored in the liver, leading to lipotoxicity, also known as fattening of the liver." In addition to these negative effects on the liver, Wooten is exploring further to determine if a high-fructose diet also affects the heart's fat and carbohydrate metabolism.

While it may seem that low-fat and high-fructose diets are an uncommon combination, this does not appear to be the case. In many low-fat diets, fructose levels can elevate when one takes in refined carbohydrates. Foods carrying a high amount of refined carbohydrates not only include sweets and desserts, but also pastas, grains and cereals. Diets rich in these foods can boost fructose consumption, increasing the risk for elevated blood lipids. This reduces the heart-protective effects of high-density lipoproteins, also known as HDL.

While the American public may be more aware of the negative effects of fat on their health, the impacts of high-fructose corn syrup seem lesser known. As public health alarms sound the negative effects of obesity, Americans are encouraged to diet and exercise, while consumption of the major food additive continues at an increased rate. What better time, then, for research from such laboratories as those led by Joshua Wooten to shed new light on the health effects of high fructose?



Watching What Kids Eat:

Education Professor Takes Initiative in Battle against Childhood Obesity

Childhood obesity and childhood nutrition have received more attention over the past decade, becoming the target of such initiatives as First Lady Michelle Obama's "Let's Move!" childcare campaign. In her efforts to promote childhood health, First Lady Obama pointed out in 2011 that "child care facilities and home-based providers can be a real building block for an entire generation of healthy kids." For Dr. Stacie M. Kirk, associate professor of special education and communication disorders, Mrs. Obama's words ring true. Kirk, who has been conducting research to address issues in childhood obesity with husband Dr. Erik P. Kirk, associate professor of exercise science, agrees that child care settings are important environments where children's health can be improved. However, she argues that much more can be done to promote healthy eating habits of children in childcare facilities.

Despite the attention childhood obesity has received from the media, health education initiatives, and government programs like the Child and Adult Care Food Program (CACFP), the prevalence of obesity in preschool children has increased dramatically over the past five years. "At the current rate," Kirk said, "estimates are that by the year 2030, nearly 30 percent of children will be obese." The CACFP reviews childcare program menus, but it does not evaluate the nutritional value of what children actually consume. Therefore, there is no assurance that what children in childcare settings actually eat meets the Recommended Dietary Allowances from the Dietary Guidelines of Americans (DGA). This, according to Kirk, can result in children receiving too many calories from fat and sugar while not getting the recommended servings of whole grains, fruits, and vegetables. Furthermore, she said, it is estimated that over 60% of three-, four-, and five-year olds are served in center-based preschool settings in the U.S., leading her to believe that such community settings are crucial in implementing preventive health initiatives.

Developing strategies to ensure that children consume a nutritious diet is at the core of Kirk's study. She explains that, "Understanding what is actually consumed by children compared to what is found on the dietary menus and some potential factors related to why certain foods are eaten compared to others may help develop strategies." Funded by an SIUE seed grant, Kirk's study compares the food intake of preschool children to the recommended intake as suggested by the DGA.

In order to make this comparison, Kirk and her team have taken pictures before and after each meal—breakfast, lunch, and snack, using them to measure what children are served and what they actually eat during each meal. The children also answer questions during each meal to document which foods they prefer. Through these daily observations, Kirk found clear patterns for the children's preferences and dislikes.

Next, the research calls for the team to analyze the nutritional content of consumed food. Kirk intends to identify differences between what foods are listed on the menu, what foods are actually served, and what children actually eat so that the center's menu cycle may be revised to more accurately meet DGA and CACFP guidelines. In turn, she also hopes that the menus based on these guidelines may be adapted to include healthy food that appeals to young children. Eventually, the information gained through Kirk's study might be used to benefit more children in care centers throughout the country.

Dental School Research Team Participates in NIH-Funded Biomarkers Study

Periodontal disease, the leading cause of tooth loss, affects more than 60 million Americans. Diabetes, heart disease and respiratory conditions are closely correlated with the infectious disease, making it even more dangerous. To address this growing problem, the National Institutes of Health (NIH) has chosen SIUE, along with four other academic institutions, to conduct a large-scale longitudinal study exploring biomarkers that indicate the progression of periodontal disease.

Biomarkers are the characteristics that are measured and evaluated as evidence of biological processes, pathogenic processes, pharmacological response or therapeutic intervention. Dr. Nathalia Garcia, periodontist at the SIU School of Dental Medicine, is the primary author for the SIUE research site. "The study will look for microbial and host-derived biomarkers to determine if an individual is likely to develop gum disease, or if existing periodontal disease is likely to worsen," said Garcia. "Effects of periodontal treatment on the levels of biomarkers will also be investigated."

Five hundred participants will be recruited through four of the centers, 60 of which will come from SIUE. For one year, participants will have closely monitored appointments every two months, where investigators will collect biological samples, saliva, plaque and blood. The periodontal disease condition in each patient will be evaluated and documented throughout the year, and then treated at the conclusion of the study.

"The significance of this study is that, for the first time, a large group of biomarkers considered important in the progression of periodontal disease will be examined longitudinally. This project investigates the use of biomarkers in explaining why people develop periodontal disease, what circumstances lead to the progression of periodontal disease and how treatments affect biomarkers" said Garcia. "This will represent advancement in understanding the disease and hopefully will open the possibility for more specific therapies of this condition".

Periodontal disease is a chronic and often painless condition (in its early stage); as a result, there is usually a delay between detection and treatment. The progression of periodontitis is not continuous, it is episodic; periodontal disease can progress in a variety of different ways for diverse patients and different sites of the mouth. A better understanding of the pathogenesis of periodontal disease using biomarkers will enable applications for more individualized treatments and better therapeutic outcomes.

Ultimately, Garcia and her team of researchers hope that the results generated by this NIH project will give the dental community more tools to assess risk and diagnose periodontal disease, while opening up the possibilities to design highly specific treatments for the disease.

The Forsyth Institute in Boston, primary grant recipient, and the following institutions were selected by the NIH to assist with recruiting and data collection for this study:

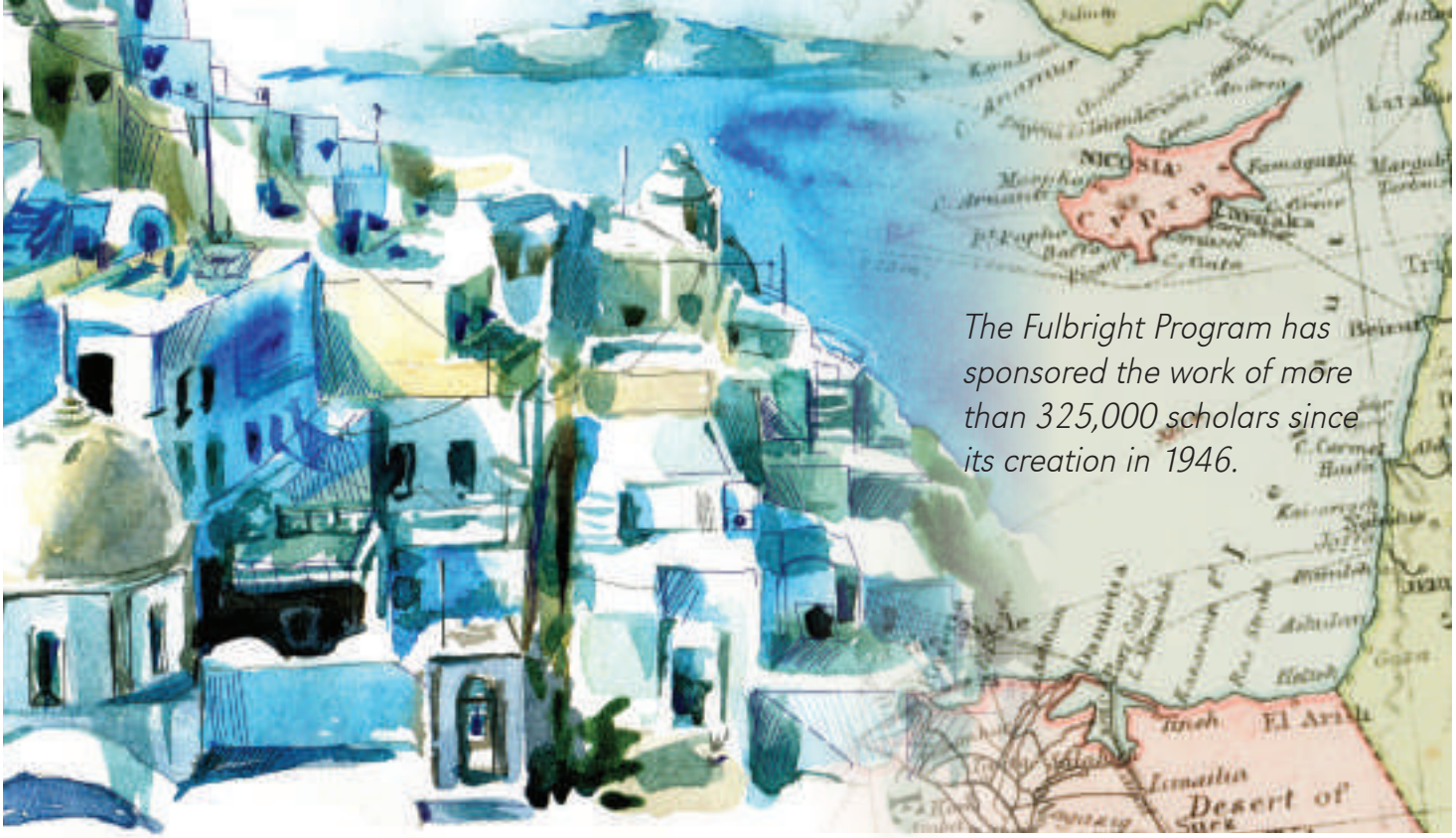
Southern Illinois University Edwardsville
University of Michigan, Ann Arbor
New York University, New York City
State University in New York, Buffalo

Dr. Nathalia Garcia, PI Periodontist School of Dental Medicine

The following faculty and staff members from the School of Dental Medicine are participating in this research study:

Dr. Nathalia Garcia, periodontist, principal investigator
Dr. Debra Dixon, dentist, co-investigator
Dr. Jane Gillespie, microbiologist/immunologist, co-investigator
Dr. Douglas Miley, periodontist, co-investigator
Diane Callier, dental hygienist
Mary Signorino, dental hygienist
Shuron Bell, dental hygienist
Donald Reed, molecular biologist

Dr. Jane Gillespie, Shuron Bell, Dr. Nathalia Garcia, Dr. Deb Dixon, Donald Reed



The Fulbright Program has sponsored the work of more than 325,000 scholars since its creation in 1946.

Fulbright Enables SIUE Nursing Faculty Member to Practice Intercultural Exchange

The Fulbright Program has sponsored the work of more than 325,000 scholars since its creation in 1946. Operating in more than 155 countries across the globe, the program seeks to increase mutual understanding between U.S. citizens and people of other countries, and to support solutions to shared international concerns. In accordance with these goals, Dr. Marietta Bell-Scriber, associate professor of family health and community health nursing, proposed a collaborative project to the Fulbright Scholar Program in 2009, in which she partnered with communities of Cyprus to teach healthcare topics focused on improving nursing practice on the Eastern Mediterranean island nation.

Bell-Scriber, a nurse practitioner and educator, was awarded a Fulbright Scholarship for 2010-2011. This gave her the opportunity to teach in both the predominantly Greek southern and Turkish northern communities of Cyprus, which share what Bell-Scriber called, "an unfortunate history of conflict." According to Bell-Scriber, those arriving in Cyprus today find the island separated into two areas and communities with distinct cultures. "Additionally," she said, "it has been reported that in The Republic of Cyprus there is widespread discrimination on the grounds of sexual orientation with rare positive measures to promote respect for human Lesbian Gay Bisexual and Transgender rights."

While Bell-Scriber did many things during her time in the southern region of Cyprus, she said that the most successful outcome arose from a transcultural course she developed and piloted. The course has since become part of the host university's curriculum as a nursing education elective. At the end of the course, students demonstrated they had become more sensitive to a patient's ethnicity and beliefs when different from their own, Bell-Scriber said. In addition, students identified the need to be able to deal with patients with different sexual orientations from their own. Bell-Scriber said that she hopes this course may continue to dispel "longstanding biases, misunderstandings, and prejudices that might even assist toward a peaceful settlement on this island."

Meanwhile, in the northern region, Bell-Scriber was able to provide seminars for both practicing nurses and master's nursing students on herbal medications, transcultural nursing, and women and heart diseases. Most important, however, were the Family Nursing Theory workshops she provided for 75 public health nurses. In February 2011, after fulfilling ten workshop hours, the nurses began using what they learned to improve nursing care in villages across the region. More recently, health assessments were developed and integrated into public schools, where assessment for hypertension, diabetes, and other chronic conditions now occurs.

As the Cypriot nurses considered new concepts and tools in nursing practice due to the dialogues in Bell-Scriber's courses, the Fulbright recipient also found the experience personally rewarding. Due to challenges experienced, she says, Bell-Scriber learned the importance of being clearer, more succinct, more patient, more visual, and of utilizing non-verbal behaviors to enhance communication and educate more effectively. Her experience in Cyprus, she said, "will continue to change the way [she teaches]." She also developed "a deeper and richer understanding of the cultural contexts in which our nursing profession is situated, as well as the similarities and differences between our international nursing communities."

Graduate Student Research Briefs

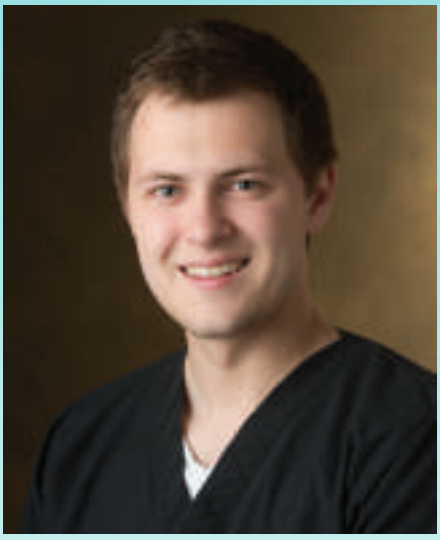
Have Ethical Guidelines Influenced Therapeutic Professionals' Ability to Build a Therapeutic Alliance with Migrant Clients?

Among the many effects of globalization trends, human displacement and migration is a key psychological stressor for individuals. Mental health professionals in the U.S. have recognized a need to understand the pressures migrants experience and how cultural differences can impede treatment of mental health needs. Bridging the cultural gap to effectively interact with and treat clients of different cultural persuasions can be a challenge for U.S. therapists who are upheld to national professional guidelines sometimes at odds with other cultural standards. Some cultures may expect the exchange of gifts for services, for example, while this would violate ethical standards in therapeutic fields. In her thesis study Madeline Brenner, a graduate student in art therapy, is exploring how U.S. art therapists can most effectively approach and treat migrant patients. Her study aims to find the means therapists can find a balance between upholding American Art Therapy Association standards and building a rapport with clients of other cultural backgrounds.

Examining the Speech-Language Treatment of a Non-English-Speaking Child in Early Intervention: A Case Study

In recent decades, the speech-language pathologist (SLP) profession has seen an escalation in service to non-native English speakers. With this rise in limited English proficient clients, SLPs are working with interpreters to better support patients. Yet, the new SLP-interpreter collaboration has introduced new dynamics into client treatment, especially if the client is a child in a family with limited English proficiency (LEP). Jaime Henderson, a graduate student in special education and communication disorders, is working with advisor Dr. Kathryn Brady to explore impacts of this SLP-interpreter relationship upon assessing and treating clients.

Henderson is conducting a case study to compare the speech-language treatment sessions of two preschoolers, one English-speaking and one Spanish-speaking. In each session, she will examine the treatment approach and the nature of the interaction among the SLP, English-Spanish interpreter, child and family member. Of particular interest is how the need to work through an interpreter might change the interaction and the provision of speech-language services to the Spanish-speaking child. It is hoped that the study may provide valuable input in improving the training of SLPs and interpreters to serve clients with limited English proficiency.



Re-inventing the Wheel: A New Model for Testing Pain Relief Pharmaceuticals

According to the Centers for Disease Control, deaths from addictive prescription pain killers have tripled since 1990. Researchers need new animal models that can effectively test non-addictive pain therapies before going to human trials. Patrick Farrow, a third-year student at the SIU School of Dental Medicine received a best paper award at the 2014 Hinman Student Research Competition, where he presented research about new models to measure orofacial pain.

Based upon the observation that rodents naturally and reliably run extremely long distances at night, Farrow, together with mentor Dr. Kevin Rowland, hypothesized that running activity would reveal how the animals responded to a given pain reliever. The model showed that rats, when placed with running wheels, could provide an accurate and objective measure of the effectiveness of pain relievers. The new methodology is inexpensive, removes much of the human guesswork, and can easily be translated to test other drugs or other painful conditions. The researchers hope that the model can be adapted to test various therapies for orofacial pain.

Faculty-led Clinics Provide SIUE Community Affordable and Research-based Resources for Health and Well-Being

As centers for higher-learning, universities facilitate research and education that explores the development of the entire human being. At SIUE, our interest in human development extends to the well-being of individuals and families, and to the training of the next generation of health, behavior and literacy professionals. Through various clinics located in our professional and pre-professional programs, SIUE faculty, staff and students provide team-driven evaluations, as well as interventions and treatments. Working with faculty researchers and qualified students, local families may avail themselves of these low-cost, superior services. The SIUE clinics, therefore, not only supply research and educational opportunities for university faculty and students, they offer a welcoming environment for community members needing accessible care.

Attention and Behavior Clinic

School of Education, Health and Human Behavior

The SIUE Attention and Behavior Clinic (ABC), located in the Department of Psychology, provides psychological services to children and families in the greater Edwardsville area. The ABC offers comprehensive childhood assessments for both Attention Deficit/Hyperactivity Disorder and Autism Spectrum Disorder, with the latter conducted under the clinic's new Comprehensive Autism Spectrum Evaluation (CASE) Site initiative. In addition to psychological assessments, the clinic offers parent training and consultation services for the management of common inattentive, hyperactive and disruptive behaviors.

All clinical activities employ up-to-date, research-based methods of childhood psychological assessment and treatment, and are supervised by licensed clinical psychologists. Dr. Gregory E. Everett, associate professor of psychology, serves as clinic director and Dr. Elizabeth L. W. McKenney, assistant professor of psychology, directs the new CASE Site initiative.

In addition to important community outreach activities, the ABC furnishes unique educational experiences for students enrolled in SIUE's clinical child and school psychology graduate program. Graduate students primarily conduct assessment and consultation services, through which they gain valuable training by working with children and their families in a supervised setting.

Dental Clinic and Community Preventative Dentistry

School of Dental Medicine

The School of Dental Medicine has as its mission to educate highly-qualified and professional dentists who can meet the oral health needs of the population in Southern Illinois. Based in Alton, Ill., the School engages the community through its Dental Clinic and through its extensive Community and Preventative Dentistry Program.

The Dental Clinic is open to individuals wishing to become patients of this affordable and extensive service. Clinical providers include students, residents or fellows, supervised by faculty. Providers meet their clients' dental needs at a reduced fee while providing outstanding service and treatment. The clinic offers a variety of treatments, including current advances in dental therapy. Located in the heart of historic Alton, the main clinic offers services to the greater St. Louis and southern Illinois regions. A further satellite clinic in East St. Louis makes services more available to those local residents.

In addition to providing therapy in a clinical setting, the School reaches out to area residents to enhance oral care services and health education for the St. Louis Metro East region. For instance, third and fourth-year students in community dentistry courses work together in teams to promote oral health awareness in Madison County schools. Teams visit K-12 settings to conduct needs assessment at the schools, make recommendations to administrators and provide oral health presentations in classrooms. Oral health screenings are also provided at local health fairs and other venues, including sites in East St. Louis and Senior Services Plus stations. Students give presentations to parents of children at a local Head Start, and they provide screenings and education to children at the Madison County Youth Detention Home. Further educational and screening is provided to individuals with special needs and elderly individuals in local nursing homes.

Cougar Literacy Clinic

School of Education, Health and Human Behavior

The Cougar Literacy Clinic seeks to improve the literacy of children in grades 1-12 who have reading and writing difficulties, and it provides practicum experience for teachers earning a K-12 Reading Specialist Certification. Individualized assessment and instruction is offered by teachers who are graduate students prepared to make informed decisions to support the literacy development of k-12 children.

In the clinic, school children receive individualized reading and writing assessments and tutoring. Families may apply, and based upon student needs and availability, students are selected into a multi-semester program. During the first term, children receive assessments to identify their literacy strengths and needs, and teachers present families with a diagnostic report. Based on assessment results, some students are selected for further tutoring. Assessment information is then used by the graduate literacy specialist candidate to plan and teach individualized lessons during the next semester to enhance the child's literacy development with problem-solving strategies and reading and writing skills.

Speech-Language and Hearing Center
School of Education, Health and Human Behavior

Speaking, hearing and understanding are essential to human communication. A communication disorder can affect the way a person interacts with others – often interfering with social, vocational and educational success. In the Department of Special Education and Communication Disorders, the Speech-Language and Hearing Center (SLHC) serves the speech, language and hearing needs of individuals by enhancing the quality of their communication skills. Under direction of the faculty, students learn to deliver high-level clinical services to a diverse clientele of many backgrounds and age groups.

The SLHC offers an extensive range of services for children and adults with disorders of hearing, articulation, language, voice or fluency. Clients may express concerns including, but not limited to, language delay or disorders; language literacy; hearing loss and deafness; fluency disorders or stuttering; voice disorders; neurological damage or disease (stroke, brain injury, Parkinson's, etc.); accent reduction training; autism spectrum disorders; speech sound disorders; or cognitive impairments. Audiology is a unique specialization, and led by Dr. T.K Parthasarathy, professor of special education and communication disorders, a team of students provide hearing screens and complete diagnostic hearing evaluations, as well as aural rehabilitation.

Services are conducted under the direction of clinical and program faculty in the Department of Special Education and Communication Disorders: Dr. Kathy Brady, Dr. Steffany Chleboun, Dr. Amie King, Dr. James Panico, Dr. T.K. Parthasarathy, Patti Awalt and Dr. Marie Klopfenstein.

SLHC clients receive individualized speech and language diagnostic evaluation and treatment. The SLHC team employs standardized and informal measures to examine the communication problem and how it impacts a person's daily life. Depending on the impairment and the needs of the client, individualized treatment or a combination of individual and group therapy may be employed.

The SLHC commitment of meeting the needs of individuals extends beyond the walls of the center and reaches to the SIUE Early Childhood Center (ECC) and a variety of local school districts. Speech-language pathology graduate students provide services to children at the ECC. Speech-language and hearing screenings, evaluations and follow-up treatment are provided to children by the students who are under direction of a certified clinical supervisor. Graduate students also travel to local schools to provide bi-weekly evaluation and treatment supervised by speech-language pathologists who are certified by the American Speech-Language-Hearing Association.

SIUE WE CARE Clinic
School of Nursing

As of January 1, 2014, the SIUE Community Nursing Services carries a new name: the SIUE WE CARE Clinic. The clinic experienced a name change to better reflect its identity as a resource staffed by committed, compassionate primary care providers. A nurse-managed clinic under the SIUE School of Nursing, WE CARE integrates primary clinical care and community outreach to promote the health of diverse populations in the Metro-East St. Louis area. The clinic aims to provide quality, comprehensive care, while offering intensive educational and social experiences to undergraduate and graduate students.

An SIUE nursing clinic has been serving the Metro-East area since 1988, and clients have ranged in age from two years to more than 100 years old. In its earlier years, the clinic provided services at the SIUE building on Broadway in East St. Louis, Ill., and has since relocated to the East St. Louis Higher Education Campus. Throughout these years, this nurse managed clinic has continued to provide care to the underserved and vulnerable populations of East St. Louis and surrounding communities.

Today, clinic services include women's health, men's health and treatment of stable chronic health conditions. Patients may visit the clinic for health screenings such as lead, hemoglobin/anemia; memory screenings; sexual health screening, treatment, and management; physical examinations; health risk assessments; and DOT physicals and drug screening. Outside the clinic walls, the WE CARE outreach programs offer health screenings, physical examinations, immunizations, and hearing and vision screening.

Education of children in families to increase health literacy is also a prime component of WE CARE. Recently, the clinic has partnered with the Christian Activity Center and SIUE Head Start programs to provide asthma education to parents and staff. The clinic has also worked with the Catholic Charities to offer caregiver training to assist low-income individuals in developing the skills needed to obtain employment as in-home caregivers.

Weight Management Clinic
School of Education, Health and Human Behavior

Housed in the Department of Kinesiology and Health Education, the SIUE Weight Management Program has been operating since 2009 and consists of ongoing internally and externally funded clinical research projects. Through faculty- and student-led research, the program investigates various dietary, behavior, and exercise-based strategies and their effects on long-term weight management. The program uses state-of-the-art methods to perform dietary analyses, physical activity assessment and body composition testing.

The program's mission is a broad-based research initiative; it aims to assist the people of Illinois and Missouri in losing and maintaining weight loss through behaviorally based clinics that focus on exercise and calorie restrictions. The cornerstone of the nine-month program is the weekly lifestyle clinic, which serves as both an educational forum and support group. The Weight Management Clinic uses a holistic approach to cover all aspects of successful weight reduction and weight management, including nutrition, physical activity and the emotional/cognitive aspects of behavior change. Weight management is a set of learned behaviors, thus the clinics are designed to teach and promote those behaviors. All classes are developed by a multidisciplinary staff of registered dietitians, exercise physiologists and behavioral psychologists.

The Clinic approaches weight management as a lifestyle change, one that will be made over time and continued throughout the lifespan. The Clinic has safely and successfully helped many individuals lose weight and keep it off. One recent participant has testified, "The SIUE Weight Management Clinic has helped me accomplish something that I have failed to do time and time again over decades on other programs, change my eating and exercise habits from unhealthy to healthy. The program has been easy to follow with good results."

Medieval Women Warlords:
Dr. Katrin Sjursen Offers New Perspective on the Role of French Female Noble Leaders

Today's popular myths suggest that Joan of Arc was unique among medieval women for leading armies. In truth, however, she is just one example of many female military leaders throughout the medieval era. Dr. Katrin Sjursen, assistant professor of historical studies at SIUE, is currently preparing a book that reevaluates the prevalence and duties of female lords in medieval France who were entrusted with crucial military responsibilities.

When Sjursen began exploring sources for her dissertation, she, like many history scholars, expected to find few examples of women in medieval France conducting warfare. Instead, she was amazed to find that at least 40 women in a 300-year period were involved in conducting military procedures in France's northern region. A prevalent theory for why so many medieval female lords' military contributions have been downplayed over the ages points to the gradual increase of power in the Roman Catholic Church. This claim, Sjursen said, is often traced to an influential premise by historian Megan McLaughlin. Dr. McLaughlin's argument asserts that by the 11th century, criticism of women conducting warfare became so pervasive that it eventually led to the end of such activities in the 14th and 15th centuries. McLaughlin believed that as the power of the Roman Catholic Church increased, it pressured women out of power with misogynistic reforms that decreased noble sovereignty and favored the oldest male children as primary royal and noble heirs.

Sjursen, however, points out the importance of context when interpreting history through medieval writers. McLaughlin, she said, looked only at chronicles, narratives concerned with convincing readers of what the author believed to be a greater truth, such as the importance of spiritual matters. "Thus," Sjursen said, "she could only get at what medieval writers thought about these women rather than at what the women actually did." These chronicles, she said, "chose whether to castigate or approve individual women based on the chroniclers' own political position." Dissatisfied with the subjective nature of these sources, Sjursen also examined the documents left behind by some of these female noble leaders, such as letters, charters, treaties and financial accounts, as well as annals, short written entries that only recorded changes of power, major war or unusual weather. These records, unlike chronicles, she said, "don't castigate women commanders because they don't castigate or approve anyone; there's no space, and that's not their purpose."

According to Sjursen, there are additional ways in which recent scholarship has inaccurately depicted medieval women's military lordships. Some historians, she said, have neglected the topic in pursuit of some other scholarly agenda, while others deny that female lords participated in warfare at all. In some instances, she said, selective uses of terminology have deprived women of their historical importance. For example, the adoption of a term such as "regent" to describe a medieval woman ruler implies a number of inaccuracies, such as the deferment of power to another male figure. In many instances, Sjursen said, using the word "ruler" instead would prove more accurate.

In her manuscript, Sjursen focuses on figures such as Blanche of Navarre, the Countess of Champagne, who is often mentioned as the regent to her son, Count Theobald IV of Champagne, but whom Sjursen instead refers to as a co-ruler. "While she was serving as Countess, charters were written to her by name, while her son was unnamed," she said. "When she retired in 1222, her son still consulted with her on numerous occasions." And at times during her retirement, King Louis IX and his mother Blanche of Castile preferred to deal with Theobald's mother rather than him. Then there is the Empress Matilda, who fought for her right to inherit her father's realm of England, which at that time also included parts of northern France. "Chronicles rarely reveal participation beyond isolated incidents of bravery, and modern studies rarely venture beyond these sources," Sjursen said. "Her charters reveal how she managed the resources at her disposal to wage war and thereby demonstrate a much broader degree of women's participation."

Sjursen, through her exploration of medieval women rulers, and through an unprecendented number of primary texts, strives to bring us closer to a new, more empowered view of women's history and their roles in the political and military cultures of their time. As a result, her project promises to bring its readers closer to people and events that would otherwise remain misunderstood.

Professor Kathryn Bentley Brings Community to Theater

During her time in the theater, Associate Professor Kathryn Bentley, Department of Theater and Dance, has helped tell the stories of others. Her many projects include her groundbreaking work in North American theater, where she introduced the traditions of descendants of slaves to English and Dutch colonists in Suriname, and her current project addressing the impossible body image standards held in contemporary culture. In her pieces, she intends to create spaces for sharing and healing.

In the summer of 2010, Professor Bentley traveled to Suriname, a small South American nation near the Caribbean Sea, where she explored the traditional Afro-Surinamese Du Theatre. There, Bentley met with theater experts who would become valuable to her research. She said, "I was awed by the richness of tradition and the ties to history that the people of Suriname have maintained."

At that time, nothing had yet been written of the Du Theatre in English. This alone was a cause of immediate interest for Bentley: "The excitement with the research was centered upon the fact that this was something I knew absolutely nothing about!" she said. Not only has Du Theatre been largely unexplored in English, little of Suriname or its art have been revealed in the U.S., according to Bentley. She adds that studying the Du, a tradition created by the Afro-Surinamese slaves of Dutch colonists, "can contribute significantly to the scholarship about slavery theatre. Similar to its American counterpart, for instance, Surinamese slavery theatre provided an artistic means of social commentary."

The following year, Bentley received a seed grant from SIUE to continue her studies of the Du, and she traveled again to Suriname. After conducting extensive interviews and archival research, Bentley created and produced an original Du piece, "Forbidden Love: Na Mini Du," co-written and directed with Surinamese writer/director Tolin Alexander. The short piece featured a cast of Afro-Surinamese actors, Surinamese drummers, and SIUE students. It was performed in both English and the Surinamese language, Sranan Tongo, to an audience of more than 300 at Suriname's CCS Theatre in the capital of Paramaribo. The cast later reunited to perform at SIUE and at a University of Maryland conference.

Of the piece, Bentley said, "This was an absolutely invigorating experience for me. Working on this project refocused who I am as an artist. It reminded me of the vastness our capabilities as artists. It reminded me that I have the skills and the responsibility to help others tell their stories."

Yet, the Du Theatre project is just one means by which Bentley conveys stories of the African-American diaspora. In 2014, she presented before the Performing the World conference in New York, for the Black Theatre Workshop production of "And the Verdict Is...A Campus Response to the Trayvon Martin Case." She further discussed the role of women in the Du Theatre at the Association for Theater in Higher Education. Even more productions focusing on social issues have emerged from SIUE's Black Theatre Workshop, where Bentley has served as artistic director since 2006.

At the end of 2013, Bentley was awarded a $20,000 fellowship from the St. Louis Regional Arts Commission. With this fellowship, Bentley is writing and developing a solo performance about body perceptions of women of color across international cultures and traditions. "I am concerned about the impressions that these hyper-sexual messages are sending to our youth. I am concerned and intrigued with how middle-aged women view their bodies as a result of these messages. I want to create an artistic piece that speaks to this issue."

Pryor Presents Lincoln Workshops with NEH Funding

Legends, rather than fading from memory, loom larger with the passing of generations. Abraham Lincoln may be the single best example of this in American culture. Over time, he has maintained a remarkably high profile while numerous films, biographies and historical studies about him have emerged. Lincoln is not simply a historical figure, but a contemporary, one as well. This raises questions for educators about how to best approach a topic which, rather than remaining the same through the years, continues to increase in size and scope. Perhaps this is one of the reasons why the Lincoln Landmarks Workshops for School Teachers, funded by the National Endowment for the Humanities (NEH) and directed by Dr. Caroline R. Pryor, associate professor of curriculum and instruction, have been so popular.

This year's workshop occurred twice in summer 2014, on June 23-27 and July 14-18 in Edwardsville and Springfield, Ill., and constitutes Pryor's sixth year serving as the project's principal investigator and curriculum leader. Interest in the workshop, much like that with Lincoln himself, has increased over the years. In the past six years, about 2,000 U.S. teachers have applied to the Lincoln workshop, 400 of whom were accepted as participants. In 2014, the workshop received 400 applications and accommodated 80 participants. For the span of the program, NEH has provided financial support for the workshop, which includes a stipend for teachers to help cover travel and housing expenses. Additionally, the U.S. Department of State has sponsored international teachers to attend the workshop; teachers from Egypt, Kenya, Russia, Jordan and South Africa have joined American teachers. Meanwhile, Dr. Pryor and her teams of instructors have helped K-12 teachers to learn about and develop pedagogical strategies to enhance lessons about Lincoln, his era and his influence on our country.

While Pryor's Lincoln workshops have become an annual tradition, they have not become mundane or routine. Each year's workshop receives a different focus, and the growth of the project's scope reflects the growth of Pryor's own scholarship. This year's program is appropriately titled, "Abraham Lincoln and the Forging of Modern America," and featured SIUE faculty members, Professor Emeritus Dr. Stephen L. Hansen, Dr. Jason Stacy, associate professor of historical studies; Dr. Erik Alexander, assistant professor of historical studies; and art historian Dr. Ivy Cooper. In addition, Amy Wilkerson, director of teaching with primary sources, demonstrated uses of the digitized collection of the Library of Congress. Dr. Laura Fowler, associate professor of historical studies, has been a frequent past contributor. Additional speakers this year included Washington University in St. Louis historians Drs. Iver Bernstein and Sowande Mustakeem; Dr. Louis Gerteis of University of Missouri-St. Louis; Dr. Graham Peck, Saint Xavier University, Chicago; and historians of the Abraham Lincoln Museum: Drs. James Cornelius and Mark Depue.

Pryor brings a career-long interest in creative approaches to pedagogy to her Lincoln workshops. In 2005, she co-edited a book with Art Pearl,

published by Rowman Littlefield: "Democratic Practices in Education: Implications for Teacher Education," which examined teachers' perspectives on democratic thought. In 2012, Pryor applied for and received an American Library Association (ALA)-NEH grant to bring the exhibit "Lincoln and the Constitution" to SIUE's Lovejoy Library, opening the exhibit to the greater St. Louis and southwest Illinois regions. Pryor also co-authored a book with Hansen that addresses the focus of the NEH Lincoln Workshops, "Teaching Lincoln: Legacies and Classroom Strategies," published in 2014 with the Peter Lang publishing house.

Pryor's commitment to bringing education to a large audience is shown through her efforts to coordinate the ALA-NEH exhibit and her dedication to the Lincoln workshops. The impacts of these experiences, she says, are many and unexpected. To illustrate this, she cited an experience during the end of her 2010 NEH Lincoln Workshop. When she asked a teacher from Egypt what material from the workshop he planned to use with his students, he replied: "I learned that Lincoln was a hero for freedom. We [Egyptians] have our heroes of freedom also. I plan to teach about Lincoln along with the heroes of freedom we have in Egypt." Pryor recalled this response soon after in 2011 when the "Arab Spring" occurred, marveling that education often has unexpected impacts. Just as unexpected, perhaps, is the notion that a young man born in an unassuming log cabin would one day grow up to be one of our nation's most enduring figures.

In a Trance: English Professor Journeys into Mysterious Caves to Explore the "Immediate" and the "Unknowable"

Since childhood, Dr. Jeffrey Skoblow, professor of English language and literature, has been fascinated by the Paleolithic cave-paintings of southern France and northern Spain. The earliest of these images date back approximately 35,000 years ago, and Paleolithic people continued to create them up to 10,000 years ago. Now, Skoblow, inspired by visits spanning more than a decade to 12 of the caves, has just completed a book exploring the power and mystery of their prehistoric artwork.

Skoblow began writing his book, "In a Trance: On Paleo Art," in 2001, four years after his first visits to the caves. Compelled by his childhood fascination, as well as questions on the possibility of understanding a long-gone past, Skoblow has applied his training as an expert in interpreting English literature by "reading" the cave paintings as visual texts. The question of what these paintings mean has resisted any attempts by archaeologists and paleo-anthropologists to provide definitive answers. "What the images mean, or what purposes they might have served, what cultural connections and distinctions they might have marked, or spiritual connections or disconnections they may have embodied … all this remains totally unknown," Skoblow said.

In addition to what Skoblow calls the "unknowability" of the Paleolithic images, his essay focuses on their "immediacy and power." The "odd combination of that powerful immediacy," he said, combined with the "impossibility of knowing what it means" has given him the opportunity to write a book that combines descriptive prose with a reflective account of the history of efforts to explain the cave paintings. According to Skoblow, the essay is ultimately interested in asking questions, "less about those images and cultures themselves, and more about our own connection to them." The piece ends by exploring the continuities of experience from Paleolithic cave dwellers to modern humans. According to Skoblow, this text is "an atypical essay … a kind of hybrid or in-between 'scholarly or creative' work," and may be seen as a clear departure for a scholar whose research has generally taken the form of literary criticism. However, hints of Skoblow's interest in the themes present in "In a Trance: On Paleo Art" can be found in both of his earlier books. "Paradise Dislocated: Morris, Politics, Art" and "Dooble Tongue: Scots, Burns, Contra-diction," focused on writers who, Skoblow explains, "were somewhat lost to scholarship, once popular but no longer regarded with any serious interest, if remembered at all," and, he continues, "in this sense," "In a Trance" fits right in, examining a 'visual text' whose meaning has utterly faded from current understanding."

"In a Trance: On Paleo Art" was published in November 2014 by Peanut Books, an imprint of Punctum Books.

The Rise and Fall of Iron Ore Empires:

Dr. Jeffrey Manuel Charts Industrial Decline

What happens to industrial regions after industry leaves? In our current age of globalization, many parts of the United States, including Illinois, have had to deal with this difficult question. This question also motivates the research of Dr. Jeffrey Manuel, assistant professor of historical studies, who is interested in deindustrialization, the processes caused by the decline of industry. Some examples of this process in the U.S. include the automotive industry in Detroit and St. Louis, as well as manufacturing in Cleveland, Pittsburgh and Buffalo.

Manuel's current research focuses on efforts to prevent a decline in the iron ore mining districts around Lake Superior, including Minnesota's Iron Range region. "The Lake Superior mining districts were a crucial source of iron ore for the steel industry throughout the twentieth century," Manuel notes. "Yet as early as the 1910s and 1920s, it appeared that they were declining in output and in employment. What makes the region stand out historically is that they did everything possible to prevent industrial decline."

The way that technology and culture have served to fend off industrial decline in the Iron Range region is also of particular interest to Manuel. According to him, "Technology was used in the form of low-grade iron ore pellets, a new way of processing iron ore that reinvigorated the region in the 1960s and 1970s, yet this seemingly miraculous technological fix led to some unanticipated problems, such as the shutdown of older mines that were unsuitable to the new technology and large-scale environmental problems with the waste from the new mining process." This, Manuel said, illustrates one of the lessons of his research: technological fixes for declining industries rarely, if ever, come free of negative consequences, although they can be difficult to predict. "The costs of these new technologies," he said, "are often found in unexpected places."

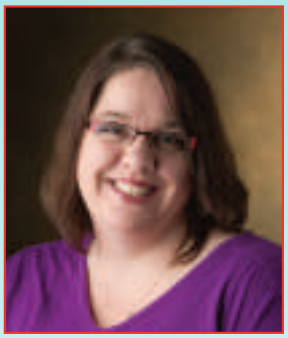
Manuel's research is also involved in examining how the Iron Range region used culture, especially industrial heritage tourism, to diversify its economy in the late 20th century. A large museum and research center was built in the region to celebrate its mining heritage, but quickly found itself the subject of controversy due to its mission and finances. "As with technology," Manuel said, "There is no 'silver bullet' solution for the challenges facing deindustrializing regions."

A recent recipient of an SIUE Seed Grant, Manuel has been conducting a new project examining the history of corn ethanol in the United States during the 20th century with a focus on the substance's political support. Dr. Manuel has recently published some of his research on deindustrialization in the journal *Technology and Culture*. He is also working on a book with the working title, "North Country Blues: The Struggle to Sustain Industrial Mining on Minnesota's Iron Range, 1915-2000," currently under contract with the University of Minnesota Press.

Graduate Student Research Briefs

Animated Awareness Campaigns: Rudolph Wendelin's Shaping of 20th Century American Environment

Most will be familiar with U.S. Forest Service mascot Smokey Bear and his message that "Only you can prevent forest fires!" A creation of Rudolph Wendelin, Smokey Bear was used in a series of awareness campaigns beginning in the 1940s. This, however, was only one of Wendelin's many creations. Although other characters have been forgotten over time, their rediscovery may be used to provide a new perspective on the post-World War II history of U.S. environmental movements.



With the support of a research grant from SIUE, graduate student Patience Ferry, historical studies, aims to do just that. Aided by the access the grant provides her to 26 boxes (or 34 linear feet) of archival material housed at the Forest History Society Library and Archives, Ferry plans to examine often forgotten materials to explain how support for environmental campaigns have been cultivated at the largely ignored grassroots level. Dating from 1930 to 2005, the archives include Wendelin's personal correspondences and artworks, U.S. Forest Service records, and much more. Ferry sees the materials as vital in examining social issues such as class, consumption and gender, as well as ways that environmental issues have been presented to the public and younger generations.

Alternative Enameling Techniques: Torch Firing with Non-Traditional Materials

Enameling is a centuries old metalsmithing technique, which fuses a layer of powdered glass onto a metal surface through a firing process. The most traditional firing technique used in the process requires a kiln. However, graduate student Melissa Hampton received a research grant in spring 2014 to support a project that instead uses the unusual approach of torch firing.

Hampton experiments with unconventional materials in metalworking, such as thread, gelatin and potatoes. Together, these alternative methods allow her to explore parallels between how this process alters materials and how radiation alters organisms via genetic mutation. Hampton, the grandchild of a chemical plant worker who was exposed to high levels of radiation during the 1940s and 1950s and developed a rare bone cancer, explained her interest in genetic mutation by citing the personal connection she feels with the concept. "The future generations of my family line are completely at the whim of these radioactive isotopes that will be carried in our DNA for hundreds of thousands of years," she said.

The project allows Hampton to explore how incorporating alternative materials in the torch firing process can leave behind residue and create new surface patterns, colors and textures. It is also thematically relevant, she said, to major nuclear accidents such as the Chernobyl incident and the disaster at the Fukushima Daiichi nuclear power plant. Her exploration and documentation of torch firing methods also holds value for the field of metalsmithing.

Techniques Used in Collaboration between Music and Art Therapists

What happens when art therapy intervention techniques are used in collaboration with music therapy intervention techniques, and how can such an approach benefit patients? Due to the limited amount of published research exploring the collaborative process combining these two types of therapies, graduate student Margaret Schmidt has undertaken a study that will explore, identify and understand such a process.

For the study, Schmidt scheduled interviews with art therapists who have participated in a collaboration using art therapy and music therapy intervention techniques to occur between April and December of 2014. The participating therapists were asked to answer questions about their experiences and results in using the combination of music therapy and art therapy intervention techniques. A research grant provided by the SIUE Graduate School was provided to fund the transcription of the recorded interviews and the use of NVivo, software that organizes and analyzes data.

Schmidt's study has the potential to help therapists share existing techniques with each other and provide more treatment approaches for patients. The study's results could also indicate further arts-based research that might be conducted to gain understanding of the benefits of treatment methods.


VISIT
PALESTINE

From Midwest to Middle East:
Dr. Denise DeGarmo Explores Sovereignty of Larger States over Smaller Ones

Dr. Denise DeGarmo, associate professor of political science, has always been interested in how national security interests lead to regional consequences. Early research, for instance, led her to ask how federal nuclear plants and U.S. policy led to negative health and environmental effects for Midwest communities. Recently, however, her focus has shifted to the Middle East. This change occurred in 2011 after she received sponsorship from the Palestinian American Research Center (PARC) in Washington, D.C. to travel to the occupied Palestinian territories. Since that time, Palestinian politics has become a central aspect of her research agenda.

DeGarmo received an SIUE STEP research grant in 2013 to conduct a project that would unfold into multiple opportunities. These opportunities first manifested during several trips that led DeGarmo to Israel and the West Bank, Palestine, where she met several Palestinian scholars known for their work on Israeli-Palestinian security issues, especially those associated with the creation of a sovereign state. With the help of her Palestinian colleagues, DeGarmo produced an analysis of how nations obtain autonomy. Her research, she said, "focused on issues surrounding the construction of external security mechanisms necessary to bring about a stable and independent Palestinian state." Although the new project continued DeGarmo's work in the area of security, she was now exploring creative possibilities for new measures that would aid the emergence of a new state.

Impressed by her work, The Applied Research Institute – Jerusalem (ARIJ), a non-governmental organization located in the West Bank, invited her to serve as a research associate with the Institute. With its interest in natural resource management, water management, sustainable agriculture and political dynamics of development in Palestine, ARIJ represents similar concerns to DeGarmo's early focus on U.S. nuclear waste disposal. "This long-term collaboration promises many interesting projects in the years to come," DeGarmo said.

In December 2013, using SIUE's Undergraduate Research and Creative Activities (URCA) program, DeGarmo found students with an interest in learning how to collect and analyze data who would help her in completing the research project. With these three student researchers, Charmaine Burrus, Rob Wann and Tyler Urish, as well as fellow Department of Political Science Associate Professor Dr. Laurie Rice, DeGarmo traveled to the West Bank to conduct fieldwork. "This experience," DeGarmo said, "provided a unique opportunity for students to travel throughout the West Bank, while gaining valuable experience on the ground."

Bolstered by these experiences, DeGarmo said, "The fruits of my research are just beginning to unfold." One example of such benefits is the book chapter "Liberation Hip-Hop: Palestinian Hip-Hop and Peaceful Resistance" that she and Dr. E. Duff Wrobbel, associate professor of applied communication studies, have contributed to the book,"Organic Globalize: Hip Hop, Development and Movement Culture," published by Bloomsbury Press.

In addition, DeGarmo's was invited by the American Political Science Association/Middle East and North Africa Workshop series to deliver talks in Amman, Jordan and Beirut, Lebanon on her proposed topic, "Cross National Variations in Challenges to Old Regimes during the Early Stages of the Arab Spring Movements."

"The purpose of this workshop" she said, "is to support early-career scholars from the Middle East in publishing their research and to build networks between these scholars and their colleagues in the US/Europe."

Opportunity, Like Disaster, Strikes:

Dr. Ariel Belasen Finds Creative Means of Economic Recovery after Catastrophes

From the ancient trade city of Ephesus which was deserted due to erosion, to Pripyat, Ukraine, which was evacuated following the Chernobyl meltdown, to the earthquakes that decimated Tohoku, Japan in 2011, history has shown that environmental disasters are a constant threat to civilization. That is why Dr. Ariel Belasen, associate professor of economics and finance, has spent several years engaging in projects and analyses on the effects of natural disasters on local and regional populations. By gauging the impact of catastrophes such as hurricanes, Belasen is helping to find ways that policy makers can, if not prevent disasters, at least speed up recovery from them.

Belasen's attention to disaster-related research projects began as early as his time as an undergraduate student, but it was at a special colloquium put on by the Southern Economic Association in 2008 when he saw that the policy implications of his research could be put into action. While undertaking his initial disaster-related project on the impact of hurricanes on local labor markets, Belasen was invited to speak at the event. There at the colloquium, held in New Orleans, on the anniversary of the aftermath of Hurricanes Katrina and Rita, he had what he called an "eye-opening experience." While half of the population of New Orleans still yet to return, a panel of economists, including Belasen, discussed potential solutions to the many problems the city faced if it was to be rebuilt. Belasen revealed that his work showed how when employers in hurricane-stricken counties offered higher wages, it would, in an act of what economists call, "creative destruction," help reverse some of the emigration.

Belasen also found that, aside from the financial impact, hurricanes and other disasters have played a major role in migration patterns throughout history, as developing countries typically do not have the resources or capacity to recover fully after a major disaster. In their 2013 study, "Migration as a Result of Natural Disasters," Belasen and Dr. Solomon Polachek of Binghamton University found that those with the means to leave those countries would do so. This, according to Belasen, has caused emigration rates to spike following severe disasters.

While Belasen's research focuses on data gathered in the aftermath of disasters, the goals of such projects are often concerned with preparing to face challenges of the next inevitable catastrophe. This is true of Dr. Belasen's latest study, which was completed with Dr. Chifeng Dai of Southern Illinois University Carbondale. Published under the title, "When Oceans Attack: Assessing the Impact of Hurricanes on Localized Taxable Sales," it used data from Florida's Bureau of Economic and Business Research to examine the financial and economic implications of a series of hurricanes on the state of Florida. Of the study's results, Belasen said, "States like Florida which do not have an income tax rely heavily on sales and usage taxes. So when a hurricane disrupts the economic activities within Florida, the repercussions are felt, not only by producers and consumers, but also by local government. This presents a major challenge to policy makers, because they would be hard-pressed to come up with the resources needed to boost consumption and production."

Dr. Robyn Berkley and Colleagues Explore Positive Impact of LGBT Identities in the Workplace

Despite great strides that have been made in the area of marriage equality and workplace rights, those in the sexual minority still find stigmas attached to them in the workplace, which may inhibit their advancement. Due to this, many gay and lesbian workers choose not to reveal their orientation to coworkers. At the same time, however, there are many successful leaders within various industries who identify as gay or lesbian.

According to Dr. Robyn Berkley, associate professor of management and marketing, aspects of one's personality or personal experiences may help gay or lesbian leaders overcome challenges that can arise when integrating one's personal identity with a professional life. Berkley worked with a team of colleagues to consider how individual identity may impact the leader-follower relationship. The team, which also consists of Dr. Roxanne Beard, Ohio Dominican University; Dr. Nicole Cundiff-Meyer, University of Alaska Fairbanks; and Nicholas Hoffman, Southern Illinois University Carbondale, explored these types of professional relationships since the workplace has seen a greater emphasis on relationships, with management styles increasingly referred to as "relationship-focused" or "employee-oriented."

The team began by looking at a 2006 study conducted by Kirk Snyder, USC Marshall School of Business, in which leadership styles of gays and lesbians were investigated as compared to that of their heterosexual counterparts. This study found that gay men reported being more relationship-oriented than their lesbian or heterosexual counterparts, both male and female. While Berkley thought these results were interesting, she said that little attention has been paid to how hidden identities, as in the case of secretly gay and lesbian workers, may affect how a leader is seen by others, or by him- or herself. It became more important to the research team to explore why some workers with hidden identities believed they were more relationship-oriented.

The team hoped that this would reveal whether the results from Snyder's study showed innate personality traits or characteristics that could be taught through intervention.

The team found some secretly gay or lesbian workers surveyed had feelings of being an imposter, or of deceiving others about their identity. Most notably, however, those who were more likely to feel like an imposter also reported being more relationship-focused in the workplace. According to Berkley, this information further spurred her team to uncover how, despite the increased stigma and feelings of being an imposter, individuals were driven to greater success as leaders. What they found, Berkley said, is that, "Even if they feel like an imposter, they can be more authentic if they have a firm belief they can be successful, even if they have not revealed their identity in the workplace."

However, this alone is not enough to drive workers to become better leaders. More importantly, Berkley said, is having a high level of emotional intelligence. This enables an individual to manage and respond appropriately to the emotions of themselves and others. "Given that gays and lesbians regularly have to monitor their environment for personal and professional safety," Berkeley said, "the researchers believe gays and lesbians may be more prone to higher levels of emotional intelligence than heterosexuals on average."

Berkley hopes that the research will influence workplace policies and practices, as well as Employment Non-Discrimination legislation. "Good leaders can have a powerful impact on an organization's success," Berkley said. "Ultimately," she continued, "organizations cannot afford to ignore a sizeable portion of their workforce who can have a value-added benefit on the organization's bottom-line."

Project CASTLE: Collaborating for Autism Spectrum Teaching, Learning and Excelling

Over recent years, autism spectrum disorder (ASD) has received broad media exposure. ASD remains among the world's most misunderstood medical conditions. Symptoms of autism spectrum disorder most often manifest during social interactions. Thus, primary targets of treatment are improving social interactions. It is unfortunate that the misconceptions about autism spectrum disorders persist, as does the difficulty those who suffer from ASD have in communicating and interpreting the behavior of those around them. Confusion about ASD abounds due to the complexity and heterogeneity of ASD symptoms.

Recent changes in the Diagnostic and Statistical Manual (DSM) have clarified misconceptions of ASD. Terminology and symptoms are now more fully explained to aid in the diagnoses of ASD. For example, in the 1970s and 1980s, it was believed that about one out of every 2,000 children had autism spectrum disorder, whereas in the CDC's most recent report in 2014, one in 68 eight-year-old children is estimated to have a form of ASD.

In one effort to quell confusion about autism spectrum disorders, Dr. Elizabeth McKenney, assistant professor of psychology, has devoted her time to the clinical research of ASD. She is working with child educators and her local community to not only educate the public on ASD, but to uncover and interpret new data that can be used to improve the lives of those diagnosed with ASD. Most notably, McKenney acts as a consultant for Project CASTLE, a research and outreach collaboration with the Edwardsville Community Unit School District. She provides support for students with ASD, and their teachers and parents. The project's research, according to McKenney, focuses on the students, evaluating the usefulness of existing educational and public-service practices. Meanwhile, studies conducted with the program's staff and students have supported the teachers and parents, and they have introduced new methods to improve students' social communication and academic performance.

Graduate Student Research Brief

Project CASTLE encourages accurate delivery of Discrete Trial Teaching (DTT) for those involved with educating and supporting children with ASD. Discrete Trial Teaching is an evidence-based treatment for ASD which is procedurally complex to implement in a classroom setting. During the projects first year, McKenney explored the effectiveness of giving performance feedback to special education teachers and teaching assistants in three elementary classrooms for students with ASD. Teachers in these classrooms often deal with students with various needs, such as inattention, difficulty completing work, and disruptive behavior. McKenney found that encouraging behavioral development is effective as a means of supporting teachers, as well as treating these students. Despite this fact, McKenney's is the first study to measure how performance feedback impacts a teacher's accuracy to DTT procedures within a public elementary school setting. After the study's initial stages, the research team was able to use its findings to train school psychologists and social workers to offer consultation and performance feedback to teachers on a continuing basis.

In its second year, the CASTLE project shifted focus to working with families, ensuring stronger results for children with ASD both at home and at school. According to McKenney, children with ASD often have a hard time applying what they learn in one setting to another environment, and therefore, close collaboration between parents and teachers is important to ensure success for all parties involved.

Although there is no "cure" for ASD, McKenney points out that in many cases one's symptoms will improve with treatment. Current research is focused on the consultation activities that support teachers' use of Pivotal Response Training (PRT) procedures within classroom environments. Like DTT, PRT is only just beginning to be explored as a form of ASD service delivery in need of consultative support within public education settings. In some areas, PRT has been shown to facilitate faster increases in students' skill acquisition than DTT. Thus, supporting this form of service delivery may produce even better outcomes.

Perspectives on Tablet Technology in Children with ASD

The widespread use of tablets has opened up new approaches in treating children with autism spectrum disorder (CWASD). Researchers have found that improved social development can occur as a result of adopting the use of a tablet as a tool with which to learn and play, citing an increase in subjects' academic engagement and improved speech and communication skills. However, some evidence from research has supported claims that the adoption of tablets in ASD treatment also presents drawbacks, including an increase in social isolation and repetitive activity, which can hinder a patient who needs to develop the ability to adjust his or her ideas as social situations require.

As she became interested in this topic, graduate student Grayce Voreis found that a limited amount of research had been conducted, especially from the perspective of educational professionals who work directly with CWASD. This led Voreis to begin her own research. Funded by the Graduate School and in affiliation with the Illinois Center for Autism, the project uses focus groups made up of nearly 20 education professionals, including speech-language pathologists, as well as early elementary and middle school teachers. Voreis expects the data gathered from the project to reveal the most effective ways to use tablets in educational settings for CWASD. Furthermore, she plans to use her research to complete a master's thesis for the Department of Special Education and Communication Disorders and potentially publish her results and present them at a national conference.

Noyce Scholarship Program Trains Qualified Science Teachers for Southwest Illinois

In 2013, SIUE received a $1.2 million grant from the National Science Foundation to recruit and train future science teachers who can help fill the gap in qualified science instruction in area schools. During the five-year grant tenure, the Robert Noyce Scholarship Program at SIUE will graduate and certify 36 secondary science teachers to serve in high-needs rural and urban communities in southwestern Illinois.

The Noyce program provides funding for scholarships, stipends and programming to recruit and prepare science, engineering, technology and math (STEM) majors to become middle school and high school science teachers. The SIUE program is a partnership of the SIUE College of Arts and Sciences; SIUE School of Education, Health and Human Behavior; the STEM Center at SIUE; master teachers; community organizations; local community colleges; and cooperating school districts.

Dr. Jessica Krim, assistant professor of curriculum and instruction, leads the multi-disciplinary effort, and she is joined by Dr. Kelly Barry, associate professor of biological sciences; Dr. Sharon Locke, director of the STEM Center at SIUE; and Dr. Susan Wiediger, associate professor of chemistry.

The SIUE Noyce program embodies a pathway for students that fortifies their self-confidence in teaching science. Students teach in a variety of outreach programs, both at SIUE and with community partners; they learn instruction in both formal and informal settings; and they receive support and feedback from SIUE faculty. Another goal of the Noyce program is to fortify the region's capacity to sustain and develop professional science teachers. To achieve this goal, the program recruits highly qualified students in the STEM areas and pre-professional health fields who demonstrate a strong teaching aptitude.

Internships and competitive scholarships offer incentives for excellent students to apply for the Noyce program, but the program's main benefit is its unique training opportunities. Ten summer internships are awarded each year to SIUE and community college freshmen and sophomores from STEM disciplines who show promise in teaching. Moreover, up to 12 competitive Noyce Scholarships valued at $11,500 per year are awarded to juniors and seniors who are committed to pursuing STEM education careers. These 12 scholars will conduct outreach to disadvantaged middle and high school students, observe master teachers, and conduct research projects.

As a major goal of the Noyce program is to supply needy schools with qualified science teachers, graduates of SIUE's program enter underserved middle and high schools in the region. However, support for these new teachers does not end after graduation. The Noyce program will sustain graduates with summer workshops, online mentoring and support, and professional development events to maintain a collaborative network of peers and master teachers in southwestern Illinois. This will further buttress the region's educator network, enabling a mutually supportive science education community.

In summer of 2014, the Noyce Teacher Scholar program supported its first round of interns and graduated three students from the inaugural class who have gone on to teach in high-need schools in Illinois and Missouri. In August 2014, SIUE received an additional NSF Noyce grant to recruit and prepare future math teachers in southern Illinois. This $1 million award is led by Dr. Liza Cummings and her team members, Drs. Sharon Locke and Tammy Voepel.

Through activities built into the program design, the Noyce interns and scholars will influence more than 2,500 middle and high school children, providing minds-on STEM activities designed to generate enthusiasm for STEM and STEM careers—and to hopefully inspire the next generation of scientists and educators.

The inaugural class of the SIUE Noyce Scholars (left to right): Courtney Thomas, Amanda Hyett, Jenna Kunde (standing), Mara Holloway, Chris Foster

Graduate Student Research Briefs

Measuring the Effects of Corporate Wellness Programs on Recruitment

As corporate research has increased over the past 30 years, much emphasis has been placed on obtaining helpful data related to recruiting desirable employee candidates. However, little attention has been paid to the potentially positive effects on recruitment that can arise from offering extra organizational benefits, such as corporate wellness programs. These supplemental programs allow organizations to offer employees resources for acquiring or retaining overall healthy living. Researchers often assume that there is a positive relationship between wellness programs and increased rates of successful recruitment efforts. However, graduate student Holly Morris is the first to conduct an empirical study of the link.

Aided by an SIUE Research Grant for Graduate Students, Morris's study explores whether recruitment efforts by an organization can benefit from showcasing corporate wellness programs on organizational websites, and if certain types of wellness programs are more effective than others in assisting recruitment. Additionally, the study is examining individual factors, such as the feelings of personal entitlement and personal values on health of those being recruited. Morris will then analyze the effects such factors have on the attractiveness of organizations with wellness programs. According to Morris, the study could inform how organizations recruit in the future.

Workplace Discrimination Against Lesbians and Gay Men in Hiring and Salary Decisions

A recent study by graduate student Jodie Leigh Pyatt is examining potential discrimination that lesbians and gay men face in the workplace. According to Pyatt, trends in recent legal activity suggest that discrimination on the basis of sexual orientation is gaining recognition as a significant issue for employees. Although roughly 66 percent of Americans say that they would support legislation that protects gay men and lesbians, 62 percent of gay men and 59 percent of lesbians still report experiencing some employment discrimination. Furthermore, discrimination against employees who are gay, or are perceived to be gay, is still legal in many workplaces. However, Pyatt points out, as many as 21 states have incorporated legislation that prohibits discrimination toward individuals on the basis of sexual orientation.

In order to explore hiring and salary discrimination differences between these groups, Pyatt's study uses an online survey tool to survey her study participants, who are recruited for their extensive experience in hiring. Using resumes to organize participants into groups according to sexual orientation, Pyatt hopes to discover if the study participants demonstrate biases against homosexual applicants in employment-related decisions. The findings, she said, would provide support for further research of sexual orientation discrimination in the workplace and help pinpoint what specifically causes different perceptions of homosexuals and heterosexuals, as well as how these differing perceptions might lead to discrimination.

The SIUE Graduate School Celebrates History of Opportunity for Renewal, Advancement, Progress

-By Dr. Stephen Hansen, Professor Emeritus of Historical Studies and Graduate School Dean Emeritus

At SIUE's 50th Anniversary Convocation, Chancellor Emeritus David Werner compellingly spoke about the hallmark of SIUE as a "fount of opportunity." More than just a platitude in the Alma Mater, Werner convincingly explained, SIUE had proven to be a "fount of opportunity" for the community and for the thousands of students who attended the University. By providing access to higher education and by acting as an engine of economic development and public service, SIUE was, Werner concluded with justifiable pride, a university that helped transform people's lives by providing opportunities to study and learn.

What does it mean to be a "fount of opportunity?" For SIUE, it means more than simply being a source of opportunity. It means that SIUE generates the conditions necessary for individual as well as public renewal, advancement and progress. It means that SIUE facilitates action that makes learning possible. Of the many factors that make SIUE a "fount of opportunity," the research and creative activities of the faculty fashion the unique combination of time, place, and circumstance for generating exceptional opportunity. Through the research and creative activities of its faculty, the University has helped address a variety of regional issues, contributed to economic growth and expanded the frontiers of knowledge. More importantly, faculty research and creative activities have generated rich learning opportunities for SIUE students by giving them the opportunity to learn the most current knowledge as well as to participate actively in the construction, evaluation, and integration of knowledge and artistic expression.

The individuals featured here are just some examples of how faculty research and creative activities have produced opportunities for students and enriched the education of thousands of undergraduate and graduate students. In each example, students taught by an active scholar, have directly benefited by being engaged at the nexus of the expansion and communication of new knowledge. At SIUE, the Teacher-Scholar is what helps make for a vibrant education, a "fount of opportunity" for students and for the community.

Stan Ford

Stan Ford's experience illustrates well how research and creative activities have helped to make SIUE a "fount of opportunity." Stan received both his bachelor's and master's in music performance in 1982. Among the faculty with whom he studied, Stan worked with world-renown pianist, Dr. Ruth Slenczynska. After graduating, Stan received a Fulbright Scholarship to study in Salzburg, Austria where he eventually accepted an appointment as professor of piano. He has since had an outstanding career as a performance pianist and he has received numerous awards and recognitions, including the International Achievement Award from the National Association of Negro Musicians and the Great Minds of the 21st Century Award 2010. "I am very, very fortunate to be afforded the opportunity to live out a performing musicians' dream of traveling the world performing in major halls as a soloist or collaborating with other world-class musicians," Stan wrote, and "I realize that none of this would have come to pass had it not been for the exceptional musical training I received from the SIUE music faculty. I am eternally grateful to the faculty, particularly my beloved piano teacher, Ruth Slenczynska."

Diane Ryan

Diane Ryan, who received her bachelor's in business administration in 1978 and her MBA in 1981, is another student whose educational opportunities were enriched by faculty research and creative activities while at SIUE. After graduating, Diane received a law degree from St. Louis University and worked for the Internal Revenue Service. She served as the IRS's National Chief of Appeals and oversaw all tax-related administrative dispute resolutions, reporting directly to the Commissioner of Internal Revenue. She directed more than 2,000 employees and administered dispute resolution relevant to 159 million taxpayers and business entities. Diane retired from the IRS in 2011 after a distinguished career of three decades and joined the Chicago law firm of Skadden, Arps, Slate, Meagher & Flom LLP, as a tax litigation attorney. While at SIUE, Diane benefited from working with a number of faculty researchers, including Dave Ault, Gil Rutman, Don Aucamp, Tom King and Bob Carver.

Patricia Heberer Rice

Patricia Heberer Rice is a historian with the Center for Advanced Holocaust Studies at the United States Holocaust Memorial Museum in Washington, D.C. There she is the Museum's in-house specialist on medical crimes and eugenics policies in Nazi Germany. She is the author of "Children During the Holocaust," published in 2011, and also authored "Atrocities on Trial: The Politics of Prosecuting War Crimes in Historical Perspective," which she co-edited with Juergen Matthäus. Dr. Heberer often works in partnership with the American Medical Association to bring the history of the Holocaust and its repercussions for medical ethics to medical faculties throughout the United States.

Patricia was an undergraduate majoring in history and German at SIUE from 1982-1986. She completed a master's in history in 1989, before beginning a Ph.D. program at the University of Maryland. Her master's thesis was directed by Professor James Weingartner and focused on the 1945 Hadamar Trial, the earliest mass atrocity trial in the U.S. Zone of occupation after World War II. Patricia said that "my thesis work with Dr. Weingartner laid the basis for most of my future work with the Nazi "euthanasia" program., and my work on war crimes trials that has formed the foundation for many publications." Her opportunity to conduct research with an active scholar at SIUE made the basis, she said, for "years of interesting research and fulfilling work."

David Kistner

David Kistner received his BS in Chemistry in 2003 and returned to earn a MBA in 2011. He currently works as a production supervisor for Afton Chemical where he utilizes both his chemistry background and his business education to run a chemical production process. While an undergraduate, David worked under the supervision of Michael Shaw in the Chemistry Department. David maintains that the time he spent in Professor Shaw's lab doing research taught him more than his regular classroom experiences. The research in Shaw's lab gave him the experience needed to win an Excellence in Undergraduate Research Award in 2002 and 2003. After graduating, David worked at Mallinckrodt Pharmaceuticals in their Research and Development Department. From there he returned to SIUE for a position as a research engineer at the National Corn to Ethanol Research Center (NCERC) before moving on to his current position at Afton Chemical. "The research work I did as an undergraduate," David explained, "gave me the foundation I needed to succeed after graduation."

Acknowledgment: Permission to use portions of the narrative about these SIUE Alumni comes from the SIUE "Alumni Hall of Fame."

SIUE Emerita and Current Faculty Organize Diverse Existentialism Conference

A retired scholar is not by definition a sedentary scholar. One need only point out the June 2014 "Diverse Lineages of Existentialism" conference to verify this claim. The conference's committee was chaired by renowned Simone de Beauvoir scholar and translator, Dr. Margaret A. Simons, distinguished research professor emerita of philosophy at SIUE. Dr. Bryan Lueck, Philosophy, and Dr. Debbie Mann, Foreign Languages and Literature, also served on the committee and assisted in organizing the event. The recent publication of Dr. Simons' five-volume series on Beauvoir provided the initiative for the conference. Together, the committee brought together what their mission statement called, "a wide variety of scholars to share their research on the diverse lineages of existentialism."

The conference organizing committee also included the nationally-recognized Jean-Paul Sartre scholar, Dr. Matthew Eshleman from the University of North Carolina at Wilmington, as well as keynote speaker Dr. Lewis Gordon, celebrated author of volumes on Africana philosophy and black existentialism from the University of Connecticut. Considering the pedigree and diverse areas of knowledge of its committee, the conference tackled many different topics, from Africana Philosophy, to Continental Philosophy, to Philosophy of the Americas, to Philosophy of Gender, Race, and Sexuality. In addition, several diverse philosophical societies participated in the event, such as the Caribbean Philosophical Association, the Collegium of Black Women Philosophers, the Merleau-Ponty Circle, the North American Sartre Society, PhiloSOPHIA, the Roundtable on Latina Feminism and Dr. Simons' own Simone de Beauvoir Society. It was the first such international conference to bring together so many strains of philosophical inquiry exploring diverse notions of self, arising after the tradition of French existentialism.

Emeriti Active in SIUE Research and Development

A prime example of emeriti faculty remaining actively engaged with the University can be found in the SIUE Emeriti Faculty Association. Founded in 2013, it has provided a means for retired faculty to remain active participants in the SIUE community. In addition to providing members access to the University and to like-minded emeriti and faculty, the group has also established a fund supporting the development and enrichment of current SIUE faculty.

The association's yearly awards competition provides support for SIUE tenure and tenure-track faculty projects that would not otherwise receive support through the University. The award is meant to strengthen the academic quality of programs at SIUE and enhance the University's reputation. Just a few examples of the type of activities the award supports include: funding guest speakers in departmental colloquia series or interdisciplinary programs, faculty exchanges, and scholar-in-residence programs.

Other activities, such as receptions for the emeriti faculty and their spouses and guests, provide emeriti with the opportunity to meet former colleagues and friends and make new acquaintances.

For more information, please visit siue.edu/emeriti.

Sponsoring Agencies of Research and Projects
2013-2014

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American Association For Dental Research
American Association Of Nurse Anesthetists Foundation
American Political Science Association
Amsted Rail
Andrew W. Mellon Foundation
Anheuser-Busch Inbev
Arts Midwest
Association For Applied Sport Psychology
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Chicago State University/National Science Foundation
City Of Highland
City Of O'Fallon
CME Group Foundation
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Community Link
Department Of Health & Human Services
East St. Louis District #189 / U.S. Dept Of Education
East St. Louis School District #189
Edwardsville Community School District
Edwardsville Township
East St. Louis School District #189 / Illinois State Board Of Education
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Human Resources & Services Administration
Illinois Arts Council
Illinois Attorney General's Office
Illinois Center For Transportation
Illinois Community College Board
Illinois Corn Marketing Board
Illinois Criminal Justice Information Authority
Illinois Department Of Children & Family Services
Illinois Department Of Commerce & Economic Development: Illinois Clean Coal Institute
Illinois Department Of Natural Resources
Illinois Department Of Public Health
Illinois Department Of Transportation
Illinois Space Grant Consortium/ NASA
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Illinois State Board Of Education/ Westat
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National Science Foundation
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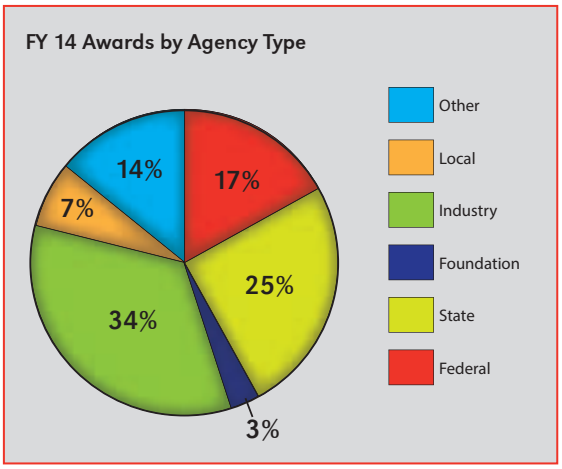
Science Education Solutions / National Science Foundation
SSM Depaul Health Center
St. Clair Housing Authority
St. John's Community Care
Stoecker And Associates
Sumner Group, Inc.
TASC/SAMSHA
The Growth Parnership, Inc.
U.S. Department Of Education
U.S. Holocaust Museum
UKIERI-UK-India Education and Research Initiative
United Way
United Way: Student One-Time Grants
University Of Central Florida / Gates Foundation
University Of Florida
University Of Illinois Urbana-Champaign
University Of Illinois Urbana-Champaign / Metro East Community Air Project
Virginia Center for the Creative Arts
Wallace Foundation
Washington University in St. Louis
Woodrow Wilson National Fellowship Foundation



FY 2015 S.T.E.P. Grant Awardees

Project Leader/ Team	Department	Project Title
Steven Brown	Art and Design	Frackturing Time and Space: Re-Constructing the Landscape of an Economic Boom
John DenHouter	Art and Design	Facades
Christopher Theodorakis Vance McCracken	Biological Sciences Biological Sciences	Toxicity of Nanoparticles in Bacteria
Kurt Schulz	Biological Sciences	Secondary Effects of Climate Change on Forest Plant Physiology
Jianwei Huang	Civil Engineering	Investigation of Bridge Continuity by Finite Element Modeling
Phillip Buckley	Educational Leadership	Public School Liability for Negligence: Examining a Complex and Confusing Legal Terrain
Joshua Kryah	English Language and Literature	Journey Out of Essex
Joshua Wooten	Kinesiology and Health Education	The Cardioprotective Role of Physical Activity During Weight-Cycling
Brianne Guilford	Kinesiology and Health Education	Is High Fat Diet-Induced Neuropathy Accompanied by Neuronal Inflammation?
Yuping Zeng	Management and Marketing	Short-Term Stock Market Reaction and Long-Term Acquisition Performance
Jason Yu	Mass Communication	Cultural Differences in the Impact of Environmental Message Salience on Consumer Judgment of Green Advertising: An Empirical Test of Cognitive Process Model of Agenda Setting
Junvie Pailden	Mathematics and Statistics	Empirical Likelihood Based Control Charts for Monitoring the Process Mean
Daeshik Choi	Mathematics and Statistics	Estimates of Matrix Functions Using Sets in the Complex Plane
Jenna Gorlewicz***	Mechanical Engineering	Toward Tactile Touchscreens that "Feel" Real
Matthew Schunke	Philosophy	Religious Subjectivity in Heidegger and Marion
Dennis Mares	Sociology and Criminal Justice Studies	A Longitudinal Study of Climate Change and Global Trends in Interpersonal Violence

***2015 Baich Award Winner

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Margaret Schmidt
Katrin Sjursen
Jeffrey Skoblow
Mattie Wall
Jerry Weinberg
Kim White
Joshua Wooten
Ronald Worthington
Jianpeng Zhou

SIUE 2013-2014 Internal Grant Award Winners

Annette and Henry Baich Award

The Annette and Henry Baich Award is given annually to the most outstanding STEP grant proposal for basic research conducted within the parameters of the Sigma Xi Society. Disciplines include the physical sciences, life and medical sciences, earth sciences, engineering, psychology, and mathematics.

Recipient: *Dr. Jenna Gorlewicz, Department of Mechanical and Industrial Engineering, School of Engineering*

Project: *"Toward Tactile Touchscreens that 'Feel' Real"*

Dr. Gorlewicz's project provides insight to the benefits of variable friction, which allows touchscreens to give haptic feedback to users. This feedback eliminates the need for sight when using a touch screen by providing different touch-based feedback, such as the sensation of "smooth" or "sticky" textures that form distinct shapes. Her proposal details a process for creating and testing a design tool for variable friction touchscreens. The tool will be used to produce prototype models which will serve to advance the touchscreens' designs and potentially help bring them into commercial markets. It is certain that this will significantly impact the experience of using a touchscreen device.

Hoppe Research Professor Award

The Hoppe Research Professor Awards are made to SIUE faculty members in order to recognize and support individual programs of research or creative activities. These awards recognize faculty members whose research or creative activities have the promise of making significant contributions to their fields of study. The Hoppe Research Professorship supports a significant and discrete portion of a faculty member's larger research agenda for a two-year period.

Recipient: Dr. Krzysztof Jarosz, Department of Mathematics and Statistics, College of Arts and Sciences

Projects: *"Small Deformations of Operator Algebras"*

Dr. Jarosz's project focuses on noncommutative Banach algebras, or operator algebras, and will explore various aspects of small deformations and perturbations of these noncommutative algebras. Noncommutative algebras depend largely on the order of an operation for a result, and thus, a change in order of the operations may affect the result. Banach algebra is a frequently employed model in scientific applications that serves as an analogue for an infinite dimensional Euclidean space together with specifically defined operations on that space. Those operations, in turn, serve as analogues for different operations on spatial vectors. Banach algebras are useful in such fields as quantum physics and relativity. Jarosz will be exploring how various deformations affect the noncommutative Banach algebras. Because the research area relies on the development of new tools and methods, Jarosz will be conducting collaborative work with other esteemed mathematicians throughout the globe.

Vaughnie Lindsay New Investigators Award

The Vaughnie Lindsay New Investigator Awards are made to tenure-track SIUE faculty members in order to recognize and support individual programs of research or creative activities. These awards recognize faculty members whose research or creative activities have the promise of making significant contributions to their fields of study and to SIUE in general.

Recipient: Dr. Melissa Chan, Department of Environmental Sciences, College of Arts and Sciences

Project: "Development of an In Vitro Blood Brain Model to Study the Mechanism and Neurotoxic Effects of Pyrethroids"

Dr. Chan joined SIUE in the fall of 2011 after earning a PhD from the Kyoto University in Kyoto, Japan. Originally from Malaysia, Chan also spent an additional four years pursuing post-doctoral work on at the National Institute of Environmental Health Sciences (NIEHS). Chan's project for the Vaughnie Lindsay award focuses on understanding how the blood brain barrier, or BBB, can impact the neurological absorption of potentially harmful consumer products, such as pesticides or pharmaceuticals. She anticipates that the preliminary results of her research will be used to improve laboratory methods used in producing these materials, and to develop useful tools and biomarkers for public health risk assessment.

Paul Simon Outstanding Teacher-Scholar Award

The SIUE Paul Simon Outstanding Teacher-Scholar Award is presented to a faculty member in order to recognize the role of interdependence between research and teaching. This highly competitive award confirms SIUE's belief that an individual must be a good scholar to be a good teacher. Winners of the Paul Simon award have demonstrated a significant contribution to their area of research or creative activity as well as a true commitment to the integration of that research with their teaching practices.

Recipient: Dr. Julie Holt, Department of Anthropology, College of Arts and Sciences

Since joining the SIUE faculty in 2000, Dr. Holt has distinguished herself as a scholar of the developmental period of North American history, contributing invaluably to archaeological scholarship of prehistoric Native American societies. In 2009, her article, "Rethinking the Ramey State: Was Cahokia the center of a theater state?" was published in American Antiquity, one of the preeminent journals in the field of archaeology. In 2010, she headed a team of SIUE faculty to gain a National Science Foundation-funded Major Research Instrumentation Grant, which included members of SIUE's anthropology, biological sciences, and chemistry departments. Holt has shown a commitment to the ideals of the Simon Award not only through accomplishments in her field, but also in her approach to teaching and research. For Holt, these two aspects of the teacher-scholar are inextricably linked, as she has consistently shown through shared publications with students, her oversight of the SIUE archaeological field school, and overall collaboration with students, especially undergraduates. "My students are my most valued colleagues," she said.

Distinguished Research Professor

The Distinguished Research Professor rank recognizes faculty members who have made an outstanding contribution to research as a result of their continued commitment to scholarship beyond the period of their promotion to Professor.

Recipient: *Dr. Albert Luo, Department of Mechanical and Industrial Engineering, School of Engineering*

The 2014 Distinguished Research Professor Award recognizes Dr. "Albert" Chao-Jun Luo for his contributions to nonlinear dynamics. This award is given to SIUE faculty members in recognition of their outstanding and sustained contributions to research and creative activities. Luo has achieved international recognition his field with his theory of flow barrier vector fields. His colleagues have credited him with developing methods of calculating chaotic motion, as well as pioneering theories of dynamic physical changes that were previously unexplained. In his own production, Luo's work in nonlinear dynamics has been published approximately 125 times in refereed journals. He has also published twelve research monographs, and over thirty pieces in proceedings, special issues, chapters and edited books. His work has been funded by external sponsors such as the National Science Foundation and local industrial partner Amsted Rail.

Luo's dedication to the advancement of his field shows a tireless motivation to achieve excellence. He currently serves as an editor for four prominent journals in his field, as well as a book series. He also serves on editorial boards and various technical committees. This is not to mention the professional symposiums, tracks and conferences he has organized and chaired, which currently number more than forty. As one colleague noted, "His wide range of activities has made our mechanical engineering program better known to outsiders, and it has promoted the image of SIUE at the national and international level."

2013 Research Grants for Graduate Student Awardees

Research Grants for Graduate Students (RGGS) awards small grants on a competitive basis to support research initiated and conducted by classified graduate students to enhance their academic progress.

Lindley Ballen, Biological Sciences
Katherine Bennett, Chemistry
Elizabeth Buseakrus, English
Gary Dotson, Mass Communications
Loren Dunham, Biological Sciences
Patience Ferry, Historical Studies
Brandi Fulk, Psychology
Vincent Giammaria, Environmental Sciences
Lisa Gibson-Thompson, Art and Design
Sarah Gillespie, Art and Design
Drake Jensen, Chemistry
Leighann Jones, Biological Sciences
Kanchan Karki, Geography
Adam Knoche, Art and Design
Paul Le, Biological Sciences
Kristin Lemenager, Biological Sciences
Hollie Lybarger, Biological Sciences
Jamay Michael, Biological Sciences
Lauren Mikkelson, Biological Sciences
Diana Nastasia, Educational Leadership
Mozdeh Nezhad, Mechanical Engineering
Akosua Ofori-Tettey, Civil Engineering
Jenje Olayemi, English
Adam Paige, Environmental Sciences
Jodie Pyatt, Psychology
Nathanial Reese, Biological Sciences
Kelsey Reger, Biological Sciences
Bree Richey, Chemistry
Brooke Seesengood, Biological Sciences
Swechhya Singh, Environmental Sciences
Kurt Stoecker, English
Renee Tate, Art and Design
Jaclyn Taylor, Biological Sciences
Irene Weber, Biological Sciences

2014-2015 Competitive Graduate Awardees

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Mahfuz Alam, Electrical Engineering
Manjurul Alam, Mechanical Engineering
Desiree Araujo, Nursing
Trista Baker, Social Work
Cynthia Campbell, English
Hilary Conrad, Kinesiology
Thomas Crosby, Historical Studies
Allyson Doty, Nursing
Duygu Durak, Industrial Engineering
Rya Heady, Speech-Language Pathology
Carly Hilo, Art Studio
Courtney Iberg, Biological Sciences
Steven Lemke, Art Studio
Naveen Maddirala, Electrical Engineering
Sarah Orler, Historical Studies
Makenzie Parks, Social Work
Celine Santos, Psychology
Teagan Smith, Applied Communication Studies
Chelsie Wade, Business

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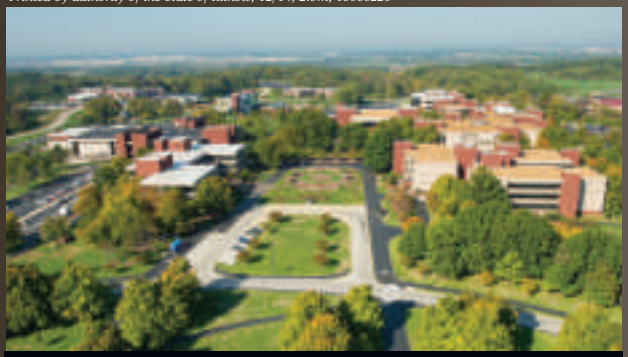

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