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7th Annual Focus on Creative Inquiry Poster Forum Program

Clemson University

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7th Annual Focus on Creative Inquiry Poster Forum

April 10, 2012

Sponsored by
Undergraduate Studies
The Graduate School
Calhoun Honors College

The poster forum today displays a few of the more than 400 projects initiated by Clemson University Creative Inquiry teams.

What is Creative Inquiry? It is small-group learning for all students. It is the imaginative combination of engaged learning and undergraduate research. Ultimately, it is the creation of an Ah-ha! Moment — and it is unique to Clemson University.

Creative Inquiry establishes small teams of undergraduate students that work with faculty mentors to take on problems that spring from their own curiosity, from a professor's challenge, or from the pressing needs of the world around them. Students take ownership of their projects. They ask questions, they take risks, and they get answers.

Students may join Creative Inquiry teams as freshmen and continue through graduation. They hone critical-thinking and problem-solving skills as they learn to work in a team — sometimes as a leader, sometimes as a follower. They present their work at national and international conferences, where they field questions from professionals and researchers.

These are the skills today's employers are seeking. "We want all of our graduates to be thinkers, leaders and entrepreneurs," says Provost Dori Helms. "We want them to be able to approach a task or problem and figure out how to solve it."

Indeed, Creative Inquiry is more than an add-on to a few students' education; it's a campus-wide, cross-disciplinary culture of engagement that makes the Clemson experience applied, engaging and extraordinary.

Acknowledgements

Creative Inquiry is supported by:

Provost Doris Helms

Dr. Janice W. Murdoch, Vice-Provost and Dean, Undergraduate Studies

Alumni Foundation

Phil and Mary Bradley

Creative Inquiry program director:

Dr. Barbara J. Speziale, Associate Dean, Undergraduate Studies

Creative Inquiry committee:

Denise M. Anderson, Parks, Recreation and Tourism Management

Beatrice N. Bailey, Teacher Education

Mark J. Charney, Performing Arts

Molly Espey, Economics

Ulrike A. Heine, School of Architecture

Michael J. Henson, Biological Sciences

Larry F. Hodges, School of Computing

Dana G. Irvin, Honors College, Student Services

David K. Knox, Institutional Assessment

Mary Elizabeth Kurz, Industrial Engineering

Suzanne Price, Student Affairs, University Housing

Gail L. Ring, Undergraduate Studies

Focus on Creative Inquiry Planning Team:

Tullen Burns, Undergraduate Studies

Dana G. Irvin, Honors College

Anne Jenkins, Public Affairs

Allison Wallace, Graduate Student

Cover Photos by Dr. Delphine Dean

Creative Inquiry team in Tanzania for the Designing Medical Technologies for the Developing World project

Schedule of Events

8:00 am - 9:30 am	Students install posters	Hendrix Ballrooms, Meeting Rooms & Multipurpose Room
10:00 am - 12:00 pm	Morning Poster Session	Hendrix Ballrooms, Meeting Rooms & Multipurpose Room
1:00 pm - 2:00 pm	Afternoon Poster Session	Hendrix Ballrooms, Meeting Rooms & Multipurpose Room
2:15 pm - 3:00 pm	Plenary Session	McKissick Theater

Welcome - Dr. Barbara Speziale

Introduction - Dr. Janice Murdoch

Featured Speaker - Dr. Delphine Dean

Creative Inquiry Approaches for Solving Biomedical Technology Problems in the Developing World

Awards Announcements - Dr. Barbara Speziale

3:00 pm - 4:00 pm	Students remove posters
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Speakers



Barbara J. Speziale Associate Dean, Undergraduate Studies

Dr. Barbara J. Speziale earned her Ph.D. in Zoology from Clemson University, a master's in Botany at the University of Minnesota and a bachelor's degree in Biology and in English Literature at the State University of New York at Binghamton. She has served Clemson University in public service, teaching, and administrative roles. She holds the rank of full professor in the Department of Biological Sciences, and directs Clemson's Creative Inquiry program in Undergraduate Studies. Dr. Speziale's research, funded by more than \$13,000,000 in external grants, includes limnological studies of algae in freshwater lakes, water quality educational materials, and science education activities that encourage students, K-12 through college, to pursue science studies and careers. She currently directs two major grants. A National Science Foundation grant created the FIRST program to recruit and retain first-generation college students in science careers. The SC Life project, funded since 1998 by the Howard Hughes Medical Institute Precollege and Undergraduate Science Education Program, provides life sciences education for K-12 students, their teachers, and undergraduate students. She has received numerous awards for her work, including the Elliott Award for Outstanding Service to Off-Campus, Distance and Continuing Education, the South Carolina Governor's Award for Scientific Awareness, Clemson's Martin Luther King Jr. Award for Excellence in Service, the Society for Environmental Toxicology / Menzie-Cura Environmental Education Award, and two awards for the 4H20-Pontoon Classroom curriculum -- the Natural Resources Conservation Service Youth Environmental Award and the 4-H Centennial Program of Excellence.

Janice Murdoch Vice Provost and Dean of Undergraduate Studies

Jan Murdoch, who has taught at Clemson since 1986, received her bachelor's with honors in Psychology from Wake Forest University in 1980, followed by a master's in General Experimental Psychology in 1982. She was elected to Phi Beta Kappa in 1980. A native of Wilmington, NC, she completed her Ph.D. in clinical psychology at Vanderbilt University in 1985, with a clinical internship at Brown University. She is licensed to practice clinical psychology and holds the rank of full professor in the Department of Psychology. Murdoch's primary interest has been in undergraduate teaching. She also works with students on directed research projects and honors research. Courses she teaches include abnormal psychology, substance abuse treatment, and health psychology. Murdoch's research interests are in learning outcomes in General Education social science courses. Murdoch's other interests include public policy, including a sabbatical leave during the 1994-95 academic year to serve as an American Psychological Association Congressional Fellow working for Senator Jay Rockefeller's Senate Committee on Veterans' Affairs staff. She also plays bluegrass mandolin with "Any Old Time."

As Dean of Undergraduate Studies, Murdoch is responsible for maintaining and enhancing the quality of undergraduate academic programs and services, including curriculum, academic advising, the Calhoun Honors College, Cooperative Education, the Academic Success Center, Creative Inquiry, and ePortfolio.



Plenary Speaker



Delphine Dean Assistant Professor of Bioengineering

Dr. Delphine Dean earned her Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (MIT) in 2005 and started her faculty position at Clemson in January 2007. Her expertise is in nano- to micro-scale characterization of biological tissues including experimental techniques such as atomic force microscopy and mathematical modeling such as finite element analysis. Dr. Dean leads the Multiscale Bioelectromechanics Lab at Clemson on studies focused on understanding mechanics and interactions of biological systems across length scales. The research is focused on a wide range of topics such as single cell structure-function relationships, nanoparticles and cell function, dental materials and dental cells, radiation

and cartilage tissue, and cardiovascular cell and tissue mechanics. She is the recipient of the 2011 Phil and Mary Bradley Award for Mentoring in Creative Inquiry for her work in mentoring undergraduates at Clemson. Dr. Dean currently helps to mentor six undergraduate creative inquiry research and design teams. These student teams work on a variety of projects including investigating the use of dental pulp stem cells for tissue regeneration, developing mathematical models to predict cell growth and migration, redesign of medical training simulators, investigating the use of robotics for solving biomedical problems, predicting rotator cuff injury from ultrasound, and developing medical technology for the developing world. She is very proud of her CI students, who have won numerous research, design, and entrepreneurship awards, filed for patent applications, and authored journal papers.

Plenary Lecture:

Creative Inquiry Approaches for Solving Biomedical Technology Problems in the Developing World

Medical devices and equipment that many of us take for granted whenever we go to a hospital can be hard to find and very expensive in resource poor settings. Our Creative Inquiry team is working to design and develop medical instrumentation and monitors that are robust, user-friendly, and low-cost for developing countries. Students visited collaborators and several sites in Tanzania in January to test their device designs. Tanzania has recently made significant advances with the quality of their healthcare; however, the infant mortality rate is still ten times greater than that of the United States. Therefore, one of the first projects our students tackled was developing a neonatal temperature sensing and control system for the prevention of hyperthermia in premature babies for Tanzanian health centers. In this talk, I will discuss this and several other innovative designs that our students have developed. By working together, engineers, clinicians, health care officials, and administrators can begin to overcome some of the challenges facing healthcare in developing countries today.

The Phil and Mary Bradley Award for Mentoring in Creative Inquiry

The Phil and Mary Bradley Award for Mentoring in Creative Inquiry is presented each spring in recognition of outstanding work with undergraduate students. Nominations are accepted from student participants in Creative Inquiry Initiative team projects. The award is made possible by a generous gift from Phil and Mary Bradley, and consists of a plaque and a salary supplement.

Bradley Award Recipients

- 2011 Dr. Delphine Dean, Assistant Professor of Bioengineering
- 2010 Dr. June Pilcher, Alumni Distinguished Professor of Psychology
- 2009 Dr. Karen Kemper, Associate Professor of Public Health Sciences
- 2008 Dr. Susanna Ashton, Associate Professor of English
- 2007 Dr. Mark Charney, Professor of Performing Arts

The Bradleys are a “One Clemson” family, supporting both athletics and academics, including providing the first major gift for the Creative Inquiry initiative. They did so because they like the idea of relevance and results. “The projects we’ve seen so far are about real problems,” says Phil, “and they’re designed to find solutions.”



Phil’s father, William F., had attended Clemson in the late 1930s, gone into service before he graduated, gotten married and started a family. In the late 1940s, he came back to Clemson with his young family to finish his degree. Years later, Phil Bradley enrolled in Clemson. After his sophomore year, he married his high school sweetheart, Mary, and before he graduated in 1965, they too had begun their own family with daughter, Renee.

After military service, the Bradleys settled in Charleston where they had their second child, Philip, and where Phil established a successful career in the insurance industry. Their children grew up coming to Clemson ball games. One of Philip’s first Death Valley memories is that of being picked up by the Tiger.

Both children attended Clemson. Renee later transferred to the College of Charleston, while Philip earned a political science degree at Clemson in 1992. He now has his own Allstate agency in Mount Pleasant. Seeing Philip graduate was coming full circle for Phil and Mary. In fact, Philip had his father’s and grandfather’s graduation years engraved inside his own Clemson ring.

The Bradley family has always believed in a life of involvement - whether it’s working for their church, hosting Clemson Lowcountry events or giving financial assistance to worthy causes.

“Clemson has played a large role in my family’s development,” says Philip. “As our own history has evolved, so has the University’s. Giving back is part of our shared tradition.”

Excerpted from: Clemson World, Summer 2006 Volume 59 Number 3: ‘One Clemson’ Family

*Creative Inquiry gratefully acknowledges our Provost, Dr. Doris Helms.
It is her vision and support that have made all of this possible.*



Dr. Doris Helms Vice President for Academic Affairs and Provost

The vice president for academic affairs and provost is the chief academic officer of the university and chairperson of the university faculty. Responsible directly to the president for all academic matters, the provost has administrative jurisdiction over teaching, student admissions, registration, financial aid, graduate studies, research and computing services.

The provost recommends to the president short- and long-range plans for academic development and formulates policies to implement approved plans. The colleges report to the provost, as do units such as the Graduate School, Undergraduate Studies, International Affairs, Research Office, the Library, Computing and Information Technology, and the Office of Effectiveness and Assessment. In the absence of the president, the provost presides over the affairs of the university.

Doris R. “Dori” Helms, Ph.D., was named vice president of academic affairs and provost at Clemson University on Feb. 8, 2002.

Helms is a graduate of Bucknell University and holds a doctorate from the University of Georgia. She joined Clemson University in 1973 as an assistant professor of zoology. She later served as department head and professor of biology, then associate dean of the College of Sciences.

Abstracts

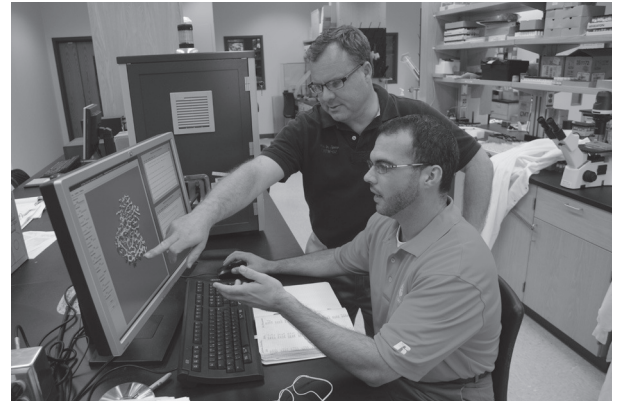
Poster # 1

Competition for Microhabitat Refugia among Plethodontid Salamanders along a Riparian Land-use Gradient

Mentors: Dr. Robert Baldwin, Thilina Surasinghe, Agricultural, Forest and Environmental Sciences

Students: Ray Adcock, Meaghan Miranda, Dabbie Jacobs, Taylor Tench, Rebecca Nelson, Jason Reynolds, Mark MacAlister, Latoisha Green, Melissa Hulbert, Justin Adams, Carmony Adler, Dana Walters

We investigated competition for microhabitats between two stream salamanders; *Desmognathus quadramaculatus* and *Desmognathus fuscus*, in four land-use conditions: forested, agricultural, residential and urban. The experiment was carried-out in laboratory conditions with water and stream substrates collected from the field. Daily, 20-minute observations were made from 0900-0100 hours under two phases: species co-occurrence and isolation and microhabitat occupied by each species was recorded. In all land-uses, *D. quadramaculatus* occupied the stream banks and selected rock crevices as preferred microhabitat under both phases, and showed high site fidelity than *D. fuscus*. *D. fuscus* showed broad habitat selectivity including interstitial space beneath rocks, logs, leaf litter, sand and gravel. They occupied the stream channel in the forested tank when co-existing. In non-forest land-uses, both species shared microhabitats in the bank. This study indicated that *D. quadramaculatus* is dominant in microhabitat use which receded with disturbances in the riparian zone.



Poster # 2

Caddisflies of the Clemson Experimental Forest and a New Species of Glossosomatidae

Mentor: Dr. John Morse, Agricultural, Forest, and Environmental Sciences

Students: James Murphy, Erica Okwuazi, Jay Wilkins, Kelsey Stafford, Rich Livingston, Micah Wolfe

The Clemson Experimental Forest encompasses 17,500 acres of mixed hardwoods and pines in the upstate of South Carolina surrounding Clemson University and is dedicated towards the purpose of research, education, conservation, and sustainable forest maintenance practices. This study seeks to explore the diversity of Trichoptera taxa found in and near 4 first- and second-order streams: Six Mile Creek, Wildcat Creek, an unnamed tributary to Todd's Creek (all in the North Forest), and Aull's Creek (South Forest). The data collected from this survey showed that the tributary to Todd's Creek had the greatest diversity of taxa, while Aull's Creek was habitat for the lowest diversity. Wildcat Creek and Six-Mile Creek had roughly equivalent taxonomic diversity. A pharate adult male representing a new species of family Glossosomatidae (genus *Agapetus*) was also found on 20 September in the tributary to Todd's Creek. This specimen is similar morphologically to *Agapetus jocassee* Morse, 1989.

Poster # 3

The Effects of Job Empowerment and Situational Constraints on Job Satisfaction

Mentor: Kalifa Oliver, Office of Institutional Assessment

Students: Janelle Cheung, Najeebe Melton, Lauren Ellis, Allison Wallace

Research has shown that job empowerment is related to worker physiological and psychological health. High levels of job empowerment are related to positive outcomes such as lower mental strain and better psychological well-being. Job empowerment positively predicts jobs satisfaction, and work constraints lead to lower job satisfaction because of experienced

frustration. Using data from a staff survey collected online at a mid-sized university, this study attempts to examine the effects of situational constraints and empowerment on job satisfaction. We hypothesize that job satisfaction will be negatively related to situational constraints but positively related to job empowerment, and the relationship between job empowerment and job satisfaction will be moderated by situational constraints, such that higher levels of constraints will weaken the positive relationship between the two variables. Results will be available at the time of presentation. This project is supported by the Office of Institutional Assessment and the Creative Inquiry program.

Poster # 4

Assessments for Redesigning Fabri-Kal Set-up Process

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Jacqueline Morsberger, Jonathan Paulovich, Ro'Nique Staley, Yuan-Han Huang

The objective of this capstone design project is to analyze and reduce set-up time and waste of the thermoforming process at the Fabri-Kal plant in Piedmont, SC. The thermoforming lines produce plastic containers by heating a thermoplastic sheet to a rubbery-elastic state. The plastic is stretched into a shaped mold using mechanical and pneumatic force. The mold is cooled to retain the shape, and trimmed from the web. The current system was analyzed using various Industrial Engineering tools such as informational surveys, Customer Needs importance surveys, work sampling, Pareto charts of system losses, 5-Why analysis, and a round table discussion. According to the findings, the design team will utilize Lean methodology to reduce non-value added effort and improve on the current set-up process. As a result, the final set-up process will aid in meeting both the initial and anticipated demands for Fabri-Kal, while maintaining the thermoforming production quality.

Poster # 5

Porcine Dental Pulp Cell Response to Micropatterned Substrates

Mentors: Dr. Delphine Dean, Bioengineering, Dr. Marian Kennedy, Material Science & Engineering

Students: Philip Gould, Theresa Hafner, Anita Patrick, Matthew Cupelli

There is very limited repair of damaged dentin by odontoblasts and almost no repair of enamel after damage. Our long-term goal is to understand how to engineer and design material that can push dental cells to repair damaged dentin and enamel. Currently, we are subjecting dental pulp stem cells to different topographical substrates to analyze their migration, proliferation, and morphology. The cells were plated onto micropatterns created using lithographic techniques. There will be four types of patterns: lines, circular holes, circular bumps, and hexagonal honeycomb patterns. The hexagonal pattern was selected because it mimics the hexagonal structures found in natural dentin. Initial results show that, after a five-day culture period, osteoblasts tend to migrate off some of the patterns. We predict that the dental cells will also migrate towards the patterns edges. With this knowledge we can create better tissue engineering replacement therapies in the dental world and beyond.



Poster # 6

Set Up Time Reduction for Fabri-Kal Production Lines

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Caroline Christ, AJ Jenkins, William Fochtmann, Yuan-Han Huang

Our objective is to reduce the set up time for a full mold set up for Fabri-Kal, a thermoforming company that produces plastic cups, containers, and lids. A full mold set up is defined as changing a production line from producing item A to producing item B. A new mold must be installed as well as packaging and material handling equipment. Our process thus far has been to interview stakeholders and understand customer needs. Through observation, we saw opportunities for improvement, and with our customer needs, we developed specifications for our product. We used data analysis to describe the current state of the system and uncover areas of delay. From the analysis, we will develop solutions based on the true root cause of the delays. Implementing these solutions will result in a reduction of time to complete a full mold set up.

Poster # 7

Clemson University Retrieval of Explants and Registry Program in Orthopaedics

Mentors: Dr. John DesJardins, Dr. Melinda Harman, Bioengineering

Students: Riley Csernica, Nicole Durig, Kevin Keith, Alison Lamb, Kathy Parker, Ryan Quinn, Christine Stamer

Although historically medical implant devices, such as total joint replacements, have produced great benefits to patients, it must be recognized that all are subject to some form of failure. Long-term data on the behavior of implanted devices and host response are essential inputs to the development process, yet no systematic programs for the retrieval and analysis of implants exist in this country. Our aim is to provide a working repository for retrieved implants, and to develop the tools and techniques for the systematic evaluation of implant designs, materials, surfaces and function. The success of the program is predicated ultimately by both developing relationships within the South Carolina medical research community. Since our inception in the spring of 2008, our program has collected over 250 explanted total joint replacements, which have been provided due to collaborative partnerships with regional hospital systems throughout the state of South Carolina.

Poster # 8

Soil Inventory of Holmes Rd., Lake Lure, NC

Mentor: Dr. Elena Mikhailova, Soil Science, Agricultural, Forest, and Environmental Sciences

Student: Bruce Eisenbrown

The objectives of this study were to conduct soil inventory of a residential plot in Lake Lure, NC using Web Soil Survey, to collect soil samples from the garden, and to analyze collected soil samples for major soil chemical properties. There was one soil serie are found within the property: Evard-Cowee, which belong to the soil order of Ultisols. Evard-Cowee loamy sand, 30 to 50 percent slopes (fine-loamy, parasesquic, mesic Typic Hapludults). Collected samples were all from the Evard soil type. Each soil sample had different levels of the plant nutrients. Each sample had similar cation exchange capacity



(CEC) and acidity. Soil nutrient analysis recommendations are discussed to maximize agricultural productivity and minimize environmental impact. This study was supported by the Clemson University Creative Inquiry Program.

Poster # 9

The ePortfolio: Purpose and Instrumentalization

Mentor: Kalifa Oliver, Institutional Assessment

Students: Brooke Baker, Evin Roper, Melanie Bolt

The ePortfolio is becoming more widespread across academic and business domains. An ePortfolio is defined as a purposeful collection of student work designed to showcase a student's progress toward, and achievement of, course specific learning objectives. Academic institutions therefore recognize an opportunity for their students through this media and challenge their students to reach professional and personal goals. Many academic institutions are incorporating these assessment, developmental, showcase, and combination, ePortfolios into their programs. The purpose of this research is to examine ePortfolio programs in four academic institutions, and investigate the uses and characteristics of different program types, as well as compare and contrast university programs based on purpose, success, and acceptance. This research will examine methods for positive implementation and sustainability, while creating or maintaining programs. Results will be available at the time of presentation. This research is sponsored by the Office of Institutional Assessment and the Creative Inquiry Program.

Poster # 10

Spatial Distribution of Stream Salamanders in Response to a Riparian Land-use Gradient

Mentors: Thilina Surasinghe, Dr. Robert Baldwin, Agricultural, Forest, and Environmental Sciences

Students: Debbie Jacobs, Rebecca LeMaster, Jason Reynolds, Justyn Plaskon, Victoria Robertson, Dana Walters, Carter Stokes, Sydney Vatrano, Frank Cisa, Joe Wunderlich, Jessica Forbes

We investigated the spatial distribution of two species of Desmognathine salamanders as a function of riparian land-use: forested, agricultural, residential and urban. Daily, 20-minute observations were made under two phases (co-existence and isolation). Spatial occurrence was mapped as point coordinates. In coexistence, the distribution range of *D. quidramaculatus* did not vary substantially among land-uses (250,000mm² - 300,000mm²). The range of *D. fuscus* was dissimilar across land-uses; the forested streams showed the smallest (390,000mm²) whereas the agricultural streams showed the largest (570,000mm²). The change in the distribution range of *D. quidramaculatus* resulted after removal of *D. fuscus* was unsubstantial whereas that of *D. fuscus* was greatly reduced upon removal *D. quidramaculatus* across all land-uses. The percentage range reduction in isolation for *D. fuscus* was 30% in the urban and agricultural streams and 20% in forested and residential streams. The range overlap was lowest (0mm²) in the forested stream and was highest in the residential stream (380,000mm²).

Poster # 11

Creative Inquiry into Composting Campus Food Waste

Mentors: Dr. Patricia Zungoli, Agricultural, Forest, and Environmental Sciences - Entomology

Students: Gary Nihart, Kevin Colson, Catherine Czerwinski, Elliot Gleaton, David Tindal, Chris Wozniak, Jason Bove, Larissa Clarke, Katherine Ripley, Jeffrey Akom

This creative inquiry is comprised of an interdisciplinary team of undergraduate and graduate students that will work with Clemson Recycling Services and Clemson Dining Services to develop a food waste composting program for Clemson

University. This creative inquiry is providing students with the opportunity to apply skills learned from their curriculum in order to solve a real world problem, assist Clemson in achieving its goals for sustainability, and develop skill such as time management, teamwork, and leadership. The team is working on projects in four areas: 1) Site development and site planning, 2) marketing, promotion, and educations, 3) Cost Benefit Analysis, 4) Compost testing and recipe development. The combined goal of these projects is to set the foundation for Clemson to reduce the quantity of food waste that ends up in landfills through composting.

Poster # 12

Operator Balance and Material Flow Optimization of Indirect Material Routes

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kyle Webster, Michelle Richard, Zachary Reichenback, Reshmi Koikkara

In partnership with Milliken & Company, the objective of this capstone design project is to analyze the process by which the indirect materials are delivered at specified locations throughout the Judson plant. The team focused on the areas of delivery frequency, delivery location, replenishment process and signal, and container and storage analysis. The team utilized time studies to analyze the current system and simulation models to evaluate alternative solutions. The final solution minimized non-value added activities and introduced standard work process, meeting the key business goals of reducing time and space requirements and completing a Plan For Every Part (PFEP).

Poster # 13

Decision Support System Data Management Tool

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Rohit Chatterjee, Kristi King, Kyle Lucas, Yuan-Han Huang

The thermoforming company Fabri-Kal, based in Piedmont, SC, currently uses SAP (System Analysis and Program Development) as a database to review important statistics. Because SAP contains an overwhelming amount of data, often in an unusable format, our team focused on creating a data management tool, in the form of an Excel spreadsheet that utilizes Visual Basic coding. This tool will focus on the statistics that management and engineers use most frequently. The tool aims to increase data accuracy, filtration, and ease-of-use while incorporating an intuitive layout for the user. The tool will also be used to support a Production Execution Efficiency goal of 80%.



Poster # 14

The Role of Actor-Observer Bias in Attribution for Obesity

Mentor: Dr. Robin Kowalski, Psychology

Student: Lauren Hock

The purpose of this study was to investigate the role of actor-observer bias in individuals' attributions, or causal explanations, for their own and others' obesity. Sixty-five adults (23 males and 42 females) completed quantitative survey measures of explicit and implicit attitudes toward obese persons. Normal weight ($BMI < 25$) and overweight ($BMI \geq 25$) individuals were equally

likely to make internal attributions for the obesity of others, but overweight individuals were significantly more likely to make external attributions for their own weight ($p < 0.003$). Women were significantly more likely to make external attributions for their own weight status ($p < 0.002$). No significant correlation was found between individuals' explicit and implicit attitudes ($r = -0.006$). However, 85% of participants demonstrated a strong or moderate implicit preference for thin persons over obese persons, suggesting the strength of inherent stigmas toward obese persons. The project was supported by an ACCIAC Fellowship in Creativity and Innovation.

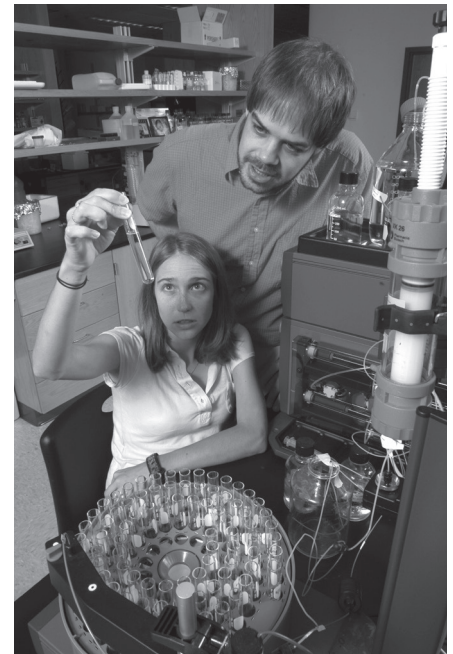
Poster # 15

Unit Only Packout Cell Redesign

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Brent Burchill, Hendrix McCants, Amy Sartain, Yuan-Han Huang

The unit only packout process and its interactions with shipping, manufacturing, and quality control departments were analyzed at Schneider Electric. Time studies were performed to document the current process. RULA and NIOSH assessments were done to gauge ergonomic strain caused by the lifting of electrical units, many of which exceeded 85 lbs. Hazards identified in these tests were eliminated within the work cell. Facility design principles were utilized in considering possible relocations for the cell, examining distances to shipping and stored boxes. Coordination with material handlers and water spiders to reassign responsibility for the transportation of materials greatly improved the number of available work hours for the operator. Wastes such as poor inventory storage, over processing, and unpredictable scheduling were identified using lean manufacturing perspectives and attacked to reduce non-value added activities. After the analysis was completed, new layouts and standard operating procedures were created for the new work cell.



Poster # 16

Optimizing Layouts or Delivery Routes to Improve Product Flow

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: David Drumm, Nathaniel Curd, Andrew Schneider, Reshmi Koikkara

In partnership with Milliken & Co. Enterprise Finishing Plant, this capstone design project focused on optimizing the layouts and delivery routes for targeted areas of the plant in order to improve product flow. The team analyzed the current state of the system, developing and prioritizing customer needs based on the processes associated with the area. The team then developed alternate layout designs using algorithmic approaches in addition to layout design software. Once all layouts had been established, ARENA simulation software was used to evaluate the effectiveness of the alternate concepts in terms of the key business goals: material handling time, DOFF integrity, FIFO implementation, and elimination of wasteful material handling steps. Concepts were then ranked based upon a concept screening matrix using input from ARENA, the team's observations, cost analysis, and discussions with Milliken. As a result, the proposed layout reduced the material travel time and distance, eliminated wasteful material handling steps and minimized costs.

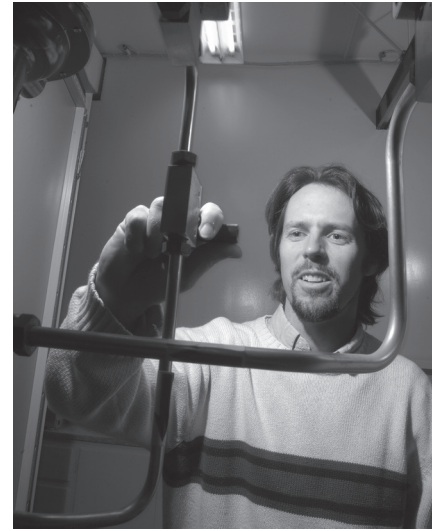
Poster # 17

Engineers Abroad: Nicaragua

Mentors: Catherine Ruprecht, Hilary Emerson, Environmental Engineering and Earth Sciences

Students: Kate Gasparro, Ross Beppler, Chris Hapstack, Taylor Wells, Matt Kofoed, Elizabeth Osell, Kristen Doolittle, Meg Osell

Engineers Abroad recently sent seven of its most bright and industrious members to rural Nicaragua to work on a variety of engineering challenges. Among the successes were the dramatic improvement of the local baseball field, the construction of a schoolhouse foundation, and surveying of the local topography for future project implementation. Another fortuitous benefit of the trip was the opportunity for the travelers to hone their Spanish language abilities. This project was partially supported by the Creative Inquiry Program, Clemson University Undergraduate Student Government, and the Clemson University Calhoun Honors College. With this generous support, members were able to make great improvement in the lives of the people of Calishuate and La Pintada, Nicaragua. This trip expounded both the cultural understanding and functional engineering skill of its participants and thoroughly enhanced their educational experience at Clemson.



Poster # 18

A Retrospective Study of the Incidence and Location of Cardiac Arrest at Bon Secours St Francis Hospital (downtown), Greenville SC evaluating Response Time and Survival from a Cardiopulmonary Arrest.

Mentor: Dr. John Whitcomb, Nursing

Students: Rachel Wadsworth, Allison Flehan, Emily Duncan, Anna Grace Easler, Lindsay Echols

Introduction/Background: This study describes clinical characteristics of cardiac resuscitative events associated with “Code Blue” team response. This review indicates areas of documentation that need to be improved to create better patient outcomes. Methods: A retrospective review of cardiac arrest records at St. Francis Hospital from the past 48 months will be performed. Statistical Analysis: Non-comparative descriptive statistics will be used. Frequency counts analyzed as percent sample characteristics and mean response times will be the major units of analysis. Results: 202 documented codes were reviewed. Length of arrest was 15-30 minutes in 34.2% (n=69), survival from arrest was 46.5% (n=94) with a survival to discharge of 20.3% (n=41). The average time to starting CPR was 1.81 minutes and the average first shock time of 3.23 minutes. Implications: This study is in line with Joint Commission performance initiatives. Changes were implemented in this facilities documentation system based on these findings.

Poster # 19

Team 13: Nutra Manufacturing Softgel Capsule Drying Optimization

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Lauren Hughes, Brian Jones, Joel Nordstrom, Tiffany Posey

In partnership with Nutra Manufacturing of Greenville, SC, this capstone design project focused on continuous drying lines 12, 13, and 15. The continuous drying process is relatively new to the softgel capsule industry. Therefore, little is known about

optimal operating conditions or the effects of various inputs on capsule quality. The objective of this project was to optimize the efficiency of Nutra's softgel continuous drying process by understanding the effect of changing process inputs in order to increase throughput, cycle time, and maintain quality level. The reduction of cracked or sticky capsules was a secondary goal for the team. Softgel capsules must meet quality levels in order to be bulk packaged and shipped to suppliers. The team first identified customer needs and product specifications, followed by current state analysis. From this study, a design of experiments was conducted to find the effect of relative humidity level, basket tumble speed, and temperature control zones on capsule drying time and quality. A second design of experiment tested the effect of air flow direction on capsule drying. The team used the results of the design of experiments to identify the optimal input levels for the specified product code. In addition, the team increased throughput with new basket changeover policies.

Poster # 20

Qualitative Analysis of the Volatile Composition Differences of Atmospheric Simultaneous Distillation and Extraction Coffee Extracts

Mentor: Dr. Feng Chen, Food, Nutrition and Packaging Science

Students: Christina Bailey, Gregory Jones

Simultaneous distillation and extraction (SDE) of freshly brewed coffee was investigated by gas chromatography/mass spectrometry. For this purpose, a Likens and Nickerson (1964) apparatus was used. The SDE and two extraction times were studied, 30 and 60 minutes. Volatiles were extracted with steam distillation and dichloromethane (DCM), volatiles were then collected, concentrated, and stored prior to analysis. Samples then were examined and volatiles determined by GC/MS analyses. Statistical Analysis was performed to determine significant differences in the percent composition of volatiles.

Poster # 21

Soil Inventory of Ramsey Creek Road, Westminster, SC

Mentor: Dr. Elena Mikhailova, Agricultural, Forest, and Environmental Sciences

Student: Dustin Gravley

The objectives of this study were to conduct soil inventory of a residential plot in Westminster, SC using Web Soil Survey. Soil samples were collected in the front yard and in an area of the pasture which is thought to be well suited for a vegetable garden. The soil samples were analyzed by Clemson university soil lab. Web Soil Survey was also used to analyze the soil in the area of interest to obtain further information on the suitability for a vegetable garden. The results gathered from Web Soil Survey and Clemson University's soil lab revealed that either site would provide for a successful garden with the right soil amenities.

Poster # 22

Awesome Android Apps

Mentor: Dr. Roy Pargas, Computer Science

Students: Ally Bertz, Emily Champion, Greg Edison, Ben Heatherly, Kyle McGuigan, Kyle Pilgrim, Jackson Potterfield, Jessie Smith

This Creative Inquiry group focuses on creating different Android applications. Listed below are different ideas for applications. One idea is to create an application that allows students to submit their problems to various departments without knowing a department's email or phone number. Another idea is to play a song from a file or the internet to compare it to what the user

is playing. This app will measure the accuracy of what is being played. We are also designing an application which will allow shoppers to scan the barcodes of items and keep a running total price for their shopping trip accurately for the store they are in. Finally, we are open to other app ideas from the general public. We will be learning how to program in Java, use the Eclipse IDE, and use the Android SDK to create Android applications that will benefit Clemson students.

Poster # 23

CyberTiger Systems: Assessing the Performance and Service Levels of Broadband Wireless Networks

Mentor: Dr. James Martin, Computing

Students: Zachary Welch, Neeraj Jain, Joshua Groppe, Adam Hodges, Nicholas Wourms

The CyberTiger Systems Creative Inquiry is an evaluation of broadband wireless networks (i.e., 3G/4G/WiFi). The questions that we are investigating include: How can a broadband wireless customer know if they are getting 'good' service or a 'fair share' of wireless resources? How are students and faculty using broadband wireless in their own lives and in their professional lives? We focus on three main qualities of wireless networks: heterogeneity, coverage, and performance. We have developed a testing "app" that allows us to evaluate networks from a user's prospective. This tool will be available to users of both iPhone and Android smartphones. Other aspects of this project include the meaningful visualization of collected test data and the analysis of user mobility patterns. This research will help us answer difficult questions about the current state of wireless networks and will play a role in the development of future "5G" wireless technologies.

Poster # 24

Inquiring Minds: Engaging Students With Hands-On Science and Math Activities

Mentors: Dr. Nicole Bannister, Dr. Neil Calkin, Mathematical Sciences, Dr. Cassie Quigley, Teacher Education

Students: Mary-Kate Spillane, Courtney Stevens, Kelly Elizabeth, Brooke Reed, Katherine Shea, Hayato Ushijima-Mwesigwa

The overall goal of this program is to excite students about learning science and math through hands-on activities. We will hold a STEM event at a school either on a week night or during the weekend to engage students, their friends, family, and other members of the community in simple yet powerful STEM experiments. We wish to develop an understanding of elementary students' attitudes towards mathematics and science in schools, which we will track through a survey. One of our objectives is to foster learning through students teaching students. To achieve this we will teach selected experiments to students, and then have those students teach the experiments to others at the event. Additionally, we hope to discover if attendance at these types of events, especially teaching at them, have an effect on student attitudes towards science and mathematics.

Poster # 25

Improving Indirect Material Flow

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Darla Browning, Thomas Hatley, Robert Miller, Reshmi Koikkara

In Partnership with Milliken's Judson Plant, located in Greenville SC, this capstone design project focused on the flow of indirect materials. The Judson plant manufactures yarn out of raw cotton through ring spinning or open end spinning processes. Cones, tubes and pallets are used to transport the yarn between departments and to other Milliken weave plants where it is made into fabric. The project scope included four major aspects of the indirect material process flow: the storage location, the replenishment signal and frequency, the delivery process, and the assessment of the indirect materials. The team

used surveys and interviews to determine the customer needs. Root cause analysis was performed to identify system losses and various concepts were developed to address them. The team then analyzed each of the concepts and arrived at the optimal solution that improved the flow of indirect materials.

Poster # 26

Development of a Pediatric Arm Stabilizer for Hospital Treatment Room

Mentors: Dr. Todd Schweisinger, Mechanical Engineering, Dr. Arlene Johnson, School of Nursing

Students: Allison Jarriel, Kate Coggins, Caroline Johnson, Meaghan Cote, Christopher Wenner, Michael Reardon, Russ Corwin, Thomas Bridges, Adam Spencer

Greenville Hospital System University Medical Center Children's Hospital (GHSUMC) requested an arm stabilizer for a pediatric treatment room. Children may experience discomfort and anxiety when lying flat on a treatment table during medical procedures. One approach to reduce patient discomfort is to develop an arm stabilizer that would allow the patient to remain in a sitting position and reduce the number of people required to aid in the stabilization of the patient's arm. The team reviewed the literature to clearly define the problem and objective for the project and then constructed an initial prototype. The team conducted a pilot study with the initial prototype at Clemson University using volunteer nursing faculty members as research subjects. With the data and feedback from this pilot study, the team is currently in the process of developing an improved second prototype as well as beginning the patent process for the pediatric arm stabilizer. This project was partially supported by Creative Inquiry and the Honors College.



Poster # 27

Coproduct Integration: Cultivating Algae From Fermentation and Distillation Byproducts

Mentor: Dr. Terry Walker, Environmental Engineering and Earth Sciences, Charles Thornton, Agricultural & Biological Engineering

Students: Daniel Carey, Jovan Popovic

This Creative Inquiry is collecting waste products from fermentation/distillation and utilizing them as a feed-stock for algae cultivation. A major nutrient required for algae cultivation is nitrogen. One current source of nitrogen used to cultivate *Chlorella protothecoides* is Yeast Extract (YE) obtained from major chemical suppliers (e.g. VWR). Our goal is to grow algae without YE by substituting our waste yeast from a fermentation/distillation process performed on. This yeast may be able to not only replace the nitrogen source, but also provide some of the other minor nutrients required for algal growth. With a proof of concept, algae can be harvested and used as a feed-stock to create biodiesel. Using this locally produced nutrient source eliminates the need for processing/transportation of YE, reduces cost, puts to use an otherwise discarded waste product, reduces the energy required for algae cultivation and is a step towards creating sustainable fuels. This project was partially supported by Creative Inquiry.

Poster # 28

Medical Technologies for the Developing World: Neonatal Temperature Control System

Mentors: Dr. Delphine Dean, Dr. John Desjardins, Bioengineering

Students: Britton McCaskill, Kaitlyn Harfmann, Andrea Dicks, Molly Russell, Margo Toney

A major healthcare issue in the developing world is the lack of access to functional incubators for neonatal care, and this has led to an infant mortality rate that is ten times higher than in the developed world. The objective was to design an alternative temperature control system that is low-cost, easy to repair, and locally manufactured. This is accomplished by measuring temperature and using a control circuit to regulate an external heat source. The neonate's temperature is maintained between 36.2-37.2 degrees Celsius, but an alarm will sound if this threshold is exceeded. The device also incorporates a heart rate monitor to indicate the overall health of the infant. The prototype has initially proven to be a successful means of monitoring neonates and maintaining homeostatic temperatures. The long-term goal is to improve the medical technologies available in these countries.

Poster # 29

Stearoyl-CoA desaturase (SCD1) Localization and Intensity in Bovine Adipose and Muscle Samples from Implanted and Non-implanted Steers

Mentors: Dr. Steven E. Ellis, Dr. Sina Safayi, Dr. Susan Duckett, Animal and Veterinary Sciences

Student: Makenzie Wilder



Anabolic steroids are commonly used during the finishing phase of steers to increase weight gain and feed efficiency. In this experiment, 12 steers were implanted with Revalor-S and 12 steers were not. The objective of this study is to assess the localization and amount of stearoyl-CoA desaturase (SCD1) in mesenteric adipose tissues (MS), subcutaneous adipose tissues (SC), and longissimus muscle (LM) of implanted and non-implanted steers. Stearoyl-CoA desaturase is the rate-limiting enzyme involved in fatty acid metabolism; converting saturated fatty acid to monounsaturated fatty acid. Samples were stained with POPO-1 iodide and green fluorescent phalloidin. Cryosections were also incubated with SCD-1 antibody (4 µg/ml) and stained with AlexaFluor 594. SCD1 staining intensity was most obvious in the perinuclear

region. Staining was visible in adipocytes, muscle cells, endothelial cells and schwann cells. Adipose tissues from SC and MS had greater SCD1 intensity than LM, regardless of treatment. The SCD1 staining intensity was reduced in MS from implanted steers relative to MS of non-implanted and SC of both treatments.

Poster # 30

EKG Modeling and Simulation

Mentor: Dr. David Kwartowitz, Bioengineering

Students: Amanda Nguyen, Laura Tumblin, Carly Atwood, Nadine Luedicke, Elizabeth Williams, Jessica Bunch, Anna Merryman

Electrocardiogram (EKG) is a non-invasive method of collecting electrical activity data about the heart which can be used to determine various life threatening pathologies such as damage due to myocardial infarction or arrhythmias. It is frequently used to monitor patient welfare during surgery. This requires a system that is capable of collecting and analyzing EKG data. To this end, we have developed an EKG unit that can interface with a computer for data processing. Our EKG unit is capable of amplifying and filtering the small electrical potential changes from the heart, while maintaining patient safety through isolation. We plan to implement this system to collect the EKG data necessary to simulate various cardiac signals for educational and training purposes.

Poster # 31

Team 16: Reducing Over, Short, and Damaged Shipments from UTi Tire Warehouse

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Tommy Hernandez, Donovan Williams, Julia Grimm

In partnership with UTi Integrated Logistics, this capstone design project centered on identifying the root cause of OSD (Over, Short, Damaged) shipments of tires from their warehouse in Laurens, SC, and developing practical solutions to reduce the error rate. Based on customer needs, target specifications were fixed for a newer and better process. After conducting a root cause analysis, the team explored concept solutions based on Industrial Engineering and Lean principles. The largest controllable problem identified was tires mixed into locations where they should not be. Much of the inventory in the warehouse becomes mixed up and unorganized for various reasons. To reduce errors in the inventory, the team devised a solution that best meets the needs of the customer, and target specifications of the new process.

Poster # 32

Consolidation of Data Management System for Making Production Decisions

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Artashia Johnson, Clarence Mabry, Alex Skypala, Yuan-Han Huang

In partnership with Fabri-Kal Piedmont, this capstone design project focuses on analyzing production data used in aiding managers to make engineering decisions. Currently, Fabri-Kal does not have a standardized approach to gathering and analyzing data, which leads to inefficiencies in implementing solutions. The objective is to design a tool that incorporates all the data necessary for making various decisions related to the production of thermoformed products. Customer needs and product specifications were determined through interviews, fishbone diagrams, and Pareto charts. Using this information, we are going to create an Access-based spreadsheet to automatically gather storyboard data and automatically consolidate useful information about the current state of the plant in a single spreadsheet.

Poster # 33

Evolution of Integral Transforms and their Applications

Mentor: Dr. Irina Viktorova, Mathematical Sciences

Students: Michael Scruggs, Mark Snyder, Akaash Patel, Abreu Eddie

The class is designed as a fast paced, research style class which offers deep insight into the background, mathematical theory, and engineering applications of several advanced calculus transforms. My peers and I are divided into three groups, one for each of the topics (history, mathematics and implications), and each group gives a presentation about their part of research on the various integral transforms. These presentations let us act as the experts as we field any questions that the other students in the class might have. Besides looking in depth at several traditional and new contemporary integral transforms, such as Laplace, Fourier, Radon and Wavelets (individual and team research on history, origination, mathematical fundamentals and wide range of applications of these transforms), the research projects involving the direct implementation of Wavelet and Fourier as well as Laplace Transform are being conducted.

Poster # 34

Ultrasound Probe Design for Better Injury Diagnosis

Mentors: Dr. Delphine Dean, Dr. David Kwartowitz, Bioengineering

Students: Alexander Cusick, Kaitlin Grove, Qi Guo, Kayla Perry, Margeaux Rogers, Hayley Scruggs

Rotator cuff injuries affect more than 90% of the US population. Treatment ranges from physical therapy to surgery. However, it is often difficult to determine which initial injuries will deteriorate and need surgery. One of the primary tools for rotator cuff diagnosis is ultrasound imaging. Ultrasound is good at distinguishing soft tissues in real-time, but it lacks anatomic context. The goal of our project is to design a new instrumented ultrasound probe that would measure transducer position and angle, which could be tagged to the specific image. In addition, our design includes pressure transducers to quantify the amount of force applied to the patient during imaging. This data can be used to estimate tissue modulus. Our long-term goal is to predict rotator cuff tears and long-term prognosis using the calculated tissue modulus and annotated images. This could help inform clinicians and lead to more accurate diagnoses.

Poster # 35

Redesign of Schneider Electric Unit Only Packout Process

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Robert Russell, Jeffrey Robinson, Sara Ivie, Yuan-Han Huang

In partnership with Schneider Electric, this capstone design project focused on their unit only packout process. Schneider Electric produces motor control centers (MCCs) and electrical units that go into the MCCs. The unit only packout area packages individual units to being shipped to customers who are not also ordering MCCs. The objective of our project was to design a more usable system that would reduce the amount of non-value added (NVA) time that the worker currently spends walking around the facility to get the supplies needed for the job. The team has observed the current process and conducted numerous surveys to determine customer needs and product specifications. This will be followed by an in-depth concept generation phase. The team will then compare and contrast the different designs based on reduction in NVA time, the square footage of space allowed for the worker to pack units, and whether the design reduces or maintains the current level of ergonomic strain on the worker. The team will then recommend a design to best meet the requirements for the area.

Poster # 36

Nature Experiences for Older Adults

Mentors: Dr. Cheryl Dye, Public Health Sciences

Students: Ashlee Wilson, Amy Moon, Sarah Colwell, Pippa Morse, Kelsey Larson, Raven Smalls, Samuel Pearson, Aliyah Anjarwalla, Josiah Conrad, Sally Oates

This CI group addressed the question, “How can the community provide opportunities for older adults to enjoy nature experiences?” Motivation for the question came from ecotherapy studies which reveal that nature experiences have therapeutic effects on health and well-being. To answer the question, students conducted interviews with older adults to explore how they would like to increase nature experiences in their lives. Interview results revealed that the most popular activity was gardening and that seniors were interested in teaching others how to care for the environment. Guided by interview results and research about ecotherapy and the therapeutic effects of nature images, the students installed labyrinths, built and planted raised vegetable gardens, created butterfly and flower gardens, installed bird baths and fish tanks, hosted intergenerational cooking classes including seniors and elementary students, and placed nature images in senior centers. These activities provide valuable guidance in enhancing the well-being of older adults.



Poster # 37

Tool Accountability and Control of the Boeing Final Assembly Plant

Mentors: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Rumzi Barakat, Erin Carroll, James Peck, Katie Skinner, Melissa Zelaya

In partnership with The Boeing Company, the objective of this capstone design project is to analyze and improve the process through which tools are lost and accounted for within the Final Assembly Building of Boeing South Carolina. The team focused on ways to improve the current system so that it allows for 100% tool accountability to prevent tools from becoming Foreign Object Debris/Damage (FOD). Within the current system, tools were easily lost because not all of the tools were serialized or traceable. Additionally, mechanics were careless about returning the tools because of busy schedules, carefree attitudes, and the fact that the tool could not be traced back to the mechanic that checked the tool out. The team conducted interviews, participated in a FOD sweep, and collected various data to determine product specifications. Based on the Customer's needs, the Team was able to improve the system and increase overall tool accountability.

Poster # 38

Soil Inventory of Westwind Dr. Berwy, PA

Mentor: Dr. Elena Mikhailova, Agricultural, Forest, and Environmental Sciences

Student: Emily Lavender

The objectives of this study were to conduct soil inventory of a plot in Berwyn, PA, using Web Soil Survey. Two soil series are found within the property: Conestoga silt loam and Urban land-Conestoga complex, all of which belong to the soil order of Alfisols. The dominant soil type present was Urban land-Conestoga complex, 0 to 8 percent slopes. Conestoga is not a prime soil in this specific plot but is very abundant in the surrounding area. Web Soil Survey was used to make analyses of the soil

and draw conclusions. The area of Chester county was historically known for being a productive farming area with rich soils and is close to the city of Philadelphia which relied on the resources provided by the area. The area is also a prime residential area with lots of development while maintaining the land productivity. This study was supported by the Clemson University Creative Inquiry Program.

Poster # 39

Soil Inventory of Heavens View Ln., Pumpkintown, SC

Mentor: Dr. Elena Mikhailova,

Student: Teddy Kiniry

The objectives of this study were to conduct soil inventory of a residential plot in Pumpkintown, SC and check its Farmland suitability and its forest productivity. 31.7 percent of the property was Chewacla Loam, 49.6 percent was Hiwassee Clay Loam, 16.4 percent was Pacolet and 2.2 percent Toccoa soils. Chewacla and Toccoa contains a mixed clay mineral content and Pacolet contains the clay mineral kaolinite, which has a one to one ratio of tetrahedral and octahedral sheets. Web Soil Survey was used to determine forest productivity (tree site index), and farmland classification. Chewacla and Toccoa had the best rating for farmland and forest productivity. Pacolet and Hiwassee soils had low ratings in all soil surveys and tests.

Poster # 40

Team 12: Tool Control and Accountability in the Final Assembly Building

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Richard Jenkins, Erik Kurtz, Nealee Moore, Zachary Owen

In partnership with Boeing Charleston, this capstone project is focused on tool control and accountability in Position 1 of the Final Assembly Building. Each time a tool is misplaced or lost there is a potential for FOD (Foreign Object Debris). FOD is anything that is out of place in or around an airplane. Once an aircraft is completed, each FOD incident after it is delivered costs Boeing approximately \$10,000 on average. The objective of this project is to design a system to enhance and standardize existing processes and develop protocols and procedures in support of tool control. After determining customer needs and product specifications, the team created a series of processes that worked together to ensure tool accountability on the production floor. The system will ensure that zero FOD incidents go unresolved along with 100% tool accountability in Position 1.

Poster # 41

Soil Inventory of a Residential Property in Lafayette, CA

Mentors: Dr. Elena Mikhailova, Dr. Christopher Post, Agricultural, Forest, and Environmental Sciences, Dr. Julia Sharp, Mathematical Sciences

Student: Benjamin Saragusa

Turf grass and ornamental plant production can be hindered by the lack of soil nutrients. The objectives of this project were to conduct soil inventory of a residential property in Lafayette, CA using Web Soil Survey. Soil samples were collected in the front and backyard area, and analyzed for soil chemical properties and major nutrients in the Clemson University Agricultural Services Laboratory. One soil series dominated the property: Tierra loam, which belongs to the order of Alfisols. Tierra loam has a California Revised Storie Index grading of 2 (good), meaning that it is well suited for cultivated agriculture. Soil samples

were analyzed in terms of soil nutrient recommendations for growing rhododendron, oleander, roses, and azaleas. This study was supported by the Clemson University Creative Inquiry Program.

Poster # 42

The Role of Food and Drink in the Study Abroad Experience

Mentors: Dr. Bill Norman, Dr. Young-joo Ahn, Parks, Recreation, and Tourism Management

Students: Alan Sampson, Cameron Smith, Barber James, Taylor Baughman, Lauren Peck, Adam Cootes, Jordan Shealy, Anna Sturgis, Peyton Jamieson

The purpose of this research was to explore the role of food in the Study Abroad experience of Clemson University students. Specifically, this study investigated the importance of food in the decision to study abroad, the country where they studied, and the food-related activities they participated in during their Study Abroad program. The research also explored changes in the participants' perception of food before and after their Study Abroad program. We collected the data through an online survey. The participants were Clemson University students (N=986) who have participated in Study Abroad programs since January 2011.

Poster # 43

Hands-On Demonstrations for Freshman Engineering Students

Mentors: Dr. Delphine Dean, Dr. David Kwartowitz, Bioengineering

Students: Joe Connolly, Miller Byrd, Andrea Dicks, Christian Macks, Jackson Turbeville, Thomas Veith

For some unknown reason, many students who enter the Department of Bioengineering choose the Biomaterials concentration over the Bioelectrical concentration. In order to spur interest in the Bioelectrical aspect of Bioengineering, our team has created electromyography (EMG) controlled racecars. This demonstration was used during freshmen CES 101 and 102 tours to test the effectiveness against a control. Our team utilized surveys to judge the participants perspective of the Bioelectrical concentration and tested our demonstration against a control lecture. We determined that our hands-on demonstration had a statistical significant impact on the perception of the Bioelectrical concentration and enhanced students' understanding of related topics. This semester, we followed up with the students and determined what major they actually picked.

Poster # 44

When Too Many Positives Equal a Negative: Evaluating Behavioral Judgments

Mentors: Dr. Robin Kowalski, Dr. Patrick Rosopa, Psychology

Students: Baker Brooke, Amber Schroeder

Research has suggested that self-perceptions influence individual judgment. This study examined the impact of self-referencing on evaluations of others' engagement in anti-normative behavior (i.e., employee engagement in organizational citizenship behavior (OCB) or counterproductive work behavior (CWB)). Participants included 135 undergraduates who were given hypothetical employee performance appraisals describing employee engagement in OCB or CWB and either reward or punishment scales or a social acceptance measure. Results demonstrated that raters' self-reported engagement in OCB and CWB influenced their evaluative judgments of others. Namely, individuals engaging in more CWB were less likely to recommend rewards for OCB engagement, whereas higher rater engagement in OCB was positively related to punishment recommendations for CWB engagement and inversely related to social acceptance of CWB. Thus, based on these results,

employers looking to accurately measure employee performance through coworker assessment should be wary of biased judgments due to self-referencing.

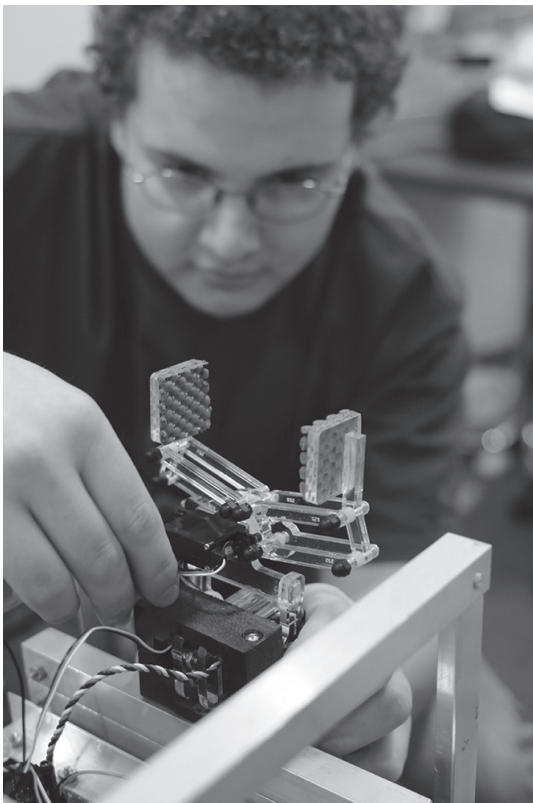
Poster # 45

Student Perceptions of Multimodal and Traditional Composition

Mentor: Dr. Cynthia Haynes, English

Students: Drew Stowe

Given the dynamic nature of technology and writing, it is important to understand how students view traditional and multimodal methods of composition. Traditional composition (plain text based) is often used to complete essays while multimodal composition (often digital, but otherwise containing multiple media elements) is often found on blogs and webpages. As technologies advance, there is more opportunity for overlap of writing and technology in the writing process. This study employed surveys (quantitative) and interviews as well as privileged observation (qualitative) methods to gather data. This study offered data on how students feel about and use different styles of writing. This study advanced a conception of composition that extends beyond writing to a composition composed of several types of media. This information is particularly salient to understanding different ways that composition courses can be administered in order to attract and benefit students.



Poster # 46

Re-Engineering of Central Venous Catheterization Simulator

Mentors: Dr. Delphine Dean, Dr. Jiro Nagatomi, Bioengineering

Students: Elizabeth Burghardt, Melissa Dunphy, Grove Kaitlin, Nadine Luedicke, Molly Townsend

Our Creative Inquiry is focused on re-engineering a simulator for Central Venous Catheterization (CVC) procedures. CVC involves the insertion of a catheter through the subclavian vein or jugular vein and into the heart. With the target veins so close to the lungs and vital arteries, imprecision is fatal. Currently available simulators are expensive, inconvenient, and often anatomically inaccurate. Some shortcomings of existing designs include the lack of a rotatable head, necessary anatomical landmarks, and a mechanism for proper patient orientation prior to the procedure. Through collaboration with an expert in medical simulation these issues have been addressed. Further complaints include a lack of reflection of common approach techniques. A clinician performing CVC is guided either by palpation or ultrasound. The tissue analogue of our simulator is key in effectively simulating this important aspect of the procedure. The ultrasoundability, along with its flesh like feel and stability at room temperature are distinct characteristics of the material. Thus, the tissue analogue is applicable to other needs beyond the CVC simulator. The tissue analogue and the simulator as a whole are in the process of being patented. Future work includes distribution of the simulator and expansion into other simulators.

Poster # 47

Developing Context-Specific Measures of Individual Culture

Mentors: Dr. Patrick Rosopa, Dr. Robin Kowalski, Psychology

Students: Donna E. Mahaffey, Brooke A. Baker, Amber Schroeder

As the expression of personality has been demonstrated to be contextually dependent (Wright & Mischel, 1987), the purpose of this research was to develop and validate measures of two cultural variables (i.e., individualism and collectivism) specific to work and personal domains of one's life. The sample consisted of 491 undergraduate students enrolled in an undergraduate psychology course who completed the study survey in exchange for extra credit. Using confirmatory factor analysis, the study measures were reduced from 170 to 36 items. The revised model demonstrated good fit, thereby providing support for its validity. A revised Q-sort with five subject matter experts provided additional support for the construct validity of these newly developed scales. The increased measurement precision of individualism and collectivism cultural scales provides insight on the role culture plays dependent upon specific situations (e.g., personal life vs. work life).

Poster # 48

Utilizing Integrated PID Controllers to Optimize Bioreactor Throughput

Mentors: Dr. Sarah Harcum, Bioengineering, Dr. Laine Mears, Mechanical Engineering

Student: Erik Hammes

The ability to rapidly produce biologic drugs for research or in response to pandemic events is critical to the health, security, and welfare of the nation. While bioreactors are able to yield these biologic drugs at a rate much greater than the traditional shake flask method, there is still much left to be desired due to the lack of innovation in bioreactor controllers. To improve upon these, we employed LabVIEW, a signal processing software, to first model the cellular environment; such as dissolved oxygen, glucose levels, temperature, and pH. A new proportion-integral-derivative controller was then created to assimilate all of the aforementioned variables to more efficiently optimize the inputs to the bioreactor. This new controller was more effective at stabilizing the proper parameters necessary for ideal cell growth than common controllers and also has the potential to identify and improve upon the speed at which the cells grow. This project was partially supported by COBRE.

Poster # 49

Optimizing Layouts and Delivery Routes to Improve Product Flow

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: David Catron, Susan Robinson, Nathaniel Lee, Reshmi Koikkara

In partnership with Milliken & Company Enterprise Finishing Plant, the objective of this study was to optimize the layout and delivery routes in an area to improve product flow, reduce congestion, and provide visual aids to monitor work-in-process. After determining customer needs and process specifications, a current state ARENA simulation model was created to understand system losses and root causes. Different concepts were compared to analyze travel distances, and optimize inventory queues to manage staging areas. Concepts were then combined, improved, and refined to conduct a comparison with the current state model. The appropriate location for machines within the specified area were determined to minimize travel distance and time, reducing waste and non-value added steps. As a result, the final layout met both the current state demand and future state needs of the plant.

Poster # 50

Team 14: NUTRA: Continuous Drying Process Optimization

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Lauren Kaszak, Tiffany Washington, Kyle Cross, Daniel Clinton

In partnership with Nutra Manufacturing, this capstone design project focused on the continuous drying process for softgel capsules. The previous process has all capsules drying for sixteen hours despite the product type. Environmental, machine, and operator settings affect the dryness of the capsules; but there has been no internal optimization testing since the installation. Our test parameters are the basket rotation speed, number of paper towels used in the basket, and the total rotation time in the baskets. The design of experiment will investigate the moisture content exponential curve during the sixteen-hour process. It has been hypothesized that tweaking the settings above will shorten the drying time to increase throughput. Testing is underway to prove our moisture content hypothesis.



Poster # 51

Cyber Bullying Among College Students

Mentors: Dr. Robin Kowalski, Dr. Amber Schroeder, Psychology

Students: William Senn, Suzannah Isgett, Micha Lattaner, Amber Schroeder

The prevalence rates, individual differences, and patterns of involvement in traditional bullying and cyberbullying were examined across middle school, high school, and college in a survey administered to 145 male and female undergraduate students. Involvement in cyberbullying during middle school bore a strong relationship to involvement during later school years. Additionally, college cyberbullying victimization showed a strong relationship to a number of individual difference measures tested including core self-evaluation, positive and negative affect, depression, anxiety, loneliness, health, agreeableness, and neuroticism. The implications of these findings for college student well-being and for prevention/intervention efforts will be discussed.

Poster # 52

Soil Inventory of Solomons Farms

Mentors: Dr. Julia Sharp, Mathematical Sciences, Dr. Christopher Post, Dr. Elena Mikhailova, Agricultural, Forest, and Environmental Sciences

Student: Allen Solomons

The objectives of this study were to conduct a soil inventory of an agricultural farm in Hampton Country, SC using Web Soil Survey, to collect soil samples from various areas around the farm, and to analyze collected soil samples for major soil chemical properties. There were sixteen different soil types found on the property. The dominant soil types present were Emporia loamy sand, 2 to 6 percent slopes (fine-loamy, siliceous, subactive, thermic Typic Hapludults) and Noboco loamy sand 0-2 percent slopes. Both of the dominant soil types are prime soil for farmland. Collected samples were either from the Emporia or

Noboco group. Each soil sample had different levels of the plant nutrients. Each sample had similar cation exchange capacity (CEC) and acidity. Soil nutrient analysis recommendations are discussed to maximize agricultural productivity and minimize environmental impact. This study was supported by the Clemson University Creative Inquiry Program.

Poster # 53

Team 15: Reduction of OSD (Over, Short, Damaged) Shipments

Mentor: Dr. Anand Gramopadhye, Industrial Engineering

Students: Kapil Chalil Madathil, Michael Cheatham, Katherine Law, Trey Nichols

In partnership with UTi in Laurens, this capstone design project is centered on identifying the root causes of OSD (over, short, damaged) tire shipments and developing practical solutions that achieve less than or equal to 3% OSD error rate. The team determined the customer needs and process specifications for the project, followed by root cause analysis with a Why-Why analysis approach. Through this, the team was able to identify which elements of the shipment process could be modified and eliminated. Concepts were refined and then benchmarked against the original system. The team was able to determine which process design modifications performed best with the current software and machines for the tire picking process. As a result, the final solution met both the initial demand and the projected demands for UTi Integrated Logistics, while maintaining the throughput of the facility.

Poster # 54

Evaluating Self-Efficacy, Locus of Control, and Skill Attainment for Undergraduate Nursing Students During Simulation for Deteriorating Patients

Mentors: Dr. Nancy Meehan, Dr. Tracy Fasolino, School of Nursing

Students: Lisa Jennings, Caroline Whisenhunt, Andrew Gosnell, Dallas Wise

Traditionally in the clinical setting when a nursing student is caring for a patient who begins to rapidly deteriorate, the primary nurse assumes care and the student simply observes. When these students graduate and become registered nurses, they care for patients who are high risk without having managed a similar situation. The lack of exposure and experience in such situations could lead to detrimental outcomes for the patient. Our research aims to evaluate the effectiveness of high fidelity patient simulation as a teaching tool for undergraduate nursing students placed in these scenarios. These life sized simulators can be programmed by the instructor to rapidly deteriorate in real time. We are using the variables of self-efficacy, locus of control, and skill attainment to gauge the benefits of simulation. The results of this study will serve as evidence needed to support the implementation of this training in other undergraduate baccalaureate nursing curriculum. Research has been sponsored by: Clemson University, Calhoun Honors College.

Poster # 55

Soil Inventory of a Residential Property in Columbus, OH

Mentors: Dr. Elena Mikhailova, Dr. Christopher Post, Agricultural, Forest, and Environmental Sciences, Dr. Julia Sharp, Applied Economics and Statistics

Student: Terese Phinney

The objectives of this study were to conduct soil inventory of a residential plot in Columbus, OH using Web Soil Survey, to collect soil samples, and to analyze collected soil samples for major soil chemical properties to determine soil suitability for

perennial herbs and flowers as well as deciduous trees. Two soil series were found within the plot: Celina and Miamian soils equally dominate the plot. Both soils are of the soil order Alfisols. Soil samples were collected from the front and back yard of the residential property. The samples collected from the front yard varied greatly from those collected from the back yard. Soil nutrient analysis recommendations are discussed to maximize perennial herb and flower growth as well as deciduous tree growth. The project was partially supported by the Creative Inquiry program.

Poster # 56

Health and Business Topics in Film and Media

Mentor: Dr. Graciela Tissera, Languages

Students: Thomas Cotton, Lauren Carswell, Christopher Gregory, Peter Leahy, Joshua Marciano, Jessica Meehan, Julie Mobley, Nancy Parra, Jeffery Schlandt, Racquel Shackleford

This project will analyze different perspectives on health, business and related topics to explore their impact on Hispanic countries and/or other areas of the world. Students will research historical and cultural aspects of several nations through videos, mass media, and pertinent materials (such as actual footage, film adaptations of novels, documentaries, movies based on real events and business and medical literature) by world renowned authors and film directors. Students will also have the opportunity to interview members of the community and work on service learning activities.

Poster # 57

An Exploratory Study of the Relationship Between the Length of Time Spent Abroad and Food

Mentors: Dr. William Norman, Dr. Young-Joo Ahn, Parks, Recreation & Tourism Management

Student: Alan Sampson

This research explores the relationship between the length of time spent in a study abroad program and the importance of food related activities during that experience. Building on the research from the Culinary Tourism CI team's survey of Clemson University Study Abroad students, a series of ANOVAs were conducted to determine if food related activities differed by students who studied abroad one or two weeks, during the summer semester or the fall or spring semester. The results of this analysis will inform the Clemson University Study Abroad office to better assist students in selecting which study abroad program to choose.

Poster # 58

Fact and Fiction: Investigating Young Children's Attitudes and Dispositions Toward Informational and Narrative Text

Mentors: Dr. Deanna Ramey, Heather McCrea-Andrews, Dr. Linda Gambrell, Education

Students: Chelsia Allison, Sally Awwadieh, Erin Carroll, Emily Dodgins, Hakeem Hicks, Mandi Lyons-Archambault, Joey Maxwell, Maddi Phillips, Jemel Pooser, Cameron Skinner

After more than a decade of research suggesting that young children need greater exposure to informational text it would make sense that contemporary children have more experience with non-fiction than did children at the turn of the millennium. Our research team, supported in part by the Clemson University Creative Inquiry Program, is endeavoring to answer the questions, "How do young children judge whether a text is narrative or informational?" and "What are young children's attitudes and dispositions toward informational and narrative text? We have adapted an interview protocol originally designed for older students to use with our participants (students in kindergarten through third grade). We will examine the interview transcripts

and code our data, looking for common themes. Our research should provide some insight into young children's familiarity with informational text, an important asset as they move into grades where they are expected to read and write in that genre.

Poster # 59

The Effects of Total Sleep Deprivation on Dual-Task Auditory Language Performance

Mentor: Dr. June Pilcher, Psychology

Student: Kristen Jennings

The effects of sleep deprivation on auditory language performance need to be examined to determine potential impacts for employee comprehension and productivity. In two studies, a total of 62 participants were deprived of one night's sleep. Subjects completed various tasks over two days in four testing sessions. This study examined the Clemson Audio Task, which assessed auditory attention, language comprehension, and dual-task performance. Subjects listened to four auditory passages across the testing sessions with the objective of responding to keywords and summarizing the main points. Results indicated that performance in identifying main points and detecting keywords significantly decreased. There were no significant differences in the number of keyword false alarms made. These results show that sleep deprivation does impact auditory language performance. The findings of this study suggest that sleep-deprived employees may suffer in language performance, so employers need to consider such issues in applicable environments.

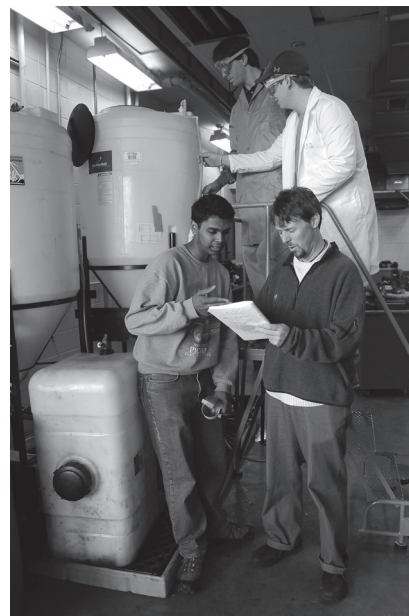
Poster # 60

Soil Inventory of Little Otwell Road Oxford MD

Mentor: Dr. Elena Mikhailova, Agricultural, Forest and Environmental Sciences

Student: Zach Szczukowski

The objectives of this study were to conduct soil inventory of Pecan Point, Oxford, MD, and to determine soil suitability for various uses. The property has three soils with Mattapex silt loam (MtB, 2.3 acres, 39.6% of area of interest, AOI) being predominant. All soils belong to the soil order of Ultisols, which contain the clay mineral kaolinite and iron/aluminum oxides. Web Soil Survey was used to determine soil suitability for dwellings with basements, seedling mortality, hydric rating, and farmland classification. Soils in the study area are very limited for dwellings with basements. All soils are either prime farmland or farmland of statewide importance. All soils have a low potential for seedling mortality. Soils MtA and MtB are both only partially hydric while soil MxC is not hydric. In conclusion the property is prime real estate for farmland use and residential use.



Poster # 61

Impact of Drought on Blue Crab Health

Mentors: Dr. Michael Childress, Kirk Parmenter, Biological Sciences

Students: Brian Holt, Kelsey McClellan, Remember Watts, Ryan Witt

Over the past 10 years blue crab landings in South Carolina have decreased while average marsh salinity has increased. To better understand this relationship between salinity and crab health, we sampled crabs in the three rivers of the ACE Basin

NERR over a four year period. Crabs were sized, sexed, photographed, and checked for disease. The Ashepoo and Combahee Rivers were found to contain the greatest number of crabs and those with the highest body condition index. In contrast, the Edisto had the least number of crabs and the poorest body condition index. Ashepoo crabs had significantly lower infection than crabs from the Combahee and Edisto. Salinity was the environmental variable most correlated with crab health with intermediate values predicting the healthiest crabs. These findings suggest that increasing salinity due to drought could decrease the overall health of blue crabs in South Carolina salt marshes.

Poster # 62

Comparative Diet Analysis of Coyotes (*Canis latrans*) and Red Wolves (*Canis rufus*)

Mentors: Cady Etheredge, Dr. Greg Yarrow, Agriculture, Forestry, and Environmental Sciences

Students: Sloane Wiggers, Olivia Souther

Top predators affect the biodiversity of an ecosystem through top-down effects, or the regulation of mesopredator and herbivore populations. In areas of the Southeast where red wolves (*Canis rufus*) were once the top predators, mesopredator populations have flourished. Recent appearances of the coyote (*Canis latrans*) imply a potential for coyotes to fill the niche left by red wolves. A comparative diet study is being conducted by analyzing more than 400 samples of coyote scat collected from the Yawkey Wildlife Center in Georgetown, SC from 2009-2011, whose results will be compared to the documented diet of red wolves. If no significant diet overlap is observed then it could be assumed that coyotes have not assumed the functional role of the red wolf. A significant overlap in the canid diets might indicate the coyote is filling the role of top predator.



Poster # 63

Focus Group Discussion as Part of Formula Development

Mentor: Dr. Aubrey Coffee, Food, Nutrition, and Packaging Sciences

Students: Audrey Boushell, Kathryn Davis, Keri Lipscomb

The objective of this research was to obtain consumer feedback on a Tex-Mex appetizer being developed. Nine panelists participated in a discussion featuring the Three Señoritas Dip Duo. Participants were surveyed about appetizers, ingredients, and flavors of Tex-Mex cuisine. Panelists were provided with samples of Spicy Chorizo Queso Dip and Smoked Pork Salsa Roja and asked to discuss the appearance, texture, and flavor of each dip on its own and with a tortilla chip. Lastly, the moderator posed questions concerning packaging, serving size and selling price. Though the dip duo was very similar, some areas required adjustment. Reformulation was necessary for the consistency of the queso dip, along with the spiciness and size of the pork pieces in the salsa. By conducting focus group, companies can make necessary changes and increase the successful launch of a product.

Poster # 64

Who Intervenes in Cyberbullying Situations?

Mentor: Dr. Robin Kowalski, Psychology

Students: Carrie Smith, William Senn, Alison Richman, Amber Schroeder

This study investigated predictors of cyberbullying intervention and perceptions of cyberbullies. Forty-nine undergraduate students completed surveys and participated in a scripted online chat in which a confederate was cyberbullied. Whereas all participants reported at least considering intervening, intervention was more likely for people with greater empathic concern, which refers to one's experience of emotions directed toward others in need. However, these individuals also felt more sadness, anger, and distress about the cyberbullying situation. High empathic concern individuals were also more likely to attribute the bully's motives to a need for superiority and the devaluation of others. Although this study suggests empathic concern is a strong predictor of intervention behavior, more research is needed to identify additional predictors of cyberbullying intervention, as well as to identify ways in which individuals with empathic concern can avoid negative emotional reactions in cyberbullying situations.

Poster # 65

Science and Math Achievement in North Carolina High Schools: The Effects of School Composition and Individual Characteristics

Mentor: Dr. Stephanie Southworth, Sociology

Students: Malisia Wilkins, Rebecca Hupp, Ernest Garrison

Maximizing student achievement is essential to remaining a competitive force in the emerging global economy. High school students science and math achievement are strong predictors of future educational attainment and career placement. By understanding the factors that underlie math and science achievement, we can organize our educational systems to provide the best outcomes for all students and foster a better future for American society. Among other questions, this study asks: 1) How does the racial and poverty composition in schools affect student achievement net of other school and individual factors? 2) Does the relative salience of a student trait on a school level affect student tracking? Using Hierarchical Linear Modeling of data obtained from the North Carolina Educational Research Center at Duke University, school and student-level variables will be examined and tested for correlation. Preliminary findings suggest racial and poverty compositions are influential on student achievement.

Poster # 66

ClemsonLIFE Nutrition Intervention

Mentors: Rita Haliene, Food Science, Corey McCarthy, ClemsonLIFE, James Collins, Teacher Education

Student: Macy Driggers

The study by Melville et al. 2007, reported adults with intellectual disabilities have an increased prevalence of obesity compared with the general population. There is a need for effective interventions for this population. The ClemsonLIFE Postsecondary Transition Program is a transition program located on Clemson University's campus that teaches students with intellectual disabilities life skills that will allow them to be independent working adults. Key life skills involve planning healthy menus, grocery shopping, and preparing meals in a food safe manner. The Healthy Cooking/Nutrition Creative Inquiry team is providing a nutrition education and meal preparation session twice a week for seven weeks for each of the four ClemsonLIFE groups. The creative inquiry team will be assessing the meal preparation skills of each ClemsonLIFE student as they progress

through the program to determine the effectiveness of the intervention.

Poster # 67

Soil Inventory of Flower Drive, Sarasota, FL

Mentors: Dr. Elena Mikhailova, Agricultural, Forest, and Environmental Sciences, Dr. Julia Sharp, Mathematical Sciences and Statistics

Student: Elizabeth Devitt

The objectives of this study were to conduct soil inventory of a residential plot in Sarasota, FL using Web Soil Survey, to collect soil samples (flower bed, rose garden, and lawn), and to analyze collected soil samples for major soil chemical properties. One soil series is found within the property: EauGallie and Myakka sands(Sandy, siliceous, hyperthermic Aeric Alaquods), which belongs to the soil order of Spodosols. EauGallie and Myakka sands is farmland of unique importance. Soil nutrient analysis recommendations are discussed to maximize agricultural productivity and minimize environmental impact. This study was supported by the Clemson University Creative Inquiry Program.

Poster # 68

Clemson Dirt to Food

Mentors: Jennifer Goree, Healthy Campus, Dr. Beth Kunkel, Food Science and Human Nutrition

Students: Ariane Alexandrescu, Mary Carney, Maggie Ellingson, Coco Ellis, Russell Lamb, Brittany Lusk, Jessie McGinty, Corinne O'Dea, Rikki Schroer, Staley Brandi, Melanie Wells

Clemson Dirt to Food brings together the passion, skills and knowledge of a diverse group of Clemson students, faculty, staff and community members. Our mission is to advance a culture of health and sustainability by connecting community members and creating opportunities to experience fresh, locally grown food. Our vision is to establish a vibrant local food system that provides the necessary structure that will enable members of our community to make healthier and more sustainable food choices. Currently, the efforts of Dirt to Food are focused on CODE Academy in Seneca, South Carolina. The CODE project has established a community garden for a neighborhood that has a high rate of unemployment and poverty. It is also being used as an integral part of the curriculum for the adjacent alternative school for at-risk middle and high school students. The faculty of CODE Academy has embraced the idea of curriculum infusion and is working now to include the community garden in all its classes. In addition, CODE students engage the surrounding community by creating educational fliers about the garden, what is in season, how to cook it and the health and environmental benefits of eating locally grown produce.

Poster # 69

The Meaning and Validity of “Kid-friendly” Food Advertising Claims

Mentors: Dr. Paul Dawson, Food, Nutrition and Packaging Sciences

Students: Mary Barnes, Marisa Case, Devin Hicks, Jerry Marsh, Mark Maurer, Candice Sapp

The team is investigating the meaning of “Kid-friendly” labeling claims made by food companies and how consumers perceive these claims. Food companies will be contacted and previous literature has been reviewed to determine the different meanings attached to these claims. The team will also develop a survey to evaluate consumer perception of these advertising claims. The nutritional quality of various foods having a “kid-friendly” claim will be determined and compared to similar food products not have the claim. Data collection is not complete at this point however the team will report on the types of foods having

“kid-friendly” claims, the various meanings of these claims, how these are interpreted by consumers and the overall nutritional quality of these foods.

Poster # 70

Clemson Farm-Fresh Market: Exploring Ways to Strengthen Market Capacity

Mentor: Dr. Angela Fraser, Food, Nutrition, and Packaging Sciences

Students: Anna Saunders, Corinne O'Day, Lauren Reavis, Nicole Schutte, Sarah Otte, Taylor Matthews, Cassandra Watford, Courtney Crawley, Heather Burditt, Jeffery Akom, Laura Falconi, Laura Roseberry, Michelle Lapp, Paten Hall, Elizabeth Neely, Hannah Quinley, Holly Hirsch, Sarah Gilbertson

The Clemson Farm-Fresh Market was established in September 2009 in order to provide Clemson University access to locally grown produce. Since its inception, the number of vendors selling products at individual markets has varied widely from 6 to 12. We believe that a strong Farm-Fresh Market would be an asset to Clemson University as it could be a potential venue for the sale of local products and it could be a fun social gathering for students and the Clemson University community. This year our objective was to study how we could improve Market participation by both buyers and sellers. The 17-student CI team contacted 86 U.S. farmers markets to determine how they advertise; the content of their webpage, if any; their mission state; participation statistics about the market; and challenges. The team analyzed the data from the 17 responses and identified a set of strategies that will be implemented into future markets.



Poster # 71

Freshmen/Senior Design and Mentoring Experience

Mentor: Dr. John Desjardins, Bioengineering

Students: Medha Vyavahare, Alexis Kaiser, Mishka Wisniewska, Abby Lewis, Dinklepreet Kaur, Jennifer Anderson, Joshua Rodriguez, Anjali Bergren, Ben Bryla, Brandon Jones, Kyle Spearman

The Freshmen/Senior Design and Mentoring Experience was created with the purpose of exposing first year freshman in Bioengineering to the complex process by which a biological problem is addressed and solved by engineers. By learning how to apply classroom knowledge to real world medical applications students are able to participate in the conception of a project, its review, and prototyping with the ultimate purpose of finally creating a marketable product. Freshmen are paired with small groups of seniors, and attend design gate meetings and weekly reviews. They are able to work alongside the seniors in the design proposal and editing process. Freshmen thus learn to become comfortable working in a lab setting, while furthering knowledge about the field of bioengineering itself. Finally, by participation in the annual Clemson University Engineering Expo, students are able to increase awareness among the youth of the types of problems bioengineering has come to solve and its varied applications.

Poster # 72

Are Antibacterial Cutting Boards Effective?

Mentor: Dr. Paul Dawson, Food, Nutrition and Packaging Sciences

Students: Sutton Fainschwarz, Paul Landeene, Emily Martinez, Aubrey Noller, Chris Riggin, Ashley Stone, Emily Wagener, Michael Waldrop

The team was curious about the effectiveness of antibacterial cutting boards for foods. The objective was to determine if various antimicrobial cutting surfaces were more effective than regular surfaces. Three types of antimicrobial cutting boards were obtained (silver-impregnated, copper and triclosan-impregnated) along with conventional wooden and plastic cutting surfaces. Each of the surfaces will be inoculated with *E. coli* then sampled for surviving cells after exposure to these surfaces over a 24 hour period. Differences in bacterial populations surviving the exposure to these cutting surfaces will be compared by through statistical analysis and reported to determine the bactericidal effectiveness of each surface.

Poster # 73

Cardiovascular Emotional Dampening: A Possible Relationship Between Blood Pressure and Perception of Risk

Mentor: Dr. James McCubbin, Psychology

Students: Jack Graham, Melissa Hibdon, Brittani Loukas, Danielle Brower-Lingsch, Gracie Ross, Suzannah Isgett, Aaron Nathan, Ronald Schram

Persons with higher blood pressure have emotional dampening, a reduced response to emotionally meaningful stimuli. Dampening of perceived threat could influence risk-related decision making. The present study examined the relationship between cardiovascular emotional dampening and risk behavior. Blood pressure, perception of affect (PAT) and risk was measured in 45 young adults. PAT scores negatively correlated with diastolic ($p=.022$) and mean arterial pressure ($p=.023$). Mean arterial pressure predicted perceived risk benefits independent of PAT scores ($p=.017$), suggesting persons with higher blood pressure report increased perceived benefits of risky behavior. This relationship between higher blood pressure and increased perception of risk benefit was most apparent in the financial risk subscale ($p=.008$). These preliminary findings suggest additional research to more fully examine the relationship between blood pressure, emotional dampening and the tendency to engage in risky behavior. Emotional dampening may increase health damaging behavior and, therefore, risk for hypertension and other chronic diseases.

Poster # 74

The Effect of Coyote (*Canis latrans*) Scent on Feeding Behavior of Mammalian Species Native to the Southeastern U.S.

Mentors: Cady Etheredge, Dr. Greg Yarrow, Agricultural, Forest, and Environmental Sciences

Students: Jenna Kohles, Wesley Boone

While coyote populations have increased in southeastern states, their impacts on native fauna are unknown. As a large-bodied predator, coyotes have the potential to alter foraging behavior of a variety of mammalian prey species. If these species feel threatened by the presence of a coyote, they may adjust their behavior to reduce risk of predation. This study was conducted to determine the effects of coyotes on the feeding behavior of herbivorous and mesopredacious mammalian species native to South Carolina's piedmont. Nocturnal attendance of mammals at established supplemental food sites is being recorded using game cameras at locations treated with scent extracted from coyote feces and control scents. The amount of food eaten each visit is visually estimated. Mammalian species diversity and abundance should decrease when coyote scent is present. Likewise, length of time spent at food sites and amount of food consumed should decrease in presence of coyote scent.

Poster # 75

The Physical Effects of Nanoparticle-Protein Corona on Vesicle Fluidity

Mentor: Dr. Pu-Chun Ke, Physics and Astronomy

Students: Poonam Choudhary, Ran Chen, Ryan Schurr, Priyanka Bhattacharya, Pu-Chun Ke

The physical interaction between a lipid vesicle and a silver nanoparticle (AgNP)-human serum albumin (HSA) protein “corona” has been examined. Specifically, the binding of AgNPs and HSA was analyzed by spectrophotometry, and the induced conformational changes of the HSA were inferred from circular dichroism spectroscopy. The fluidity of the vesicle, a model system for mimicking cell membrane, was found to increase with the increased exposure to AgNP-HSA corona, though less pronounced compared to that induced by AgNPs alone. This study offers additional information for understanding the role of physical forces in nanoparticle-cell interaction and has implications for nanomedicine and nanotoxicology.

Poster # 76

The Placebo Effect

Mentor: Dr. Kay Cooksey, Food Nutrition and Packaging Sciences

Students: Matthew Berenbrok, Kaitlin Elliot, Layton Glymph, John Kirkland, Mackenzie Lussier, Michael Pratt, Amy Presher, Donald Taylor, Dallas Fletcher

The purpose of this project is to inform consumers about the dangers of counterfeit drugs in the U.S. Some of these dangers include: drug contamination, wrong drug dosage, wrong or no active ingredient. Although it is difficult to assess to what extent counterfeiting occurs, literature states that 15-35% of all medication worldwide is fake. The manners in which drugs are being counterfeited include duplication of package using advanced printing techniques, copying holographic and other graphic features. Countermeasures are being implemented to alert consumers in order to curb the effectiveness of counterfeiters. These countermeasures can range from complex holographic images that can be seen by consumers to inks with trademark identification using UV inks that can only be seen with special tools by the pharmacist. Furthermore, this project will supply consumers with information that will allow consumers to recognize counterfeit medications, using examples of counterfeit packages found on the market recently.



Poster # 77

The Effects of Habitat on Reported Avian First Arrival Dates

Mentors: Jason Courter, Dr. Ron Johnson, Agricultural, Forest and Environmental Sciences

Students: Corissa Boaman, Elyse Gettler, Kasey Auman, Selina Taylor

Climates are warming, and in response, many North American bird species are migrating earlier. Understanding changes at broad spatial scales remains difficult, however, prompting scientists to rely on emerging networks of ‘Citizen Scientists’ to

collect such data. The objective of our study was to assess whether where first-arriving bird species were seen affected whether or not their reported arrival dates had advanced. To test this hypothesis, we surveyed members of the Cayuga (NY) and Carolina (NC and SC) Bird Clubs to see where they regularly encountered first arriving individuals. We used contingency analysis to compare whether habitat influenced the likelihood that a bird showed migratory advancement. Results indicated that species with advanced arrival dates were disproportionately reported in certain habitats (e.g., grasslands, gardens; $P=0.044$). Our results identify a subtle, but previously overlooked bias in bird phenology studies conducted by citizen scientists.

Poster # 78

Working United with Balance: An Analysis of a Non-Profit Agency in Transition

Mentor: Dr. Susan Hilligoss, English

Students: Deneshia Smith, Jen Bingham

Every workplace has an organizational culture and a cultural analysis can help leadership and staff better understand their organization by identifying and linking various elements of culture. Through interviews, observation and document analysis, we examined the communication methods of a United Way affiliate that is in the process of transitioning to a new national organizational model. We discovered that the cultural distinction of this affiliate is one of change and balance, and that these are the traits most valued by the leadership. This project was partially supported by MAPC (ENGL 856)

Poster # 79

The Impact of Intercollegiate Athletic Participation on University Students' College Experience

Mentor: Dr. Denise Anderson, Parks, Recreation and Tourism Management

Students: Kate Evans, Thomas Brittle, Christy Lolly, Dendy Eppy, Ashley Grooms, Kenzi Hunnings, Tyler Komoroske, Robert Peeler, Courtney Pund, Jay Rochester

Research has demonstrated that the experiences of intercollegiate student-athletes differ from those of non-athletes within social, physical, and academic realms. Athletes are likely to form their social circles around their athletic participation, participate in heavy alcohol consumption, are more likely to consume prescription drugs for nonmedical reasons, and more likely to choose academic majors specifically to maintain eligibility for their sport (Zamboanga, 2008; Seaman, 2011, Potuto, 2007). The purpose of this study is to examine the social, physical and academic college experience of student-athletes as compared to non student-athletes at a mid size southeastern division 1 university. Surveys measuring the social, physical, and academic experiences of students will be distributed electronically to 1,250 students (both athletes and non-athletes) during the Spring 2012 semester. Results will be analyzed to determine similarities and differences between the experiences of student-athletes and non-athletes. Results will be used to inform university academic and athletic faculty/staff.

Poster # 80

Microbial Safety of Hamburger Cooked With a Combination Sous-Vide and Grilling Method

Mentor: Dr. Felix Barron, Food, Nutrition and Packaging Sciences

Student: Matt Eisenstat

With the recent outbreaks of *Escherichia Coli* overseas and locally, public trust in processed foods, raw foods, and meat products has markedly decreased. While some amount of concern is founded, the fear of bacterial contamination often leads to overcooking and over-processing of food products to avoid outbreaks and possible litigation. The combination method of sous-

vide and grilling for hamburger products is offered as a safe and alternative method to reduce microbial populations without increasing internal temperatures.

Poster # 81

Characterizing Cytochrome Oxidase 1 Mitochondrial Gene for Use in Phylogeographic Studies in the Hawaiian Waterfall-climbing Goby, *Sicyopterus stimpsoni*

Mentor: Dr. Margaret Ptacek, Biological Sciences

Students: Parag Raychoudhury, Hannah Warren, Kristine Moody

Over the past decade the use of neutral genetic markers for conservation studies has become widespread. Consideration must be given to the development of markers that are appropriate for the evolutionary questions being asked. We have characterized a 650 base-pair region for the cytochrome oxidase 1 (CO1) mitochondrial gene for future use in phylogeographic studies of the endemic Hawaiian waterfall-climbing goby, *Sicyopterus stimpsoni*. We have sequenced 13 individuals from the island of Kaua'i and 15 individuals from the island of Hawai'i, which show five different haplotypes. Haplotype diversity (h) of 0.624 shows a strong potential for this gene region to yield information about spatial genetic structure and nucleotide (π) of 0.0037 suggests that multiple sites across the locus are polymorphic. These findings suggest that CO1 will be a useful genetic marker for future studies of connectivity between islands and in designing management strategies for existing adult subpopulations.

Poster # 82

Changes Occurring in Twelve Mile Creek

Mentor: Dr. Lawrence Murdoch, Environmental Engineering and Earth Sciences - Geology

Student: Nicholas Bozzarello

Located in Twelve Mile Creek in Norris, SC, two dams were removed within the past two years in response to an environmental threat from a dangerous cancer-causing chemical, polychlorinated biphenyls. (PCBs) Ever since the dams were removed, the river has been going through its own series of geological changes including the increased speed of the river's flow as well as a change in sediment depths around the river bed. This project aims at observing the changes in the riverbed width and sediment depth and analyzing what the river bed sediment depth levels will look like with the use of "cross sections" to make a visual image of the river bed. The riverbed layout should change back to a normal fluvial river system layout with much less sediment than before.

Poster # 83

Inflatable Load Cell: A Device to Measure Pressure Change in Soil

Mentors: Dr. Lawrence Murdoch, Environmental Engineering and Earth Sciences

Student: William Webber

Pressure changes in soils provide insight to the physical response imparted by a change in load unto the soil. Pressure within soil fluctuates often due to various external influences such as weather, erosion, farming, construction as well as the physical and chemical characteristics of the material. My research helps to develop a system that is capable of measuring and monitoring pressure changes within soils. The system consists of an expandable load cell that responds to soil pressure fluctuations, oil to transfer the pressure response, and a high resolution transducer that measures the oil response and provides useable data for interpretation. The elasticity of the load cell's membrane, volume of oil in the system, depth deployed, temperature and humidity are all variables that affect the accuracy of the pressure readings and sensitivity of the load cell to external pressure.

Poster # 84

Fluid Uptake from Porous Substrates by Butterflies Determined by Proboscis Size: A Study of the Limiting Pore-Size Hypothesis

Mentor: Dr. Matthew Lehnert, Agricultural, Forest, and Environmental Sciences - Entomology

Students: Kelsey Tuttle, Jessica Grant

Butterflies and Moths feed from various food sources, such as surface substrates containing liquid using a coilable, tube-like proboscis. Previous studies found the smallest pore size in a substrate in which a Monarch butterfly can feed directly correlates to the radius of the food canal in the proboscis; the limiting pore-size hypothesis. We explored the limiting pore-size hypothesis by comparing the range of pore sizes used by the Monarch Butterfly with those used by the Cabbage Butterfly, *Pieris rapae*. We placed individuals of *P. rapae* on paper towels (representing porous substrate) saturated with 10% sucrose-solution draped over stages of different heights in which different pore sizes were filled at each height due to the Jurin law of capillarity. The Cabbage butterflies were able to feed from all pore sizes, some of which were smaller than those used by the Monarch butterfly, warranting further study of the limiting pore size hypothesis.



Poster # 85

Situation Taxonomy Creative Inquiry Team

Mentor: Dr. Cynthia Pury, Psychology

Students: Lauren Hinkel, Cynthia Marshall, Matthew Burling, Ross Homer-Bouthiett, Taylor Krulac, Danielle Rhodes, Brittaney Trent

The Situation Taxonomy Creative Inquiry team is conducting several studies to test the dimensions of situations we previously established: change, ownership, valence, timing, target, privacy, and consideration. In one study, participants were sent text messages asking what they were doing, later rating those behaviors on our dimensions and others. We are designing two studies with the hypothesis that if our dimensions represent basic human cognition, they should be processed rapidly. One study asks participants to identify object ownership as quickly as possible. Another explores if these dimensions are characteristics of architectural space, and, if so, should be identified rapidly. We will be conducting a study asking participants to report an inappropriate action they witnessed and ask questions to determine if mismatches on our dimensions made it inappropriate. Finally, we will use multidimensional scaling for 100 pairs of English action idioms to determine if these fit into our previously established dimensions.

Poster # 86

A Focus on Foreign Foodstuffs

Mentors: Dr. Margaret Condrasky, Dr. Paul Dawson, Chad Carter, Food, Nutrition, and Packaging Science

Students: Bouton Anderson, Cory Kohler, Samantha King, Tessa Brinkman, Grace Couch, Colyn Felch, Caroline McTier

The goal of this CI project was to produce a healthy snack item. Product development focused on a granola bar using relatively unknown ingredients: maya nut, sacha inchi, and hempseed. These underutilized ingredients feature complimentary amino acids, crude fiber, and an optimal ratio of omega 3 and 6 fatty acids. Besides its health benefits, the bar supports sustainable economic stability and environmental awareness of the ingredients origins. Incorporating these ingredients into a familiar product eases consumer uncertainty and hastens future application. Nutrient content and shelf life determination are planned

using laboratory equipment and ingredient profiling. Every production trial was recorded using careful measurements that allow for simple replication. Each week the recipe was altered to obtain a desired quality as guided by the surveys. This unique, nutritious product offers uncommon ingredients that benefit the consumers, producers, and suppliers.

Poster # 87

Development of Farm to School Family Activity Sheets

Mentors: Dr. Katherine Cason, Maciel Ugalde, Joyce Senior, Food, Nutrition and Packaging Sciences

Students: Joy Anderson, Melissa Macher, Jennifer Obrien, Kathleen Sanders, Kristin Scott, Laura Roseberry, Hunter Sizemore, Ashley Stone

The Farm to School Program is one of the initiatives to increase healthy eating behaviors among children, their families and communities. In South Carolina it is being implemented as 2-year project funded by the Centers for Disease Control and Prevention (CDC). It aims to connect schools (K-12) and local farmers with the objectives of serving healthy meals in school cafeterias, improving student nutrition, providing agriculture, health and nutrition education opportunities, and supporting local and regional farmers. The Creative Inquiry Students had the goal of designing hands-on educational newsletters for children aged k-5 and 6-12 and their families. Each newsletter included an educational section, a hands-on educational activity, and healthy recipe. The results were the development of 8 age appropriate monthly newsletters that are currently being used in the South Carolina Farm to School program as part of the educational strategies. This project was partially supported by Creative Inquiry and South Carolina Farm to School Program.

Poster # 88

The Consequences of Employees Seeking Treatment for Psychological Problems: Perceptions of Responsibility and Resiliency

Mentor: Dr. Thomas Britt, Psychology

Students: Janelle Cheung, Janelle Cheung, Gordon Hodge, Cassie Walker, Skye Gillispie, Anna McFadden, Crystal Burnette, Chad Breeden, Tierney Evans

The present study investigated the effects of employees seeking treatment for psychological problems. Undergraduate students (N=170) were exposed to eight different scenarios describing an employee who was experiencing symptoms of anxiety. Within the scenarios, the individual was either a soldier or a civilian, exposed or not exposed to work stress (in the form of combat for the soldier and work overload for the civilian), and either sought or did not seek mental treatment. Participants reported on responsibility for symptoms and the resiliency of the employee. Military personnel were judged as less responsible for their symptoms when they experienced combat, but civilian personnel were not judged less responsible when they experienced work overload. Soldiers who experienced combat were judged as more resilient when they sought treatment than when they did not, but civilians were not judged differently as a result of seeing treatment. Practical implications of the findings will be discussed.

Poster # 89

Assessing Inclusion in Summer Camp Programs

Mentors: Dr. Teresa Tucker, Dr. Tracy Maineri, Parks, Recreation and Tourism Management

Students: Patrick Williams, Kelly Deguneuther, Jacob Durham, Logan Fulbright, Amber Meteraud, Stuart Moore

Despite the growing literature on inclusion in summer camps, camp practitioners remain unclear about the definition of inclusion and can be unaware that their camp practices align with accepted inclusive practices. The purpose of this study was to determine the extent to which camps employ inclusive practices and whether camps consider themselves inclusive. Data was collected via iPad surveys from 136 camp directors and staff at the 2012 American Camp Association National Conference. Results indicated that camps employ many of the inclusive best practices discussed in the literature and that over 94% of the camps have served campers with special needs; however, only 62% of camps consider themselves to be inclusive for campers with special needs. These findings suggest that though camps employ inclusive practices for campers with special needs, they do not always see themselves as inclusive for those campers, indicating the possible need for practitioner education regarding inclusion.



Poster # 90

Real Time Blood Loss Monitor for Developing Nations

Mentors: Dr. Delphine Dean, Dr. John Desjardins, Bioengineering

Students: Colin Burns-Heffner, Tyler Youngman, Matt Kofoed, Andrea Dicks

Excessive loss of blood during and after childbirth is responsible for nearly 60 percent of maternal deaths in the developing world. When alerted within a critical time frame, preventive interventions can save the life of the mother. However, visual estimation of blood loss, the most widely adopted monitoring practice, is strongly limited by human error. Efforts to supply hospitals with western technologies often fail due to the instruments breaking. Further, few hospitals have resources or trained personnel to fix malfunctioning equipment. This leads to expensive medical equipment sitting in piles, broken and unusable. Therefore, we have decided to create an IR Plethysmograph out of parts that can be found in developing nations such as Tanzania and Nicaragua, so that they can build them and repair them themselves instead of relying on outside sources.

Poster # 91

Distribution of Plankton Communities within a Restored Pond System: a Baseline

Mentor: Kate Lyn Sheehan, Agricultural, Forest and Environmental Sciences

Students: Lindsay Mumma, Maddie Kral

Our original research study was designed to determine how the building of a structure, that would later distribute nutrients, might affect the plankton community within a pond system. We provide baseline information here for the distribution of plankton in artificial ponds at the Clemson University Bottoms. Three samples were randomly collected from each of four ponds. Prior to conducting our surveys, three adjacent sampling zones were randomly chosen within each pond. From these

zones, planktonic organisms were sampled using a 15 mm plankton net. The number of zooplankton and phytoplankton were quantified in each sample. Zooplankton were measured and identified to genus and species. There were approximately four species of Daphnia and four species of Copepoda identified among our samples. After analyzing all our data, we concluded the plankton communities in each pond were similar.

Poster # 92

The Diamond of Courage: Various Aspects of Courageous Behaviors and How They are Perceived

Mentor: Dr. Cynthia Pury, Psychology

Students: Jeremy Crump, Michael Adams, Chad Breeden, Matthew Burling, Kheri Corbin, Renee Kulik, Karen Skjerning, Mary Whiteley

Because there is relatively little data on courage in the scientific community, psychologists have often had difficulty measuring the various aspects of courage in the past. Courage is most specifically defined as “performing acts of valor or virtue when facing danger despite the presence of fear or terror.” Here at Clemson University, we have worked to bring courage into a more defined light by separating it into several different categories. Not only can courage involve action despite fear of pain or discomfort, but also when taking risks and setting goals, such as in the workplace or in one’s personal life. Courage can also be downplayed and perceived as humility; this phenomenon is called “courage blindness.” Still others use courage for immoral reasons, such as justification of stealing or murder. A stronger understanding of courage will allow us to better aid society. This project was partially supported by the Creative Inquiries program.

Poster # 93

Roper Mountain Science Museum Renovation Project

Mentors: Dr. John DesJardins, Dr. Delphine Dean, Dr. Martine LaBerge, Bioengineering

Students: Colin Burns-Heffner, Drew Holman, Laura Reese, Alanna Walker, Tyler Youngman

Roper Mountain Science Museum (RMSM) is a center devoted to science enrichment through interactive and informative displays. Through funding by the South Carolina government, a grant has been secured for renovations. Seven hundred square feet of the museum will be devoted to biomedical engineering and nanotechnology. This creative inquiry focuses on developing technologically advanced displays targeted to fourth grade students that engage and excite them in the field of biomedical engineering. Proposed displays include EMG controlled race cars, life size cells, skeletons containing FDA approved medical devices, da Vinci surgical simulations, and gait analysis. By the end of the semester, a proposed budget and layout will be submitted to RMSM for approval and exhibitions will begin transforming from idea to reality. This project was partially sponsored by the Creative Inquiry program.

Poster # 94

Biostratigraphy and Paleontology study of the Lower Lag Deposit of the Harleyville Formation

Mentor: Dr. John Wagner, Environmental Engineering and Earth Sciences - Geological Sciences

Student: Corey Buchanan

The Harleyville Formation in South Carolina was deposited during the Eocene Epoch (about forty million years ago) in a marine environment. The sediment is rich in both invertebrate and vertebrate fossils; however this study focuses on foraminifera. Foraminifera are single celled marine organisms similar to amoebas that secrete microscopic calcium carbonate

shells. The study site was the La'farge Cement Quarry in Orangeburg County, South Carolina. Methodology for this study involved processing samples collected from four distinct layers within the formation. Processing consisted of sorting and cleaning the samples. Foraminifera were extracted from the cleaned sample using binocular microscope and identified. The process was repeated for each of the four layers under investigation. During the time interval between the deposition of the four sampled layers, fossil evidence indicates that the water depth increased and the water temperature decreased. This paleontological study was sponsored by Clemson University's Creative Inquiry Program.



Poster # 95

The Differential Effects of Feeding Versus Providing Food on Perceived Intimacy in Dyads

Mentor: Dr. Tom Alley, Psychology

Students: Lauren Brubaker, Terese Falabella

Previous research indicates that viewers tend to perceive a couple's relationship as more intimate if feeding is observed (Miller et al., 1998). It was hypothesized that viewers watching heterogeneous pairs dining together would give higher ratings of perceived intimacy if a couple was observed provisioning (i.e., handing food to dining partner) or feeding, with feeding producing the highest ratings. Data were collected from 211 Clemson University students (67 male) who watched five different male-female dyads in five videos that displayed provisioning, feeding, or no food sharing. After each video, participants completed a brief survey asking about the attractiveness, attraction and intimacy in the dyad they had just observed. The discussion will focus on the different impressions created by seeing different types of food sharing behaviors.

Poster # 96

Design and Production of a Simple, Inexpensive Microbial Biosensor

Mentors: Dr. Delphine Dean, Dr. John DesJardins, Bioengineering

Students: Kevin Keith, McCaskill Britton

Bacteria and other microorganisms are ubiquitous in the environment. Although most bacterial strains are harmless, many can be pathogenic and known to be the causative agent of many different infectious diseases such as botulism, cholera, emesis, and Typhoid fever. In developing countries, diarrhea or gastrointestinal-linked diseases like these are the second-leading cause of death in children. The purpose of this project is to design and produce an electrochemical sensor capable of detecting microbial presence in a liquid medium. Electrochemical sensors have the benefit of being highly sensitive, rapid, and altogether inexpensive. They measure the change in electrical properties between electrical structures as cells become immobilized on or near the structures. The design and production of a biosensor capable of detecting bacteria in liquid medium, such as liquid stool, could have significant impact as a diagnostic tool for various gastrointestinal diseases and have particular utility in resource-poor settings.

Poster # 97

Temperature Changes in a Streambed to Evaluate Groundwater Discharge

Mentors: Dr. Lawrence Murdoch, Environmental Engineering and Earth Sciences - Geological Sciences

Student: Joshua Smith

The interaction of groundwater and surface-water is instrumental in the transport of contaminants and nutrients, which affect the ecosystem of a watershed. This study was conducted to design a probe to measure the temperature gradient in a riverbed. The difference in groundwater and surface-water temperatures was used to calculate groundwater flow velocities into a river. A sand dominated streambed of Twelve Mile River and the fractured rock exposed along Town Creek were investigated using the probe. The values were compared to readings recorded from an instrument that measures groundwater discharge. A computer-modeling program was used to solve for the velocity of the water flowing into the bottom of the stream. This project provides a new method for measuring the velocity of water moving between groundwater and surface-water.

Poster # 98

Effects of Herbicide Application on Plankton Communities of Freshwater Ponds

Mentor: Kate Sheehan, Agricultural, Forest and Environmental Sciences

Student: Marissa Vereen

We assessed the effects of herbicide treatment on plankton communities in and around vegetation of pond systems. Habitat© herbicide was sprayed on emergent vegetation within the ponds and samples of plankton communities were collected on multiple dates. We sampled on the Clemson University campus in six ponds from September 19 to November 11, 2011. There were seven separate sampling dates during this time. Three ponds were not treated with herbicide and served as control samples. Sampling of the plankton community in the water column consisted of two samples per pond: one taken in vegetation and one out. We identified, quantified, and measured plankton species in each sample. We also collected water quality data (temperature and dissolved oxygen). Here we make inferences as to how a plankton community changes over time after an herbicide application.

Poster # 99

A Study of the Foraminifera from the Giant Cement Quarry in Harleyville, South Carolina

Mentor: John Wagner, Environmental Engineering and Earth Science

Student: Alexis Jarvis

This experimental study analyzed microfossil assemblages from the Giant Cement Quarry in Harleyville, South Carolina to determine if they match the geologic age typically assigned to this area. The purpose of the research was to determine if the sediments collected from the quarry in September 2011 contained the expected types of minerals and fossilized foraminifera (single-celled organisms). The foraminifera examined were typical of the time zone P17 and there was also an abundance of galuconite and quartz grains. The study therefore supports the hypothesis that the sediment collected from the Giant Cement Quarry belongs to the geologic formation.

Poster # 100

Archaeal Diversity Within the Gastrointestinal Tract of the Florida Manatee, *Trichechus manatus latirostis*

Mentor: Dr. Michael Henson, Biological Sciences

Students: Laura Bagwell, Sandra Bediako

The conversion of cellulosic substrates to methane and carbon dioxide is performed by the cooperation of various groups of microorganisms. Metabolism of complex compounds is based on a sequence of oxidation-reductions reactions that are carried out by a community of microorganisms. In ruminants complex substrates are degraded by bacteria to fatty acids such as acetate, propionate, and butyrate. According to the laws of thermodynamics, the oxidation of the fatty acids must be coupled with the consumption of the reducing equivalents. Consequently, fatty acid oxidation is accomplished by a syntrophic group of microorganisms, one oxidizes the fatty acids to produce hydrogen, and methanogens consume the hydrogen. The Florida Manatee is a marine mammal with a hindgut cecal fermentation system. Previous data has shown that acetate, propionate, and butyrate are the major fatty acids produced when manatee fecal samples are enriched on switchgrass and filter paper. The diversity of archaea within the gastrointestinal tract will be analyzed using DGGE and ARDRA, in archaeal population from the stomach to the rectum. Acetate, butyrate, and hydrogen-carbon dioxide are being used as substrates to enrich for methanogenic bacteria.

Poster # 101

Improving Childrens' Fitness with Interactive Videogames

Mentor: Dr. Janice Lanham, Nursing

Students: Emily Smith, Gale McCall, Madeline Welsh

Our project includes the beginning stages of researching various exercise videogames for elementary schools to include in their PE sessions. The project will include testing a plethora of Xbox kinect games and choosing the ones that increase the heart rate the most and are most suitable for children. The rising childhood obesity rates are the driving force of our investigations and research. The games will be used to help children get a daily dose of exercise while having fun with their peers.

Poster # 102

The Exploration of Pretreatment and Anaerobic Conversion of Municipal Solid Waste to Methane

Mentor: Dr. Michael Henson, Biological Sciences

Students: Michael Schreiber, Athanassios Paraskeva

Our society revolves around the use of fossil fuels as a pivotal energy source. With the continued growth combustion-based technology, a need for a cleaner, cheaper, and more readily available energy source is necessary. To resolve this problem, the production of methane from the anaerobic conversion of municipal solid waste (MSW) in a two-stage bioreactor is being investigated. Artificial MSW was created using paper, corrugated board, food waste and switchgrass to mimic the organic fraction of true MSW. The artificial MSW will undergo multiple pretreatments, including ammonium hydroxide addition, enzyme hydrolysis, and lignin blocking prior to fermentation to expedite initial hydrolysis of cellulosic materials, the rate-limiting step in methanogenesis. A seed culture from a preexisting bioreactor will be used to inoculate the second stage methanogenesis reactor, allowing for pH and sludge flow control from the initial reactor, optimizing the production of methane. This project was funded in part by the Creative Inquiry Program.

Poster # 103

The Hispanic World through Film, Literature, and Media: Service Learning Projects

Mentor: Dr. Graciela Tissera, Languages

Students: Jeremy Kincheloe, Anaïsa Figueroa, Shelby Jenkins, Nicole Cooper, Emily Winburn, Maghan Knight, Nancy Parra

This project will analyze social, political, and economic issues in the Hispanic world through videos and pertinent materials. Students will also complete service learning projects to help Hispanic communities. Through their service to Hispanic communities, students will explore the impact of culture, immigration, education, language, health, and jobs on family members and their future expectations in multicultural environments.



Poster # 104

Intramural Sports Influence on Social Skills Development for ClemsonLIFE Students

Mentors: Dr. Teresa Tucker, Dr. Tracy Maineri, Parks, Recreation and Tourism Management

Students: Josh Bennett, Molly Brinson, Nick Grogg, Lauren Lide, Katie McMann, Brandon Moore, Julian Patton, Cory Rivers, Hillary Thackston, Morgan Williams

The ClemsonLIFE Program, a postsecondary education program for students with intellectual disabilities, strives for these students to have an inclusive college experience. Research on inclusive recreation and research on collegiate intramural sports programs indicate that participation provides social benefits and social skills development. However there is little research on the experiences of students with intellectual disabilities in a collegiate intramural sports program. The purpose of this study was to examine the effects of participation in intramural sports on the social skill level of ClemsonLIFE students. Ten ClemsonLife students participated in two intramural sports (bowling & softball) in Spring 2012. Focus groups with ClemsonLIFE and non ClemsonLIFE students were conducted at the end of each sport's season. All ClemsonLIFE students completed a social skills and leisure assessment prior to and immediately following intramural season. Preliminary data analysis suggests that ClemsonLIFE students gained social benefits through participation in the intramural program.

Poster # 105

TigerTern

Mentors: Dr. Kenneth Weaver, Charles Heck, Computing

Students: Zachary Hance, Ashleigh Austin, Wyndhman Batton, Wythe Crisler, Carrie Eisengrein, Zachary Hance, Caitlin Hulsey, Joshua Junious, Ar'tashia Johnson, Nathaniel Lee, Benjamin Masters, Danny Mecca, Andrew Phifer, Chelsea Wallis, Jacob Wood

Our cross disciplinary team comprised of computer science and industrial engineering students began with the goal to research, design and prototype an instructor's station that would accommodate educators with varying physical needs and teaching methodologies. We wanted to use universal design principles to create a lectern that could be pre-set to various desired configurations, such as height. We found existing technology, TecTern, from Egan Visual Inc. met our basic structure specifications. Working with Egan Visual and TeamBoard, we are modifying the TecTern to develop an automated height-adjusting lectern we call TigerTern. With a card swipe, instructors can store their desired TigerTern height on the system and,

then each time they want to use the TigerTern, they can swipe their card again to automatically move it to the pre-set height. We anticipate users of TigerTern will be more comfortable and effective.

Poster # 106

Experimenting with OpenFlow: A Software-Defined Approach to Computer Networking

Mentors: Dr. Kuang-Ching Wang, Dr. Stan Birchfield, Electrical and Computer Engineering

Students: Benjamin Ujcich, Scott Groel, Ryan Izard



Software-defined networking (SDN) is a new paradigm for how computer networks are operated and managed. Traditionally, most networks follow a decentralized control model: traffic-forwarding decisions are made within the networking devices themselves. The distributed control makes it difficult for network management and customized needs. By contrast, SDN removes the control from individual devices and centralizes the decision-making in one controller to allow for greater flexibility in network management. OpenFlow, a popular implementation of SDN, is currently deployed at Clemson for use as a testbed for network researchers. Two topics of interest from Creative Inquiry team members include the continuing development of the university's data analysis network and further research into allowing for the coexistence of multiple

controllers on a single network. The team serves as a basis for future in-depth research on the National Science Foundation's Global Environment for Network Innovations initiative, a nationwide experimental platform for next-generation network research.

Poster # 107

Probiotics Healthy Drink

Mentor: Dr. Felix Barron, Food, Nutrition and Packaging Science

Students: Rebecca Phifer, Alli Corvese, Julie Dean, Patrice Newsome, Danielle Beaumont

Goal is to develop a healthy probiotics drink based on cactus juice. A cactus juice based drink was preliminarily developed and its nutritional value evaluated and compared to other juices in the market. The especial ingredients of interest in the cactus juice are the increased amount of dietary fiber and other micro nutrients. Further analysis is in progress regarding its health potential claims.

Poster # 108

Industry Interactions: Connecting Students with Companies

Mentor: Dr. Bob Moore, Packaging Science

Student: Drew Barry

For students, the primary goal of this Creative Inquiry is for students to begin making connections with companies in the packaging industry as sophomores, long before graduation. For our Packaging Science program, the primary goal is to make

companies in the packaging industry aware of Clemson Packaging Science, and to create industry collaboration with and support for our program. For the packaging industry, the primary goal is to provide companies with Packaging Science graduates from Clemson, one of less than ten schools in the world with a comprehensive degree in Packaging Science. The primary product / artifact of the Creative Inquiry is a relational data base, containing searchable information in many different categories. The data base is created based on student interactions with companies, associations and non-profit groups, and governmental agencies. Student interactions with industry occur in a variety of ways, including industry trade shows, conferences, visits to companies, and as companies visit the Clemson campus. This project was generously supported by the Creative Inquiry program.

Poster # 109

Comparison of Biomass and Lipid Production of Heterotrophic Algae, *Chlorella protothecoides*, using Biodiesel Derived Crude Glycerol and Pure Glycerol

Mentors: Dr. Terry Walker, Environmental Engineering and Earth Sciences, Charles Thornton, Agricultural & Biological Engineering

Student: Shwetha Sivakaminathan

One of the worldwide concerns is the depletion of fossil fuels because none of the existent technologies can handle the current energy demand. The aim of this study was to assess the growth of a microalga *Chlorella protothecoides* in batch and fed batch mode using crude glycerol, a byproduct of the campus biodiesel plant, as substrate in order to scheme a cost efficient process for producing high quality biodiesel. In the fed-batch mode, the biomass and lipid concentration improved to 22.13 and 9.75 g/L respectively from 11.14 and 3.16 g/L in the batch mode with the crude glycerol. The maximum lipid productivity of 1.22 g/L day in the fed-batch mode was also higher than that produced by batch cultivation. This work demonstrates that crude glycerol can be utilized as a potential substrate to other expensive sources like glucose and serve as a huge cost cutting step in lipid production.

Poster # 110

Fostering Future Female Transportation Leaders through TransportationYOU

Mentor: Dr. Jennifer Ogle, Civil Engineering

Students: Elizabeth O'Sell, Dongni Wang, Laura Rowe, Bryanna Saunders, Honor Cosentino, Rebecca Mercer, Katerina Moreland

The Women's Transportation Leadership Creative Inquiry Team has helped develop program material and curricula for the inaugural Transportation YOU DC Summit to be held in March 2012. Transportation YOU is the joint initiative of WTS International and the U.S. DOT that launched with the 2010 signing of a memorandum of understanding by US Secretary of Transportation Ray LaHood. Twenty-five high-school age females and their transportation professional mentors will meet in DC to experience transportation behind the scenes in our nation's capital. Participating girls will have opportunities to meet Sec. LaHood, Directors/CEOs of major engineering corporations, and Directors of Transportation-related Agencies. Participants will also go behind the scenes on tours of TRACON, Dulles Airport, Metro, NTSB Training Center, and the White House. Our team has been selected to provide logistical and program support and to develop a documentary of the inaugural summit along with promotional materials to be used across the country. This poster will document the work and the outcomes of the teams: leadership, teamwork, professional development, and diversity. This project was sponsored and supported by WTS International and the Creative Inquiry program.

Poster # 111

Patient Triage Tool for Hospital Resource Allocation

Mentors: Dr. Kevin Taaffe, Dr. Ashley Childers, Industrial Engineering, Dr. Walter Limehouse, MUSC

Student: Caroline Christ

When a hospital experiences an emergency, or when there are fewer resources than there are patients that require them, healthcare professionals must make ethical decisions as to who gets treated appropriately. The Sequential Organ Failure Assessment, or SOFA, was developed to help quantify, and categorize, the severity of a patient's condition. I have developed a computer based tool that calculates a patient's SOFA score, stores it in a database, and can triage all of the patients in the database based on their SOFA score and their respective category of severity. This tool would provide healthcare professionals with quick and easy access to triage information on their current patients. It would support them in making informed decisions on how to allocate their resources in an emergency situation. This project was supported by Dr. Kevin Taaffe and Dr. Ashley Kay Childers, Clemson University, Dr. Walter Limehouse, MUSC, and the Creative Inquiry program.

Poster # 112

Rare Rocks in the Clemson Experimental Forest

Mentor: Dr. Richard Warner, Environmental Engineering and Earth Sciences

Student: Colin Phillips

This project was focused on collecting and analyzing samples of rare rocks collected in the Clemson Experimental Forest. These rocks are known as migmatites. Migmatites have not been thoroughly studied in the Clemson Experimental Forest Project because they are so rare. Migmatites are metamorphic rocks that have been heated to a temperature that allows some of the minerals to melt. The minerals involved are usually quartz and feldspar and some mica. These melts segregate and crystallize to form new granitic material in the host metamorphic rock. Once the samples were collected, they were analyzed for their mineral content and the composition of the minerals. We then used this information to figure out the temperature at which these rocks formed. This will be very useful and will add to our geologic understanding of the Clemson Experimental Forest.

Poster # 113

Strawberry Ice Cream Flavor Standards

Mentor: Dr. John McGregor, Food, Nutrition and Packaging Science

Students: Kristiaan Fish, James Madox, Kolisetti Sweta, Sterling Capotosti, Alyssa Bransley, Madore Caitlin, Hanna Santoro, Melissa Ciccone, Nakita Kappel, Stephanie Suhoza

The purpose of this investigation is to determine if the National Ice Cream Retailer's Association (NICRA) flavor standard for strawberry ice cream represents the preference of consumers. A sensory preference taste panel will be conducted on strawberry ice creams formulated with purees made from four different sources: Individually Quick Frozen (IQF) strawberries, processed strawberry puree, fresh strawberries, and artificial strawberry flavoring. Panelists will rank the four ice cream samples from least preferred to most preferred. It is predicted that given the choice between IQF, processed, fresh, and artificial flavoring; the consumer will prefer the product closest to the NICRA standard. This project was partially supported by Creative Inquiry, and Grant Research for National Ice Cream Retailer's Association.

Poster # 114

Understanding Weekend Bias in Studies of Bird Phenology

Mentors: Jason Courter, Dr. Ron Johnson, Agricultural, Forest and Environmental Sciences

Students: Brian Lang, Claire Stuyck, Evan Kaiser

Phenological studies provide ecologists with a better understanding of large-scale environmental processes such as climate change. Phenological data, such as first arrival dates of migrating birds, are being collected and reported by citizen volunteers through recent 'Citizen Science' efforts. Potential benefits are enormous if known biases of citizen data reporting are identified and addressed. One particular issue in bird migration studies is the tendency for "first" arrivals to be reported on weekends. We analyzed weekend bias for five common species in North America, compared results to a similar study in Europe, and found weekend bias in North America was present but considerably less than in Europe (i.e., 32.5% vs. 43%), perhaps indicating differences in demographics between European and North American birders. In general, weekend bias in citizen data reporting has decreased over time and accounting for 'day of week' in models examining phenology shifts could help make conclusions more robust.

Poster # 115

Development, Delivery and Assessment of a Worksite Nutrition Education Intervention

Mentor: Dr. Vivian Haley-Zitlin, Food, Nutrition, and Packaging Science

Students: Amy Silver, Caitlan Schanne, Charles Johnson, Cole Vanson, Caitlyn White, Josh Downey, Caroline McTier, Shannon Brennan, Sally Gooch, Chelsea Graham

More than one-third of US adults are obese, with South Carolinians among the most obese. Americans need healthy lifestyles. Nutrition students provide information that can change people's lives. Our Obesity Creative Inquiry Team developed an educational program (Basics to Balance) with six lessons (calories, physical activity/water, carbohydrates/sugars, protein, fats/oil, and vitamins/minerals) with PowerPoint slideshows, handouts, and activities. Our team delivered this 6-week program at a local worksite, Fall 2011. Pre- and post-intervention, height, weight, waist circumference, BP, oxygen levels and subject's body composition (InBody 520) were measured. Sixty-three individuals (30 male/33 female) began the program. Weekly lessons were taught to 10-15 workers/group. Post intervention, average weight loss in males was 11.5 lbs., compared to females, 3.7lbs.; more men reached normal BMI levels. Percent body fat did not change significantly in either gender, but food choice selections improved in both. Results support on-site nutrition interventions and provide insight for future improvements.

Poster # 116

Gangsterism in Film

Mentor: Dr. Marjie Britz, Sociology

Student: Courtney Cox

We have been studying gangsterism in film. Although we are surrounded by this theme in blockbusters all the time, this class looks a lot deeper than just at the gun-toting men we would describe as "gangsters". We discover the difference between good and evil, and how those two characteristics effect every part of our being, including lifestyle, values, relationships and more. We have learned about the way the law shapes, controls and even creates criminals. I personally have changed my perceptions of right and wrong because of this class. The bad guy isn't always the evil one, and a priest may even lie under oath. We just have to open our minds to see that crime happens in more than the conventional ways we all imagine.

Poster # 117

Effect of Cranberry Supplementation Upon Insulin Signaling Pathway and Behaviors for *Caenorhabditis elegans*

Mentors: Dr. Yuqing Dong, Dr. Min Cao, Biological Sciences

Student: Ryan Kane

Aging is an inevitable process, nutrient intervention with cranberry has shown to increase the lifespan of *Caenorhabditis elegans*, the primary model organism to study aging. This project focuses on the insulin/IGF signaling pathway, which plays a major role in lifespan regulation. Interestingly, the cranberry-mediated lifespan extension was suppressed by the deletion of DAF-16, the final effector of insulin/IGF pathway. Our finding suggests that cranberry acts through insulin/IGF signaling to modulate *C. elegans* lifespan. Moreover, we observed the nuclear translocation of DAF-16 associated with the cranberry supplementation, indicating the activation of DAF-16. In addition, the phenotypic characteristics for *C. elegans* were observed to rule out the possibility that cranberry supplementation might alter the normal phenotypic characteristics of *C. elegans*. Taken together, our results indicate that the supplementation of cranberry is capable of increasing the healthy lifespan without any influence on organism's normal behaviors.

Poster # 118

Healthy Population Data for Rehabilitation Tasks in a Driving Simulator

Mentors: Dr. Johnell Brooks, International Center for Automotive Research

Students: Mary Mossey, Megan Collins, Chase Atkinson, James Broemer, Amy Strout, Vijay Bendigeri

This study investigated the performance of a healthy population in three rehabilitation tasks in a CDS-250 driving simulator (developed by DriveSafety©). Seventy males and 70 females between the ages of 18 and 29 participated. The three tasks participants completed were steering reaction time, brake reaction time, and a combined steering and brake reaction time. Therapists use these driving simulator tasks to work with patients who suffer from functional losses due to injury or illness. The purpose of this study is to gather normative data for tasks that will be used in hospitals and clinics as a baseline comparison for patients undergoing rehabilitation.



Poster # 119

National Youth Nutrition Survey Development by Creative Inquiry Students

Mentors: Dr. Cason L. Katherine, M. Catalina Aragon, Kattia Blanco, Yenory Hernandez-Garbazo, Food, Nutrition and Packaging Sciences

Students: April Beckett, Elizabeth Bennett, Susan Bowles, Heather Britt, Rylie Carpenter, Abigail Davis, Karli Hogsed, Anna Hayden Whitworth, Brianna Williams

The Expanded Food and Nutrition Education Program is designed to assist limited resource audiences on their knowledge and behavior related to diet and nutritional well-being. In order to enhance the current evaluation methods, six universities from across the country have joined efforts to develop and test impact evaluation tools for their youth audience. Creative Inquiry students were actively involved in one of the most important stages of this project. Cognitive interviews identify potential

problems that might lead to survey response error, and further better these tools based off the audiences responses. Students conducted these interviews with a sample of ethnically diverse children from South Carolina (n=15). Data collection results will be analyzed using Nvivo. Collaboration between creative inquiry undergraduate students, graduate students and an advisory panel was fundamental to successfully achieve this step of the EFNEP evaluation tool development process.

Poster # 120

Organized Crime

Mentor: Dr. Marjie Britz, Sociology

Student: Jarrett Maffett

Students in the Organized Crime Creative Inquiry seek to separate the stigmas attached to different criminal organizations including African American gangs, Irish gangs and the Italian Mafia. By comparing the portrayals of the groups in films such as American Gangster and The Departed, students hold regularly scheduled group discussions so that they can analyze similarities between the different groups as well as the validity of the cinematic depictions of the criminal organizations. Based on the students' analyses of the films, they are able to assess the validity of the organizations and apply their knowledge gained from additional readings and discussions to determine whether or not the criminal organizations are correctly portrayed. Students also study the art of plot development and strive to ascertain the morality of each character. The research is valuable because students are better able to understand the structure and organization of each of the crime groups.

Poster # 121

Development of a Diabetes Education Intervention

Mentor: Dr. Vivian Haley-Zitlin, Food, Nutrition, and Packaging Science

Students: Gabrielle Judd, Emily Lemmerick, Lauren Peagler, Anna Vaughan, Wayne Byrd, Caitlyn White, Jenna Rojek, Patricia Fedele, Natalie Roberts, Sarah Borowicz

Diabetes is on the rise in the US; 25.8 million adults and children have this disease (ADA, 2012). The incidence has risen in the American population, 7.8% to 8.3%, in the last 3 years. The SC adult population with diabetes is > 9% (CDC, 2011) and SC has always been one of the states with the highest percentage of the disease for the last 15 years. Action has begun across the state to spread awareness, prevention, and counseling to those at risk and already diagnosed. The Clemson Diabetes CI team has developed educational tools for counseling diabetic patients on improving their health and lifestyles. These include lessons to be delivered in group settings and cookbooks for individuals. We plan to use group education of lifestyle improvements and one-on-one support educational strategies to improve the lives of the patients while discovering which method is best accepted by patients.

Poster # 122

A Gender Gap in Scientific Production: a Bibliometric Analysis of Journal of Soil and Water Conservation, 2001-2010

Mentor: Dr. Elena Mikhailova, Agricultural, Forest and Environmental Sciences

Students: Biting Li, Avery Parmiter, Ariane Rodrigues

Bibliometric techniques and Web of Science were used to investigate the presence of women in the editorial board and publications in the Journal of Soil and Water Conservation from 2001-2010. Ninety-one percent (31 out of 34) of the editorial board were men. Sixty-eight percent of male editors (21 out of 31) published from 1 to 25 articles of their own from 2001-

2010. In contrast, only one out of the three female editors published her 2 articles during the same time period. The list of 100 most frequently published authors during this period indicated all male authors. Journal articles from randomly selected years (2004, 2006, 2009, 2010, a total of 310 articles) were analyzed for presence of female authors. Fifteen percent of articles (48 out of 310) are led by females. The results show significant gender gap in the editorial board of the journal and authorship of the articles.

Poster # 123

Preserving History: The Structural Analysis of Fort Sumter

Mentor: Dr. Sezer Atamturktur, Civil Engineering

Students: Will Alexander, Andrew Sheldon, Saurabh Prabhu

Fort Sumter earned its prestige in American history through the critical role it played in the Civil War. Located on a man-made island in Charleston harbor, South Carolina, the fort was designated as a national monument in 1948. Today this national monument continues to hold much symbolic significance in the nation's heritage. In order to allow future generations to appreciate this landmark, a detailed assessment of the structure's condition and an implementation of a sophisticated monitoring program are imperative. To accurately assess the condition of the fort, a variety of non-destructive and semi-destructive on-site inspection and evaluation techniques are completed. This evaluation primarily utilizes finite element modeling to simulate potential loading and damage scenarios. The results from these tests can be used to make predictions of significant damage, which can be applied to the maintenance and preservation of the fort.

Poster # 124

Learn EHR with TeachEHR

Mentors: Dr. Nancy Meehan, Nursing, Dr. Roy Pargas, Computer Science

Students: Lauren Rhodes, Casey Gooden, Kevin Vandermolen, Melissa Garwood, Gale McCall, Brittany Watson, Nancy Parra, Lisa Jennings, Taj Heyward, Ben Velky

Our creative inquiry team aims to teach electronic documentation skills in an educational setting. This year, our team focused on teaching the Medication Administration Record (MAR) portion of electronic health records (EHR) through our educational tool (TeachEHR). TeachEHR is a student-created simulation of an EHR system designed to introduce EHR competencies to students. The government is mandating that all health facilities implement an EHR system by the year 2014; therefore it is crucial that students become familiar with electronic charting. Our system contains features that healthcare professionals have to be familiar with while using commercial EHR systems. The MAR portion enables students to practice entering patient data regarding various aspects of medication dispensing, including dosage, frequency, and the method by which it was given. To ensure patient safety, it is vital to note all aspects of medication administration. We are currently collaborating to make TeachEHR compatible with Medication Dispense Systems.





Poster # 125

The Original Modern Package

Mentor: Dr. Robert Moore, Department of Food, Nutrition, and Packaging Science

Student: Rebecca Brown

How has iconic packaging progressed to accommodate modern packaging materials, specifically the new aluminum Coca-Cola bottles? I was prompted to choose this topic due to Coca-Cola's new and fascinating use of aluminum for creating bottles that mimic the original shape of their classic glass bottles. I find this a smart marketing move and plan on researching all of the benefits and drawbacks the Coca-Cola

Company has encountered by using this type of packaging. I plan on completing a complete profile on the aluminum Coca-Cola bottle which will include how it is made, what are the specifics that go into production, and how it compares to the old glass manufacturing process. This research will help better the community's knowledge on new forms of packaging and the ecological benefits they can provide.

Poster # 126

Culinary Nutrition: Wishing Apple Snack

Mentors: Dr. Marge Condrasky, Dr. Paul Dawson, Food, Nutrition and Packaging Science

Students: Jordan Ward, Timothy Broderick, Briana Foust, Courtney Chiang

The goal was to produce a healthy alternative snack for children that contained a serving of both fruit and vegetables. Through the use of the Stage-Gate product development process, the team completed the product concept in a timely manner while achieving the goals set forth. The concept consists of dehydrated apple chips and a chocolate dipping sauce blended with dehydrated vegetable powders in order to incorporate the full serving of vegetables. The 150-calorie snack contains a full serving of fruit and vegetables that is sure to stand out of the crowd from the energy-dense and non-nutrient-dense children's snacks currently on the market. Shelf life determinations along with sensory evaluations are the next steps needed to complete the product. The product is sure to please children of all ages while unknowingly providing nutrients as well as a full serving of fruits and vegetables that is sure to trump the unhealthy competition.

Poster # 127

Evaluating the Nutritional Values of Professional Developed Children's Recipes for Restaurants

Mentors: Dr. Margaret Condrasky, Food, Nutrition, and Packaging Science, Dr. William Norman, Parks, Recreation & Tourism Management

Students: Liz Dixon, Jamie Martin, Alex Munson, Lauren King, Emily Dennehy, Justin Huang, Amanda Ancona, Katherine Ancona, Christina Bell, Chris Milhouse

With the obesity epidemic in children on the rise, our group sought out to determine if there were nutritionally sound meals available for children in restaurants. The American Culinary Federation's (ACF) Chef and Child Foundation (CFF) has developed recipes for children and collaborated with Clemson University to develop nutrition facts and improve recipes that fall short of nutritional criteria. Students in the FDSC 450 Section 09 for Culinary Tourism analyzed the nutritional value of

the CFF recipes and worked together to redevelop those that needed nutritional improvement. The recipes were evaluated for appearance, taste, texture, temperature, and overall acceptability after every testing. Evaluations of recipes are currently ongoing but final recipes will be written up and explained. Final recipes also will be submitted to ACF and posted on their website for chefs across the country to use. This project was partially supported by Creative Inquiry

Poster # 128

Crowdsourcing Kanji Learning Methodology for Kanji Nonnatives

Mentor: Dr. Toshiko Kishimoto, Languages

Students: Ian Moore, Jon Barry, Molly Cross, Patty Greene, Jacqueline Mann, Ethan Picone, Marques Robinson, Ryan Shea, Nicholas Wourms

Current kanji learning methodologies for American college students are largely dictated by traditional learning methods proven successful in the primary education classrooms of Japan. The similarity in methodology of American college students and children living in Japan raises questions of effectiveness. If respective students' differ in environment, mental development, and practical usage, would it compromise the effectiveness of the current methodology? The Creative Inquiry, under Professor Kishimoto, implemented a novel approach in order to develop a cursory objective learning methodology for kanji non-natives by crowdsourcing student information via the internet. The study computationally analyzes data and correlates the crowdsourced trends of students to create a path forward for new Kanji learning methodologies. The study shows that students with varying levels of experience should approach studying differently. For this Creative Inquiry, kanji nonnatives refer to college students studying at American universities who were raised outside of a kanji tradition.

Poster # 129

The Learning Landscape Project: The Dacusville Middle School Math Garden

Mentor: Dr. Matthew Powers, Landscape Architecture

Students: Hannah Job, John Good, Nicolas Hernandez, Adam Bouknight, Ronald Thomas, Colleen Williams, Ally Hangartner, Lisa Girard, Katie Fronek, Brandon Green, Jamie Russell, Virginia Bailey, Beyza Sen

A Learning Landscape is a landscape specifically designed to enable teaching through interaction with the natural landscape. The project featured here focuses on the design of a learning landscape for Dacusville Middle School (DMS). The central feature of the DMS learning landscape is the math garden. The goal of the math garden is to help middle school students learn basic math concepts such as area, fractions, and equations. Clemson landscape architecture students initiated the design by analyzing the campus, meeting with school officials, surveying teachers and students, and presenting conceptual plans to a school-wide focus group. The final design features customizable, multifunctional spaces that teachers and learners can use to explore various concepts through experiential learning. In the end, students and volunteers actually built the math garden on the campus using funds provided by Creative Inquiry. The result is a garden that makes learning meaningful by bringing math to life.



Poster # 130

CUTakingCharge

Mentor: Dr. Gail DiSabatino, Student Affairs/Public Health Science

Students: Jillyn Mayer, Brittany Fennell, Megan Dorris, Natalie Forsberg, Callie Vogler

CUTakingCharge is in the midst of initiating a change surrounding the attitudes and behaviors of alcohol consumption. CUTakingCharge has implemented a variety of methods, such as focus groups and interviews, to measure students' attitudes and behaviors surrounding alcohol. CUTakingCharge also held an alcohol forum and a rally where students were able to publicly pledge a change in behavior. Currently, the members are taking on a new project to provide water at organized parties. Though no major conclusion has been made, short term results show that students are willing to support a cause related to reducing alcohol consumption evidenced by the number of participants involved in the Facebook and Twitter groups as well as those who are partaking in the supplication of cases of water. CUTakingCharge members are dedicated to finding ways to reduce the issue of binge-drinking and hope to obtain more concrete results as the project continues.

Poster # 131

Visualizing Curricula

Mentor: Dave Lee, Architecture

Students: Samantha Mabe, Ashley Colquhoun, Joy Newberry

Clemson University, like many universities with an architecture program, is constantly exploring ways to develop a more successful architectural education. This Creative Inquiry course explores the current architectural curriculum of Clemson's program, as well as programs throughout the nation, and researching new ways of improving the curriculum. This Creative Inquiry research project is partially supported by the Creative Inquiry program. The study first explored the history of architectural education and the possible future of architectural education. The study of future educational trends focuses on specializations and certificate programs. Recently, this study created visualizations of each of the NAAB-accredited architecture school's mission statements in order to determine the goals of each program. A survey is also being conducted about current and future architecture education. The information gathered will be used to develop further visualizations and explore possible specialization programs that can be implemented in architecture programs to help graduates be more successful in future practice.

Poster # 132

Gangsterism as a Film Genre

Mentor: Dr. Marjie Britz, Sociology

Student: Bobby Owens

The topic of gangsters in Hollywood has been the center of many debates throughout the years. The movies that involve gangsters have remained a staple in American cinematography for decades. The fascination with gangsters has compelled audiences to take a different look at how society treats crime and ethnic groups. The group watched films that portrayed gangsters of different ethnicity and in different context. The different groups that were examined included the Italians, the Irish, African American gangs, and the Russians. During this project the gangster genre was viewed with special emphasis placed on the role of women, corruption of authority, community involvement, good vs. evil, role conflict, and duality of role. The findings showed that Hollywood does a good job at making these films interesting but they are not always true to what really goes on in the gangster world.

Poster # 133

A Horse Show Team: An Integrative Approach to Horse Training, Marketing and Sales

Mentor: Dr. Kristine Vernon, Animal and Veterinary Sciences

Students: Savanna Coleman, Cali Johnson, Julia Hunsucker, Julia Tagher

There is only so much one can glean from a book or listen from an instructor in the classroom before you must work with a production system. Understanding theory is important, but theory and the realities of a production network are vastly different. In seeking careers in the equine industry, practical intelligence is the key to entrepreneurial success. These creative inquiry opportunities provide the option of extensive networking with all facets of the equine industry by allowing students to visit farms, lectures, and meet face to face with current industry professionals. These trips offer exposure to other regions of the industry that we would not otherwise have this opportunity. Not only do these trips provide alternative education; but also, provide students with the chance to acquire internships, graduate school, veterinary school, and even careers in the future. While classroom learning is a vital instrument to entering the field of equine science, it cannot be used to substitute for hands-on experience.

Poster # 134

Evaluating Sleep Quality in College Students

Mentor: Dr. June Pilcher, Psychology

Students: Amanda Padgett, Kristen Jennings, Katherine Sullivan

The main purpose of the study was to discern if a lecture educating students about the importance of sleep positively affected sleep habits of the students. In the study, the Pittsburg Sleep Quality Index (PSQI) was used to assess sleep quality and sleep disturbances. Nineteen items generate seven "component" scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, the use of sleeping medication, and daytime dysfunction. The sum of these components yields one global score. Thirty-one students were given a pre and post survey to determine whether their sleep habits improved. Significance was found for the habitual sleep efficiency component suggesting that after the sleep presentation, students made their sleep time more efficient. All other components were non-significant. These results show that information on better sleep habits can aide in the resources needed for students to improve the amount of time slept in bed each night.

Poster # 135

Maximizing Infiltration Rate via Rain Gardens

Mentor: Dr. Stephen Moysey, Environmental Engineering and Earth Sciences

Students: Andrea Creighton, Alexander Smolka, Matthew Finley

Rain Gardens are topographical features designed to detain and infiltrate runoff into the groundwater system. This project focuses on the effect of topography in the infiltration process. The topographies being tested include: bowl-shaped, ridged, tiered, and the original slope. Four rain gardens were constructed, 4'x4'x4', into a hill slope. Temperature and soil-moisture probes were installed to sample temperature and water content of different depths, while multi-channel ground-penetrating radar (GPR) was used to monitor average hydrologic conditions in the subsurface of each cell. To verify the ability of GPR to track changes in water content through time, an experiment was performed in a sand tank. Sixteen channels of multi-offset radar data were collected during a 2-hour irrigation experiment, which showed changes in the travel time of the bottom of tank reflection associated with changes in the amount of water in the tank. As communities urbanize, the detrimental effect of runoff becomes important, and maximizing rain garden efficiency is one remediation. This program was sponsored by the Creative Inquiry Program.

Poster # 136

Effect of Performing an Emotional Task on Psychological Energy

Mentor: Dr. Thomas W. Britt, Psychology

Students: Rebecca F. Wiener, Madison Mehder, Ashlee Baker, Anna C. McFadden

The present study examined the effect of performing an emotional task on physical, mental, and emotional energy. Additionally, this study investigated if a new measure of psychological energy would detect small changes in emotional energy perceptions. Participants ($n = 45$) first completed trait and state measures of psychological energy, empathy, emotionality, and need for affect. Participants were then exposed to either an emotional or non-emotional video and responded to the state survey a second time. Results of a repeated measures ANOVA revealed a significant 3-way interaction [$F(2, 42) = 4.18, p = .02$] of energy type (mental, emotional, physical)*condition (emotional vs. non-emotional)*time (pre-post). These results showed that individuals reported less of all three types of psychological energy after completing the emotional task. Additionally, the largest decreases were seen with perceptions of emotional energy. Practical implications and limitations will be discussed.

Poster # 137

Soil Inventory of Tradition Way, Rock Hill, SC

Mentors: Dr. Elena Mikhailova, Dr. Christopher Post, Agricultural, Forest, and Environmental Sciences

Student: Thomas Reburn

The objectives of this study was to conduct a soil inventory of a suburban plot in Rock Hill, SC using the Web Soil Survey. Thirteen soil samples were collected and analyzed for soil chemical properties and major nutrients in the Clemson University Agricultural Services Laboratory. They are divided up by land use into four strata: 5 samples along a stream, 3 from turf areas, 2 from undeveloped and eroded sites, and 3 from the banks of a water retention pond. This suburban site is occupied by Urban Land-Cecil complex, 2 to 10 percent slopes, moderately eroded. Cecil belongs to the soil order of Ultisols. Urban Land-Cecil complex is not prime farmland.

Poster # 138

Development of a Metal Foam Manufacturing Process for Increased Mechanical Property Control

Mentor: Dr. Joshua D. Summers, Mechanical Engineering

Students: Apurva Patel, Jordan Lane, Timothy Hess

We assessed the effects of herbicide treatment on plankton communities in and around vegetation of pond systems. Habitat© herbicide was sprayed on emergent vegetation within the ponds and samples of plankton communities were collected on multiple dates. We sampled on the Clemson University campus in six ponds from September 19 to November 11, 2011. There were seven separate sampling dates during this time. Three ponds were not treated with herbicide and served as control samples. Sampling of the plankton community in the water column consisted of two samples per pond: one taken in vegetation and one out. We identified, quantified, and measured plankton species in each sample. We also collected water quality data (temperature and dissolved oxygen). Here we make inferences as to how a plankton community changes over time after an herbicide application.

Poster # 139

Analysis of Microbial Diversity within Hunting Island High and Low Salt Marsh Sediments Using Standard Culturing Techniques, DGGE, ARDRA, and Sequencing

Mentor: Dr. Michael Henson, Biological Sciences

Students: Sandra Bediako, Ryan Hammonds, Megan Burdette

The marine environment is a prolific resource and an untapped habitat which makes it ideal for the exploration of less studied organisms. Salt marshes are coastal wetlands that are flooded and drained by salt water due to tidal activity. The marsh soil is composed of deep mud and peat that is created by microbial decomposition of plant matter. The decomposition is accomplished by several groups of microorganisms and results in a condition called hypoxia. The microbial activity within the peat produces a sulfurous odor that is characteristic of salt marshes. Standard microbiological techniques and molecular techniques were used to analyze salt marsh sediments collected from Hunting Island state park near Fripp Island in South Carolina. Denaturing gradient gel electrophoresis (DGGE) and Amplified ribosomal rDNA analysis were used to evaluate the bacterial diversity with the high marsh sediments and low marsh sediments. Various bacteria and fungi have been isolated and characterized using cellobiose or xylose as a substrate. This project was partially supported by Microbiology 403/603 Laboratory.

Poster # 140

Team Tribology: Multi-disciplinary Exploration of Materials Friction, Lubrication and Wear

Mentors: Dr. John DesJardins, Bioengineering, Dr. Marian Kennedy, Materials Science and Engineering

Students: Jessica Canavan, Matthew Cogburn, Jaclyn Kovach, Taylor Pate, Alexander Tam

This semester, the “Team Tribology” Creative Inquiry focused on presenting at the Engineering Exposition, creating and calibrating a wear bench, and testing properties of materials. For the Engineering Exposition, coloring and race track activities were developed to teach elementary school children about friction and wear. A collaborative testing effort with students at Tuskegee University was established in order to build and calibrate a wear bench to test material properties at the two sites, eliminating bias. Using materials generously provided by Milliken & Company and a linear reciprocating wear bench, composites were tested, and the results were detailed. This study analyzed properties of materials to be used in industry. Hopefully, all of our research will inspire future engineers. The project was partially supported by the Creative Inquiry program as well as Milliken & Company.

Poster # 141

Popular Science Journalism

Mentors: Dr. Lesly Temesvari, Matthew Johnson, Biological Sciences, Curtis Newbold, Rhetorics, Communication and Information Design

Students: Rachel Wasylyk, Thomas Larrew, Briana Kloc, Danielle Tom, Blake Bendixen, Lana Ward, Remember Watts, Megan Woodard

A team of student journalists research current advancements in science and translate the information into a form comprehensible to the public. Closing the gap between society and the scientific community is imperative. With immense amounts of research being conducted daily, it is important for the public to remain well-informed – especially in a democracy where people need to make educated decisions. The students use science blogs, primary literature, and science journal websites to collect information – as well as interviews with researchers at Clemson. A detailed system of student teaching, collaboration,

and extensive peer review is utilized to produce high-quality publications. All the articles are published in a magazine, *Tigra Scientifica*, which is distributed on Clemson's campus and in the surrounding area. In addition to this, a column is printed weekly in Clemson University's newspaper, *The Tiger*. This project began in Spring 2011 and is partially supported by the Creative Inquiry program.

Poster # 142

Developing Antimicrobial Mixture for Foodborne Pathogen Control

Mentors: Dr. Xiuping Jiang, Dr. Thomas Yeargin, Food, Nutrition and Packaging Science

Students: Ellison Taylor, Chris Covey, Allison Setser, Sharbel Elhage, Courtney Evans

Some strains of *Escherichia coli* are pathogenic and cause human illnesses. This bacterium can be found in food, water and the environment. The goal of this experiment was to identify if a synergistic relationship exists among different classes of antimicrobials in inhibiting *E. coli* that could be applied as a wash solution in the food industry. The inquiry focused on two antimicrobials, lactic and caprylic acids. Caprylic acid is a medium chain fatty acid that affects *E. coli*'s substrate utilization, and lactic acid is a short chain fatty acid that affects the growth, amino acid transport, and oxygen consumption of *E. coli* among other bacteria. In this study, both the Kirby-Bauer disk and well tests were used to test the potency of these organic acids against *E. coli*. The results of the two inhibition tests reiterate previous findings that lactic acid is consistently effective at 3% and 5% in preventing the growth of *E. coli*. However, caprylic acid was almost completely ineffective in inhibiting *E. coli* using both tests, which contradicted previous findings as reported in the literature. Therefore, caprylic acid has been eliminated from this study and other antimicrobials are currently under evaluation.



Poster # 143

An Examination of the Effects of Affective Job Responses, Engagement, and Motivation on Employees' Ultimate Intentions to Leave Organizations.

Mentor: Dr. David Knox, Institutional Assessment

Students: Brandon Watson, Celanie Morgan, Julie Gambrell, Kalifa Oliver, Lauren Ellis, Allison Wallace

Employee turnover is a tremendously costly problem in the American workforce and has therefore become a popular organizational research topic. The present study examines how the turnover intentions of employees from a large Southeastern university are affected by affective commitment, job satisfaction, organizational engagement, and motivation. This study also examines how affective commitment functions as a moderator of the relationship between affective commitment and turnover intentions. The data was collected through an online survey of over 500 university staff members. This research can help organizations to better understand the factors that contribute to employees' desire to leave their job. By understanding predictors of turnover intentions, organizations can proactively work to provide the type of support necessary to make workers want to stay in their current employment situation. Results will be available at the time of presentation. This project was partially supported by the Office of Institutional Assessment and the Creative Inquiry Program.

Poster # 144

Visual Attention and Reaction Times of Healthy Populations

Mentor: Dr. Johnell Brooks, International Center for Automotive Research

Students: Megan Collins, Chase Atkinson, Alex Beck, Shawn Mordhorst, Marlena Wesh, Mary Mossey, Vijay Bendigeri

This study analyzed visual reaction time data from over 90 males and over 90 females between ages 18 and 29 as well as over 20 males and over 20 females between ages 50 and 78. Vision Coach (developed by Perceptual Testing Inc.) is an interactive light board that is being used by occupational therapists for rehabilitation of patients, training professional athletes, military and law enforcement professionals. The current study seeks to collect visual attention and visual reaction time data from healthy individuals, for later comparison to other populations such as those with disabilities or visual problems, and to driving skills. Using a rehabilitation tool like Vision Coach to improve visual functioning, visual processing, and muscular coordination can enhance driving abilities, while knowledge about drivers' capabilities could provide valuable input to vehicle manufacturers to improve design and assistive technologies.

Poster # 145

Tigers for Tigers Coalition

Mentors: Dr. David Tonkyn, Biological Sciences, Louis Bregger, International Programs

Students: Haley Kernell, Sean Carnell, Carmony Adler, Haley Kernell, Grace Fredrickson, Molly Willison, Maria Campolo, Carolyn Lennon, Cassidy Poole, Brian Lang

With the extinction of three tiger subspecies, fewer than 3,200 tigers remain in the wild. Conservation and research are our top priorities in order to bring the tiger back from the edge of extinction. We are currently working on organizing a national student organization on the endangered tiger and forming a steering committee with representatives from other tiger-mascot schools to plan this national organization.

Our goals are: 1) to establish a student-run national organization with partners at each participating university devoted to the preservation of tigers in the Id; 2) to have each chapter partake in an annual/unified fundraiser in which all proceeds go towards tiger conservation; 3) to expose students to current conservation needs from experts in the field; and 4) to identify areas where collegians can become directly involved. At the conclusion of the summit, we would ensure that our efforts are visible, continuing, effective, and educationally valuable.

Poster # 146

E-mails Gone Wild: The Effects of Cyber-Sexual Harassment on Affect in a Simulated Work Environment

Mentors: Dr. Robin Kowalski, Amber Schroeder, Jessica Doll, Psychology

Student: Suzannah Isgett

Sexual harassment can influence job performance and individual affect. The current study was designed as a first step to explore the effects of cyber-sexual harassment within a simulated workplace. Participants received "job tasks" that were paired with either sexually harassing or neutral statements from an opposite-gendered "supervisor." After completing each round, participants were given measures of affect (PANAS), perceived task difficulty, and future willingness to work with each "supervisor." Participants' levels of negative affect in the sexually harassing condition were significantly greater than in the neutral condition, and participants were also significantly less willing to work with the sexually-harassing "supervisor." The results suggest that cyber-sexual harassment may be related to negative affect. Future researchers may examine how cyber-sexual harassment affects employee task performance and withdrawal behaviors.

Poster # 147

Screening for Factors Required for Fruiting of the White Rot Fungus *Stropharia rugoso-annulata*

Mentor: Dr. J Michael Henson, Biological Sciences

Students: Tradd Cotter, Jain Abhiney

White rot fungi are well known for their valuable enzymatic properties and ability to degrade and metabolize a wide spectrum of organic compounds. Although certain white-rot fungi, such as *Stropharia rugoso-annulata*, are easily grown in pure culture, fruiting is not possible without the addition of non-sterile soil from its native habitat. In this study, we are evaluating whether abiotic or biotic factors from the soil will initiate fruiting and sporulation. The possible abiotic factors will be measured by liquid chromatography-mass spectroscopy while the biotic factors will be assessed using dilution to extinction techniques and Denaturing Gradient Gel Electrophoresis. These findings will be further evaluated.



Poster # 148

Childhood Obesity in the Latin American Community

Mentor: Dr. Janice Lanham, Nursing

Students: Samuel Baxter, Brittany Watson, Jackeline Galvez, Amy Moon, Tiffany Hughes, Paige Pribonic

This creative inquiry focused on childhood obesity, which has received national attention in recent years-- largely affecting minority children. There have been great strides in the fight against childhood obesity, but there is still work to do. How do we combat childhood obesity among minority populations in America? In search of an answer, the group conducted a literature review and found a few major factors that increased the risk of a child being at risk of obesity: minority, socioeconomic status, parent(s)' degree of education, and ability to pay for healthy food options. The group concluded the best way to combat childhood obesity was to design an activity book that educated, motivated, and improved upon the knowledge and implementation of a healthy lifestyle among minority children. This project carries a solution to childhood obesity, through education and illustration, which is culturally competent.

Poster # 149

Creating a Learning Module for Production of Probiotic Juice Based Drinks and Other Medical Foods

Mentor: Dr. Felix Barron, Food, Nutrition and Packaging Science

Students: Matt Eisenstat, Kelly Merchant, Amanda Truesdale, Austin Abellana, Paul Lagarenne

Medical foods are any food product with ingredients that have been indicated in the treatment of a medical disorder. Probiotics have quickly become one of the most popular and supported medical food ingredients currently in circulation. Probiotics are bacterial strains that are grown in food for consumption by humans in medical foods or supplements. They are transient colonizers of the human gut and have been indicated in several metabolic disorders. This investigation intends to create learning modules to teach the skills needed in creating, packaging, and analyzing medical foods.

Poster # 150

Class Syllabi, General Education, and ePortfolios

Mentor: Dr. Gail Ring, Undergraduate Studies

Students: Stephens Wyatt, Katherine McMann, Jordan Laney, Madison Hagerty, Rebecca Kinross

Our research examines how faculty syllabi can help support students' understanding of the general education competencies. Specifically, our research focuses on upper-level courses in which students have the potential to generate an artifact for the critical thinking competency. There are several factors that contribute to a successful artifact for this competency: integration throughout the major; a capstone experience; and, in some cases, an internship. A comparative analysis of artifacts, the courses from which these artifacts originated, and the syllabi of these courses was conducted. Our preliminary findings suggest that capstone courses and senior design projects typically generate successful artifacts while artifacts that focus on a single course or artifacts generated from freshman and sophomore courses do not fare as well. We hope sharing these findings with faculty and students will help students better understand the critical thinking competency and, as a result, artifacts for this competency will improve.

Poster # 151

Digital Images of Food Products

Mentor: Dr. John McGregor, Food Science

Students: Kristiaan Fish, Benjamin Wittington, Kappel Nakita, Mary Tanner, Allison Anderson, Jennifer Goodman, Joanna Gorcesky, Amy Haile, Susan Mathews, Candace Sapp

Many food retailers now market and sale their products through online websites. Products are typically displayed as digital images of the external package or as a generic image of the food item. The purpose of this investigation is to determine whether there is a difference between consumer preferences of food based on the appearance of food in photos versus actual samples of the food. To do this, one set of panelists will be given photos of five salsa samples and five ranch dressing samples to evaluate, and another set of panelists will be given physical samples of the same five salsa and ranch samples to evaluate. It is predicted that the ratings for the two types of samples will not be statistically different.

Poster # 152

Clemson Student Organic Farm

Mentors: Dan Harding, Robert Hogan, Architecture, Dr. Geoff Zehnder, Agricultural, Forest and Environmental Sciences - Entomology

Students: Aaron Bowman, James Baxley III

The Clemson Student Organic Farm project was a multi-semester Creative Inquiry course that investigated how architectural interventions could support the development of sustainable agriculture within the university environment. The project included research into the history of southern agrarian culture and building typologies as well as the history of Clemson as both an agricultural school and the site of a former plantation. Local food represents a critical component of sustainable communities and the Clemson Organic Farm is uniquely positioned to serve as an advocate for and working example of sustainable agriculture in practice. The student teams were tasked with identifying assets and strategic opportunities for interventions to support the operation and mission of the farm, several of which have been realized as student design+build projects on campus. The project created opportunities for applied research through service learning and an opportunity to support economic, environmental, and cultural sustainability. This project was partially supported by the Creative Inquiry

program, the Community Research and Design Center, and the Clemson Sustainable Agriculture program.

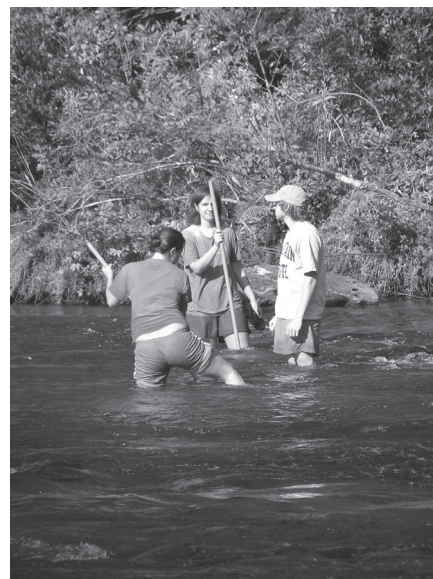
Poster # 153

Exploring ePortfolios: From Nursing Education to Nursing Practice

Mentor: Sheri Webster, Nursing

Students: Shannon Burkhalter, Ashlan Ferguson, Sydney Edwards, Grea Boyd

Question: This creative inquiry (CI) will focus on guideline development for use of the academic ePortfolio as both learning and marketing tools of baccalaureate nursing graduates. Healthcare employer's feedback will be elicited on ePs developed with and without the use of the guidelines. **Methods:** This exploratory study will include demonstrating the learning eP developed with the new guidelines and without the new guidelines to a group of healthcare employers. Both quantitative and qualitative data will be collected via survey and interviews. **Results:** Guidelines for the development of ePs promoting their dual use by baccalaureate nursing graduates as both educational/learning and professional/marketing tools will be established and exemplar ePs will be created. **Conclusion:** Baccalaureate nursing students will have appropriate guidelines to aid them in the development of an eP that will transition from a learning tool to a marketing tool for employment. This project was partially funded by Creative Inquiry.



Poster # 154

A Nanobrewery Investigation in the Science of Fermentation

Mentors: Charles Thornton, Agricultural & Biological Engineering, Dr. Timothy Teitloff, Mathematical Sciences, Dr. Terry Walker, Environmental Engineering and Earth Sciences

Students: David Carey, Adam Mangel, Peter Thompson, Jason Raines, William Strum, Michael Mudge

What do beer, pizza, and sustainable biofuels have in common? Other than what sounds like an interesting Friday night, each of these are products of fermentation. Zymology, the study of fermentation and yeast, is a science widely applied to the production of fuel, pharmaceuticals, and food (including beer). Through construction and operation of a nano scale brewing system we investigate the chemical and biological processes associated with fermentation and how varied operating parameters and feedstocks can affect the final product. Data obtained during this research will contribute to a future engineering course regarding Biofuels Production Technology and Strategies.

Poster # 155

It's In The Bag!

Mentor: Dr. Kay Cooksey, Food Nutrition and Packaging Sciences

Students: Michael Amico, Kaitlin Elliot, Gillian Fruth, John Kirkland, Josh Layfield, Benjamin Lagare, Isaac Levin, Adam McDonnough, Anna Miller, Marcus Mrazek

In reaction to the public's rising concern for environmental footprint, many cities across the country are reducing, and even eliminating the use of plastic bags for retail use. Through examination of current literature and case studies comparing the

environmental effects of paper, plastic and reusable bags, we plan to uncover the unbiased truth on each of their environmental footprint, and in the process, debunk any myths and rumors concerning grocery and retail bags. We seek to examine the underlying reasons for the public's concerns of single-use bags, and even packaging in general, and address each of these issues by researching and finding the unbiased facts about their true impact on the environment. In addition, legislative actions and consumer and industry response to those actions will be illuminated. Ultimately, we will propose the best solution concerning bag material for retail use based on economic, social and environmental impact.

Poster # 156

Horse Judging Teams – Team-based Learning in the Horse Industry

Mentor: Dr. Kristine Vernon, Animal and Veterinary Sciences

Student: Caitlin Widener

The critical thinking, persuasive speech, and decision-making skills learned through competitive horse evaluation can be invaluable to a student's experience both in college and in the professional sector. These abilities assist students in the classroom by preparing them for presentations and communication with professors and in life beyond college by providing them with the terminology and analytical abilities needed to speak with industry professionals, possible future clients and even those outside of the equine industry. Through the Horse Judging team, students gain exposure both to the competitive horse world and gain vast industry experience through farm tours and the chance to interact with equine professionals from all sectors of the industry, from Arabians to Quarter Horses to Hunters and beyond.

Poster # 157

Primitive Recreation in the Clemson Experimental Forest

Mentor: Dr. Elizabeth Baldwin, Parks, Recreation and Tourism Management

Students: Jess Sowell, William Sowell, Cindy Nigro

In 2010 a survey was done on the campus of Clemson University about the student knowledge and use of the Clemson Experimental Forest. It was determined that most respondents were unaware of the forest, the location of the forest or the recreational resource provided to students. As a result of further surveys the desire of a picnic area and campsite proved to be supported by many respondents. A site was chosen and a primitive picnic shelter and campsite have been built. As a result of this project a second creative inquiry has started a site assessment of the new site in order to develop it further, as well and make recommendations for use and sustainability of site.

Poster # 158

Microbial Community Mediated Reduction of Carbon Dioxide to Higher Molecular Weight End Products through the Consumption of Electrical Current.

Mentor: Dr. J. Michael Henson, Biological Sciences

Students: Yi Jie Wang, Jerrie Onley, Ryan Hammonds

The purpose of this research is to develop microbial communities capable of consuming electric current to reduce carbon dioxide to biofuels. Environmental samples of mixed microbial communities have exhibited the potential to catalyze the reduction of carbon dioxide to higher molecular weight carbon compounds using electrons provided from a graphite electrode. This research was conducted using a mixed microbial community from a cow's rumen to reduce carbon dioxide to acetate

through the consumption of electrical current. Initial electron recovery as acetate has been as high as seventy six percent. The conversion of carbon dioxide into acetate through the consumption of electricity provides an attractive means of storing electrical energy in the form of carbon bonds.

Poster # 159

The Economic Impact of Binge Drinking on Clemson University Students

Mentor: Dr. Denise Anderson, Parks, Recreation, and Tourism Management

Students: Lorraine Lobascio, Jonathan Brazeal, Ashton Cook, Hannah Fellers, Jacqueline Gibbs, Anthony Johnson, Walter Legette, Sarah Miller, Brianna Rollins, Meghan Scanlon

The purpose of this study is to research the economic impact of binge drinking on Clemson University students. The study intends to learn about Clemson University students' current drinking habits and how they choose to spend their money, particularly on alcohol. The percentage of students' income that is spent on alcohol will be considered along with how students budget their money for alcohol expenditure. In addition, the study will determine whether more binge drinking is done in public venues such as bars, or in private settings such as parties and houses. The results from the mixed methods approach will provide an idea of how expensive drinking is for a Clemson University student, and how they limit their spending without necessarily limiting their drinking. Research findings will be submitted to alcohol awareness groups on campus to aid in future alcohol-related studies and alcohol awareness workshops.

Poster # 160

In Their Voices: The Experiences of Postsecondary Students with LD and/or ADHD

Mentor: Dr. Jennie Farmer, Teacher Education

Students: Christy Monroe, Shannon McNellis, Shelby Arneberg, Nathalie Matthews, Kirsten Nelson

Students with learning disabilities (LD)/ADHD experience difficulties with academics and social-emotional levels that persist into adulthood. They attend postsecondary institutions at a lower rate than their peers without disabilities. They are unlikely to seek help for disability related needs due to a desire to remain anonymous and belief that assistance will not be helpful. The purpose of this study was to investigate the school experiences of postsecondary students with LD/ADHD related to their disability and how their disability has impacted their lives and relationships. Participants completed three oral history interviews about their experiences with LD/ADHD related to schooling and personal relationships. Preliminary results indicate the social-emotional struggles related to the students' disability were more significant in their lives than the academic difficulties. Our belief is that if we know more about these students' experiences, then we can modify interventions to make them more effective, thus increasing outcomes for students.

Poster # 161

3T3 Fibroblasts Solving Mazes in Response to Growth Factor Concentration 3T3 Fibroblasts Solving Mazes in Response to Growth Factor Concentration

Mentor: Dr. Delphine Dean, Bioengineering

Students: Elliott Mappus, Amanda Nguyen, Brian Peterson, Tyler Harvey, Erik Hammes, Mary O'Kelly

In wound healing, fibroblasts migrate to the site of injury and serve an integral role in repairing and healing the wound. Understanding of the migration mechanism and effects of fibroblast growth factor is vital. In order to study the fibroblast

migration mechanism, we examined the process of wound healing interrupted by a physical barrier when two leading edges of fibroblasts are separated by a physical maze constructed from polydimethylsiloxane (PDMS). In addition, we are studying cell reaction to chemical barrier mazes using polyethylene glycol and fibronectin. The results of these studies will be compared to mathematical models of cell growth in response to chemical soluble factors. Our long-term goal is to build a model to predict cell growth and migration in 3D that can be used to help design novel wound healing therapies.

Poster # 162

Louisiana Oyster Reef Restoration

Mentor: Dr. Caye Drapcho, Environmental Engineering and Earth Sciences

Students: Heather Sprague, Melissa DeSantiago, Wyatt Chip, Cynthia Westmoreland, Carolyn Coffey, Peter Kenneson

This project focuses on presenting our volunteer work with the Oyster Reef Restoration project that was held in the Rockefeller Wildlife Refuge on the Gulf coast of the state of Louisiana. As of now, our project has focused on researching the benefits of oyster reefs in our coastal ecosystems. We have also looked at different reef designs, quantifying carbon dioxide sequestration, and other physical and biological aspects of oyster reefs. Travel to the Gulf Coast was partially supported by the Creative Inquiry program. Funding has provided a first hand opportunity to work on the Gulf coast and help remediate the loss of oyster reefs in the world. Future work on this project includes more oyster reef research as mentioned above.

Poster # 163

Trailgating

Mentor: Dr. Leidy Klotz, Civil Engineering

Students: Patrick Daffin, Abigail Richardson, Carlie Metzger, Samantha Cooks, Tyler Garrett

Use our unique/diverse skills, talents, and innovative perspectives (what some may call naivety, we call brilliance) to be change agents both at Clemson and in the world at large. We will continuously innovate, design, educate, and communicate our movement to ensure we manipulate (whoops motivate :) the masses and KILL the sustainability status quo!

Poster # 164

Transition to Motherhood in Low Socioeconomic Women

Mentors: Dr. Lisa Duggan, Dr. Nancy Meehan, Nursing

Students: Brittany Watson, Laura McLachlan

Becoming a mother is a transitional process. Little research has been performed on the experiences of low socioeconomic women as they adjust to motherhood. This study aimed to analyze the transition to motherhood among low socioeconomic first time mothers. The data was subjective and gathered through journals and interviews with pregnant women of low socioeconomic status at the Greenville Hospital System OB/GYN Clinic of Greenville, South Carolina. Results showed the participants felt uncertainty regarding pregnancy and motherhood, faced financial and physical challenges, planned for the arrival of their infant, and examined the parenting styles of others. Despite preparation and prenatal classes, the women still felt unprepared for motherhood once their infants were born. Qualitative analysis of this data can guide additional studies in addressing the transition to motherhood among women of low socioeconomic status.

Poster # 165

Diversity in National Parks

Mentor: Dr. Elizabeth Baldwin, Parks, Recreation, and Tourism Management

Students: Rob Doneth, Justin Chatloch Linsey Hudson, Jacob Bennett, Kathleen Benton, James Revis, Justin Dawley, Zachary Ballentine, Abby Perrin, Paul Nelson

In order for national parks to be relevant to the changing population of the United States they need to understand more about the diversity of users that currently do and many times do not use parks. There are many parks with local populations of immigrants not familiar with the concept of a national park. The Gatlinburg, TN area adjacent to the Great Smoky Mountains National Park is one such area. This study has focused on the growing Hispanic community living next to the national park to find out more about what they think of the park, how they use the park, and what barriers currently exist to park use. This research has used interviews with local community members and park officials to develop and understanding of the community in an effort to support the parks efforts to become more relevant.

Poster # 166

Examining the Effect of Calf Housing Location on the Stress Response in Primiparous Dairy Cows and Neonatal Calves

Mentor: Jillian Fain, Animal and Veterinary Sciences

Students: Kaylee Quinn, Will Basinger, Dylan Djani, Kendrick Lindsey, Kalyn Reed, Nathan Leckie, Elizabeth Hood

In an ongoing study, the effects of calf separation on reproductive parameters in primiparous cows as well as growth rates in neonatal calves were assessed in relation to stress response. There are two designated animal groupings with controls having removal from the dam at birth and housing in isolated calf hutches and the treatment group housed in close proximity to their dams allowing visual, olfactory and auditory stimulation but retaining physical isolation. To determine the effects of separation stress, hip-height, heart rate, weight, and urine cortisol are collected from calves 24 and 48 h postpartum then weekly until weaning. Dams are scanned weekly, starting 2 weeks postpartum to determine follicular development while blood and urine samples were collected weekly, starting directly after parturition, to determine progesterone and cortisol levels, respectively. Several 24 h urine collections have been made to establish the diurnal nature of cortisol on the Clemson farm. There is an anticipated higher stress response in calves that are housed in close proximity to their dams prior to weaning.

Poster # 167

Lean Principles and Lean Accounting in Practice

Mentor: Dr. Frances Kennedy, Accounting and Finance

Students: Kristen Doolittle, Anthony DePalo, Todd Rapoport

Students on this Creative Inquiry team have been given the opportunity to participate in a corporate training program and to lead a lean improvement kaizen at Clemson University. Once the students successfully completed a training program, they received a Lean Six Sigma project in which they collected and analyzed data, and recommended improvements to a process and solutions to a problem. At the end of the kaizen project and upon acceptance of the team's recommendation by University management, the students will have earned a Green Belt status in the Lean Six Sigma program. This project was partially supported by the Creative Inquiry Program. With their generous support, members were able to acquire fundamental skills that will be carried with them for the rest of their lives, while being given the opportunity to help improve the University that we all know and love.

Poster # 168

Understanding Recreational Use in the Clemson Experimental Forest

Mentor: Dr. Elizabeth Baldwin, Parks, Recreation, and Tourism Management

Student: Jessica Gibson

There is little known about the profile of the recreational users of the Clemson Experimental Forest, yet the 17,000 acre forest has many trails with many different user groups. This project will focus on collecting data throughout the year at multiple sites in the forest using isurvey, a new portable survey tool on iPads that allow standardization of questions for generalization. This data will be collected at multiple sites in the forest, along with qualitative responses, and notes on maps. This will allow us an overview of use, along with an understanding of potential conflicts, and values help by recreational users of the forest. Data has been collected continuously from October 2011 to the present.

Poster # 169

The Effect of Herbicide Application on the Benthic Environment In and Out of Vegetation

Mentor: Kate Sheehan, Agricultural, Forest and Environmental Sciences

Students: Justin Holladay, David Saari, Seth Davis

Herbicide has become widespread used to kill unwanted vegetation, but little is known about its effect on the surrounding environment. In this study, we examine how the application of herbicide to several ponds affects the benthic community. Six ponds were used at the aquaculture facilities at Clemson University. By examining organic content of soil, enumerating and classifying organisms, and measuring organism size, we attempted to identify differences among benthic parameters. Samples from experimental (herbicide applied) ponds and control (no herbicide) ponds were sampled over time in order to determine what effects, if any, herbicides have on benthic fauna. We also assessed benthic communities in close proximity to vegetation and in areas without vegetation. The majority of organisms found were *Physella* (snails), and were used as a identifier of causative effects. Samples taken immediately after herbicide treatment did not differ significantly from samples taken over the following twelve-week period.

Poster # 170

The Ecology of the Invasive Snail Species *Bellamya Japonica*: Studies of Dispersal, Fecundity, and Substrate Preference Testing

Mentor: Dr. John Hains, Biological Sciences

Students: Samantha Hardwick, Leland Stoddard, Colleen Milsted, Evan Meadows, William Colones, Gregory Ricalde, William Shipes

The ecology and dispersal of *Bellamya japonica* in Lake Hartwell began around 2006. Our studies of phototactic behavior are completed and we are now studying reproductive and other behavioral characteristics. The spread of this invasive species is a function of both its dispersal and its reproductive rate. We have begun field experimental studies of fecundity and lab experimental studies of factors which might affect dispersal. These studies are designed to identify rates and patterns of fecundity and substrate preference. Field specimens are confined in observation chambers in the field and weekly observations are made of the number of offspring. Lab studies of preference, if any, for different substrate textures. In addition, field surveys using underwater video surveys are being designed to describe the extent to which this population has dispersed in Lake Hartwell. Combined, these studies will the ecological response of this invasive in a new habitat.

Poster # 171

An Assessment of the Use of Bite Count as an Energy Intake Monitor in a Cafeteria Setting

Mentors: Dr. Eric Muth, Dr. James Salley, Psychology

Students: Mallory Westmoreland, Mary Ann Brown, Rebekah Dixon, Haley Good, Courtney Jackson, Phil Jasper, Kevin Kohm, Randy Owens, Carie Strickland, Allison Sowell

Background: Self-monitoring is critical to the success of the treatment of obesity. Feedback from a wrist-worn device designed to monitor bite count could potentially reduce the need for expert review and increase compliance. The purpose of this study is to assess the accuracy of the device in a realistic, cafeteria setting with a variety of foods and eating styles. Methods: Data are being collected from 300 participants eating in Harcombe Dining Hall. Participants eat in groups of four. Each participant is monitored by automated tools and trained observers. Expected Results: It is expected that overall the bite counter will accurately count bites. However, algorithms may need to be further developed for certain behaviors. Further, it is expected that bite count will correlate with caloric intake. Conclusion: An accurate, objective tool for monitoring eating behavior can help people reduce their caloric intake and combat obesity.

Poster # 172

Nutrition Education Intervention with Clemson Students

Mentor: Rita Haliena, Food, Nutrition and Packaging Science

Students: Nancy Teston, Mary Margaret, Vanessa Barrow, Katelyn Berisha, Kerrie Bond, Donna Boyd, Jo Corley, Josh Downey, Matthew Francis, Valerie Smith, Rebecca Stout, Kylie Walford

The transition from high school to college may be difficult for many young adults. Weight gain may be one of the results of this difficult transition as a result of stress, increased snacking, and changes in exercise habits to name a few. According to a study by Gropper, et al (Journal of American College Health, 2009), the “freshman 15”, referring to a weight gain of 15 pounds during the first year of college, may be a myth. According to the study the researchers found 2/3 of the students did gain weight over the first year but only about 5% of the over 200 students gained the famous “freshman 15”. To enhance the nutritional knowledge of Clemson freshman and hopefully eating behaviors, this creative inquiry for the past two semesters have designed nine interactive information tables at several dining halls. Evaluation techniques will be utilized to determine the overall effectiveness.

Poster # 173

Collaborative Venues for Engagement in Undergraduate Research: Participants’ and Facilitators’ Experiences in Intergroup Dialogue

Mentors: Dr. Cheryl Warner, Counselor Education, Dr. Rebecca Morgan, Clinical Mental Health, Dr. Jeffrey Kenney, Gantt Center

Students: Jesse Taylor, Marie Rosasco, Kendra Smith, Anthony Ford, Sara Burns, Johnson Marlon, Alanna Walker, Jackeline Galvez, Jevonta Henderson, Emily Fox, Piper Laverne

How does participation in Intergroup Dialogue affect participants? How does participation affect facilitators? What are the skills and competencies learned through Intergroup Dialogue facilitation? 11 Facilitators, chosen by CI Faculty Leaders, developed and then implemented Intergroup Dialogues to over 4,000 new students, including six topics at an average of 2 dialogues per week each. Topics dealt with social identities and included: crossing borders, heterosexual norms, interracial dating, gender, body image, and religion and spirituality. Facilitators learned Intergroup Dialogue facilitation skills via

Intergroup Dialogue facilitation, delved into research questions and processes, developed competencies in diverse interactions, and prepared for the world of work in a global society. PDF CI is a multi-level research process that observes the use of dialogue to better understand polarized societal issues.

Poster # 174

Engineers Without Borders: Making Impacts in Liberia

Mentor: Dr. Mark Schlautman, Environmental Engineering and Earth Sciences

Students: Kevin Keith, Kali Luffy

Each year, a majority of the world's population lives in conditions far below that of the poverty line conceived of in most industrialized countries. Many of citizens of the coastal, West African country of Liberia live in conditions that a traditional American would find abhorrent. The United Nations categorizes Liberia as being a "least developed country", the lowest of its socioeconomic Classification. Less than a decade from a brutal and extensive civil war, Liberia is slowly starting to rebuild its national infrastructure. Much work is still to be done however, particularly in rural areas of the country where running water, electricity, and even paved roads are often absent. Students from Clemson University's Creative Inquiry have travelled to the country each of the past two years to deliver much needed engineering and structural support to villages most in need.

Poster # 175

Assisted Reproductive Technologies in the Mare

Mentors: Shannon Headley, Rebecca Shirley, Dr. Kristine Vernon, Animal and Veterinary Sciences

Students: Lauren Pace, Chelsea Sinclair, Danielle Williams, Christine Rambeau, Bryce Pinson, Stacy McKinnis, Katie Loewenstine, Lauren Pace, Kandace Smith

Our CI, entitled "Assisted Reproductive Technologies in the Mare" focuses on improving breeding and foaling efficiency in horses. We have learned how to read ultrasound images of mares' reproductive tracts to correctly time breeding, we have participated in the collection and processing of stallion semen for use in artificial insemination, and we have practiced artificial insemination techniques. Each of these assisted reproductive technologies is used commonly in the horse industry to increase conception rates and maximize the use of good quality stallion genetics. Additionally, we help manage the foaling process for safety and efficiency. We check ion concentrations in milk of pregnant mares to predict how soon they will deliver their foal and assist in the delivery of the foal. We ensure the health of newborn foals by testing the specific gravity of the colostrum before the foals suckle, and by testing the levels of IgG in the foal's blood 12 hours after consumption of colostrum. This CI is a great opportunity for students to gain experience using assisted reproductive technologies that are necessary in today's horse industry.

Poster # 176

Detailed Mapping of Amphibolite Rock in the Clemson Experimental Forest

Mentor: Scott Brame, Environmental Engineering and Earth Sciences

Student: Alex Grayson

The Clemson Forest Mapping Group is a Creative Inquiry group project whose goal it is to map the Clemson Forest's geology. We have found in the group, however, that sometimes certain small rock types included in larger rock formations map relationships that do not always match up to what is actually there. The purpose of my project was to concentrate on a small

area where this distribution error was true and to map it using different methods than the normal surface outcrop sampling. I decided to measure the pH of the clay soil derived from the rocks and map them. I sampled from areas directly around the outcrops and also the areas between the outcrops. By doing this I was able to produce an accurate map and conclude that pH soil mapping results in a more accurate understanding of the rock distribution than surface outcrop mapping in the Clemson Forest.

Poster # 177

Measuring Pressure Changes in a Sealed Well

Mentors: Dr. Lawrence Murdoch, David Hisz, Environmental Engineering and Earth Sciences

Student: Mathew Creel

Small deformations in earth's crust result from changes in atmospheric pressure, earth tides, and precipitation. They cause pressure changes to occur in aquifer systems, resulting in water level fluctuations in wells. These water level fluctuations are measured over time using pressure transducers. The purpose of this project is to measure pressure changes in a well using two methods and determine how the results differ. First, pressure changes are measured in an unsealed well. Second, a designed system takes pressure measurements in a sealed well. This system eliminates the effects of atmospheric pressure directly on the water in the well. Both systems show diurnal signals due to earth tides and have an inverse correlation to barometric pressure. The sealed system showed more consistent correlations than the unsealed system. Therefore, using sealed wells to measure pressure changes may be a more accurate means of analyzing aquifer dynamics.

Poster # 178

Enriching Historical Interpretation at Fort Hill and Hopewell Plantation

Mentor: William Hiott, Clemson Historic Properties

Students: Lauren Burton, Lindsay Hudson

As Clemson PRTM and History students, we wondered how Fort Hill and Hopewell Plantation, two valuable assets of Clemson Historic Properties, could have their historical interpretation enriched. Under the direction of William Hiott, we believe this could be achieved in two ways. Fort Hill could be upgraded by expanding the current interpretation to new technologies, where a video would explain the significance of each room. Hopewell Plantation could be placed on the National Register of Historic Places independently of the Pendleton Historic District, so that the home could develop a separate identity of interpretation. We are still finishing these projects and will be unable to see the positive outcomes until the future. Through our creative inquiry, we aim to accomplish both ideas, in hopes that it will benefit the Clemson University community and their knowledge of the area's history.



Poster # 179

Clemson's Green Culture

Mentors: Dr. Beth Kunkle, Food, Nutrition, and Packaging Science, Jennifer Goree, Student Affairs, Dr. David Ladner, Environmental Engineering and Earth Science

Students: Kelsey Bailey, Erin Grubbs, Victor Liao, Alexis Marianiello, Jesse McGee, Devon Cornelius, Tianlun Yang, Erin Horgan



The LIEF (Leading and Innovating for our Environment and Future) Living Learning Community, through research, interviews, investigative journalism, seeks to discover the current attitude on Clemson's campus about environmental awareness. Our goals are to determine Clemson's current sustainable practices, to effectively disseminate information about sustainability, to identify where Clemson needs improvement and to lead and promote new projects for a sustainable future at Clemson. A main challenge we face is combatting the myths and stereotypes convincing people sustainable living is difficult or unimportant. While debunking misinformation, we work to educate the Clemson community about ways to reduce one's carbon footprint and to implement environmentally conscious methods into everyday life. As technology and social media now grip society, our means of disseminating information is through the Internet, social media sites, and videos. We hope that our work creates a widespread culture among Clemson students, faculty, staff, and residents, changing sustainability from a concept or buzzword into an action.

Poster # 180

Establishing Adaptive Sports Programs for Youth with Disabilities

Mentors: Dr. Joseph Ryan, Special Education, Dr. Deborah Cadorette, Athletic Leadership, Dr. Antonis Katsiyannis, Teacher Education

Students: Kelsey Davis, Kaycee Albertson, Caroline Butler, Heather Conn, Amy Cook, Haley Driggers, Megan Kopschik, Langlee Maldonado, Jillian Pezzino

Children with disabilities are at increased risk of health risk factors including obesity often due to low levels of physical activity and limited participation in sports. However, organized adaptive sports programs are increasingly available for individuals with disabilities. This presentation provides recommendations for establishing successful adaptive baseball and soccer leagues for children and youth with disabilities in schools and other community-based recreational facilities. In addition, the authors describe lessons learned from seven years of experience with a university-community partnership in both baseball and soccer for individuals with disabilities.

Poster # 181

Clemson University Wastewater Treatment Plant Headworks and Pump Station Developmental Plan

Mentors: Dr. Caye Drapcho, Dr. Tom Owino, Environmental Engineering and Earth Sciences, Dr. Tony Putnam, Campus Utilities

Students: Sarah Galphin, Jacob Burkey, Kevin Sayles, Jo Batts

Clemson University wastewater treatment plant is in need of a new headworks screening facility and pump station to create a cleaner water quality and environment. A potential location was chosen for the new headworks facility and pump station with

considerations to historical sites and wetlands preservation. A geotechnical investigation occurred, as well as mapping of the property boundaries to further confirm site suitability. Environmental impacts to soil and groundwater were also evaluated. The headworks facility was chosen based on screening types, grit removal methods, and full automation. A pump station was designed by calculating the head loss from the known projected wastewater flow and elevations. The force main and pumps were sized, and pump types compared. This therefore provided a potential developmental plan for construction of the headworks facility and pump station. This project was partially supported by the Creative Inquiry program, the Biosystems Engineering Department, and Campus Utilities.

Poster # 182

Land Application of Wastewater Sludge for Energy Crops

Mentor: Dr. Caye Drapcho, Environmental Engineering and Earth Sciences

Students: Jazmine Taylor, Elizabeth Edelstein, Kaitlyn Murray, Steven Chow, Louis Hill

The Clemson University Waste Water Treatment Plant currently has to pay to dispose of its sludge in a landfill. Waste water sludges, however, can be used as a fertilizer for the production of renewable energy crops. In this Creative Inquiry, students analyzed the quality of the waste water sludge and formulated conclusions on the best type of crop, location and quantity of sludge application, necessary maintenance, and crop energy yield, all while remaining within budgetary and regulatory constraints. With our research, we were able to offer a sustainable alternative to landfilling the plant's sludge. The project was partially supported by the Creative Inquiry program. We would also like to thank the Clemson University Waste Water Treatment Plant and the Clemson University Student Organic Farm for their assistance.

Poster # 183

Assessing the Need for, Designing, and Implementing Triage Water Systems for Villages in the Central Plateau of Haiti

Mentors: Dr. Jenifer Ogle, Civil Engineering, Sarah Cooper, English

Students: Emily Harvin, Mike Resler, James Marione, Jeff Plumblee, Katie Wunder, Mette Kolind

Cholera kills thousands of Haitians each year, and in response CEDC has researched quick, low cost methods to eliminate this disease from the villages' water supplies. An upfront, low-cost system has been designed to treat the water using cartridge filtration, UV treatment, and chlorination. CI students have performed extensive testing on the designed systems in Clemson and plan to install a pilot system in Bois Jolie in March. By partnering with CI, CEDC has gone further to help secure funding for implementing systems in 19 more villages, effectively providing clean water for 100,000 Haitians. This is phase 1, with phase 2 in planning. To expedite the site assessments, installation, and training of locals, CEDC plans to supplement the two interns currently in Haiti by opening an intern-run management office in Cange to direct operations. The value of our program is to serve the human race to take responsibility for our actions.

Poster # 184

Pyro Matches Package Design

Mentor: Andrew Hurley, Packaging Science

Students: Rachel Randall, Dan Hutcherson, Josh Galvarino, Joanna Fishcher, Katie Thackston

This project was developed with guidelines given from IOPP's 48 hour Repack student design challenge. By researching current problems associated with match packaging, students brainstormed and developed a new and innovative match package.

The Pyro match package design process began with a careful evaluation of the current packaging of matches. After much consideration, it was determined that the current box for wooden matches was lacking and in much need of a redesign. The conventional tray and sleeve combination that is used to house wooden matches makes it difficult for users to hold while striking the match. When the sleeve is removed, the matches become exposed and chances of spillage increase. The tray does not provide a single match dispensing system, increasing users interaction time with the package. Finally, the material currently used for the package is neither sustainable nor waterproof, making it a poor choice. This research combines the aspects of package design and research to develop new products and packages that are innovative and eye-catching.

Poster # 185

Forex: Foreign Currency Exchange Exploration and Experimentation with Twitter Picks

Mentor: Dr. Jason Thatcher, Management

Students: Scott Cole, Kyle Leprevost

Forex, the foreign currency exchange market, is very similar to Wall Street's stock market, except instead of measuring the health of corporations, Forex gauges the welfare of countries and their respective units of currency. Through the broker, Forex.com, an American adult (i.e. an 18-year-old college freshman) can run some day-trading experiments with real money on a 50:1 leverage. By observing the graphs of the currency value fluctuations, one can conjecture as to which currency in a pair will dominate in the near future and attempt to profit on it. After some intense research and crude experiments in 2011, a practice account was opened with TD Ameritrade in order to dissect the trend between the Forex market and Twitter posts. In particular, the fluctuations of the EUR/USD pair were scrutinized, and models were fabricated in order to turn the Twitter feed into a consistent profit.

Poster # 186

Environmental Communication and Public Display

Mentor: Dr. Dylan Wolfe, Communication Studies

Students: Hannah Allison, Megan Madden, Erica Harper, Hope Snipes

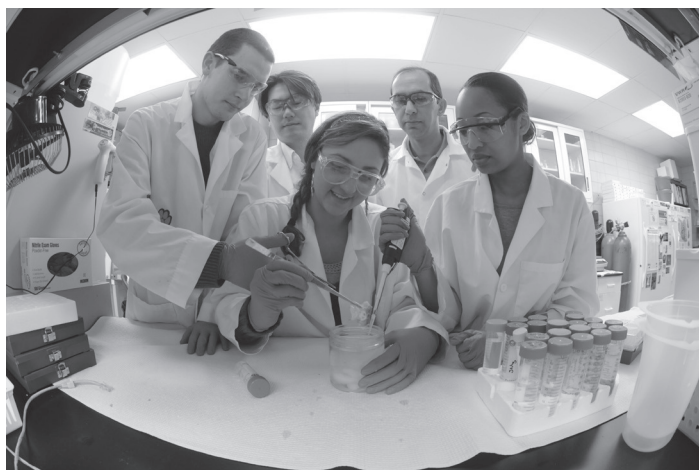
Since 2007, students in communication studies and other disciplines have worked with Dr. Dylan Wolfe to study, document, and publicize the Nature-based Sculpture Program (NBSP) and the South Carolina Botanical Garden (SCBG). This team has explored how people interact with and understand public art and natural spaces. Dr. Wolfe and his students have conducted collaborative research projects, participated in several service-learning initiatives, and collected a large document, image and multimedia archive. Thus far these projects have generated multiple sets of qualitative and quantitative data, two peer-reviewed publications, and several academic presentations. Students have also led initiatives to create a website, digital archive, volunteer event, mobile display, and a permanent exhibit in the Botanical Garden Visitor Center. This presentation of our work will highlight outreach products, interactive measurement, and initial findings of our research program. This project was partially supported by the Creative Inquiry program and the Clemson University Service Alliance.

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