

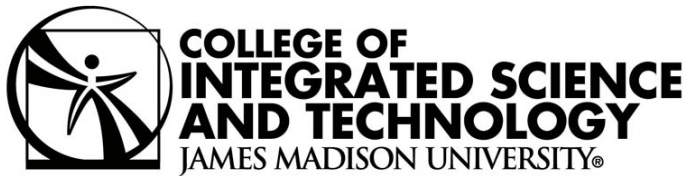
COLLEGE OF
INTEGRATED SCIENCE
AND TECHNOLOGY
JAMES MADISON UNIVERSITY®

9th Annual

CISAT Faculty RESEARCH Exhibition



October 14, 2011
1:00 - 3:00 p.m.



October 14, 2011

Colleagues and visitors,

It is a pleasure to welcome you to CISAT's annual Faculty Research Day. We especially value this program as an opportunity to learn about new and unfolding research, share ideas, and, in general, strengthen the identity of the College as a vibrant academic community.

Certainly, scholarship has always been recognized as one of the three areas of a faculty member's role. CISAT faculty members have a distinguished track record of publications, presentations, and other means of disseminating their discoveries within venues that tend to involve professional disciplinary associations and to focus on colleagues from outside the College. The beauty of the CISAT Faculty Research Day is that it is truly an inter- and cross-disciplinary presentation of projects, allowing faculty to showcase their work for colleagues here who may otherwise not have an opportunity to see it. The topics span the full programmatic spectrum of the College. The topics also span the globe, as many of the presentations highlight work in which the College's students and faculty engage in international settings. Finally, the presentations highlight the natural involvement of students in research, and how effectively faculty integrate research into their vital commitments to scholarship and teaching at JMU.

As a participant - either a presenter or an attendee - I am sure you will find this event to be one at which you will make new connections that will be rewarding.

Sincerely,

Sharon E. Lovell
Interim Dean

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IPv6 Security Attacking the 6to4 Tunnels

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The Internet Protocol version 6 (IPv6) has been designed to meet the expansion, security demands of the Internet. The migration from IPv4 to IPv6 has encountered numerous challenges and setbacks. To enable such migration, the 6to4 tunneling protocol was designed as one of several techniques that facilitate the coexistence of IPv4 and IPv6 networks during the transition period. The 6to4 tunneling protocol encapsulates IPv6 traffic inside IPv4 envelopes and then forwards the latter through an IPv4 network to its destination. De-capsulation is then performed at the entrance point of the destination IPv6 network and the enclosed IPv6 traffic travels inside to its target. Another approach is to create a Virtual Private Network (VPN) tunnel between the source and destination networks across the IPv4 Internet. These tunnels are vulnerable to various attacks attempting to destroy, disrupt, alter, or simply eavesdrop on the payload data. In this work, we demonstrate one type of these attacks, called Reflection Attacks, on 6to4 and VPN tunnels. We then propose a firewall-based defense mechanism. We built a small internetwork consisting of two fully-IPv6 networks that communicate with one another across a fully-IPv4 simulated Internet. We used a packet builder tool, to synthesize ping packets with a spoofed IP address located on one of the IPv6 networks. We used Wireshark to capture the traffic and illustrate how the operation of the 6to4 tunnel was disrupted. We developed a set of graphics and laboratory exercises to teach these concepts and protocols to an undergraduate audience.

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Daily Self-Monitoring of Body Weight, Step Count, Fruit and Vegetable Intake and Water Consumption: A Feasible and Effective Long-Term Weight Loss Maintenance Approach

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Background: To determine the feasibility and effectiveness of a weight loss maintenance (WTLM) intervention for middle-aged and older adults using daily self-monitoring of body weight (BW), step counts (SC), and fruit/vegetable (F/V) intake plus daily self-monitoring of water consumption.

Methods: Two-group, clinical intervention study of a 12-month WTLM program including daily self-monitoring of BW, SC, and F/V consumption, with (WEV+) and without (WEV) daily self-monitoring of water consumption. Forty weight-reduced (mean weight lost= 6.7±0.6kg; BMI 29±1 kg/m²) individuals aged 63±1 yrs were enrolled in one of two WTLM interventions. All participants were instructed to record daily BW (Weight), SC (Exercise), and F/V intake (Vegetable); WEV+ participants were also instructed to consume 500 ml water before each main meal and to record daily water intake. Outcome measures included weight change, diet/physical activity behaviors, theoretical constructs related to health behaviors, and other clinical measures.

Results: The 12-month data showed a linear decline in weight ($\beta = -0.32$, $P < 0.001$) and a quadratic trend ($\beta = 0.02$, $P < 0.01$) over time, but no group difference ($\beta = -0.23$, $P = 0.08$). Analysis of the 365 days of self-reported weights for each participant determined that weight loss was greater over the study period in WEV+ ($\beta = -0.013$, $P < 0.01$) than WEV ($\beta = -0.002$, NS), corresponding to weight changes of -0.67 kg and 1.00 kg for WEV+ and WEV, respectively.

Conclusions: A low resource intervention emphasizing daily weighing, physical activity, and F/V consumption is successful at maintaining weight loss for 12 months. Daily self-monitoring of increased water consumption may provide additional benefit.

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An Integrative Review of Student Evaluations of Teaching

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Student evaluation tools (SET) provide program administrators an overall picture of the effectiveness of their curriculum and faculty members (Emerson, 2007). Yet faculty members are concerned over how SET impact the measurement of their teaching effectiveness and instruction in relation to tenure and promotion decisions (Ackerman, 2009). The purpose of this integrative review was to review the current research literature on the design and psychometric testing of teaching evaluation scales, to synthesize the results, and to propose implications specific to nursing programs that is evidence-based and will provide guidance on faculty teaching evaluations. A systematic literature review was conducted utilizing multiple databases from 2001 to 2011. A total of 29 abstracts were examined with 20 articles included in this review after final analysis. The emerging themes were: Faculty characteristics and perceptions; Student characteristics and perceptions; Course Characteristics; Development of new tools; and Validity and reliability of SET. Findings emphasize SET as an incredibly useful part of a three-pronged system of faculty effectiveness. Triangulation is a method that promotes a more solid, varied measure of faculty teaching effectiveness from the perspectives of all involved: faculty, students, and self (Appling, 2001). This literature review not only provides the context in which to interpret SET, but also supports an expanded, more complete view of faculty evaluation, one that can more accurately discriminate who is a truly expert instructor, as well as assist those who are less than expert with concrete and useful ways to develop.

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American Motorcycle, American Fuel

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The Problem: More than 90% of the World's vehicles are powered by petroleum products and the global oil reserves are running out. The Solution: Conservation, education, and the implementation of renewable fuels will all be needed to address the impending oil crisis. Without question, we will need to use less fuel - regardless of what the replacement fuel is. When it comes to replacing gasoline, there aren't a lot of options. Ethyl-alcohol is most promising because it meets many of the requirements for a replacement fuel: it works in existing automotive engines, it is compatible with the fuel distribution infrastructure, and it can be made in substantial quantities (i.e. it is one of the few fuel options that actually works). There is also a lot of controversy surrounding ethanol in terms of energy input/output, environmental impact, and impact on the global food supply. This project provides a platform for a broad-based public education and outreach campaign that looks deeper into the global oil situation, the challenges that we will face as the oil reserves are depleted, and the need for improving Science, Technology, Engineering, and Mathematics education. STEM is the key to developing the clever, creative solutions we need to develop a replacement for oil that has no negative impact on the global food supply, has a strong reduction on harmful emissions, and represents a truly sustainable renewable fuel.

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Materialism and the Interpretation of Physical Space and Social Space

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Background: With the continued proliferation of consumerism and materialism in America, the present study has begun to investigate how value systems influence student interpretations of physical place and social space. Methods: A mixed method approach was utilized with a sample of undergraduate students from a Mid-Atlantic University (n=75). Students completed an electronic survey to assess materialistic orientation and participated in a class assignment wherein they took a variety of photographs representing 10 identified dimensions of health. After a nominal process, students were asked to write responses to photographs selected as best in each dimension. Preliminary Findings: Student responses often reflected the more superficial expectations of the course, but when language use was examined more deeply there was congruence between how responses were framed and materialistic orientation. Conclusions: findings indicate four salient points of the study. 1) The mixed methods approach provided a unique ability for insight in interpreting data that could not have been achieved in any other fashion. 2) Pedagogically, the insights gained provide a framework for intervention with students. 3) Conceptually, these findings challenge faculty to understand the nature of change, and the necessity of addressing underlying logic systems with deep thinking. 4) In practice, challenging logic systems is necessary for future health professionals who will serve a wide spectrum of future patients.

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Student Success in an Undergraduate Mixed-Majors Biotechnology Course: A Comparative Assessment of Team-Based Learning and Lecture

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This study compares Team-Based Learning (TBL) to traditional lecture format in student performance, confidence and attitude in a mixed-majors introductory biotechnology course. TBL, a well-defined teaching method emphasizing application of course content in small groups, was implemented in three sections of the course. For comparison, a two-section cohort of students was taught in the typical lecture format for the course. The lecture and TBL sections performed no differently, as measured by scores on common test and exam items. Likewise, the course format did not affect students' attitudes or confidence in course concept mastery, as measured by pre- and post-course surveys. In both TBL and lecture formats, science, technology, engineering and math (STEM) majors reported higher pre- and post- course attitude and confidence levels than did non-STEM majors. Neither STEM majors nor non-STEM majors showed a change in attitude from pre- to post-course, regardless of course format. Confidence increased in all student groups regardless of major or course format. These cognitive and non-cognitive data support the use of TBL as an effective alternative to traditional lecture. Our work contributes to a growing body of literature indicating that both majors and non-majors can succeed by learning independently and from their peers.

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Estimating Forest Attributes using Ground-based Stereo Photography

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This research project assessed the feasibility of using ground-based stereo photography to rapidly estimate the attributes of a forest. Being able to rapidly estimate forest attributes is important because the data can be combined with traditional forest inventory data to reduce uncertainty. To evaluate the feasibility of using stereo photography to estimate forest attributes, 23 0.02 ha circular plots were installed at random locations in the Paul State Forest in Ottobine, VA,. At each plot basal area/ha, volume/ha, and biomass/ha were calculated and digital stereo photographs were collected in each of the four cardinal directions. After the data were collected, a computer-based algorithm was used to estimate the basal area/ha for the plots, and the correlations between estimated basal area/ha and volume/ha and biomass/ha were calculated. Using data collected from all the plots, the results for basal area ($R^2 = 0.03$, RMSE = 21.8 m²/ha) were poor, and the correlations between predicted basal area / ha and volume / ha ($R^2 = 0.06$) and biomass / ha ($R^2 = 0.02$) were low. However, when low quality images were eliminated, the basal area prediction accuracy improved ($R^2 = 0.68$, RMSE = 6.1 m²/ha), and the predicted basal area/ha values had higher correlations with volume/ha ($R^2 = 0.66$) and biomass/ha ($R^2 = 0.67$). These results indicate that this technique shows promise but that data collection protocols must be established.

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Use of Artificial Streams to Investigate Mercury Cycling in the South River, Waynesboro, Virginia

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A 130-mile stretch of the South River and South Fork Shenandoah River is posted with a fish consumption advisory due to mercury contamination. Mercury in the river originated from a textile facility in Waynesboro, Virginia, that used and discharged mercuric sulfate from 1929-1950. While discharges of mercury to the river ceased more than 60 years ago, mercury levels in fish remain above safe levels for human consumption. This is due to the continued cycling of historic mercury in the river and its eventual uptake and biomagnification through aquatic food webs. This study investigated the relative importance of water-borne versus sediment-borne mercury in controlling biological uptake of mercury into the aquatic food web. Twelve artificial stream channels were constructed along the contaminated South River and the uncontaminated North River to provided four experimental treatments: contaminated sediment/clean water, contaminated sediment/contaminated water, clean sediment/contaminated water, and clean sediment/clean water. After six weeks of colonization and growth, algae in each treatment was collected and measured for mercury accumulation. Mercury accumulation in water-only exposures was 4 times higher than in sediment-only exposures and was equivalent to accumulation in treatments with combined water and sediment exposure. This indicates that mercury in the water column is much more important in controlling biological uptake than mercury in sediments. As a result, future remediation efforts need to focus on strategies that limit mercury transport in the water column.

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Factors Related to Weight Gain as Perceived by College Freshmen

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Although not inevitable, weight gain is common in college freshmen, and lifestyle choices impact weight status. The purpose of this study was to survey all freshmen enrolled in 2010-2011 at a mid-Atlantic university halfway through their freshman year, to determine their perceptions of freshman weight gain. Of the 3468 freshmen invited by email, 365 (10.5%) participated in the online survey, and 140 (38%) reported having gained weight with a mean of 7.7 + 4.4 pounds in the 136 reporting the amount gained, although 198 (59%) reported that they had attempted to prevent weight gain. When asked their preference for obtaining information about preventing weight gain, displays in dining halls (38%) and email (33%) were their top choices. Students identified specific campus dining facilities where they usually or rarely tended to overeat; 141 (43%) had increased vending machine purchases, and 166 (50%) reported increased alcohol consumption. Only 192 (58%) considered calorie or nutrient levels when choosing meals or snacks. The top two factors subjects identified that contributed most toward weight gain were dining hall food and not working out, whereas factors preventing weight gain were exercising and healthy food choices. Statistically significant relationships ($p < 0.05$) were found between several variables using the chi square statistic, highlighting such aspects as overeating, food choices, and exercise that are related to weight gain or its prevention among these freshmen. Results of this study reveal important factors educators can use to help freshmen avert weight gain.

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Teaching about Cultural Competency in BSN Programs: How Are We Doing at JMU?

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The American Association of Colleges of Nursing (AACN), a nursing education accrediting organization, provides a curricular framework to facilitate the development of cultural competency for undergraduate nursing students. Within this document, five competencies were developed to encompass the key elements considered essential for nursing graduates to provide culturally competent care. The competencies are: 1) Apply knowledge of social and cultural factors that affect nursing and health care across multiple contexts 2) Use relevant data sources and best evidence in providing culturally competent care 3) Promote achievement of safe and quality outcomes of care for diverse populations 4) Advocate for social justice, including commitment to the health of vulnerable populations and the elimination of health disparities and 5) Participates in continuous cultural competence development. It is recommended that the competencies be included in nursing curricula to ensure that practicing nurses are prepared to eliminate health disparities and provide effective, quality care across a variety of diverse populations groups. Currently, while nursing faculty are committed to emphasizing and including content that will prepare students to provide culturally competent care, little is known about how well content is learned and incorporated into clinical practice for students. The JMU Nursing Diversity Committee surveyed undergraduate nursing students to identify awareness and understanding of cultural competence that is present in both classroom and clinical courses.

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Design and Test of a Prototype Ocean Thermal Energy Conversion System

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As the main exhaustible energy sources begin to deplete, the need for alternative energy sources will continue to grow. It is important that these alternative energy sources are pursued far in advance of when they are needed. Ocean Thermal Energy Conversion or OTEC is an alternative energy source that can be harnessed in many places around the world. If successfully proven and implemented, it could bring certain areas in the world electricity independence.

A scaled down (150 W) OTEC cycle prototype has been developed. It was created along the basic principles of an organic Rankine cycle. The cycle consists of four main components, a feed-pump (or refrigerant pump), an evaporator, an expander (a Tesla turbine), and a condenser. While some OTEC systems are actually open and use water as a working fluid, refrigerant R134a will be used in this system. This will be more efficient for our system, especially because we will be pumping a small amount of fluid through our system.

A secondary goal of this project will be to create awareness of OTEC. By creating a organic Rankine cycle mimicking the technology used on the large-scale OTEC plants, our hope is that it will bring more knowledge and awareness of OTEC to the CISAT community. As our model is complete, it can be displayed in one of the labs, or even used in some of the energy courses in the future.

Funded by CISAT 2011 Research and Teaching Grant

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Students, Texting and Driving: A Hard Connection to Break

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Purpose:

This ongoing project is designed to reduce or prevent distracted driving behaviors. By increasing students' knowledge and fostering positive attitudes consistent with safe driving behavior, the goal of this project is to reduce the number of students who drive distracted.

Objectives:

1. Identify distracted driving behavior among students.
2. Evaluate inconsistent knowledge, attitudes and behaviors.
3. Increase knowledge of distracted driving behaviors.
4. Recognize barriers to prevent distracting driving behaviors.
5. Define incentives, education, policies and enforcement to reduce distracted driving.

Methods:

Students completed a 10 item survey and were given a car shaped air freshener embossed with a “don't drive distracted” message, along with an information flyer on distracted driving facts and tips. They also had the opportunity to sign a pledge to not drive distracted.

Results:

- o Most rarely or never groom or put on or take off clothing while driving and consider these behaviors very or somewhat risky.
- o Most change controls on devices while driving; yet do not consider this very risky or had a neutral attitude.
- o Most considered driving while tired or fatigued risky; few reported this behavior.
- o Half rarely eat while driving; 1/3 consider this somewhat risky.
- o Most often or sometimes talk on the phone while driving; a majority considers this risky.
- o Half engage in texting while driving; almost all recognized this as risky.

Conclusion:

Inconsistent attitudes are reported by a number of students. Students know their behavior is dangerous or risky yet they continue to drive distracted. Further education, prevention and law enforcement may help this problem.

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Remediating Impacts from Camping and Off-Road Vehicle Use in the Dry River Water Supply Area, City of Harrisonburg

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In 2009 the City of Harrisonburg issued a directive to eliminate camping and Off-Road Vehicle (ORV) use in the Dry River Water Supply Area, located west of Harrisonburg. In 2011 a remediation plan designed to restore the area to a more ecologically stable condition, suitable for a water supply area, was begun. The plan involved locating and reverting all of the existing campsites to a more natural condition, and locating and mapping the most severely impacted areas from ORV use. During the summer of 2011, twenty-seven campsites were located and obliterated using techniques developed in studies of Virginia Wildernesses in 1989. In addition, 9.7 miles of trails and roads were mapped and classified using GPS equipment into 5 categories based on the degree of damage from ORV use. Of those, 8 miles were in good condition, whereas 1.7 miles were found to be in need of remediation.

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Gardens as an Informal Science Learning Tool in Harrisonburg, Virginia

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Harrisonburg, Virginia has a population of ca. 44,000 people with diverse ethnic and economic backgrounds. The location of Harrisonburg allows for a relatively long growing season and enough rainfall to support gardens, especially when sustainable measures are followed. Considering these factors, gardening for food production, recreation, and creation of informal science-learning activities can positively contribute to family welfare. We are working together as a team to plan and develop a mosaic of community gardens in the city. The gardens, along with workshops and other information sets for the public, will allow community children and adults to make observations about the response of plants to garden care, how to sustain a garden, how nectar-feeding species in the garden contribute to the production of human food, and how to make observations that can be used in scientific monitoring. As an integrated teaching and research strategy that partners professional scientists with members of the community, this project is an example of informal science (learning about science from everyday experience) and citizen science (collecting and learning from data collection) that benefits both the public and the scientific community. The information presented summarizes the short- and longer-term goals of the project in terms of benefits for the natural and human community: the development of citizen science projects and the creation of study sites for environmental learning in Harrisonburg.

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A Cross Cultural Examination of the Influence Matrix

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Objective: The Influence Matrix is a key component of a new unified theory of psychology (Henriques, 2011) that provides a model of social motivation and emotion that assimilates and integrates many different lines of research in personality, social and developmental psychology and the purpose of the current study was to analyze the reliability and validity of a scale developed to measure the constructs posited by the Matrix. Method: The Influence Matrix Social Motivation Scale (IMSMS) was given to 500 American, 127 Russian, and 42 Costa Rican college students. This poster will report on data obtained from the American and Russian samples. Results: Reliability and validity analyses indicate support for both the basic validity of the items and subscales and for the basic theoretical predictions of the interrelations between the subscales derived from the theory. The predictions were somewhat better matched in the American sample than the Russian sample. Conclusion: The IMSMS is a promising measure of the key constructs posited by the Influence Matrix that has general validity in samples of diverse populations.

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Evaluating Cost: The Forgotten Component of Expectancy-Value Theory

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For the past 30 years, the contemporary version of Expectancy Value Theory (EVT) postulated by Eccles et al. (1983) has offered one of the most influential models for understanding motivation, especially academic motivation. The theory poses that motivation is determined by one's level of expectancy (i.e., can I do this task?) and value (i.e., is this task worthwhile?). In EVT, cost is a type of value and is defined as one's perception of the sacrifices that need to be made to participate in a task. However, cost has been largely ignored in empirical research. Moreover, how cost combines with measures of expectancy and value to predict motivation is unknown. The purpose of the current study was to address these shortcomings.

To this end, we generated a new pool of items to represent the constructs of expectancy, value, and cost that could be used across a wide range of academic settings and age groups. JMU students (N=774) taking a general education psychology course responded to the items. An exploratory factor analysis supported the three-factor model of expectancy, value, and cost. Hierarchical multiple regression analyses using expectancy, value, and cost scales as predictors revealed differential predictive validity on five academic outcomes: Expectancy was the strongest predictor of final grades and value was the strongest predictor of interest. Further, cost significantly contributed to the model, negatively predicting four of five outcomes. The current findings offer strong evidence that researchers should consider incorporating cost when studying Expectancy Value Theory.

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Enhancing Tourism in Page County, Virginia with Internet GIS

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Page County, Virginia and the towns of Luray, Stanley and Shenandoah attract tourism annually due to various attractions such as Luray Caverns, Shenandoah National Park, George Washington National Forest and Civil War sites. Located in the Shenandoah Valley between the Blue Ridge and Massanutten Mountains, Page County provides plenty of mountain views, scenic roads and rolling hills. At the same time, the area has also faced one of the highest unemployment rates in Virginia in recent years.

The goal of this project is to design and develop a user friendly, interactive GIS online geared toward tourists as well as others who want to learn more about the area's attractions and businesses. The project focuses on two areas: tourism and existing businesses. Tourism is the strength of the Page County area and brings visitors worldwide to the area every year. Existing businesses fuel the local economy.

Therefore, focusing on nurturing the health of current businesses would help the local economy as well as local businesses. With healthy businesses, the area would look more attractive to future businesses that consider investing in the Page County area.

The benefit of an Internet GIS is that the location-based interface is accessible to everyone with Internet access - from local citizens to potential visitors and businesspeople worldwide. The user-friendly web interface helps attract worldwide interest in visiting Page County and investing in it.

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Materials for Solar Hydrogen Production

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The common public perception is that hydrogen is an ideal "green" energy carrier (fuel) because its combustion produces only pure water and no CO₂. However, most hydrogen is currently made from natural gas using steam methane reforming (SMR), which produces CO₂ as a byproduct. For over 35 years there has been interest in making truly "green" hydrogen by the photoelectrolysis of water powered by sunlight. In order to make this process practical, it is necessary to develop efficient photoelectrode materials that can be produced inexpensively. We report our progress on the preparation and characterization of materials for the production of hydrogen by photoelectrochemical (PEC) water splitting. We used spray pyrolysis to deposit thin films of BiVO₄ on glass and other substrates. X-ray diffraction measurements established that monoclinic BiVO₄ was formed. This material has an energy gap of approximately 2.4 eV and is a promising photocatalyst for a variety of applications. We used scanning electron microscopy (SEM) to study the morphology of the deposited films. Depending on what precursor compounds we use, we can produce dense or porous BiVO₄ coatings. PEC characterization was carried out in a two-electrode cell with a platinum counter electrode under illumination from a solar simulator. The photocurrent density is proportional to the hydrogen production rate and steady state values up to 0.1 mA/cm² were measured. The effects of adding calcium, molybdenum, and tungsten as dopants in the BiVO₄ were also investigated.

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A Model for Collaborating Among Colleges and Universities when Conducting Community Needs Assessments

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The Healthy Community Council (HCC) is a community coalition composed of stakeholders representing community agencies, universities and non-profit organizations in Harrisonburg and Rockingham County Virginia. The mission of the HCC is to increase quality of life for all citizens within the community. Based on recent U.S. Census data, there are approximately 120,000 residents in the community. The HCC has developed collaborative relationships with the four area colleges and universities. This partnership learning model benefits the community, faculty and students.

The learning model has been utilized when conducting the community needs assessments every five years since 1996. Data obtained from the 2000 assessment established emerging needs which generated \$11 million in funding for community initiatives. HCC members, faculty and students all collaborate to identify community assets, challenges and emerging needs. Using this model, faculty and students engage in community-based participatory research and provide oversight for the assessment.

Through this learning model experience students gain insight on community health, gain knowledge in essential research methodology, receive faculty mentoring, and interface with community leaders as well as service providers. Students, with guidance from faculty members, research needed secondary data, contact study participants, assist with data management and analysis, and contribute to assessment data dissemination. Faculty members receive scholarship opportunities and venues for networking with colleagues and professionals.

This presentation will address the structure, activities and outcomes of this partnership learning model. Discussion will also include how this model can be used by other universities and community organizations to develop community partnerships.

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Concurrent Aerobic Exercise Interferes With the Satellite Cell Response to Acute Resistance Exercise in MHC I Muscle Fibers

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The addition of aerobic exercise (AE) to a resistance exercise program (RE) (concurrent exercise; CON) can interfere with maximum size gains achieved with RE alone. Further, CON appears to interfere with MHC I, but not MHC IIa muscle fibers. The underlying biology responsible for this 'interference' is unknown. The magnitude of satellite cell (SC) proliferation following exercise has been shown to influence muscle adaptation. Therefore, the purpose of this investigation was to assess the fiber-type specific SC response to RE, AE, and CON exercise. Eight recreationally active college-aged males completed the following two exercise trials separated by a 10-day washout: RE – subjects performed unilateral leg-extensions and presses (4 sets of ≥ 10 repetitions at 75% 1RM); AE/CON – immediately following an identical RE protocol with the opposite leg, subjects performed 90 min of cycling (60% VO_{2max}). Muscle biopsies were obtained from the vastus lateralis immediately before and 4 days after each session. Muscle samples were cross-sectioned and analyzed for SC density (SC per muscle fiber) and fiber type. SC density increased to a greater extent following RE ($38 \pm 10\%$), compared to AE and CON. Similarly, MHC I muscle fiber SC density displayed a greater increase following RE ($46 \pm 16\%$), compared to AE and CON. No exercise mode differences were observed among MHC IIa fibers. Our data indicate that CON blunts the SC response to RE, specifically in MHC I muscle fibers. This suggests that SC physiology contributes to the interference effect that concurrent AE has on MHC I fiber growth.

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ERACER: A Database Approach for Statistical Inference and Data Cleaning

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Real-world databases often contain syntactic and semantic errors, in spite of integrity constraints and other safety measures available in modern DBMSs. We present an iterative statistical framework for inferring missing information and correcting such errors automatically. The key insight of our approach is to exploit dependencies not only within tuples, but also between attributes of related tuples. We draw on techniques from statistical relational learning to develop an efficient approximate inference algorithm that can be implemented in standard DBMSs using SQL and user-defined functions. The resulting framework performs the inference and data cleaning tasks in an integrated manner, using novel techniques to infer correct values accurately even in the presence of dirty data. We evaluate our methods empirically using multiple synthetic and real data sets. The results show that our algorithm infers missing values comparable to baseline statistical methods, such as exact inference in Bayesian networks. However our framework simultaneously identifies and corrects corrupted values with high precision, and is significantly more efficient because of its database-level implementation.

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Who Teaches Ethics? An Inquiry into the Nature of Ethics as an Academic Discipline

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Disciplines serve a number of functions, including providing a community for academicians who share a common intellectual identity. This paper presents an empirical study of the educational backgrounds of professors currently teaching college-level ethics courses in the U.S. The purpose of the research is to discern whether there exists a community of ethics professors by examining the educational backgrounds of those teaching ethics in American colleges and universities. The research suggests that most professors teaching ethics courses offered through philosophy departments have credentials in philosophy, but that the largest number of ethics courses are taught outside philosophy departments by professors who have no degrees in philosophy.

Our research suggests that there are two very distinct kinds of ethics courses. About 46% of undergraduate ethics courses are taught in philosophy or religion departments, and for those courses, the instructors generally have graduate degrees in religion or philosophy, or are working towards such a degree. On the other hand, about 54% of ethics classes are taught outside of religion or philosophy departments, typically by professors without graduate degrees in religion or philosophy. Our research was not able to determine whether the professors teaching these courses have availed themselves of specific training in ethics outside of their home discipline. It appears that in application areas, applied ethics is perceived to be a course that can be taught by faculty who have little or no formal training in ethics.

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Lack of Diurnal Variation of the Human Tear Protein Lacritin in Healthy Adults

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Purpose: Lacritin is a human tear protein that is prosecretory, mitogenic, antimicrobial and promotes sustained basal tearing in rabbits. Mass spec studies have shown that lacritin is selectively downregulated in blepharitis and dry eye patients. Here we ask if lacritin levels in tear samples from healthy adults are subject to variations during the diurnal cycle.

Methods: Tears were collected from the lower cul-de-sac from 100 healthy individuals using a polyester fiber rod. Single tear samples were collected at random times from 66 healthy subjects and multiple samples were collected from 34 individuals for the diurnal study at time 0, 4 hr, 8 hr, and 24 hr. Rabbit antiserum made against lacritin was used in a direct ELISA to quantitate lacritin present in the tear samples.

Results: The amount of lacritin present in tears from healthy individuals (n=66) was ~ 4.5% with no significant difference in age groups. Preliminary results from the diurnal study (n=34) suggest that there is no significant difference in the amount of lacritin in tears collected at various time points during normal daylight hours (7:30 am-5:30 pm), with average values from the time points between 4-5%.

Conclusions: Immunoanalysis suggest that human lacritin comprises approximately 4-5% of total tear protein in healthy individuals with no significant differences between males and females. The diurnal study suggests that levels of lacritin produced in healthy individuals do not fluctuate significantly during normal daylight hours. This finding will help guide future study design in healthy and diseased individuals.

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Offshore Wind Test Site Development

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In May 2011, the Virginia Department of Mines, Minerals and Energy awarded to JMU a contract to identify coastal and near-shore sites in Virginia with the potential to host large offshore wind turbines for the purpose of testing and demonstration. This capability at the scale envisioned is not presently available in the U.S., but both European and American turbine manufacturers have expressed an interest in leveraging such a resource if it were available. This effort is consistent with the U.S. Department of Energy's strategic vision for offshore wind development, and the Norfolk and Hampton Roads regions of Virginia present an appropriate industry base and coastal/water resource. JMU leads this effort and is partnered with Timmons Group of Richmond, WeatherFlow, Inc. of Poquoson, Principal Advantage, Ltd. of Virginia Beach, and Old Dominion University.

The primary tasks of this project are to analyze the feasibility of both land-based and offshore wind turbine test and/or demonstration pad sites; to characterize the wind resource and metocean design environment at these sites; to perform due diligence on environmental and community acceptability; and to prepare the documentation that would be needed to proceed to permitting of the proposed test/demonstration turbine locations. Specifically, the project addresses site control and environmental permitting; interconnection; wind and ocean resource characterization; engagement with wind energy industry and supply chain participants; watershed analysis, and stakeholder engagement for proposed test/demonstration turbine locations. The project was initiated in June 2011 and will be completed in April 2012.

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Blind Tom and Little Jack: Geospatial Studies of the Historic Manahoac Indians of Virginia

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After the first documented European encounter with the Manahoac of the Upper Rappahannock River valley in 1608, references to identified Indian communities in this region are extremely limited. Yet, local court records as late as the mid-18th century include cases involving Saponi Indians who were arrested for a variety of crimes against frontier English and German settlements, including livestock theft and setting fire to the forest. Spatial analysis of the locations of these incidents in relation to archaeologically known Late Woodland or Contact Period sites, particularly those listed by Smith as 'Kings Houses' and investigated by Bushnell (1935), demonstrates that several ancestral Manahoac settlement areas were cores ('persistent places') around which small, family-based groups continued to live for decades after the Manahoac as a people are believed to have abandoned the Piedmont and migrated northward with the Tuscarora. This work creates a model for future investigations of poorly documented, interior tribes conventionally believed to have abandoned the interior of the Eastern Woodlands in the wake of European contact.

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Overcoming Barriers to Accessing Crisis Intervention Services for Adults with Acquired Brain Injury: A Systems Change Process

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In Virginia, publicly funded options for neurobehavioral treatment for individuals affected by brain injury do not exist, despite the fact behavioral and cognitive consequences are the most common debilitating outcomes of acquired brain injury (ABI) (Milders, Fuchs, & Crawford, 2003). This action trajectory research (Anderson & Herr, 2005) seeks to assess the barriers to behavioral health services and develop a protocol for crisis intervention for adults with ABI. The research team used a mixed-methods approach by deploying a survey instrument and facilitating a series of focus groups. The survey was deployed to regional providers through Qualtrics and the results were analyzed using SPSS/PASW17. Focus group data was analyzed using NVivo 8 and later triangulated with the survey data. The findings highlighted barrier themes, also found in the existing literature, which then guided the project actions.

Based on the assessment data and best practices review, the team assembled a workgroup of regional stakeholders. This interagency collaborative designed a cross-systems map using the sequential intercept model (Munetz & Griffin, 2006) which served as the basis for the protocol that the team began to pilot in the community as crisis cases arose. Concurrently, the project team organized several training opportunities to address the previously identified educational gaps. Outcomes measures relative to these programs are under investigation.

Preliminary findings support the necessity of an inclusive interagency approach to adequately respond to adults with ABI in crisis. This systemic intervention should reflect a continuum including systems-wide education and training, risk assessment, and community supports.

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Enhancing Nursing Students? Understanding Of Poverty through Simulation

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Objectives: The purposes of this study were (a) to describe the implementation of a poverty simulation, (b) to evaluate its use on nursing students' attitudes about poverty and (c) to offer lessons learned.

Methods: Using a mixed-method design, a convenience sample of senior undergraduate nursing students (n = 43) from a public university in a Mid-Atlantic state participated in a poverty simulation experience. Students assumed the roles of real-life families and were given limited amounts of resources to survive in a simulated community. This simulation took place during a community health practicum clinical day.

Measurements: The Short Form of Attitudes about Poverty and Poor Populations Scale (APPPS) was adapted for this evaluation. This 21 item scale includes factors of personal deficiency, stigma, and structural perspective, which measure a range of diverse attitudes toward poverty and poor people.

Results: The results of this evaluation demonstrated that nursing students viewed the poverty simulation as an effective teaching strategy and actively participated. In particular, nursing students' scores on the factor of stigma of poverty demonstrated statistically significant changes.

Conclusion: With proper planning, organization, and reflection, a poverty simulation experience can be a positive impetus for lifelong learning and civic engagement.

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Information Seeking Habits of Athletic Trainers

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Evidence based practice requires clinicians to be efficient at seeking, acquiring and assessing available evidence relevant to a clinical question. As practicing evidence based medicine emerges as a critical concept in Athletic Training, it is valuable to identify how and why Athletic Trainers (ATC) acquire evidence and the barriers and challenges they face in doing so. Therefore, the purpose of this study was to identify the information seeking behaviors of athletic trainers. An anonymous 24 item electronic survey was sent to 3000 members of the National Athletic Trainers' Association. One thousand eighty seven surveys were returned (34%). Athletic trainers seek additional clinical information to generally stay informed (48%) and to find the best clinical practices (22%). To maintain general professional knowledge, reading journals ranked highest, followed by attending a conference, reading a textbook and talking to co-workers. To answer a specific clinical question, reading a textbook was ranked highest, followed by seeking opinion from an "expert". Most ATC's prefer Google to find answers to professional information ranking Google Scholar and PubMed as the next most common resources for seeking information. Of these, PubMed offers the most sophisticated advanced searching tools, yet 71% of respondents do not use these. Time to search for information and the inability to access published articles were reported as barriers to information seeking. Twenty six percent of respondents reported that they do not have access to articles/information not publically available. The majority of respondents support continuing education programming to enhance their information seeking skills.

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Improving Thermal Efficiency of Field Shelters

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Rapid deploying mobile shelters are used in areas which lack energy resources. Therefore, their performance is judged with their thermal efficiency.

The author, together with a team from ISAT undergraduates, participated in conducting a series of field tests, for a Virginian manufacturer, to assess the performance of his shelters. The shelters were tested with 2 types of thermal barriers. The results were compared with the results from a shelter, identified as the Control, which had no barrier.

The testing protocol took care to ensure that the three shelters were exposed to nearly identical thermal loads and were operated at nearly identical interior temperatures to ensure that the only variable significantly differentiating fuel use rate amongst the shelters was the insulation configuration. As expected, and in agreement with the principle of Multilayer Insulation (MLI), the Control shelter performance was the worst.

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SLI Adolescents' Verb Morphology: Patterns from Two Narrative Elicitation Tasks

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All narrative elicitation methods may not be equal in the language patterns, and in particular the verb morphological patterns, they reveal in adolescents' language. Knowing how different narrative tasks affect verb use patterns of adolescents has potentially important clinical and research implications. The purpose of this study was to compare verb morphological performances of adolescents with and without SLI on two different narrative tasks.

Twelve adolescents with CAs between 15;0-16;11 meeting commonly accepted exclusionary and inclusionary criteria for SLI were pair-matched to 12 TD adolescents on the basis of gender, native language (English only), nonverbal IQ (range 85- 115), CA, and SES (all middle SES). The adolescents were asked to generate a story while looking at the sequential pictures in the "Frog, Where Are You?" wordless picture book. They were then asked to generate a story while looking at one of two single pictures depicting different scenarios. The picture order was counterbalanced across each pair of adolescents. Language samples were audiorecorded and orthographically transcribed following procedures used in previous studies. Analyses of the transcripts involved classifying each verb as correct/incorrect and categorizing it as to type/form (e.g., regular past tense). Patterns for tense shifting within a narrative were also analyzed. Reliability of transcription and analyses was high, exceeding 90% intra- and inter-rater agreement.

Narrative elicitation task affected observed verb morphological patterns. Findings have clinical and research implications.

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Evaluation of an Intervention to Decrease Weight Gain in College Freshmen at James Madison University

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Weight gain among college freshmen appears to be increasing, potentially due to changes in environment, greater freedom, more stress, and a social atmosphere that encourages increased consumption of unhealthy foods and less physical activity. The purpose of this study was to evaluate an intervention conducted in 2009-2010 where college freshmen received nutrition information through various methods and determine which method yielded the greatest lifestyle change. One survey went to all sophomores asking if they received the invitation and reasons for not participating. A second survey went to all 61 participants from the 2009 study to solicit their perceptions of the study, 40 responded (11 email group, 7 text group, 9 classroom group, and 12 controls) with 90% having completed the study, and 75% of those not completing the study identified time as the reason. Although only 18% wrote down any tips, 43% tried some of the tips, 20% said that the study had caused them to change some eating habits, and 23% stated that the study has caused them to change some physical activity habits. Although 20% could not remember any specific tips, 43% stated that they feel more aware of what they consume, and 50% stated that the topics provided the right amount of information. Overall, participants seemed pleased with information received and the method by which it was received. Time appears to be the factor with the greatest effect on student participation in research on freshman weight gain, and must be considered by educators when planning interventions.

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Preparing the Future Nursing Workforce for Political Activism

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Being aware of policy implications for the advocacy of both the nursing profession and for patient outcomes is critical to the advancement of health related legislature at the state and federal level. The 2010 IOM report recommends nursing education prepares a workforce of nurses for key government leadership positions. This study evaluated if group participation in a health policy and legislative blog was effective in increasing nursing student self-efficacy scores on political activism. The research design was an evaluative before-and-after design using each participant as his/her own control. The study utilized a convenience sample of 56 senior level nursing students enrolled in a leadership course. A paired-samples t test was conducted to compare the pre-test mean and the post-test mean of a 12 item political self-efficacy survey. The overall self-efficacy score and all three self-efficacy subscales were statistically significant ($p < .05$) demonstrating a noteworthy increase in self-efficacy for political activism. This study has identified an effective teaching strategy to improve the self-efficacy of nursing students in advocating for the nursing profession and patient outcomes. The outcome of this study was that graduating baccalaureate students enter the workforce with an established level of confidence in their ability to affect change in health policy promotion.

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Visual, Auditory, and Vibrotactile Feedback System for Hearing Conservation with Personal Stereo Use

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There are growing concerns regarding risk of permanent hearing damage from personal stereo use. The iPod, currently the most common form of personal stereo, is used by hundreds of millions of individuals worldwide. Current research indicates that almost all contemporary personal stereos are capable of output sound levels that have the potential to cause hearing loss; therefore, it is individual choices regarding listening levels and duration that determine whether the individual is at risk during use. Visual feedback, in the form of a green, yellow, or red light representing sound level risk, was provided to listeners and it was found that when visual feedback was available listeners selected significantly lower listening levels than when no feedback was provided. These results suggest that, with proper public education regarding the potential harmful effects of loud music listening, the implementation of visual sound level warnings would positively influence the behavior of iPod users to reduce the risk of music-induced hearing loss. Since many iPod users do not always have the device in the line of sight, the effect of providing auditory and vibrotactile feedback is now being investigated. In this presentation the instrumentation will be described and the feedback system will be demonstrated.

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Nursing Cultural Competency when Caring for Hispanic Patients and Families

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Purpose: To begin an inquiry of nursing care needs of a Shenandoah Valley Hispanic Community by asking Hispanic lay health promoters (LHPs) - What cultural knowledge do nurses need when caring for patients and families of Hispanic culture and ethnicity?

Research Design: A qualitative, grounded theory design was used to reveal themes describing culturally competent nursing care that emerged from discussions with 26 Hispanic men and women from Mexico, Columbia, Guatemala and Honduras.

Methods: Latino lay health promoters (LHPs) working with the Promotores de Salud were asked to participate in focus groups to describe their experiences with nursing care. Focus group data collection continued until saturation was reached.

Results: Three preliminary themes were identified - Connectedness, Language, and Systems. For Connectedness participants convey that they appreciate knowing who the nurse is and that being nice, kind, trying to establish trust and paying attention, is very important. For Language while it is not necessary for the nurse to speak Spanish, participants suggest the nurse speak slowly with pauses to allow for time for translations. With Systems participants feel frustration that they often do not understand discharge instructions and cost of care.

Conclusion: Preliminary findings suggest that Hispanic participants are asking for patient-centered nursing care with an emphasis on the patient as an individual. These findings support the need for personal nurse-patient interactions to create an environment in which nurses can work collaboratively with patients to meet patient care needs.

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Perceptual Feature Learning for Robot Control

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Enabling robots to navigate using visual input is a long-standing goal of Artificial Intelligence research. The main challenge is an over-abundance of data: one image may contain millions of individual pixels. Most of that information is not relevant to the robot's goals. My recent work explores algorithms that attempt to extract relevant information by selectively compressing sensory data. Information is retained only if it enables the robot to make accurate predictions about the outcomes of its actions.

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Genetic Analysis of the Intermediate Stages of the *Bradyrhizobium japonicum*/ Soybean Symbiosis

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Bradyrhizobium japonicum is a Gram-negative bacterial symbiont of soybean. Bacteria invade specialized root nodules in which they fix nitrogen for the plant. Although the genetic requirements for the initial and final stages of the symbiosis are well-understood, intermediate steps of bacterial invasion and adaptation remain a mystery. To dissect the molecular symbiotic development, bacterial mutants blocked in the infection process are studied. In particular, mutants of *B. japonicum* *ecfS* (encoding a putative alternative sigma factor thought to regulate genes in response to plant signals) elicit the formation of non-nitrogen fixing, immature soybean nodules. Overexpression of neighboring gene, *tmrS*, results in an identical symbiotic defect, suggesting *tmrS* encodes a negative regulator of the symbiosis, and perhaps *EcfS* directly. Transcriptomic analysis has revealed putative *EcfS*-*TmrS* gene targets hypothesized to function in the adaptation to the symbiosis. Insertional mutants of *fegA* (encoding an outer membrane iron receptor protein hypothesized to receive a plant-specific signal) are also blocked at an intermediate stage of the infection. Comparisons of *FegA* to its closest homolog, *FhuA*, suggest that the unique symbiotic function of the former is due to differences in the N-terminal domains of these proteins. Thus, recombinant *FegA*-*FhuA* chimeras have been created and will be tested for their ability to complement the *fegA* mutant in the symbiosis. Taken together, work towards understanding the infection process, via the study of the mechanism of *EcfS*-*TmrS* and *FegA* function, will facilitate the design of infection-efficient bacterial strains engineered for seed inoculation.

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A Teacher-Child Interaction Training Program to Assist Teachers in Managing Problem Behaviors of Preschoolers in their Classroom

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Teacher-Child Interaction Training is a school-based universal prevention program in which teachers are taught to use principles of behavior management to prevent and reduce problem behaviors of young children.

This research was conducted in an elementary school in the Shenandoah Valley. Five female teachers and instructional assistants from two preschool classrooms participated. Each classroom had 18-20 students 3-5 years old. English was the second language for over 90% of the students.

Classroom observational data were collected by trained JMU graduate and undergraduate students four mornings per week during circle and centers time. Data were collected using a 10-second interval recording system in which the occurrences of targeted teacher interactions and child behavior were coded during randomized observation schedules.

The intervention was implemented sequentially in a multiple baseline across classrooms design.

Teachers attended two three-hour workshops one month apart. Child Directed Interaction focused on the development of attachment relationships and guidance through selective positive attention. Teacher-Directed interaction focused on consistent discipline through purposeful communication and consequences, with clear commands and follow through for compliance and listening. A brief "sit and watch" was implemented following serious disruption.

In-classroom prompt feedback to teachers regarding their interactions was provided on a continuing basis by an experienced coach through a "bug-in-the-ear" live communication system.

The data showed an increase in positive teacher interactions and a reduction in unnecessary commands and questions. The children showed improved academic engagement through increased compliance and answering of questions, and reduction in the disruptive behaviors of destruction, aggression and yelling in the classroom.

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An Analysis of Natural Disasters in the Caribbean: 1950-2010

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In recent decades there has been an increase in the number of natural disasters, along with an associated increase in loss of life and property, around the world. The region of the Caribbean has not been spared the impact of this trend. A volcanic eruption that began in 1995 on Montserrat resulted in the evacuation of over half the population. An earthquake in Haiti of magnitude 7.0 on the Richter scale left over 300,000 dead and one million homeless in 2010. An outbreak of cholera in Haiti following the 2010 earthquake made responding to the disaster even more complex with over 400,000 cases and over 6,000 deaths between October 2010 and August 2011. The impacts of these disasters are devastating to small island economies. Hurricane Gilbert, a category 5, cost Jamaica an estimated \$4 billion and St. Lucia an estimated \$1 billion. In this research we study the 60-year trends in natural and associated disasters that are common in the Caribbean: earthquakes, volcanic eruptions, hurricanes, flooding, landslides, drought, and disease outbreaks. Haiti and Jamaica have suffered the greatest number of disasters in the 60 period. When comparing the time periods 1950-1999 and 2000-2010, the number of named storms as well as the number of strong storms (Categories 4 and 5) appears to be on the rise. Disaster management and hazard reduction and mitigation have been inadequate and, unless addressed, will result in unnecessary loss of life and property into the future.

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Development of a Quantum Dot Simulator (QDSim) for Researching Semiconductor Nano-Crystalline Photo Detectors and Lasers

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Semiconductor Quantum Dot (QD) nanostructures with dimensions on the order of the thermal DeBroglie wavelength of electrons provide three-dimensional (3-D) quantum confinement of carriers. These nano-crystallites have led to a recent class of laser sources and photo detectors which are an alternative to the conventional bulk and quantum well devices. An important tool for making progress in the development of these laser sources and detectors is the modeling and simulation of the devices to be realized. This requires the use of good methods that are able to incorporate various physical phenomena present in real devices. In this paper we discuss the details of the development and implementation of a computer software program that provides an interactive environment for studying and researching quantum dot devices. This quantum dot simulator (QDSim) allows one to analyze dynamic characteristics such as relaxation oscillations, modulation and turn-on delay as the injection current increases as well as other characteristics of a real quantum dot laser source. The simulator, which is based on modeling and numerically solving rate equations for InGaAs/GaAs and InAs/InP self-assembled quantum-dot systems using the fourth-order Runge-Kutta algorithm, also permits researching time-resolved photoluminescence and electroluminescence results in quantum dot photo detectors. The computer program and physics presented here are intended as aids for teaching or conducting basic research in the field of quantum confinement optoelectronics.

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Biochar: A Pyrolysis System and Captured Heat

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Biochar is a high temperature charcoal used as an agricultural amendment that also sequesters carbon. Most of the research on biochar manufacture in the United States has either focused on large scale continuous systems with multiple products or small batch systems with biochar as the only product. At JMU we have worked on a batch system to make high quality biochar and capture the heat for use either as a backup system for hot water heating, or to heat a greenhouse in winter. The system is now in its third iteration. In the first we used a small grant from CISAT to experiment with low cost material using a minimalist design. We captured some heat but the design was smoky and hazardous to handle. The second design, funded by a CISAT research grant, captured considerable heat, made 8-10kg of biochar and produced 250,000kj per batch of biochar made, but remained smoky. The third generation pyrolysis unit is now under construction on Avalon Farms in Broadway, VA, funded by a 25 x 25 grant. This unit on completion will be able to make the same amount of biochar, with less smoke, and send the captured heat to a storage tank to help heat a greenhouse and home on the site. We expect the completed system to cost under \$4,500, excluding labor. It will be tested in full this coming winter.

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Factors Associated with Health Services Administration Students' Interest in Long-Term Care

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With the aging of the population, there will be an increased demand for health administrators in long-term care (LTC) settings. This study explored factors related to interest in careers in LTC among 68 undergraduate health services administration students at James Madison University. Students completed an online survey that contained items relating to demographics, completion of gerontology coursework, experience in LTC settings, frequency and quality of contact with older adults, perceptions of the career field, attitudes towards aging, and interest in LTC. Logistic regression was used to examine factors associated with interest in a career in LTC administration upon graduation. Of the students surveyed, 32% expressed interest working in LTC administration. Volunteer or work-related experience in LTC settings, quality of contact with unrelated older adults, satisfaction working with the elderly, and confidence in the ability to work in LTC were all positively associated with interest in LTC administration. These findings suggest that educational programs should incorporate experiential learning activities in LTC settings and tailor coursework to foster confidence in the field to potentially increase the number of students in LTC administration.

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Quantity Food Production Lab with Clinical Focus for Dietetics Majors

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Quantity Food Production has long been a requirement in dietetics programs; however, students do not always see its importance and relevance to clinical dietetics practice. Over the past several years an opportunity was presented to introduce a clinical element into the lab portion of the course and at the same time demonstrate a clear link to the Clinical Nutrition classes taken by the students. The course now includes two clinical quantity labs each semester. One of these focuses on modified texture for dysphagia and stroke patients. The other focuses on a special diet selected by student managers from a case study from one of their Clinical Nutrition classes. Students work with Certified Dietary Manager or Registered Dietitian guest instructor with experience in food production for the condition, to plan the menu and organize lab demonstration, product display, and discussion for the class. Faculty and interested students from Dietetics, Speech Pathology, Occupational Therapy, and Nursing have been among invited guests to participate in discussion and sample the meal. Student reactions and online search results are then recorded in an Elluminate Live! online session as a follow-up and debriefing activity. Face-to-face and written comments from students have been both positive and constructively critical; these provide valuable feedback for development of future clinical quantity labs.

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Infrastructure Geographies of Shrinking Cities

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While plenty of attention has been given in recent times to how declining industrial cities might recast themselves in terms of their economic identity and image, less thought has been given to how shrinking cities might manage their fundamental infrastructure. This poster explores the geographical contexts and responses to population decline and its impact on water utilities. In growing cities, the challenge is to stretch limited resources to meet expanding demands; the opposite difficulty is faced by shrinking cities: how to effectively reduce supply to meet diminishing demands. The most prominent examples of this situation are in Eastern Germany in the period following reunification, and across cities in the "Rust Belt" in the United States of America, where populations have declined significantly in the past 50 years. Considering especially the case of Detroit, this work looks at the infrastructural challenges faced by such a shrinking city, the impact of changing urban geographies on water utilities and identifies what lessons can be learnt for future infrastructure planning. Changing urban geography will inevitably prompt a restructuring of utility geography.

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Eight Weeks of Treadmill Workstation Use on the Performance of Office Work Tasks and Health

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The U.S. Census Bureau reports that three quarters of Americans sit at a desk every day at work. Individuals spend less time participating in physical activity, exercise and nonexercise physical activity, and at least half their day sitting. In response to the increased need to expend more energy throughout the day, the walking workstation was designed to offset the negative effects of sedentary office professions. Nonexercise activity thermogenesis (NEAT) is the energy expended for everything that is not sleeping, eating, or sports-like exercise. An increase in NEAT can alter energy balance, thus increasing energy expended. The effects of low NEAT energy expenditure may also contribute to the development of weight related conditions: hypertension, obesity, type II diabetes, and cardiovascular disease. Eight university workers were recruited to examine the effects of the walking workstation on work productivity (mouse clicking and typing speed) and selected physiological measurements (weight, resting blood pressure, body composition, glycosylated hemoglobin (H_gA_{1c}) over eight weeks.

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