

Pittsburg State Univeristy

STUDENT RESEARCH
COLLOQUIUM
ABSTRACT WRITINGS
S P R I N G 2 0 1 5



2015 PSU Research Colloquium
Abstracts

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Bodyweight Support
Zachary Hunt, Tyler Ford, Kirk Smith, Fred Gladbach, David Reddick
Engineering Technology

During the first week of school in August, students in the Senior Design MFGET*666 class were given choices of projects to work on through the 2014 fall and 2015 spring semesters. Engineering Technology students are required to complete this two-semester class project when they reach three or fewer remaining semesters in their degree program. One of these projects students were given the choice to work on included building a machine in order to support a runner on a treadmill. This would allow a runner to perform until physical exhaustion without falling during a V02 Max Test. This machine was to be designed in conjunction with the Pittsburg State University Exercise Science Department, as the machine will be used on their treadmill for university athletes and other participants.

Students were able to personally meet Dr. Carper, the main person of contact in the exercise science department, and introduce themselves as well as ask the customer (Dr. Carper) what he expected to see included in the design of the machine. In his requests, Dr. Carper included that the machine must fit around the treadmill currently located on the second floor of the Student Recreation Center in the Health and Performance Lab. In addition, it must support up to a 500 pound runner and the runner needs to be able to have free range of motion while running. The test administrator must also be able to take measurements such as blood pressure from the runner while the test is being performed. Dr. Carper would also prefer, but not require, that the machine be portable in the event the treadmill was ever to be moved into a different lab or room.

For a solution, students have proposed an open frame design which will accommodate runners, monitoring equipment, and other test administrators if necessary. Since the system cannot be attached to the treadmill, the frame is designed to fit around the treadmill. The design consists of three main parts: the frame, the fall limiter, and the harness. The main feature of the design consists of the frame. The frame's purpose is to support the weight of a 500 pound person, the maximum weight that the treadmill can support, falling a distance after failure while running. In order for the frame to be useful, when a person falls while running, they must be caught before they make contact with the treadmill belt. To accomplish this, a system has been designed that uses two self-locking winches which can be operated simultaneously with one handle for simplicity. These winches will allow for adjustments in the length of the cable from the subject to the frame as the treadmill incline increases. A harness is also needed for the system in order to support the runner upon a fall. The harness would need to be comfortable enough for someone to run in it and keep full mobility. The system will ideally catch a runner each time the V02 Max Test is administered, thus, a multiple use harness is desired.

Metal Mold Development for Aluminum Casting
Brendan Herrera, Kyle Ragan, Jeremy Mclennan, Araon Noack, Nick Crain, Tyler Casteel
Engineering Technology Design, Build Manufacturing Research Team

Every year the Manufacturing Methods I class is faced with manufacturing a hacksaw as the main project over the semester. During two of the weeks, the class is introduced to permanent mold casting; a process we currently utilize to produce our hacksaw handle. This process is done by pouring molten aluminum into a mold; which increases productivity. The current mold machine was built in 1970 and is capable of producing 100+ hacksaw handles every year; however, it is inefficient.

The objective set by this research project was to be able to produce multiple castings in one pour, reduce process variation, and reduce scrap. To accomplish this, we need to update our permanent mold to a tilt/pour automated machine. It utilizes the same style as a permanent mold, but is able to control the flow of material by tilting the machine from 0 to 90 degrees. The tilt/pour process eliminates the Human factors and reduces variability. By the end of this project, this machine will be able to successfully cast the new handle to the May of 2015 deadline.

The clients for the project are Dr. Russ Rosmait and Mr. Jacob Lehman; two professors that run the Manufacturing Methods I class. They set key requirements that covered modernizing the casting process and making the new hacksaw handle cast-able and machine-able. It also needs to provide a quality hacksaw useable outside class.

The first step before starting to design a new permanent mold is to come up with a design inputs table. The table should be a weighted list of requirements and requests from the clients. The overall mold had to be designed to fit the tilt/pour machine currently in the metal casting lab. To increase productivity, the new mold was designed to be a two-on mold process, which produces two handles per cycle. Each cycle is limited to a 5 pound pour cup, which the design of the new mold could not exceed. When switching from an old permanent mold process to a tilt/pour process, the method of pre-heating the mold had to be redesigned. The clients asked for automated process; a Programmable Logic Controller (PLC) was installed. Along with updating the tilt pour machine, the clients asked to be able to visually monitor mold temperature variation by installing a Human Machine Interface (HMI).

For the clients and future PSU students, a sound hacksaw handle that will be able to with-stand the force that it may encounter in a variety of extreme situation was required. The new handle design is to keep the same ergonomic grip that the old handle has and keep the hand guard that runs on the bottom of the handle. The clients also asked to be able to perform the same secondary operations as the old hacksaw in the machine shop. In order for that to happen, the diameters of holes and the length between each hole must stay maintain the same dimensions as the old handle.

Nanostructured and Ferromagnetic Iron Oxides for Energy Storage Applications

Felipe D. Souza, Ram K. Gupta

Chemistry

A facile hydrothermal technique was used to synthesize nanostructured iron oxide. The synthesized iron oxide was characterized using various techniques. The X-ray diffraction analysis confirms that the magnetite (Fe_3O_4) phase of the iron oxide. There were no extra peaks other than peaks due to Fe_3O_4 were observed indicating phase purity of Fe_3O_4 . Further, the morphology and average particle size of the synthesized iron oxide were investigated using scanning electron microscopy. The average particle size of these nanoparticles was about 65 nm. Magnetic properties of the hydrothermally synthesized Fe_3O_4 nanoparticles were studied in detail. The magnetization of the Fe_3O_4 nanoparticles was studied by varying applied magnetic field and temperature. The magnetic measurement reveals the ferromagnetic nature of the synthesized Fe_3O_4 nanoparticles at room temperature with coercivity and remanent magnetization of 98 Oe and $0.51 \mu\text{B}/\text{molecule}$, respectively. In M vs T measurements, we observed a transition around 120 K. The observation of such transition (Verwey transition) indicates the high quality and phase purity of the synthesized Fe_3O_4 . Moreover, the Fe_3O_4 nanoparticles were electrochemically characterized for their potential application as an electrode for ultracapacitors. The specific capacitance of 97 F/g at the current of 1 mA was observed with excellent cyclic stability. The obtained high specific capacitance, excellent cyclic stability and ferromagnetic behavior at room temperature suggest that this facile method could be used for the production of cost effective magnetic and environment friendly iron oxide nanoparticles for next generation supercapacitor devices. Note: This material is based upon work supported by the National Science Foundation under Award No. EPS-0903806 and matching support from the State of Kansas through the Kansas Board of Regents.

Time Series Analysis in American Air Passengers
Minh Bui
Mathematics

Tourism in too many areas has been increasing for decades because of development in communications, transportation, and increased awareness of opportunities through global economic integration. Recent events like Malaysia air crash or disappearance have negatively impacted Malaysian airline in many facets. One of the impacts is the decrease in the number of air passengers using Malaysian airline after those accidents. This emphasizes the importance of forecasting numbers of air passenger. There are two common approaches to forecasting international travel and tourism demand in the literature. Those are econometric models and time series models. This paper discusses different techniques in time series analysis, along with showing the relationship with economic cycles, natural disasters, wars, accidents, and man-made disasters in the United States air passenger numbers.

Economic approach is often referred to as "structural demand modeling," In terms of forecasting tourism demand, a problem with causal models is that values of the explanatory variables need to be predicted or known for the time at which the forecast is required. It is difficult to quantify some explanatory variables or proxy measures, which is sometimes biased (John Coshall, 2006). Lim (1997) decided not to employ economic demand modeling techniques. This paper therefore only shows some similarity between the economic factor and numbers for air traveling without trying to analyzing the relationship in further detail in terms of econometric model.

Seasonality is an important feature of tourism demand time series and requires careful examination in modeling and forecasting seasonal tourism demand (Kulendran and Wong, 2005). Outlier and structural changes are commonly encountered in time series data analysis. The presence of those extraordinary events could easily mislead the conventional time series analysis procedure resulting in erroneous conclusion. In research by Jennifer Christine, Hsin (2011) show that inbounds tourism from Japan has been severely affected by communicable disease. Man-made crisis and natural disasters have affected international tourism demand considerably (Song and Li, 2009). The effects of these events on tourism demand are to some extent predictable based on appropriate scenarios analysis (Song and Li, 2008). In the area of event tourism, neither time-series nor structural equation approaches are of much use because special events are, in a sense, statistical outliers (Tideswell, et.al. 2001). Therefore, regardless of different methods being used to forecast the future, the forecast would be totally off if there are special events happen.

In this presentation, different forecasting methodologies will be explained and used, including Moving Average, Exponential Smoothing, Winters' method, Decomposition, ARIMA, and Fourier Analysis. The forecasting accuracy comparison is conducted based on several measures of error magnitude: the mean absolute percentage error (MAPE), and the root mean square percentage error (RMSPE)

Functional Magnetic Nanoprobes: Novel Nanotheranostics for the Treatment of Prostate Carcinomas
Deaven Thompson, Blaze Heckert, Shoukath Sulthana and Santimukul Santra
Department of Chemistry, Biology, KPRC

The imaging, diagnosis, and successful treatment of prostate cancer (PCa) continue to be a challenging problem and it is estimated that 1 out of 6 men will be diagnosed with the disease during their lifetime, making this disease the second leading cause of death among men. Therefore, developing more effective therapeutic agents against advanced PCa that allow for simultaneous therapy and monitoring of tumor growth are equally important. Particularly, theranostic (dual therapy and diagnostic) agents are targeted to the disease regimes that allow delivery of therapeutic agents in high concentrations to PCa, while monitoring of drug localization to the tumor. The concept of a nanoparticle-based therapeutics is ideal as a single agent that could deliver a drug and imaging agent to the prostate tumor via recognition of surface receptor markers highly expressed on the tumor cells. In this presentation, we will discuss about a new method of targeting prostate cancers. We report for the first time that the use of glutamate ligand-decorated and taxol anti-cancer drug encapsulating magnetic nanoparticles to target PSMA-bearing PCa cells. Prostate Specific Membrane Antigen (PSMA) is over-expressed on the surface of LNCaP prostate cancer cells and successfully targeted by glutamate-decorated magnetic nanoparticles. Results showed more than 80% LNCaP cells were death after 24 h incubation of the drug-carrying nanoparticles. No apoptosis was observed in PC-3 cells due to the absence of PSMA receptors. These results were further confirmed using optical microscopy and magnetic resonance imaging technologies.

Inhibitor-Induced Combination Therapy of K-RAS Driven NSCLC
Blaze Heckert, Deaven Thompson, Kalee Woody and Santimukul Santra
Department of Chemistry, Biology and Kansas Polymer Research Center

Mutations in K-RAS are prevalent in 25% of Non-Small Cell Lung Cancer (NSCLC) and so far are considered to be undruggable. K-RAS is known to be the primary monogenic driver in NSCLC and more common in smokers. For the enhanced effectiveness of K-RAS inhibition, Hsp90 inhibitor has been used. The Hsp90, a molecular chaperone known to affect multiple signaling cascades, facilitates aberrant cancer cell survival by protecting mutated oncoproteins from targeted degradation. In this presentation, a new combination therapy will be discussed for the treatment of K-RAS driven NSCLC to using Hsp90 inhibitor, Ganetespib and therapeutic drug taxol. Towards this end, new biocompatible hyperbranched polyester was developed, capable of formulating cancer targeting theranostic nanoplatform. The projected aliphatic dendritic polyester is spherical in shape, indicating the presence of enough polymeric cavities for the effective encapsulations of therapeutic drugs, Hsp90 inhibitor and other cargos. The formulated nanomedicine was labelled with near infra-red optical dye (Oil) for optical imaging, whereas encapsulation of BiDOTA complex added X-ray imaging modality to monitor drugs (Ganetesib and taxol) homing. Nanotechnology based modern techniques were used to facilitate such molecular encapsulation processes. The surface of the polymeric nanoparticles was decorated with small molecule folic acid using "click" chemistry. Results showed that the formulated nanoplatform is non-toxic (without the drug) and able to cross the A549 cell membrane by the folate receptor-mediated internalizations (Figure). Further results with the combination therapy of NSCLC will be discussed in this presentation.

PSU Society of Automotive Engineers Formula Competition
Ali Alahmari, Jennifer Bradley, Aries Herrion, Nick Miller, Thomas Vanbecelaere, Rafael Vasquez
Engineering Technology

The Formula SAE competition is based on the concept of student teams creating a fictional manufacturing company that has been contracted to develop a Formula-style race car. The competition encompasses all aspects of the automotive Industry: research, design, manufacturing, and testing. The Pittsburg State University car was created using as many stock Items as possible; however, the team focused on 5 other key areas: Suspension, Aerodynamics, Engine, Drive Train, and Chassis. Through Finite Element Analysis (FEA) In SolidWorks•, the chassis was designed to include structural members to comply with both the rule of triangulation, as well as maintain an impacted deflection less than 25mm. A stock 2004 Honda 600CC CBR engine was modified for the competition through a maintenance overhaul and the manufacture of a new air Intake that created less turbulence and therefore less stagnant air in the intake chamber. Air flow simulation in SolidWorks• was used to design an aerodynamic body with side pods that capture the deflected air from the nose cone to force optimal airflow to the radiators, enhancing engine cooling. The body components were fabricated in collaboration with the PSU Plastics Engineering Technology Program. Suspension components were designed through FEA simulations providing a factor of safety of 2. Drivetrain components were analyzed to maximize the transfer of the engine's torque to increase speed and maneuverability. The Pittsburg State University FSAE Design team has designed a competition worthy car that will be competing this summer in Lincoln, Nebraska.

Dead End Homologue (DND1) Protein and Its Target mRNA is Influenced By Age and Estradiol in Normal and Systemic Lupus Erythematosus (SLE) T Cells

Anuradha Bhusri and Dr. Virginia Rider

Biology

SLE is a gender biased autoimmune disease (9:1 female to male). The immune system is a complex biological system that fights with foreign antigens including bacteria and viruses. The immune system works by producing antibodies against antigens. In SLE, the immune system produces antibodies against its own tissues. These antibodies are known as auto-antibodies. The female sex steroid, estradiol, alters T cell signaling pathways in SLE T cells and contributes to SLE onset and progression. Estradiol inappropriately regulates genes involved in T cell signaling pathways only in SLE T cells and not in control T cells. This suggests that the changes in the gene expression patterns in SLE T cells could lead to impaired peripheral tolerance in women and SLE onset. Peripheral tolerance is immunological tolerance developed after T and B cells mature and enter the periphery. Dead end homolog (Dnd1), an RNA-binding protein, inhibits miRNA by binding to target mRNAs. Dnd1 targets, such as p27 -Kip1, contribute to the maintenance of peripheral tolerance. Microarray analysis suggested estradiol suppresses Dnd1 expression in SLE T cells but not in normal T cells. The present study measured DND1 protein in freshly isolated normal T cells and tested the effect of estradiol (10^{-8} M) on DND1 expression. T cells were purified from normal blood samples (n = 16) by Histopaque gradient and negative selection. Proteins were extracted and DND1 immunoprecipitated. The immunoprecipitates were size fractionated by SDS-PAGE and transferred to nitrocellulose membranes. The membranes were reacted with DND1 antibody. The protein amount was determined in triplicate using chemiluminescence. T cells from women <35 years contained significantly higher amounts ($p = 0.37$, Pearson's rho test, resulting R value was used to calculate significance p-value) of DND1 compared with T cells from donors >35 years. DND1 was 63% higher in younger age group than older age donors. DND1 increased in response to estradiol with maximum expression (3.5-fold) at 3 h post estradiol stimulation. p27 expression was measured by the real-time (Step-one, Applied Bio systems) polymerase chain reaction (PCR). p27 expression was suppressed ($p = 0.27$, two tail T test was used to calculate the significance P value) in SLE T cells (n=12) compared with normal T cells (n=7). Together, the results confirm the microarray data indicating that estradiol does not suppress Dnd1 nor p27 mRNA expression in normal T cells. p27 has an established role in the development/maintenance of tolerance via complex regulation of CD4+ T cell proliferation and effector function. Future experiments will test the hypothesis that the inappropriate suppression of Dnd1 allows miRNA inhibition of p27 (Kip 1) and thereby alters CD4+ T cell effector subtypes in SLE. Changes in CD4+ T cells subtypes lead to a reduction in suppressor function and impaired peripheral tolerance. Also look at the aspect in detail, weather the estradiol effect is age dependent.

Small Mammals From Three Different Habitats In the Mined-land Wildlife Areas in
Crawford and Cherokee Counties, Kansas

Fabio Giacomelli, S. D. Ford, H. Nonnenmacher, K. Mijares.

Biology

Small mammals, orders Rodentia and Soricomorpha, play an important role in nature as prey, predators, seed dispersers and even as nuisance species causing losses to agriculture. These species are distributed throughout the United States, and it is important to study them due to their ecological and economic importance. The aim of this study is to identify small mammal species in 20 different mined-land wildlife areas in Crawford and Cherokee Counties, in Southeast Kansas. Three different habitats were trapped in each area: grassy, brushy and forested. A line of 200 snap traps was set in each habitat, for three consecutive days. Sampling was held seasonally in 2014 (winter, spring, summer and fall). A total of 12 species was collected: Elliot's short-tailed shrew (*Blarina hylophaga*), North American least shrew (*Cryptotis parva*), prairie vole (*Microtus ochrogaster*), pine vole (*Microtus pinetorum*), house mouse (*Mus musculus*), Eastern woodrat (*Neotoma floridana*), white footed mouse (*Peromyscus leucopus*), deer mouse (*Peromyscus maniculatus*), fulvous harvest mouse (*Reithrodontomys fulvescens*), plains harvest mouse (*Reithrodontomys montanus*), hispid cotton rat (*Sigmodon hispidus*) and meadow jumping mouse (*Zapus hudsonius*). The grassy habitat was the most productive in richness and abundance of species, where all 12 species were caught totaling 660 specimens. The second most productive habitat was the brushy habitat, with 10 out of 12 species and 483 specimens, being North American least shrew and fulvous harvest mouse the species not represented. The least productive habitat was forested habitat in which only 8 species were represented and 209 specimens were caught, being North American least shrew, house mouse, plains harvest mouse and meadow jumping mouse the species not represented. Grassland habitat is the richest and most abundant among the three habitats studied, possibly due to the increased amount of shelter and food available.

Spin Coating as a Technique For Optimizing the Power Conversion Efficiency of Dye Sensitized Solar Cells
Dinushi Jayatunga and Benjamin O. Tayo
Physics

Spin coating technique is not popular as a basic fabrication technique in the field of photovoltaics though it is commonly used in depositing electron blocking layers, compact layers and counter electrodes in the fabrication of photovoltaic materials. In this project, mainly we seek to fabricate very efficient dye sensitized solar cells (DSSC) using spin coating technique as the basic fabrication method. The goal is to enhance the incident photon-to-current efficiency (IPEC) by optimizing the angular speed of the spin coater with thickness variance in nanostructured semiconducting metal oxide $n\text{-TiO}_2$ -layer. The TiO_2 nanoparticle layer was prepared by spin coating on indium-doped tin oxide glass by annealing. The carbon counter electrode and the ruthenium dye anchored electrode were then assembled as a function of thickness of the TiO_2 layer. The thicknesses of the thin films were adjusted by varying the speed of the spin coater in the range of 1 - 4 rpm. The DSSC was illuminated with a solar simulator under AM 1.5 G illumination at 100 m W/cm^2 in the presence of I^-/I_3^- electrolyte solution. I-V characterization was performed to extract cell parameters. Current recorded maximum energy conversion efficiency (η) is 3.32%; a short circuit current density of $10.20 \text{ mA}\cdot\text{cm}^{-2}$, open circuit voltage of 0.50 V and fill factor of 65.33% for the optimized speed of the spin coater of 3.35 rpm for one layer of $n\text{-TiO}_2$ layer. Our studies show that the IPEC value of a DSSC can be optimized by adjusting the angular speed of the spin coater and thin film thickness.

Effect of Video Games in Learning of Industrial Technology Students
Lakshman Kishore Muppuri
Industrial Technology

The nonimmigrant international students from all over the world coming to United States of America face difficulty in understanding the vocabulary and English language since they are from different style of teaching environment. International students face difficulty and get stressed in learning the subject as they are brought to them in the traditional U.S style of teaching which can lead to negative effects like increase in dropout rates and losing interest in studies. The problem is students feel stressed when they are taught with complicated issues in subjects. A possible solution to overcome this issue is by using strategic games in learning like the WORD SPLASH.

How and to what extent does using Word Splash a strategic vocabulary word game in academic curriculum enhance the learning ability of international students in industrial technology courses at Pittsburg State University?

The problem is that the international students of Industrial technology at Pittsburg state university face are struggling with the language & vocabulary such as not using the correct word or phrase during speaking and writing which is resulting either poor communication or losing the grades by submitting the paper with poor vocabulary. Word Splash is game that can help student improve in learning terminology in comprehension and vocabulary strategy, it is the game which can be played inside the class by having fun among the students. This event also motivates them in order to be attentive in the class to learn more things and to communicate well in the class. The game can be played like before starting a new chapter the new words of it are analyzed and picked by the teacher then words are splashed on the screen of the computer or the sentences whose vocabulary needs to be corrected, then the students have to work on this to correct them when they fit in the right word it gives green tick else they have to try again in the mean they get many suggestions and out comes what can be fit into it.

The type of the research methodology to be used is qualitative which has the sequence as follow, first by selecting the participants and site like international Industrial technology students at PSU. After qualitative observation of selected participants with their permission, then by formulating the standard research questions from my observation the Qualitative interviews like face to face to the participants will be done so with that difficulties can be known by which students are facing due to traditional method of teaching. With the specified questions from above observations and then providing time to play game so that they can feel the difference and take the interviews again to observe the change. Then formulating the documents on all the above process by taking visual materials also into consideration gives proper results to research study by which can be finally concluded.

Non-Small-Cell-Lung-Cancer Treatment Using Hsp90 Inhibitor Carrying Magnetic
Nanotheranostics

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K-RAS is the most common mutated oncogene associated with Non-Small Cell Lung Cancer (NSCLC). So far there are no available targeted therapies for the direct inhibition of K-RAS. The standard course of treatment for patients with advanced NSCLC, often includes combined therapy using therapeutic drugs. However, repeated failure of these therapies due to resistance (MDR), indicated the urgent need for molecularly targeted therapies. Hsp90 has recently become an attractive molecular target for herapeutic intervention of lung cancer. It is a chaperone protein and known to play a major role in the stability and maturation of several key signal transduction proteins, leading to aberrant cell growth causing cancer. Ganetespib, an Hsp90 inhibitor, has been shown to have superior antitumor activity in several studies and currently, its efficacy for advanced NSCLC treatment is under clinical trials. In this presentation, a new combination therapy will be discussed for the treatment of K-RAS driven NSCLC by using Hsp90 inhibitor, ganetespib and new platinum complex, Pt(MCO)₂. We are introducing polymeric platinum complex Pt(MCO)₂ for the first time as an alternative to the known platinum drug Cis-Platin and hypothesized that this multivalent platinum complex will be cytotoxic to the cancer cells. Towards this end, folate decorated theranostic iron oxide nanoparticles were formulated to target NSCLC. The drugs and near infra-red dye Oil were encapsulated using unique solvent diffusion method. The formulated multimodal theranostic nanomedicine was used for the targeted treatment of NSCLC, in vitro. The targeted drug delivery and the drug homing were monitored using optical and MR imaging. Results showed that the formulated nanoplatforms are non-toxic (without the drug) and toxic when drugs were carried. Detailed characterizations and in vitro results will be discussed in this presentation.

Novel Polyurethane Foams Derived from Bio-based Materials

N. Elbers, Ram K. Gupta

Chemistry

β -caryophyllene and α -phellandrene are two naturally-occurring alkenes which were used in this study to synthesize novel bio-based polyols. These polyols were used for the preparation of polyurethane rigid foams. A photochemical thiol-ene reaction was employed using β -caryophyllene and α -phellandrene in combination with 1-thioglycerol and 2-mercaptoethanol to synthesize polyols with functionality of 3 and 4 depending on the molar equivalents of 1-thioglycerol and 2-mercaptoethanol. The synthesized polyols have been characterized using gel permeation chromatography, FT-IR, viscosity, and hydroxyl number. The synthesized polyols were successfully used for preparation of rigid polyurethane foams which contained 50% commercial polyol (Jeffol SG-360) and 50% of the synthesized bio-based polyols from this study. These polyurethane foams were characterized for mechanical property, closed cell content, morphology, thermal stability and glass transition temperature. The properties are good by industry standards. The goal is to assess these foams' potential use for various applications such as thermal insulation of freezers, pipes, storage tanks, and buildings.

Exploration of Quotient Spaces and Group Actions, With Application to Visualizing Music
Srividhya Balaji
Mathematics

Various authors have explored how the mathematical area of geometric topology can be used to visualize musical concepts and shed light on the structure of a musical composition. For example, Tymoczko and others have modeled the set of chords as an orbifold. We explore the definitions of quotient spaces and group actions on spaces with the aim of visualizing Ragas (Modes) in Indian Carnatic Music. A raga is a melodic scale, which takes a definite set of notes, from the twelve notes in an octave. Extempore raga elaboration involves the permutation and combination of these notes, which gives rise to an infinite number of patterns.

Liquid Exfoliation Study on Graphene
Chathuri Silva, and SerifUran
Physics

Layered materials (graphite, graphene oxide, graphite oxide, hexagonal boron nitride, molybdenum disulfide, etc.) hold the potential to be exfoliated into two dimensional (2D) crystals whose properties are very attractive for various applications in electronics, sensing, catalysis and energy storage. The bonding within the layers of these layered materials is covalent, but adjacent sheets are bonded via van der Waals forces to form 3-dimensional (3D) crystals. Desired solution/solvent would break the van der Waals bonds, but not affect the covalent bonds within the layers. Layered materials can be exfoliated in common solvents and deposited as individual flakes. The amount of exfoliation depends on the surface energy, solution/solvent type, time of exfoliation, and concentration of the mixture. We have studied graphene flakes produced by gas-phase hydrocarbon detonation. Acetylene (C_2H_2), a gaseous hydrocarbon, highly combustible, and produces a very hot flame (over $3000^{\circ}C$ or $5400^{\circ}F$) when combined with oxygen. The end product of the combustion is a black soot that contain various size and thickness graphene flakes. We studied the liquid exfoliation of these flakes using a mixture of Propylene Carbonate, Dipropylene Glycol (DPG) and Aromatic Hydrocarbons. Optical microscopy, Scanning Electron Microscope (SEM) and UV-Vis Spectrophotometry have been used to characterize the samples.

Innovative Anti-Oxidant Nanoceria for the Early Diagnosis and Treatment of Lung Cancer
Shoukath Sulthana, Blaze Heckert, Jyothi Kallu and Santimukul Santra*
Chemistry, Kansas Polymer Research Center, Biology

Cerium oxide nanoparticles (nanoceria, NC) has emerged as an important nanomaterial due to its 1) unique redox property of switching oxidation states between Ce^{3+} and Ce^{4+} depending upon the environment and 2) higher surface to volume ratio for better oxygen exchange and higher reactivity. Over the past decade, these exceptional redox properties of NC were extensively used in various biological studies including neuroprotective, anti-inflammatory, anti-aging, cardio protection and other oxidative-stress related complications. In addition, the anti-oxidant NC showed exceptional anti-tumor activity when incubated with carcinomas. According to the American Cancer Society 16,65,540 new cases of cancer and 5,85,720 deaths were reported in 2014. Non-Small-Cell Lung Cancer (NSCLC) is a major cause of death amongst smokers. Nanotechnology in cancer therapy has earned popularity because of their potential to cross biological barriers and to deliver therapeutic drugs specifically to the disease site in higher concentrations.

We have discovered novel polyacrylic acid-coated functional NC for the targeted diagnosis and treatment of lung cancers. In this study, we have designed NC-based theranostics to be used as personalized nanomedicine specifically for the heavy smokers. Combination therapy was used to deliver two therapeutic drugs, doxorubicin and Hsp90 inhibitor Ganetespib for the effective treatment of lung cancer. In this project, we have introduced an innovative nanotechnology for the timely detection and simultaneous delivery of two therapeutic drugs to the lung cancer cells. The surface functional groups of NC were decorated with folic acid to target folate-receptor over-expressing A549 lung cancer cells. Experimental results showed more than 80% cell death within 24 h of incubation using drugs-encapsulating NC-based nanotheranostics. Detailed synthesis protocols, cytotoxicity, controlled drug release and microscopic results will be discussed in this presentation.

An Update to the Adaptation and Implementation of Building Information Modeling to create a 3D Virtual PSU Model Construct of the PSU Campus for improving Facilities Maintenance and for use by Various Other Multiple Discipline Users

Sean F. McCartney
Engineering Technology

Since first proposing this topic at last year's Colloquium I have proceeded further with the project completing phase one which is the construction of the virtual base model for which all supporting data and modeling intelligence will be loaded. A basic project overview consist of the following: The current method used for the purpose of Facilities Maintenance is to rely on 2D based drawings and documentation. This method is outdated due to the fact there are more advanced methods of documenting and coordinating maintenance activities on a campus the size of Pittsburg State University. To be able to fully utilize these new practices there needs to be more of a digital database for the resources to both draw from and report back to. The goal of this project is to modernize the way in which Maintenance is conducted on the PSU, in addition to multiple other disciplines that can utilize the output resources of this research project. To complete this implementation of the facilities maintenance will be based on a hierarchy of supporting documents that have either already been created or are in the process of being created. This model was constructed in a collage process incorporating the aspects of 3D BIM Modeling of the PSU Campus and Buildings based on 2D Drawings and Laser scanning data capture. The Model is very close to be ready to be loaded with various other multi-discipline specific information allowing for a fully integrated 3D Virtual PSU environment. Some of these disciplines can include: Security and Campus Safety, Clubs and Activities location meetings information, PSU Campus Marketing for future students, PSU Campus Orientation for new students, Virtual tours for families and friends (utilizing gaming software turning the virtual 3D Model into a Gaming/Interactive environment), future campus planning and expansion, Student involvement in future campus projects, Landscaping Design, Interior classroom planning for Faculty and staff, Renovation and remodeling of existing buildings and other yet to be determined processes. All of this work has been completed with existing technology, software and tools owned by PSU. The Modeling work can be done with assistance from the student body and dynamic input can be provided by faculty, students and advisors. A cross section of representatives from all parties can create a steering committee to ensure project is on course and deliverables are met. There is no additional cost to PSU as all of the activities needed to be done are done by various departments on the PSU Campus currently. The scope of the project is such that is can be completed over a period of time, allowing for multiple rollouts of the various features of the completed 3D virtual Model.

Comparing Changes in Plant Functional Diversity Over 31 Years of Community Development
Jacob Heil, Dixie Smith, Annanda Jayawardhana, Neil Snow
Biology and Mathematics

The Monahan Outdoor Education Center is a reclaimed mining site and mine waste dump owned by Pittsburg State University. The site had been reduced to a barren state by the toxicity of the waste dumped there. From 1984-1985 a reclamation process attempted to replant the Monahan with natural grasses. This was a multi-step process that included adding layers of rock and topsoil to the mine waste before seeding the grasses. The reclamation process was meant to re-vegetate the land and control runoff and soil erosion. Multiple PSU graduate studies have been conducted on the Monahan. The first, by Vickers in 1989, evaluated the re-vegetation process in the years following reclamation. The second, by Imhoff in 1994, evaluated soil quality and found that little to no progress had been made in overall soil quality at the Monahan. The third, by Yates in 1996, evaluated the grassland community using a multivariate statistical approach. Today the Monahan is a mosaic of woods, grassland, and wetlands.

In this study the plant community on the grassland portion of the Monahan was sampled in order to evaluate the Functional Diversity of the species found there. Functional Diversity is a field of analysis that helps to estimate the Biodiversity of a sample area through an analysis of the functional traits in present species and their interaction with the rest of the ecosystem. Functional Diversity is a developing field and many different statistical indexes have been proposed. This study follows the index laid out by Villéger et. al. in the 2008 paper *New Multidimensional Functional Diversity Indices for a Multifaceted Framework in Functional Ecology*.

Another important aspect of this study is the comparison of current data to past data. Results from this study will be compared to a previous Pittsburg state University graduate study by Yates in 1996. This comparison will hopefully yield insight into the community development of this site over the years since its reclamation. The experimental design of this study was largely drawn from Yates's thesis. In 45 sample plots all-species were identified and percent cover for each was estimated. In each of the 45 plots, 5 sampling quadrats were randomly assigned. In each quadrat the species found there were recorded and percent cover was estimated. This is an ongoing study, and while not all parameters have been analyzed at this time, we will present some basic comparisons of diversity, richness and dominance.

Facebook and Happiness: Life in a Frame
Valquiria Vita
Communication

"If a tree falls in a forest and no one is around to hear it, does it make a sound?" This thought, stated by one of the participants of this research, sums up the findings of this study.

Facebook is part of more than 890 million users' daily routines, and the majority of what is posted everyday can be considered a happy or a positive post, which is a post related to positive emotional outcomes. This research intends to show the close relationship between Facebook and happiness. The goals are explaining what benefits people get from posting a positive event of their lives on Facebook, and also how Facebook friends feel when they are exposed to these happy posts. The study, supported by Uses and Gratifications theory, consists of a thematic analysis of positive Facebook posts, followed by interviews with 10 Pittsburg State University students.

Findings from the thematic analysis showed eight categories emerging among the positive posts on Facebook: engagements, parties, relaxation, trips, shopping, grades, thanks and blessings, and selfies.

Findings from the interviews proved that after being exposed to the happy posts participants developed feelings of jealousy, dissatisfaction, anxiety, and competition. Nine in 10 interviewees also answered that they could not graduate and not post anything on Facebook. According to the interviews, in general, people feel the need of showing only the happy side of their lives on Facebook. Also, an important event doesn't have the same impact if it is not made public on Facebook, which explains the comparison with the tree that falls in the forest with nobody there to hear it.

Abstract of Investigating Taiwan's PTT Gossiping Board and Its Influence on Citizenship

Wei-Chen Lin
Communication

As the technology developed in the 21st century, the notion of citizenship reached its summit by spreading over the internet in democratic countries. There were no borders preventing internet users' opinions from being limited within a country after internet functioned as a global village. Thus, social movements and demonstrations were taking place worldwide, especially online. In this study, the researcher wanted to investigate the relationship between the online forum PTT (Taiwanese biggest electronic bulletin board system) and its influence on the users' citizenship. Due to the fact that the boards from PTT summed up to more than 13,000 categories, the researcher especially chose Gossiping Board for its long-time popularity and latest debatable topics nationally and internationally. By understanding if and to what degree the users' civic duty was being influenced by the discourse taking place in this online forum, the researcher could contribute results to the field of Communication, Political Science, and Social Science.

Since the entire PTT is composed of traditional Chinese words, the researcher has translated the necessary data into English and assisted with visual aids (screenshots). The researcher also applied two analyzing techniques to interpret the data: Erich Fromm's psychoanalytic perspective involving his conceptualization of Active versus Passive Stimulation and Elihu Katz's Uses and Gratifications Theory. Studying 1 out of 10 posts, from 1102 posts in one day, the researcher eliminated the number down to 111 posts to be the core data for this study. After applying the aforementioned two techniques, the researcher divided the posts into categories with 34 categorized as active stimulation while the remaining 77 posts were categorized as passive stimulation.

The results implied that Taiwanese people pay more attention to national concerns than they do to international issues. While some international issues did draw their active attention (results included imported beef from North America and ISIS activities), Taiwanese citizens were more preoccupied with national politics. Despite the fact that posts initiating passive stimulation (i.e., gossip about celebrities) outnumbered post that initiated active-stimulation, when the data was analyzed qualitatively, it became apparent that PTT users are actively engaged in carefully considering the issues involved with the maintenance of civic duty. While it was evident that sensationalism plays a role in the gratification of media consumers in Taiwan, it also became clear that Taiwanese citizens are willing to transcend the passive stimulation of sensationalism and accept the responsibilities of active stimulation and its cognitive demands. These results suggest that PTT is highly instrumental in initiating the involvement of citizens actively engaged in the maintenance of a democratic way of life.

Correlations between Crime Rates in US Cities, and the Popularity of Rap and Hip-Hip Music
Alexis Williams
Economics

As the popularity of rap/hip-hop music has grown (measured by number of hip-hop songs in the top 100 for that year) in the United States of America, we can see a correlation with higher rates of drug usage, repeat criminal offenders, single parent homes, lower average education levels and lower overall community incomes. Then with the rates of these factors changing we can see a positive relationship with the change in violent crime rates over time. For this research the time period examined will be the years between 1990-2009. This research will look at crime rates of the United States of America as a whole for one component, and then I will be breaking it down state by state for the years 1999 and 2010. I will use different econometric testing methods to see what correlations I can find between the popularity of rap music and US crime rates. Other variables that will be used in my testing are poverty rates, high school graduation rates, drugs use, unemployment rates and number of single parent homes.

The hip-hop culture initially emerged in New York City in the 1960's according to Becky Blanchard in her article Poverty & Prejudice: Media and Race. It was described as a combination of traditionally African American dominated music types such as jazz, soul, gospel and reggae; and because of this it had a major impact on shaping the culture of the working class in New York City though out the 1970's. Hip-hop was a way for African Americans to poetically describe the environment around them, while creating a "fun and funky" new art form. Hip-hop also had a faction called rap music that was more based on the themes of reggae, and it focused more on the struggles of the people in their communities and wanted to be the "social voice". It did not take long for hip-hop to fall into the control of the powerhouse music companies that were owned by upper white class individuals; a few examples are Top-40 charts and MTV. When the small local D)'s lost their influence in the hip-ho culture, these large upper white class companies started recreating what was once thought to be "hip-hop" in the past. Around this period we saw artists like Ice cube, Public Enemy, Ice-T and NWA coming out with song that were focus on attacking white racism, challenging the government/ authority and encouraging social activism. This change going on throughout the hip-hop community continued all 1980's, which like in the past affected the African American community, and became what people thought, "Being black" was.

America was now looking at images of rappers in their videos living in low income projects and ghettos, committing crimes and waving around guns like it was normal thing to. This in return caused the youth of these communities to believe that is what they were supposed to be doing because the saw it on TV, and the experienced it in there every day lives.

Factors Impacting the US Housing Market
Danielle Ackermann
Marketing and Economics

This research will evaluate the housing market and the factors that have the greatest impacts on it. The housing market has a massive impact on the United States economy as a whole. By determining which factors have the greatest impact on the housing market, there will be ways to measure the health of the housing market to prevent; and prepare for future housing bubbles and crashes, like the one that occurred in the mid-2000s.

Previous research on the housing market has been done, but there is not a concise set of factors that impact the housing market. Nafeesa Yunus and Peggy E Swanson researched and evaluated how the markets interact among different regions of the country. Karl Case and Robert Shiller found factors that impact the market; however they found variability between states. In addition, their research was performed in 2003, a few years before the housing bubble crashed. Ranhan Gupta and Sonali Das researched how to predict future downturns in the housing market. Using data from the 20 largest states in the US economy, they used Vector Autoregressive models and Root Mean Square Errors to make their predictions. Jonathan Kohn and Sarah Bryant researched variables that impact the housing bubble, and the correlation between the variables.

By using econometric estimation and Eviews software, many different variables will be evaluated with the stability of the US housing market. Variables that will be assessed include, but are not limited to: new home sales, median asking rents, the consumer price index, gross domestic product, and ease of credit. By including the nation as a whole, including different variables; and using time-series data, this estimation will give a different perspective than previous research on the topic. These results will help to assess the housing market's stability and improve the stability of the economy as a whole.

Framing Fracking:
Media representations of the processes, voices, and uncertainties of industrial practice
Crystal Taylor
Communication

In June of 2014, geologists reported that, for the first time, more earthquakes greater than magnitude 3.0 occurred in Oklahoma than in California (Terry-Cobo, 2014). In Oklahoma, the frequency of earthquakes that are strong enough to be felt has increased 44 times in recent years and this has been correlated to a dramatic increase in high-volume, horizontal hydraulic fracturing (HVHFF) operations (Hume, 2014).

The purpose of this research is to (1) to determine the distinct attributes of tracking as it is framed at the local, national, and international levels; (2) to understand the image restoration strategies employed by the oil and natural gas industries; and (3) to further analyze the stakeholder processes involving policy makers and community members to date. The investigation is novel in that it analyzes environmental media representations of induced earthquake risk across three different geographic and media landscapes (e.g., local, national and international). A total of 169 print news reports were included for analysis: 48 local/Oklahoma reports (28% of total sample), 72 national reports (42% of total sample) and 49 international news reports (30% of total sample). Differences in the types and sources of information were found between the local, national and international framing of the connection between high-volume, hydraulic fracturing (HVHFF). Interpretation, discussion and implications are provided.

Although Oklahoma is currently leading the US in earthquakes it is not currently included among the 16 states the USGS recognizes as having a high risk for hazardous earthquakes. Oklahoma media has a history of underreporting the voices of victims suffering from environmental contaminations date back to the Tri-State Mining practices in NE Oklahoma, and now as Oklahoma becomes more familiar with shaky ground. While scientists look for any potential connections between tracking and the environment many times the voices of those impacted by these decisions are muted, underrepresented in the news reports. The emotional trauma and economic losses experienced by those within the community has yet to become salient attribute of the framing of the Oklahoma fracking.

The economics of public safety has yet to emerge as an "investment" opportunity outside of the insurance market. Of noticeable concern is the lack of strategic messaging designed to foster collective self-efficacy that would allow people to know what to do in response to earthquakes? Instructional information related to personal earthquake preparedness was virtually absent from the sample. The most consistent instructional information communicated to Oklahoma residents was to buy earthquake insurance.

In Oklahoma, the stakeholders remain divided. Activists want to ban tracking while others argue for tougher regulation, such as seismic monitoring near injection wells and mandatory data sharing. Donald Clarke, who teaches at the University of Southern California, said a key to preventing earthquakes appears to be to controlling the flow and pressure of the water as it is being injected. The challenge is determining where it's safe to inject large volumes of wastewater. "There are places that are safe to do this," he said. "Figuring out where those places are is probably one of the most important pieces of the puzzle" (Simpson, 2014).

Key words: episodic /thematic media frames, environmental risk, image restoration theory

Supporters, Activists, and Partners: Strategies to Forge Stakeholders Partnerships and Optimize
Environmental Community Outreach Programs
Jose Contreas and Mollie Wesley
Communication

Throughout the Spring of 2015 an in-depth quantitative analysis of stakeholders throughout the Grand Lake watershed was conducted on behalf of the Grand Lake Watershed Alliance Foundation (GLWAF). GLWAF's mission is to protect the water quality within the 10,298 square mile Grand Lake watershed located across the 4-state region, within portions of Arkansas, Kansas, Missouri and Oklahoma. The watershed is the principle water source that is relied upon by nearly 1 million residents in the region. The watershed has regional and national economic importance but lacks the financial commitment necessary to prevent further degrading of water quality.

This project was designed to assist the Grand Lake Watershed Alliance Foundation by: (1) producing an exhaustive comparative analysis of similar Foundations (2) identifying key stakeholder groups throughout the watershed for future collaborative initiatives; (3) developing a concept and testing message-based educational materials regarding environmental risks/dangers across the region; and (4) developing fundraising and outreach mechanisms to assist the organization's future efforts to cultivate strategic regional corporate and private partnerships. This research utilizes standardized scales to assess participants' knowledge, attitudes, pro-social environmental behaviors, and beliefs toward the emerging environmental risks facing the watershed.

This project extends Mason & Triplett's (2015) line of research that focuses on pragmatic communication strategies to both inform and protect stakeholders in the watershed region who are continually impacted by persistent and pervasive environmental threats, such as blue-green algae. Our poster presentation summarizes the report of findings and discusses implications and future stakeholder management strategies to assist communities who must adapt to the regional environmental changes that are reducing water quality.

Media effect on the 2014 Ebola Outbreak
Laura Lambert
Communication

By late October 2014 eight confirmed cases of Ebola had been or were being treated within the United States. During the time of Ebola's amplification period in the media an online survey hosted through the Department of Communication's Communication Research Lab was distributed. Data was collected between October 4, 2014 and December 5, 2014. Participants included 327 individuals (male n=117, 36%; female n=210, 64%) from across the United States. The extended parallel processing model (EPPM) serves as the theoretical frame to examine the relationships between media exposure and audience perceptions of Ebola's threat severity and their personal susceptibility. Additional measurements include the public trust in the U.S. public health infrastructure, perceived third person effects, and individual behavioral intentions. Significant differences were found such that audiences who reported higher levels of exposure to media reports about Ebola were more likely to perceive an elevated level of personal susceptibility and increased threat severity. This project outlines the research limitations, discusses applied implications for public health practitioners, and includes future directions for additional exploration.

A Cross Cultural Comparison of Visual Images within Alzheimer's Care Facility Websites
Elizabeth Spencer
Communication

Currently an estimated 44 million people are living with dementia worldwide (ADI, 2014). The World Health Organization (WHO) reports the 60+ years of age worldwide population will more than triple between 2000 and 2050 to 2 billion. The concept of Western patients receiving long term dementia care in foreign countries is a new and emerging phenomenon (Gray, 2013; Pomareda, 2014; Wergerer, 2014). This study examines the visual images within Alzheimer's care facility web sites (n= 1 05) and uses a cross cultural comparison lens to contrast differences in patient representations and treatment options. The goal of this study was to analyze the differences in representations of Alzheimer's patients, their caregivers, and the visual representations of their abilities and physical surroundings. Results from this study found that international regions vary the visual representations of Alzheimer's patients, providers, caregivers, treatment options and types of social interactions (e.g., family, other patients). More multiculturalism and ethnic diversity was documented in memory care centers in the Southeast Asia and Western Pacific WHO regions.

Assessing the Proficient Prose Literacy of College Students
Anna Drenick, Matthew Rohner, Tyherah Sayles, Carmen Schlund, Carmen Seeley, Jadie Veatch,
Susan Anne Carlson, Diane Miniell
English

The oral presentation will be given by undergraduate PSU English majors who are proctoring audiotaped oral comprehension tests for sixty-five Emporia State University English majors on March 30th and 31st, 2015. The testing of Emporia State University students is one stage of a larger project, in which Dr. Susan Carlson, a PSU Professor of English, is testing eighty-eight PSU English majors and sixty-five English majors at Emporia in order to find the proficient prose literacy skills of these students. Proficient prose literacy in English would be defined as the student's ability to comprehend and synthesize sophisticated literature (like Dickens' novels or Shakespeare's plays), works that are regularly assigned in literature classes at PSU. According to the Educational Testing Service, students would need an ACT score of 33-36 in Reading Comprehension to have proficient prose literacy skills. The average reading comprehension scores on the ACT for PSU students is a 22 out of 36; for ESU students it is a 21 out of 36. Besides the oral comprehension tests, test subjects are also taking a demographic questionnaire and a national literacy test. Student-subjects at both universities are also being invited to participate in focus groups, in which they will be videotaped discussing their reading strategies and the strategies they might use to avoid reading and still pass their English classes. The hotel, travel and food costs for the ten students who are proctoring exams in Emporia are being funded by a PSU Independent Research Project Funding Grant.

The undergraduate PSU students will participate in a formal training session before the trip to Emporia, and will then be part of a research discussion on Monday, March 30th, in which I'll give the students the outline of the larger project and the most recent findings on adult literacy from national and international studies. In that meeting, we'll discuss their reactions to the testing that day, the implications of decreasing literacy, the economic impact on the U.S., and the ways decreasing literacy might affect these students' future careers as educators and writers. For the competition on April 8th, the ten PSU undergraduate students will give the eight-minute oral presentation and design the accompanying PowerPoint. In the presentation, they will discuss the following: a) the purpose of the overall research study; b) the research testing procedures at Emporia; c) their own personal reactions to testing the reading comprehension of fellow students and d) the best ways (in their group's opinion) to improve the proficient prose literacy skills of their fellow undergraduate English majors. Though my research partner, Ms. Diane Miniell and I will advise the students, they will be the ones designing the PowerPoint, creating the speeches, and determining the speakers for each part of the presentation.

Analyzing Stevie Smith and Religion through Digital Humanities
Hannah Walker
English

In "Stevie Smith: Collected Poems" there are themes present such as death, cruelty, religion, loneliness, absurdity, and war. Considering that her childhood was riddled with death, illness, and loss, this isn't necessarily surprising. But what I find most interesting in her collected works is her treatment of God and religion. James MacGibbon, the editor of "Stevie Smith: Collected Poems" says about her religious beliefs in the preface to the book, "I am not qualified to define them but her life-long attachment to the Church of England, in belief and unbelief, is evident in her poetry, as it was in her conversation, even when she spoke or wrote vehemently against it and professed herself an unbeliever" (9). After reading her collected poems it is clearly evident that religion, and God, were on her mind. But what is not evident is whether or not she was actually a believer of God. Even MacGibbon, a long-time friend of Smith's, is unsure where her faith finally rested on the question of religion. The Reverend Gerard Irvine, who knew Smith from her earlier years said, "In religion Stevie was ambivalent: neither a believer, an unbeliever, nor agnostic, but oddly all three at once. Intellectually she rejected the dogmas of her high Anglican background, as unreasonable and morally inferior. But she had an obsessive concern with them.... One could say that she did not like the God of Christian orthodoxy, but she could not disregard Him or even quite bring herself to disbelieve in Him" (Collected Poems 9). The purpose of this, relatively tiny, study is to ascertain, through the use of analysis tools like Voyant and TAPoR, whether or not Stevie Smith's poetry truly reflects a belief, or disbelief, in God. While the nature of this study was purely speculative, I believe that the data gleaned from this study does warrant further research. Through a larger macroanalysis we can see that there is a negative connotation associated with God in Stevie Smith's poetry, but there is also a positive connotation associated with Christianity and Love. This hints at the idea that Stevie Smith didn't have issues with religion or Christianity, but with God himself. There are so many interesting avenues of research that this opens up, but most of all it increases our understanding of Stevie Smith's poetry while at the same time giving us more questions to analyze her poetry through.

Repentant, Redeemed, & Reformed: Moll Flanders as a Clockwork Orange
Kacie Cooper
English

Moll Flanders is a clockwork orange. But what exactly is a clockwork orange? According to Anthony Burgess, author of the novel of the same name, a clockwork orange describes one who "has the appearance of an organism lovely with color and juice but is in fact only a clockwork toy to be wound up by God or the Devil or (since this is increasingly replacing both) the Almighty State" (xiii). Moll Flanders' entire identity less life is made up of mechanical movements dictated by various outside forces, but never by Moll herself.

The theme of overarching powers of the state, God, and the Devil, in Daniel Defoe's novel *Moll Flanders* is eerily similar to themes within another London-based tale of redemption: *A Clockwork Orange*, written centuries later, with the crucial difference being the ultimate fate of the narrators in each tale - one fated to forever being a clockwork orange, the other fated for true redemption of his own free will. *Moll Flanders* appears to exhibit free will through her choices made within her criminal life, her time in prison, and her life after prison, but in all instances she is simply being wound by outside forces like a clockwork orange. On the other hand, *Clockwork's* Alex, despite the "reconditioning" of his criminal brain, exhibits free will in all stages of his criminal life, his time in prison, and his life after prison, thus rendering it impossible to label him as a clockwork orange.

After addressing what forces turn a person into a clockwork orange and what keeps them in that state of being, we must then consider the forces acting outside of our own lives, and whether or not this label applies to us. Are we all just clockwork oranges? Are we simply wound by our own versions of God, the Devil, or the Almighty State? It may appear as if Moll's actions are of her own free will, but we will see that she is simply wound by forces outside of herself, and eventually, wound by her author. If in the end Moll is wound by Daniel Defoe, who do the hands belong to that are winding him? In that sense, can the same question be asked for Alex, or Anthony Burgess? Perhaps, ultimately we are all really clockwork oranges, though it is the question of what "winds" us that will always remain- our own free will, or something else?

Language Usage and Thematic Roles of Shakespearean Plays & Poems
Richard Glenn Storey
English

Introduction

One of the rapidly developing fields in literary studies nationwide is Digital Humanities. Larger schools, such as Kansas State University, have dedicated centers from which they can use computer tools and ever-developing methodologies on all types of literature to whatever ends they choose. As a student at a regional university, the access to cutting-edge technology is hard to come by with budget constraints and feasibility issues. What we can do, however, is to do simple, "distant" readings of literary works. The kind of information that we get from these types of readings can be used to validate centuries' worth of research on authors like William Shakespeare. These macro-level studies of literature may offer insights that had previously gone undetected and lead to new developments into how we interpret and study classical texts.

Purpose

The works of William Shakespeare have been studied in every way imaginable. As one of the most-recognized authors of all-time, each of his works has been gone over by literary enthusiasts with a fine-tooth comb with countless close readings and heated discussions about the true intent of his plays and poems. Over the past 400 years, there are certain plays of Shakespeare's that are commonly thought to be constructed with love as their central theme and imbued with language to that effect. What I have yet to come across in my studies is a distant reading of some of Shakespeare's works. In particular, I wanted to look at the types of words used most frequently in his plays *Romeo & Juliet*, *Antony & Cleopatra*, and *A Midsummer's Night Dream*. Love certainly plays itself out in each of these three plays, but in varied ways. In looking at the language of these plays I wanted to see if Shakespeare used the same type of writing in his sonnets. Is nearly five centuries of close research validated by a distant reading? Or is there something in the research that shines a new light on any of the above mentioned works? **Methods/Materials** Using the websites voyant-tools.org, tapor.ca, and wordle.net, I ran the three plays and all of Shakespeare's sonnets through text analysis programs that generated individual word clouds, concordances, and word trends. The graphs, charts, and tables that were produced from these computer simulations allowed for interpretation and study how Shakespeare used love as a theme in his plays, and how the language of the plays compared to the that of his sonnets.

Results/Conclusions

The data of the text analysis programs I ran showed conclusive results that love is in fact the central theme of each of the plays I chose and overwhelmingly so for the sonnets. One interesting result from my simple distant reading of Shakespeare's plays is that love did not always equate to affection between two people; it carried negative connotations in both *Romeo & Juliet* and *Anthony & Cleopatra*. More in-depth studies in the future would, in my opinion, result in more detailed results.

Molly Flanders: A Narrative Sociopath
Ann Hinton
English

The early eighteenth century gave rise to many literary triumphs. Classical tales were no longer the focal center of story-telling; according to Ian Watt, author of "*From The Rise of the Novel: Studies in Defoe, Richardson, and Fielding,*" writers started basing their stories on realistic perspectives, encompassing all experiences life had to offer (364). Individual stories and experiences became the focal point of literature with the dawn of the novel. This literary revolution opened up the creative floodgates, allowing creations such as *Moll Flanders* to be written. *Moll Flanders* is an achievement for many reasons, but one specific reason is that the reader can view life through Moll's eyes, allowing the audience to experience Moll's experiences alongside her. Rather than relying on coincidence to spur action, the novel uses a character's past to inspire motivation and action. This gave audiences the chance to sympathize with Moll throughout the novel. Ian Watt, author of "*Defoe as a Novelist: Moll Flanders,*" accords this revolution largely to the social rise of individualism in the early eighteenth century (95). Defoe saw this social rise of the individual and applied it to the literary sphere: Defoe portrays Moll not only as an individual, but as a narrative sociopath.¹ Moll shirks identity by relying only on herself to survive and forms no real relationships with any other characters.

By focusing only on This essay is not in any way attempting to clinically diagnose Moll Flanders. Rather, it is making an observation through a narrative, literary lens.

A Technical Perspective on Creative Art
Michelle Gorges
English

Abstract of "A Technical Perspective on Creative Arts" by Michelle Gorges For those of us who have ever taken a Gen Ed class that we found uninteresting, challenging, or irrelevant (which, I don't doubt, includes just about every university attendee since the academy's creation), we have likely found ourselves asking "Why do I even need to take this class?" In my own English Comp classroom, Automotive Technology students capable of rebuilding an engine panic when asked to write a personal narrative; Engineering students who can comfortably design new technologies roll their eyes when assigned to analyze a satirical story; and Graphic Design students proficient in website creation avoid eye contact in the hope that I will not call on them for literary interpretation. Creative Arts classes often bring out this reaction in students of "non-creative" majors. Students who have been trained to exemplify modern marketable skills (critical thinking, problem-solving, even written communication) frequently struggle to apply those same skills to assignments labeled "Creative Arts." Instead, they try to alter their work approach in order to emulate teachers or students within the unfamiliar field. Although this emulation strategy often results in a passing grade, it also frequently results in mild disinterest or worse-full-on boredom.

For those of us who have attended dependent Technical Writing programs (that is, Technical Writing programs within larger English programs), we have likely encountered a similar feeling of frustration in mandatory Literature courses. Assignments like poetic interpretations, literary analyses, and fiction writing feel unfamiliar after our training with technical material and our professors' incessant reminders to leave as little room for interpretation (and therefore miscommunication) as possible. Like our peers in Technology courses (Auto Tech, Engineering, Graphic Design), we have been trained to think "mechanically"-to break down and rebuild complex materials for the benefit of our audience. Just as my Technology majors grow frustrated when I assign a personal narrative, Tech Writing students struggle to relinquish their mechanical approach to writing and analyzing when given Creative Arts assignments. Rather than continuing with these apathetic attempts to emulate our Creative Arts classmates, I propose that we embrace our technical training and apply it to those same assignments. In other words, I propose that we implement what the academy has so persistently reminded us to market as "critical thinking skills" and approach Creative Arts courses as another problem-solving exercise. The problem: we do not see the connection between Creative Arts and our Technology degrees; the solution: we make that connection ourselves.

In order to better explain this approach to technical-creative study, I will be analyzing the Literature assignment that led me to implement it in the first place. The assignment, which was assigned to me in yet another mandatory Literature class, was certainly not unwelcome. I enjoyed the professor, my classmates, and even the course content. However, once again I could hear a small voice in the back of my mind asking, "But what does this have to do with Technical Writing?" It was this question that prompted me to complete the assignment in a technical creative-fashion, and it was the resulting technical-literary analysis that prompted me to share my approach with the greater Technology student body. And so I have elected to write this essay in the hope that other "non-creative" majors may benefit from my findings.

Daughter of Newgate: Defoe's Views of Charity, Marriage and Punishment of Criminals
Melissa Barnett
English

When reading literature I always try to consider what it is the author is trying to persuade me to believe. All writing, no matter how it is presented, uses some form of rhetoric. Whether it is intentional or not, words are always used to convince someone of something. Daniel Defoe's, *Moll Flanders*, is no exception. In this tale, we as readers are asked to consider whether Moll Flanders' redemption is genuine. Moll herself guides us through the many twists and turns of her life all the while providing insight into why she made the choices she did. The supposed editor at the beginning of the story warns us as readers to be wary of Moll's sincerity. All of this amounts to the use of rhetorical devices in order to persuade readers to come to the predetermined conclusion condoned by the author himself. Defoe masterfully composes Moll's story and provides his readers with a solution for the woes of his time. In my paper, I discuss how Defoe uses Moll's story to show the failings of the societal institutions of marriage, charity and the punishment of criminals during his time intended to encourage and develop virtue within society. I would argue that instead of irony, Defoe uses the art of rhetoric to support his claims. Like other rhetoricians, he is searching for the truth when it comes to salvation. By looking at Moll in this manner, we can clearly see the impact of these institutions on her redemption and ultimately on society's ability to be redeemed if all remains unchanged.

Marriage in the Coquette
Laura Allgood
English

The research for this paper began last semester within Introduction to Writing about Literature. While in this class, we studied the novel *The Coquette* by Hannah Webster Foster whose main character Eliza Wharton challenges the social conventions at that time. This novel is a retelling of the tragic, true story of Elizabeth Whitman, who died in childbirth after being involved in a scandal concerning a pregnancy out of wedlock.

The purpose of this paper is to explore the ideas centered around marriage that are presented implicitly within *The Coquette* by Hannah Webster Foster. While the social mores of the time required that women get married and that marriage itself will lead to happiness, the character of Eliza Wharton refutes that stance. She stubbornly opposes that which her society said was necessary.

Each of the marriages presented within *The Coquette* show that marriage does not equate to happiness. While Sanford's is the epitome of an unhappy marriage and denotes a clear reason why marriage does not equal happiness, even the marriage of General and Mrs. Richman that has all that is necessary for a perfectly happy marriage does not protect them from the loss of their baby, Harriet. In between the marriages of Sanford and the Richmans are those of Boyer and Lucy. Neither one ends up as happy as they'd like to be, but both recognize the necessity placed upon the institution of marriage.

The social constraints placed on the characters in the novel are due to the time period in which they were living. The idea that marriage was the foundation for the new republic was prevalent in America at that time. This was a direct influence on the views of the characters and on Webster Foster when writing this novel. It was necessary for women, the moral center of society, to marry men so that the men could be influenced by the women's virtue and therefore lead society in the right direction.

Altogether, the ideals of the time insisted that it was marriage that allowed the men to run the country correctly and that also allowed women to participate in society. This perpetuated the situation of women during the revolutionary era and did not allow them the freedom that the newly formed country purported during that time.

Ultra-thin porous nanosheets of NiCo₂O₄/Graphene For Flexible Electronics

Ashley Jimenez, Ram K. Gupta

Chemistry

With increasing demand for energy and limited fossil source, there is urgency in developing high performance and stable materials for energy related applications. Albeit significant progress has been made in recent years developing of cost effective and better performing materials for energy conversion and storage applications, it still lags behind in meeting the global demand. In this work, we have developed materials which could be used as an electrode for flexible, portable and highly-efficient power sources. We have proposed a new breakthrough strategy to synthesize highly porous hierarchical flexible nanosheets of NiCo₂O₄-graphene oxide (NiCo₂O₄-GO) on nickel foam by a facile electrochemical deposition method. The morphogenesis of the NiCo₂O₄-GO hybrid nanostructure based electrode exhibits hierarchical porous flexible nanosheet-like structures. The electrochemical properties of these electrodes were investigated by cyclic voltammetry and galvanostatic charge-discharge measurements in 3M KOH electrolyte. The obtained results exhibit that this new hybrid nanostructure has a specific capacitance of 1078 F/g at a discharge current of 1 mA with great cyclic stability. These excellent capacitive performances of NiCo₂O₄-GO can be attributed to its hierarchical porous nanosheet-like unique structure. This unique structure provides efficient ion transport that is highly desirable for superior rate capability and excellent cycling stability. Hence, our method provides a promising facile and binder-free nanostructure electrode for next generation high-performance super capacitor applications.

Note: This material is based upon work supported by the National Science Foundation under Award No. EPS-0903806 and matching support from the State of Kansas through the Kansas Board of Regents.

Carrier transport mechanism of copper phthalocyanine based photodiode for solar cell applications

Tyler Elmore, John Candler, R.K. Gupta

Chemistry

Copper phthalocyanine (CuPc)/n-silicon junction was fabricated using thermal evaporator method. X-ray analysis of the CuPc film confirms the β -phase with preferred orientation along (100) direction. The crystallite size of the CuPc film was estimated using XRD data and observed to be about 12.6 nm. The current-voltage characteristics of Au/CuPc/nSi/Au device was studied in dark and under illumination. The device shows diode characteristics. The diode parameters such as ideality factor, barrier height and series resistance were determined using different techniques such as conventional forward bias I-V characteristics, Cheung method and Norde's function. A good agreement between the diode parameters calculated from these methods was observed. The analysis of the diode characteristics confirms that the transport mechanism of the Au/CuPc/n-Si/Au diode at the higher electric fields is governed by the space-charge-limited currents. The photoconducting behavior of the diode suggests that it can be used as a photosensor in optoelectronic applications.

Note: This material is based upon work supported by the National Science Foundation under Award No. EPS-0903806 and matching support from the State of Kansas through the Kansas Board of Regents.

Preliminary Key to the Identification of Aquatic Snails in Kansas
Hannah Thomas and J. A. Arruda
Biology

Kansas is home to a variety of aquatic snails. Unlike many organisms today, there are many unidentified species due to the lack of a suitable key. Because of this, there is uncertainty in which species are present in Kansas. The purpose of this study is to create a preliminary identification key that can be used to determine common species of aquatic snails in Kansas. The main identification tool is shell characteristics. Its use can lead to a better understanding of what species live within the state borders. A series of existing dichotomous keys and identification material were compiled to address the species that might be found within Kansas, based on earlier work. Using this information, characteristics known to be distinctive of each species were used to create the alternatives used in the key. In addition to existing work, specimens in the Biology Department collection were used as samples to test the key and make necessary modifications. Photographs of collected specimens were used to provide a visual aid to the key. In conclusion, a preliminary key to the aquatic snails in Kansas was successfully constructed. The key will be capable of identifying the likely aquatic snails of Kansas, including both native and introduced species. In addition, the key can be utilized by professionals or amateur collectors.

A Comparison of Water Quality in the Spring River and its Tributaries
Jesse Morland, Thomas Westerhaus and Joe Arruda
Biology

Water quality in the Spring River basin is integral to southwest Missouri, southeast Kansas, and northwest Oklahoma and is an important ecological resource that continues to be impacted by humans. Values of the Spring River system include recreational opportunities, drinking water supply, fish and wildlife, and overall biodiversity, including freshwater mussels. Non-point sources of pollution include runoff from agriculture, urban, and abandoned mine lands while point sources primarily includes municipal wastewater treatment plants. The purpose of the study was to assess water quality differences among the sites and the influences the tributaries have on the main river. In 2014, as a part of two separate courses, water samples were collected from bridges at seven sites, including the Spring River and its tributaries. Some variables were measured in the field and others in the lab. The variables measured were grouped into the categories of general chemistry, mining, and urban/agriculture. The data were analyzed as an analysis of variance. Of the 10 water quality parameters, five showed some statistically significant effect related to site or season. In the general chemistry category, there were no significant differences for site, season, or site and season among the variables of dissolved oxygen, temperature, and turbidity. In the mining category, there were significant differences for site and season for pH, conductivity, and sulfates, while total iron showed no significant difference. In the urban/agricultural, nitrates showed significant differences among season and site while soluble reactive phosphorus showed significant differences only for sites. Ammonia had no significant differences for site or season. Turkey and Cow Creek were most different from the other sites. Cow Creek was significantly higher in conductivity, sulfates, and soluble reactive phosphorus. Turkey Creek was also higher than the other sites in soluble reactive phosphorus and highest in nitrates. These differences could be due to wastewater and local impacts. When concentrations were higher in the tributaries, there was no significant effect on the main river sample site below the tributary. The lack of effect is likely due to smaller discharges of the tributaries compared to the large discharges of the main river. In conclusion, there were significant differences in water quality among the tributaries, in Cow and Turkey Creeks. There was no evidence that the tributaries influenced water quality on the Spring River.

Time Series Analysis in American Air Passengers

Minh Bui
Mathematics

Tourism in too many areas has been increasing for decades because of development in communications, transportations, and increased awareness of opportunities through global economic integration. Recent events like Malaysia air crash or disappearance have negatively impacted Malaysian airline in many facets. One of the impacts is the decrease in the number of air passengers using Malaysian airline after those accidents. This emphasizes the importance of forecasting numbers of air passenger. There are two common approaches to forecasting international travel and tourism demand in the literature. Those are econometric models and time series models. This paper discusses different techniques in time series analysis, along with showing the relationship with economic cycles, natural disasters, wars, accidents, and man-made disasters in the United States air passenger numbers.

Economic approach is often referred to as "structural demand modeling," In terms of forecasting tourism demand, a problem with causal models is that values of the explanatory variables need to be predicted or known for the time at which the forecast is required. It is difficult to quantify some explanatory variables or proxy measures, which is sometimes biased (John Coshall, 2006). Lim (1997) decided not to employ economic demand modeling techniques. This paper therefore only shows some similarity between the economic factor and numbers for air traveling without trying to analyzing the relationship in further detail in terms of econometric model.

Seasonality is an important feature of tourism demand time series and requires careful examination in modeling and forecasting seasonal tourism demand (Kulendran and Wong, 2005). Outlier and structural changes are commonly encountered in time series data analysis. The presence of those extraordinary events could easily mislead the conventional time series analysis procedure resulting in erroneous conclusion. In research by Jennifer Christine, Hsin (2011) show that inbounds tourism from Japan has been severely affected by communicable disease. Man-made crisis and natural disasters have affected international tourism demand considerably (Song and Li, 2009). The effects of these events on tourism demand are to some extent predictable based on appropriate scenarios analysis (Song and Li, 2008). In the area of event tourism, neither time-series nor structural equation approaches are of much use because special events are, in a sense, statistical outliers (Tideswell, et.al. 2001). Therefore, regardless of different methods being used to forecast the future, the forecast would be totally off if there are special events happen.

In this presentation, different forecasting methodologies will be explained and used, including Moving Average, Exponential Smoothing, Winters' method, Decomposition, ARIMA, and Fourier Analysis. The forecasting accuracy comparison is conducted based on several measures of error magnitude: the mean absolute percentage error (MAPE), and the root mean square percentage error (RMSPE)

Electrical Properties and OFT Studies of Copolymers From 3-phenyl[5]ferrocenophane- 1 ,5-dimethylene
and Various Para Substituted Phenylmaleimides

Henry M. Thomas, Benjamin O. Tayo, and Charles J. Neef
Chemistry and Biology

Redox active polymers have received considerable attention within the past 25 years. The potential applications of redox polymers include batteries, biosensors, and photovoltaics. To meet the requirements of these applications, redox polymers must be electrochemically stable, possess a high degree of redox material, and be well hydrated. Within redox polymers, a variety of polymer backbones and redox active materials have been utilized to meet these requirements. Poly(vinylpyridine), poly(Nvinylimidazole), poly(allylamine), and poly(ethylenimine) are included in the polymers reported for support of the redox mediator. Among the most popular redox mediators reported include ferrocene, osmium, and ruthenium.

Ferrocene containing polymers continue to receive considerable attention due to their well understood chemistry and stable redox responses. Our research has focused on understanding the spatial arrangement and electrical properties of alternating copolymers from 3-phenyl[5]ferrocenophane-1 ,5-dimethylene with various para substituted phenylmaleimides. Cyclic voltammetry using these chemically modified electrodes with aqueous sodium perchlorate showed two redox waves indicating electronic interaction between the ferrocenyl and maleimide moieties. To understand the spatial arrangement of the monomers, first-principle studies using density functional study (OFT) was used to obtain the optimized geometries. OFT studies clearly showed the ferrocenyl moiety in close proximity to the maleimide moiety, suggesting that electronic interactions could result between these two moieties.

Biosensor Studies with Copolymers from Vinylferrocene and 4-Vinylpyridinium
Raymond B. Westby & Charles J. Neef
Chemistry

Ferrocene polymers have received considerable attention as redox mediators due to their well-behaved reversible oxidation and redox stability. To incorporate ferrocene into polymers for use as redox mediators several strategies have been utilized, such as, pendant to the polymer main chain, cross linked into the polymeric material, or as self-assembling monolayers. With each approach, ferrocene has been shown to be an effective mediator for electron transfer from the redox enzyme to the electrode substrate. In conjunction with ferrocene polymers, redox enzymes such as glucose oxidase, horseradish peroxidase, and NADH have been used.

In this research, we have focused on copolymers containing vinylferrocene and 4-vinylpyridinium for biological sensor applications. Chemically modified electrodes were prepared by solution casting these materials onto a platinum electrode for subsequent cyclic voltammetry studies using sodium perchlorate as the supporting electrolyte. In this study we examined various ratios of ferrocene to pyridinium and the effects of alkyl chain length of the pyridinium on sensor performance. Use of these materials in biosensors for the detection of dopamine or serotonin will be presented.

Novel Filler Systems to Enhance Barrier Properties for Rotational Molded Parts
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¹Department of Plastics Engineering Technology, ²Kansas Polymer Research Center

Introduction:

Rotational molding is a thermoplastic process for producing hollow parts by placing powdered resin into a hollow mold and then rotating the mold in an oven until the resin melts and coats the inside of the mold cavity. An industrial partner with manufacturing facilities in Kansas currently manufactures gas tanks using a three-drop rotational molding process.

Purpose:

This project focused on both fitness-for-manufacture and fitness-for-use. Fitness-for-manufacture considerations included production of economical, cross-linked polyethylene-based parts made via the one-drop process. Fitness-for-use considerations included good impact strength, dimensional stability, and California Air Resources Board (CARB) compliance for fuel permeability.

Materials and Methods:

A one-drop procedure was identified for making one-drop samples. A two-drop procedure was identified for making two-drop samples. Our main characterization methods were Izod impact testing, fuel permeation testing, and drop testing. Four fillers were added to one-drop and two-drop samples. The four fillers were designated Filler A, Filler B, Filler C and Filler D.

Results:

The two-drop samples had slightly better impact strength than one-drop samples. In the one-drop samples, filler incorporation decreased impact strength significantly. In the two-drop samples, filler incorporation also decreased impact strength, but not as significantly as in the one-drop samples. The incorporation of filler may have provided a barrier for fuel permeation in the one-drop samples. The incorporation of filler may also have provided a barrier for fuel permeation in the two-drop samples. The inner layer-filled samples had a lower permeation rate than the others, but almost all samples remained under the upper limit.

One-drop control samples did not pass the drop test at 2 meters, and no further drop testing was performed on filled one-drop samples. The two-drop samples were then tested at 2 meters and four out of the seven passed the drop test. There was no clearly observed trend to predict which samples would pass or fail. The control two-drop unfilled sample passed, while two outer-layer filled samples passed and one inner layer-filled sample passed.

Conclusions:

We concluded that the two-drop process would be more beneficial. The two-drop samples had better impact strength, lower overall permeation rates, and passed drop testing at 2 meters. Filler C performed the best regarding the two-drop parts. Filler C filled samples had comparable impact strength to the control two-drop sample, had a lower permeation rates compared to other filled samples, and passed drop testing. Filler D also performed well in two-drop parts. Filler D filled samples had lower impact strength than two-drop controls, but Filler D filled samples had a lower permeation rate than the upper limit, and passed drop testing.

The Roles of Perceptual Load and Dilution in Visual Selective Attention
Mayuri Murali, Peyton Drouhard, Kyle Lichtenauer, Mitchell Floyd, Mar-ke West
Psychology and Counseling

Perceptual load theory (Lavie & Tsal, 1994) proposes that our attentional selection is more efficient under conditions of high perceptual load due to spare capacity being insufficient to "spillover" and fully process nontarget flankers. Tsal and Benoni (2010) propose that reductions in flanker interference are due to dilution rather than a lack "spilled over" attentional resources. Gaspelin, Ruthruff, and Jung (2014) have suggested that neither perceptual load theory nor dilution adequately explain the effects of nontarget stimuli on flanker interference. Their "slippage" account proposes that a visually-similar, to-be-ignored flanker involuntarily captures attention on a proportion of the trials.

Ninety participants were randomly assigned to 6 conditions resulting from a 3 (load: low, high, low with dilution) X 2 (cue-target SOA: 0 or 100 ms) X 3 (target-flanker distance: 1-3 positions) X 2 (target-flanker compatibility: compatible vs incompatible) mixed design, with load and SOA being between-subjects factors.

Participants viewed a fixation display consisting of a center dot surrounded by a circular array of 7 dots for 1000 ms. In the low load condition, two of the dots on the circle were replaced by the letter T rotated 90 deg clockwise or anticlockwise. The target was marked by a cue consisting of four dots. The unmarked flanking T could be placed 1-3 positions away on the circle, and could be rotated in the same direction of the target (compatible) or in the opposite direction (incompatible). In the high load and low load with dilution conditions, the remaining dots on the circle were replaced by rotated and mirrored L shapes, which were a contrasting green in the dilution condition.

In all conditions, flanker interference diminished with cue-target separation. The overall magnitude of flanker interference was highest in the low load condition, but was significantly modulated by a 114 ms SOA precue at the two-position separation. The overall magnitude of flanker interference was lower in the high load condition, but the pattern of cue modulation was similar. In the low load with dilution condition, flanker interference was observed only at a target-flanker separation of one in the 0 ms SOA condition. Our results are consistent with those of Gaspelin et al. (2014) in that neither perceptual load nor dilution fully account for the results. Flanker interference is also modulated by the precue as predicted by slippage theory.

Heavy Metal Electrochemical Sensors
William Sisson and Charles J. Neef
Chemistry

Heavy metal contamination is a significant problem environmentally due to the high toxicity associated with these metals. Various metals such as lead, cadmium, arsenic, and mercury have been accidentally released into the environment from mining operations. This problem can be seen in Picher Oklahoma which was designated a superfund site in 1983. Due to the heavy mining of this area and lack of oversight, high levels of lead and zinc have been released into Tar Creek.

Detection and identification of heavy metals is essential for protecting people, as well as, protection of the environment. Current methods of identification include atomic absorption spectroscopy, inductively coupled plasma atomic emission spectrometry, and the use of piezo-electric quartz crystals. However, these methods require expensive equipment and are often time-consuming. Another method of heavy metal detection often used is fluorescence spectroscopy. In fluorescence spectroscopy, the heavy metal binds to a fluorophore resulting in a change to the fluorescence spectrum. While fluorescence is simpler and less expensive, it is ineffective for metals, such as lead or copper, which act as fluorescence quenchers.

Previous work within our labs has focus on copolymers of a novel ferrocenophane diene with 4- vinyl pyridine which exhibited two redox waves in the CV when the supporting electrolyte included heavy metals such as lead or cadmium. However, these second redox waves were small suggesting weak interactions of the metal with the pyridinyl moiety. Currently, we are working with copolymers of the ferrocenophane diene with vinyl imidazole. Since imidazoles are known to interact stronger with heavy metals, we anticipated stronger signals in the CV. We will report the characterization and heavy metal testing of these novel ferrocene-imidazole copolymers.

Changes in Estrogen Receptor alpha (ERa) Phosphorylation in Human T Cells
Samantha Meneely and Virginia Rider
Biology

Estrogen has two receptor proteins, estrogen receptor alpha (ERa) and estrogen receptor beta (ERB). ERa has a half-life of 4 hours for breast cancer and normal target tissue such as the uterus, while ERB has a half-life of 8 hours. The receptor alpha is found to have an importance in breast cancer tumors that are ER-positive. The regulation at the cellular level is key to the effectiveness of endocrine therapies in breast cancer, and an understanding of its underlying mechanism is critical for the identification of novel drug targets for the design of combinatorial therapies. ERa can undergo multiple posttranscriptional modifications (PTMs); however, relatively little is known about the function and regulation of any of the PTMs that ERa can potentially undergo, especially in vivo. Based on the results from two different studies, the structure of ERa for the highest PTMs is the NB domain. In total, 19 phosphorylation sites have been identified in ERa thus far, and most sites contain a Ser-Pro motif. In breast cancer, certain sites of the estrogen receptor (ER) exhibit differential effects of phosphorylation (Ser 104/106, 118, and 167). In some cases phosphorylation of these sites resulted in hypersensitivity to estrogen and an increase in cancerous cell division. In other cases, there was no effect on the progression of breast cancer. Furthermore, different pathways are responsible for the phosphorylation of different sites. These pathways include mitogen-activated protein kinases (MAPK) signaling, IKKa, DK7, a subunit of transcription factor II H, Akt, GSK3J3 p90RSK, mTOR/p70S6K, Rsk, and casein kinase II. Here, I compare phosphorylation of these sites between resting and activated human T cell samples. I purified T cells and extracted the total proteins from both resting T cells and T cells activated with phorbol 12-myristate 13-acetate (PMA) and ionomycin. I investigated changes in ERa via immunoprecipitation using the ERa antibody and Protein A, as well as Western blot. The blot was reacted with estrogen receptor alpha, phospho 104/106, 118, and 167 antibodies. These phospho antibodies only recognize the receptor when the site is phosphorylated. The amount of phosphorylation at each site was compared between resting and activated T cells, and the amount of phosphorylated receptor was adjusted to the total ERa in each sample. Differences between phosphorylation at specific sites in resting versus activated human T cells is expected to reveal potential differences in ERa action and lay the ground work for comparison of these same sites in lupus T cells. The results for a sample size of 10 indicated that when ERa is at 100%, Ser 104/106 resting T cells are 89.30% and active are 92.00%, Ser 118 resting T cells are 80.08% and activated are 87.54%, and Ser 167 resting T cells are 86.44% and activated are 78.35%. These results await statistical analysis.

Diversity and Nesting Success of Cavity-nesting Birds Using Bluebird Nest Boxes in Different Habits

Natalia Agostini schneider¹ and Fabio Giacomelli²

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Biology

Cavity-nesting birds build nests and lay eggs in cavities, sometimes including artificial cavities such as nest boxes. Artificial nest boxes have been used in many successful conservation projects in the United States, as an effort to reduce the damage caused by human interferences. The objectives of this study were: to identify the avian species of cavity-nesters that nest in bluebird boxes; evaluate nesting-success; and, compare the diversity of species in three different grassland habitats (Grassland-Road, Grassland Woodland and Grassland-Wetland). This study was held in a reclaimed mined-land area, Pittsburg State University's Monahan Outdoor Education Center, near Pittsburg, KS. In each habitat, 15 bird boxes were set in a line, 50 yards apart, totaling 45 bird boxes. Predator guards were added to 33 boxes (total of 11 per line). Data were collected weekly from April to September 2014. Seven cavity-nesting species were identified, in a range of 10 meters around the bird boxes: brown-headed cowbird, Carolina chickadee, Carolina wren, Eastern bluebird, Northern flicker, red-bellied woodpecker and red-headed woodpecker. Nesting success was observed in three boxes, for three species: brown-headed cowbird, Carolina wren and Eastern bluebird. The total number of species was lower than expected, but it was possible to observe successful nesting. From 45 boxes, eight boxes had nests (18% of occupation); however only in four boxes birds had nestlings (9% of occupation). In the Grassland/Wetland site no box was occupied by birds, without apparent clear explanation, considering that the wetland had water during the whole period of study, and was surrounded by tall grass. On the Grassland/Road site, two out of 15 boxes had nests (13% of occupation). The Eastern bluebird was the only species to build nests in this habitat. Two nests, eight eggs, seven nestlings, and six, fledged Eastern Bluebirds were observed. On the Grassland/Woods site, two out of 15 boxes had nests (13% of occupation). Both bird-houses were occupied by Carolina wrens, totaling two nests, ten eggs, five nestlings and five fledged birds. One of the nests was parasitized by a brown headed cowbird, which laid one egg resulting in one fledged cowbird. Even though the rates of occupation were low, bluebird houses presented potential to be used in conservation projects where the goal is to provide extra cavities for nesting. The low use of boxes may be due to the fact that they had only recently been erected. Future use may well be higher. Therefore, it is necessary to continue this study in order to gather more data to better evaluate the effects of artificial cavities over bird nesting success of different species.

Endocrine Control of the Homeobox10 (Hoxa10) Gene
Restricts Pattern Formation of Uterine Decidual Cells
Brady Steinbock and Virginia Rider
Biology

Pregnancy in mammals represents a unique immunological challenge, which requires two antigenically distinct organisms to coexist. Evidence suggests that the acquisition of immune tolerance, required for successful pregnancy in mammals, is networked to uterine stromal cell differentiation. The objective of this project is to investigate the endocrine control of homeobox (Hox) a10, which is postulated to regionally restrict the pattern of stromal cell differentiation in the uterus. Ovariectomized rats were injected with progesterone (2 mg) daily for three consecutive days (progesterone pretreated, 0hE). Some rats were given a single injection of estradiol (0.2 µg) on the fourth day and uteri were removed six hours after estradiol treatment (6hE). Uteri were removed, fixed, and embedded in paraffin for localization of Hoxa10 protein. Hoxa10 was quantified by Western blotting using chemiluminescence. Hoxa10 messenger RNA (mRNA) expression was measured by semiquantitative polymerase chain (PCR) amplification. Western blot results revealed increased expression of Hoxa10 after implantation (day 6) and in uterine extracts from rats pretreated with progesterone followed by 6 h of estradiol. Research in progress, to localize Hoxa10 in rat uteri, is allowing us to answer the question of whether progesterone or progesterone plus estradiol restrict the number of cells expressing Hoxa10. Current research includes the use of sectioned uterine models utilizing immunohistochemistry and a horseradish peroxidase detection (Vectastain ABC Kit) to visualize the cellular expression of Hoxa10 at different stages of a mimicked pregnancy. The Hoxa10 expression is anticipated to be limited to the periluminal stromal cells, which differentiate into the decidua. Completion of these experiments will provide new insight about the factors that regulate stromal cell differentiation, a process that is essential for the establishment of pregnancy.

Facile Synthesis and Electrochemical Analysis of CoS₂ Nanostructures for Supercapacitor Applications
Esam Alqurashi, John Candler, Ram K. Gupta
Chemistry

Nanostructured CoS₂ was synthesized by a facile hydrothermal method. The effect of growth parameters such as solvent and presence of surfactants on the size and morphology of CoS₂ was investigated. It was observed that these variations could provide CoS₂ with range of sizes, shapes and morphologies. The nanostructured CoS₂ were structurally and electrochemically characterized. The structural characterizations were performed using X-ray diffraction (XRD) and scanning electron microscopy (SEM). The electrochemical measurements were performed in a standard three electrode cell containing a platinum wire as a counter electrode, a saturated calomel electrode as a reference electrode and CoS₂ on nickel foam as a working electrode. The potential application of these materials for supercapacitor was tested using cyclic voltammeter and galvanostatic charge discharge method. It was observed the specific capacitance of CoS₂ depends on its morphology and electrolyte. The maximum specific capacitance of 335 F/g was observed in 3 M NaOH electrode. The electrochemical stability of these electrodes were also investigated. The results suggest that CoS₂ could be used as an electrode material for fabrication of supercapacitor devices. Note: This material is based upon work supported by the National Science Foundation under Award No. EPS-0903806 and matching support from the State of Kansas through the Kansas Board of Regents.

Role of Electrostatics in the Diagnosis and Treatment of Diseases
Vida Karimnia & Benjamin O. Tayo
Physics

We are surrounded by electric charges in space. Electric charges are everywhere and we interact with these charges at all times. The compact fluorescent lamp (CFL) bulb blinks when you wave a blanket near it. This is because the charge balance of the medium is disturbed, producing an electric wave turbulence. That's how the electrostatic wave stimulates the gas molecules in the bulb. Technically, when an object with less or more electrostatic charge enters into a medium, it causes a disturbance in electric charges with respect to the object and medium. If the object has tip points, electrostatic charges will accumulate at those points producing a region of high charge density, but if the object does not have any tip points, then the charge spreads out uniformly. If we apply this concept to the field of medicine, we realize that airborne diseases are caused by differences in charge balance between a person and medium or person to person. Since viruses are nothing but a protein coated on a genetic material, they carry positive or negative charges. When the virus is airborne and has an opposite charge with respect to the target, then the target attracts the virus with an acceleration much bigger than Earth gravity. In radiation therapy for curing cancer, gamma or X-rays are used to create a uniform charge distribution in cancer cells tending to make their code readable by healthy cells. In the light of this concept it can be now understood that some cancer diseases are due to charge imbalance in the body. If this charge imbalance can be eradicated, the disease gets cured. We examine the role of electrostatics in the treatment of diseases including cancer.

Seeking Halal meat in Pittsburg, Kansas
Saimul Islam Chowdhury
Technology

What is Halal? Halal is an Arabic word which means any object or an action which is permissible to use or engage in and Halal meat is meat that has been slaughtered according to Islamic law, as laid out in the Quran. A lot of international students have to struggle with their day to day life but having to worry about their food especially in a place which is considered to be the biggest multi-cultural country in the world, would be last thing in their mind. The nearest Halal meat shop is in Kansas City which is 123 miles away. Students who don't have a car are having a hard time getting Halal meat which is affecting their studies. In order to better understand this problem the proposed study will attempt to answer the following question: Is Halal Meat Shop a necessity in Pittsburg, Kansas?

Every Muslim needs to consume Halal food and considering the number of Muslim students coming in Pittsburg State University every semester, a Halal meat shop seems like a necessity for this town. According to A. Hurt there are 548 international students from 45 different countries enrolled in this semester and almost 200 of them are Muslim students (personal communication, February 25, 2015). The primary reason Muslims do this is because they believe that God has instructed them to do so. But it is also scientifically proven that Halal meat or Halal food in general is healthier than the meat we buy from the market So, if a food meets these criteria's, then it is considered acceptable to eat or Halal In practice this means:

- x The animal was slaughtered by a Muslim or by a Jew or a Christian (since they share the same God) and they must slaughter it in the name of God.
- x The slaughter involves cutting the carotid artery of the animal and letting the blood drain.
- x Death from a blow to the head, stunning the animal or fallen animals, is not permitted.
- x The other sources also indicate that one must be merciful to the animal (e.g. not letting it see other animals be slaughtered, and making sure the blade is sharp so the slaughter is painless.
- x Pork is prohibited altogether.
- x Blood is prohibited altogether.

So Halal is not as simple as eliminating pork from the menu.

It is not only religious motives that can determine people awareness towards halal food or products for consumption, but also health issues related to religious identity and degree of acculturation in whatever we consume daily. Thus, for example, it is important to ensure that the meat comes from a healthy animal so that people can be healthy. It is true that a lot of these modern diseases and illness is attributable to poor nutrition and unhealthy meat that people eat every day. This is closely related to argument for halal consumption since the primary aim of Allah on halal is to ensure healthy life for people. As such, the university authority and retail stores like Ron's and Wal Mart should consider providing all kind of Halal meat.

In this study I emphasize the necessity of a Halal meat shop in Pittsburg, Kansas. To achieve that goal I have to collect data As I have chosen qualitative method of data collection, I will choose a sample of participants. I will choose 20 Muslim Students from the MST department of Pittsburg state University. I will develop a set of thoughtful, targeted, unbiased questions and ask the participants. Thus, data was collected through personally administered questionnaires.

The Creation of Intelligent Transportation Systems by Utilizing Existing Building information Modeling
and Intelligent Municipalities Data Sharing

Sean F. McCartney

Construction Engineering Technology

Intelligent Transportation Systems is a process by which two main focus areas are given attention: The realization of Connected Vehicles (CV) implementation and to further the advancement of Automation. The first area is easier to understand in the way vehicles are become more intelligent and autonomous not extension of the drivers as with previous generations of automobile owners, but functioning independently as when a new car can parallel park itself or stop without input from the driver. The second scope area is more vast and the reason that the United State DOT has established the ITS Strategic Plan. As this is such an important and yet broad area of concern. A possible solution to some if not all of this scope would be to utilize existing techniques like Building Information Modeling (BIM) and creation of Intelligent Municipalities so that the Intelligent Transportation system could be used to Interact within the city models and be able draw from each of their information to maximize the transferring of intelligence from one system to another and back. One of the greatest advantages is that the bulk of readily available material is being produced in amounts unconceivable 10 or even 5 years ago. With this said it would be highly possible to focus more on the data sharing and management aspects than trying to conceive something entirely new and original. Reproduction or gathering of the information already existing does nothing more than muddle the system and tie up available resources that may be better used other places.

Creating Intelligent Infrastructure Capitol Assets for Municipalities
Sean F. McCartney
Construction Engineering Technology

One of the greatest concerns facing municipalities is the continued use, maintenance and lifespan of the main infrastructure supporting the municipalities' needs and its residents. As the various infrastructure projects are completed as with a new car, once they are complete they immediately start to age and begin to need preventive and reparative maintenance. If there was a way to make the infrastructure itself an intelligent component of the city environment then be of greater value to the municipality. To this end to be effective at providing intelligent information the infrastructure component would need to provide information in the following areas: it would have to be able to complete data gathering, management and sensing on its own, there would have to integrate the infrastructure components into a collective portfolio that would be readily accessible by multiple end users as well as being update and flexible in possible assets reallocation or changes to the original demands of the infrastructure component. Currently the greatest problem facing the infrastructure community is that when data is available it is stored away from the component, and is not properly collected and managed. To implement the changes needed to start creating intelligent infrastructure components the biggest advantage is that sensing equipment, modeling software's and practices are currently in place and readily affordable and fortunately becoming inexpensive when considering the longevity of the operation of capitol infrastructure components. The ultimate purpose is to detail a process by which an infrastructure component t can become intelligent while minimizing cost, utilizing current techniques and sources and proper management of the data in a concise and easily desirable basis.

Institutions and Logistic Performance in Emerging Markets
Jasmyn Turner
Business Administration

This paper is an exploratory study to investigate the influence of national institutions on logistic performance in emerging markets. Emerging markets are important locations for companies seeking new markets and production efficiency. They offer favorable features that can contribute to strong growth potential through investment and sourcing opportunities. The attractiveness of emerging markets suggests many companies are dispersing their operations globally, creating new challenges in their global supply chains and logistics. The main question addressed in this research is whether institutional arrangements such as competitiveness and country risk will effect logistic performance in emerging markets. This paper uses the logistic performance index (LPI), published by the World Bank Group to provide information for this question. The approach for this study of logistics is interdisciplinary, combining both theories of international business and supply chain management. Both disciplines analyze logistics as an important value creation activity of multinational enterprises that are dispersed globally. The methodology to evaluate the research models will be the latent growth curve model, which is a methodology that combines the analysis for cross sectional data and longitudinal data. This methodology is well established in medical research but is still a new innovation in business administration. The aim of the paper is to develop testable propositions regarding the effect of institutions on logistics performance. The results and conclusion will be further investigated and presented at the 2015 Research Colloquium.

Supporters, Activists, and Partners: Strategies to Forge Stakeholders Partnerships and Optimize
Environmental Community Outreach Programs
Justin Newman

Throughout the Spring of 2015 an in-depth quantitative analysis of stakeholders throughout the Grand Lake watershed was conducted on behalf of the Grand Lake Watershed Alliance Foundation (GLWAF). GLWAF's mission is to protect the water quality within the 10,298 square mile Grand Lake watershed located across the 4-state region, within portions of Arkansas, Kansas, Missouri and Oklahoma. The watershed is the principle water source that is relied upon by nearly 1 million residents in the region. The watershed has regional and national economic importance but lacks the financial commitment necessary to prevent further degrading of water quality.

This project was designed to assist the Grand Lake Watershed Alliance Foundation by:(1) producing an exhaustive comparative analysis of similar Foundations (2) identifying key stakeholder groups throughout the watershed for future collaborative initiatives; (3) developing a concept and testing message-based educational materials regarding environmental risks/dangers across the region; and (4) developing fundraising and outreach mechanisms to assist the organization's future efforts to cultivate strategic regional corporate and private partnerships. This research utilizes standardized scales to assess participants' knowledge, attitudes, pro-social environmental behaviors, and beliefs toward the emerging environmental risks facing the watershed.

This project extends Mason & Triplett's (2015) line of research that focuses on pragmatic communication strategies to both inform and protect stakeholders in the watershed region who are continually impacted by persistent and pervasive environmental threats, such as blue-green algae. Our poster presentation summarizes the report of findings and discusses implications and future stakeholder management strategies to assist communities who must adapt to the regional environmental changes that are reducing water quality.

Improvement to Business Strategy by Utilizing Components of Building Information Modeling
Sean F. McCartney
Construction Engineering Technology

The features and values of building Information Modeling are have been developed over a number of years since the conception of Building Information Modeling, however as construction companies are diligently working on developing these concepts further and utilizing the software for construction and modeling applications many are failing to realize the potential of the software as a management and business tool. The core value with Building Information Modeling is communication, then secondarily management and finally the construction datum itself. This lack of communication is a serious problem in that with proper management and integration of Building Information into the business model a greater scope of Integrated Program Controls (IPC) could be achieved through the entire lifecycle and even utilize NIM for the decommissioning and demolition cycle of a project. The demolition Business community could greatly benefit from this process of integration as well. The existing software is compatible with other cornerstone management and business software platforms allowing for ease of data transfer for maximum effectiveness without duplication, reformatting or converting files. The value both in management of assets, resources and monetary to gains to the business community can be very rewarding and profitable.

The Voice of Printmaking
Catherine Jepson
Art

For the 2015 Research Colloquium, I will display and discuss my independent journey through the world of printmaking. My childhood was filled with art, however, I was nervous to dedicate my life to art as it was all I had ever known and felt the need to pursue a different path. In the fall of 2012, I switched my major from business to biology but was not satisfied or eager about my studies. That fall, I decided to participate in my first art class at PSU, which was Printmaking and Paper Arts. I was immediately at home with the processes and materials. I began a series of independent studies courses over the next few years to quench my interests.

My first independent studies course was in the fall of 2013. During that semester I researched printmaking, learned new techniques, developed a series which was later in an exhibition, and blogged about my research about the old and 'broken' letterpress in the department. As my letterpress research was successful, I met with the department chair in regards to a small budget to supplement a potential letterpress restoration. In the spring of 2014 with a budget in tow, I successfully restored the art department's letterpress to working condition. I even obtained an internship at a letterpress studio in Kansas City for that summer where I learned about and participated in commercial printing. That following fall, I returned to PSU to embark onto two more independent studies courses. The first course included the opportunity to use the letterpress that I had restored. I also was fortunate enough to share my story and a demonstration of the working letterpress to the group that attended the "Letterpress Restoration Celebration." The second independent studies course from that semester was dedicated to researching textile printing and design and using those findings to assist in producing my own textiles. During this semester, I discovered how vital printmaking is to me. The journey presented through these art forms continuously lead me to investigating infinite questions. Creating is my chosen method of learning; it is my language, my voice.

Currently, letterpress and textile printing are my career pursuits upon graduation this upcoming December and have led me to two major conferences in New York City at I will be attending this summer. It has also come to my attention that there are two letterpresses being stored in the Axe Library, and have been since the 1990's. I am in the process of working with the art department in an attempt to restore them and move them into the printmaking studio with the previously restored press. My journey through printmaking has not only changed my life, but is benefitting the future of PSU's printmaking classes. The title of the printmaking class now has the addition of "letterpress" and in the upcoming fall, I will be teaching the printmaking class and our professor, how to letterpress print. I am thrilled that my passion will be shared with future classes.

The Not-So-Perfect Woman: Impossible Standards in Modern Society
Heather Jensen and Rikki Miller
Psychology and Counseling

This presentation is a literature review of the social theories that may serve to provide an understanding of the pressures on women in the modern American society, with specific distinction between pressures emanating from society and those emanating from the self. An analysis of scientific literature and popular cultural media was conducted to explain the implications of the social pressures and how they are evolving. Theories include control theory of self-regulation, social role theory, social cognitive theory, social comparison theory, and reactants theory. Pressures such as familial roles (homemaker vs. provider), sexuality, appearance and presentation, and ambition have been evaluated. The results show that these theories work both together and also independent of each other to formulate a woman's individual self-concept and her role as a woman in society as a whole. In recent years, action has been taken to counteract many of these social pressures and stigmas, and it is concluded that women are increasingly pushing the limits, and therefore altering social norms and constraints in order to achieve a greater sense of autonomy.

Tiny Houses
Peyton Drouhard, Nicole Feipel, Megan Paulu
Psychology and Counseling

A social movement where people shrink the space that they live in. The typical American home is around 2,600 square feet. This number has grown due to the increase in wealth, materials available, and prestige that is associated with large houses. The typical tiny house is between 100-400 square feet but aims for any size under 1,000 sq. ft. Tiny Houses come in all shapes, sizes and forms but they focus on smaller spaces and simplified living. The reasons for joining the Tiny House movement are as varied as the types of houses themselves. Sarah Susanka and Lloyd Kahn have both written on the merits of shrinking living spaces. Jay Shafer and Marianne Cusato have started businesses providing minimalistic homes that focus on the essential parts needed for a functioning house. These pioneers have brought changes to how extravagant living is viewed. Their influences have led to the development of Tiny House Communities where people aim to reduce their carbon footprint and escape the American Dream". Tiny Houses have also been built to assist destitute Americans and provide shelter to victims of natural disasters.

Motor Function Rehabilitation Post-Stroke
Alexis McKinnon
Psychology and Counseling

Introduction

A stroke is a debilitating loss of oxygen to the brain. It is one of the leading causes of death in America and can change a person's life for the worse in just minutes. This horrible happening has many negative effects for those affected, but there are several ways to rehabilitate.

Those most often affected by strokes are those with high blood pressure, diabetes, and heart diseases, along with those who smoke or have had brain aneurysms. Age, race, and family history also effect the chances of a stroke. Strokes occur more often in those of older age, races such as African American, Alaska Native, and American Indian, and in those who have previously had a stroke or had family history of a stroke. The symptoms of a stroke include face drooping, arm weakness, and speech difficulty.

Strokes affect its victims in the emotional, cognitive, and physical realms. Due to experiencing a stroke, people may feel fear, anxiety, frustration, anger, sadness, and a sense of loss. Because this is a brain focused issue, there are many cognitive issues such as aphasia, memory loss, and vascular dementia. The physical consequences are dysphasia, fatigue, foot drop, hemiparesis, incontinence, pain, paralysis, seizures and epilepsy, sleeping problems, spasticity, and vision problems. The focus of this research is on the physical rehabilitation of stroke victims, which includes strengthening motor skills, mobility training, constraint-induced therapy, range-of-motion therapy, and the use of several forms of technology-assisted physical activities.

Purpose

The purpose of this research is to gather the rehabilitation methods for post-stroke conditions and to determine the most effective methods of regaining motor functions after a stroke while exploring new possibilities for this field. With this research, there exists the hope that it will further the field of physical rehabilitation for stroke victims.

Materials/Methods

The methods include a literature review of articles from online databases pertaining to the field of physical rehabilitation of strokes. The author will examine the equipment of physical and occupational therapists in alignment with the articles to determine which tools are the most effective for physical rehabilitation. Interviews with several physical and occupational therapists will provide additional information for their most preferred and effective tools in helping stroke victims to rehabilitate. The information gained from these methods will be combined in a research paper.

Results/Conclusions

Due to this research still occurring, conclusions cannot be given at this point in time. During the poster presentation, viewers will learn of the conclusions from this study.

The Conservation of Nucleotides May Affect the Efficiency of V (D) J Recombination
Tayita Abudu, Karsten Creech, and Mandy Peak
Biology

B-cells and T-cells are major components of immunity that detect a large variety of antigens that enter the body. Immunoglobulin (B-cells) and T-cell receptor diversity is developed through somatic recombination. The method utilized by the cells is called V (D) J recombination. The three gene segments that are involved in this somatic recombination include V (variable), D (diversity), and J (joining). V (D) J recombination utilizes several components in the formation of the variable regions. RAG-1 and RAG-2 initiate the process of this recombination by nicking the double-stranded DNA between each gene segment and its bordering recombination signal sequence (RSS), which consists of a conserved region that borders the site of DNA cleavage. RSS sequences flank the coding receptor DNA that is sought out for recombination. The RSS contains a conserved heptamer (CACAGTG) and nonamer (ACAAAACC) separated by 12 or 23 DNA base pairs. RAG-1 recognizes the heptamer and nonamer binding sites. Even though there is knowledge that a variety of nucleotides are involved in recombination, current studies have shown that recombination sequences are not random. Spacer sequences that are most commonly found to be involved in V (D) J recombination are shown to have conservation of nucleotides at certain frequencies. Currently there is hope to determine recombination frequency of nucleotides. This information is important to know where RAG-1 most likely binds to as well as what V (D) J gene segments determine the diversity of B-cell and T-cell receptors.

Where Did Six Million People Go?
Sarah Jones and Ashley Moreno
Psychology and Counseling

Six million Jewish people were killed in one of the worst genocides in human history. The Holocaust subjected them to abuse and terror until they met their untimely demise through gas chambers, disease, starvation or maltreatment. The controversy surrounding the Holocaust reached a new level in 1963 when Harry Elmer Barnes began publishing materials that claimed the Holocaust to be a hoax by the United States to justify their involvement in World War II. Over the years, the Holocaust revisionism movement has developed a faithful following of young individuals that have succumbed to the persuasion and group tactics utilized by leaders to gain followers.

There are three ideas that serve as the basis for this movement: the lack of exact orders in German documents that call for the extermination of the Jewish population, the denial of Auschwitz as a death camp and discrepancies in census data from years before and after the war. The objective of this presentation will be to analyze the denial of the Holocaust from a social psychological perspective in order to gain a better understanding of how the leaders of this movement have assembled such a loyal following. The social psychological concepts and theories that serve to provide an explanation of this movement include: confirmation bias, inoculation technique, cognitive dissonance theory, the central route to persuasion theory and group polarization theory.

Although the ideas perpetuated by the followers of this movement are not accepted by mainstream historians; those who do accept these ideas as truth are fiercely faithful to them. An appropriate and accurate understanding of the methods utilized by leaders of these types of movements to gain followers, and in turn momentum, is necessary to ensure that the audience is not as easily persuaded. An educated audience will prevent momentum for future historical revisionist ideas that seek to alter history. As George Santayana declared, "Those who do not learn history are doomed to repeat it."

Preventing Respiratory Depression with Patient Controlled Analgesia Usage:
Pulse Oximetry vs. Capnography

Andrea Hight
Nursing

Introduction

Patient Controlled Analgesia (PCA) is used post operatively for pain management. Through the use of a PCA pump, patients, can self-administer a dose of pain medication with the push of a button. Although PCA usage is considered to be relatively safe, research shows the risk of patient harm is 3.5 times greater when a PCA pump is being used. The greatest risk to patients is that of respiratory depression, which can result in respiratory failure and death. Therefore careful monitoring of PCA patients' respiratory function is essential to prevent adverse events. PCA pump usage can either be monitored with pulse oximetry, or controlled through capnography. Pulse oximetry measures the patient's oxygenation status, which is an indirect measure of respiratory function. The pulse oximeter can be set to alarm the nurse whenever a patient's oxygenation status dips below a certain percentage, usually 92%. Capnography controlled PCA pumps measure the amount of carbon dioxide expelled by the patient as a measure of respiratory function. If a patient's carbon dioxide measurements are not within normal limits, the capnography will alarm and will also lock-out the PCA pump thus preventing another dose of pain medication from being administered. Although some hospitals use pulse oximetry, while others use capnography, new research suggests that pulse oximetry may not be the safest method for monitoring PCA patients.

Purpose

The purpose of this research is to determine which method of monitoring is most effective at providing early detection of respiratory depression. Both pulse oximetry and capnography are currently used in medical facilities to monitor for respiratory depression in patients with PCA pumps. Since both methods are used, the importance of determining which method is most effective is pertinent to improving patient outcomes. Through the research, determination can be made on which method is most effective at the early detection of respiratory depression and therefore safer for patients.

Materials/Methods

Using the Leonard H. Axe library services through Pittsburg State University, CINAHL Plus with full text database was utilized along with ESBCOhost. Keywords such as "Patient Controlled Analgesia", "Capnography", "Capnography +Patient controlled analgesia", and "Pulse Oximetry" were used. All articles used were full text, peer reviewed, and published within the last 8 years. The interlibrary loan service was also used to gain access to two articles that were unavailable through the Pittsburg State University library databases.

Results/Conclusion

In a recent study, capnography captured 100% of patients with respiratory distress, while pulse oximetry captured only 33%. The suggested reason for the difference in detection, is based on the fact that pulse oximetry measures oxygenation status off of trending data and indirectly measures respiratory status. On the other hand, capnography shows an immediate change in respiratory status, but monitoring the amount of carbon dioxide produced. The results of the research consistently showed that capnography controlled PCA usage was the safest method for the early detection of respiratory depression.

Efficacy of Opioid Use in Pediatric Burn Patients
Tess O.K. Weast
Nursing

Introduction

The premise of the Hippocratic Oath is to do no harm. This standard of care is not exclusive to physicians, but all healthcare professionals. All forms of medical treatment come with caveats; however as health care professionals it is our duty to reduce the number of negative side effects experienced as a result of treatment. Treatment for pain as a result of moderate to severe burns comes with several potential negative side effects. Specifically, when opioids are used to alleviate pain. The most common of which is opioid addiction and/or tolerance. Concerns regarding opioid medications are only exacerbated in pediatric patients who experience pain as a result of a moderate to severe burn.

Purpose

The purpose of this study is to explore the research on the efficacy of opioid medications compared to other forms of treatment in alleviating pain in pediatric patients who have sustained moderate to severe burns.

Materials/Methods

Multiple databases of research were utilized to integrate the most up to date findings on the efficacy of opioid treatment and alternative treatments of pain in pediatric burn patients. Such databases include: PubMed, PsychArticles, Google Scholar, and the Axe Library.

Results

Results regarding the efficacy of opioid treatment for pain in pediatric patients who have experienced moderate to severe burns were inconclusive. Current findings indicated that opioid medications are currently the "go to" medication to meet the needs of reducing pain despite the lack of statistical evidence to reinforce the current standard of care. The conclusion made from the present analysis' findings is that the field of pain treatment would benefit from further assessment of non-opioid medications and alternative treatments for pain in pediatric burn patients.

The Effect of Noise Induced Hearing Loss (NIHL) on Millennials as They Enter the Workforce
Peter Polizzi
Technology

Noise induced hearing loss (NIHL) is a problem that has the potential to affect everyone. Whether the noise be occupational or recreational, the exposure to noise has the ability to cause harm. Baby boomers and members of Generation-X have been exposed to this noise for decades. Effects of NIHL are being felt at younger ages than previous generations, largely in part because of technology. Millennials have the ability to be exposed to noise constantly. Millennials are more vulnerable than any other generations because they don't know life without it.

There is no doubt that younger generations are more dependent on technology, but where is the line drawn between making life simpler and harming your health? If a millennial employee only protects their hearing at work, it leaves 16 hours available where exposures are unregulated and hearing is unprotected. As members of this generation enter the workforce, they will do so with the potential for more hearing loss than any other generation had for their age. Hearing loss, among other communication barriers will lead to reduced productivity and as well as an increase in the stereotypes that widen the generational gap. The way that companies present employee training and hearing conservation methods will undoubtedly change to include education about recreational noise exposures. Increased knowledge through proper education and training about NIHL can potentially protect the hearing of millions of people, particularly the millennial generation and those to come. The proposed study will examine the potential effects of NIHL as it becomes more prevalent within the Millennials population and their performance as they enter the all aspects of the workforce.

With research results from the proposed study, employers, employees and the general public will be able to benefit from the findings. The subjects of this proposed mixed methods study will be selected from Pittsburg State University by completing a screening process. A sequential exploratory mixed methods design will be used to collect data on the severity of personal noise exposures of the subjects in this study. For quantitative analysis, a survey instrument using Likert scale questions will be used to collect data on the subject's perception of NIHL and their listening habits. The qualitative analysis will be drawn from 10 of the 100 survey respondents to further explain the phenomenon found in the quantitative analysis through observations and interviews regarding the respondents' listening habits. The fact that Millennials are entering the workforce with a significant hearing loss is already known. The methods of noise mitigation and training against noise exposures in use and recognized today by OSHA and industry standards will have to change to reduce potential litigation and address hearing related performance expectations in the workplace.

Lack of Availability at the PSU Daycare Center to Accommodate International
Student's Kids Under the Ages of 6
Pamela Hagher
Human Resource Development

Many International student mums in Pittsburg State University (PSU) are faced with the difficulty of childcare upon arrival on campus. The problem, to a great extent is the lack of availability at the PSU Daycare Center to accommodate International student's kids under the ages of 6. In order to better understand this problem, the proposed study will attempt the following question:

How and to what extent can PSU Daycare Center accommodate International
student' kids under the ages of 6?

Research shows that PSU is the fifth most family friendly oriented campus in the United States of America and so for most mums, it is an expectation that once they arrive in PSU, there would be a daycare provision for their kids, but this is not the case. Having access to childcare is one of the student mum's top priorities. Upon inquiry at the PSU daycare center, it is required that the child has to be on a waiting list, a list which does not guarantee the child's entry. This procedure makes it very difficult for the student mum, as she is faced with the challenges of being in a new environment with no help. The student mum requires the child care services upon arrival on campus because in most cases they travel alone with the kids from miles away in order to pursue an academic qualification. Upon arrival, orientation commences immediately after the resumption date scheduled and it runs for a week and classes commence afterwards, thereby leaving the International student mum stranded with no place to keep her kids. This lack of provision of child care negatively affects the emotional and mental state of the student mum.

For this research proposal I would collect data from International student mums in PSU and I intend to collect this data by doing a survey of the International student mums in PSU and distribute questionnaires to these mums. I would also interview 20% of the mums, after which I would analyze the data based on the questionnaires completed and interviews conducted and include it in this research proposal.

Childcare is one of the most effective ways that colleges and universities can render help and assistance to International student mums to earn a degree or complete a successful degree program, yet most universities fail to provide this special need. Child care facilities not only allows parents peace of mind but also provides them more time to devote to schoolwork, the facilities can also help increase retention in the international student mums.

By making this provision PSU would succeed in providing the student mum with the assistance she requires in order to achieve academic excellence and make her stay on campus a pleasant one.

Inducible Expression of Transgenes for Charcoal Rot Resistance in Soybeans
Grace H. Anderson
Biology

Our objective is to create soybeans resistant to Charcoal Rot (CR), a fungal disease that is a significant problem in Kansas agriculture. CR is the primary Kansas soybean crop disease, costing \$50 million annually. Management strategies include crop rotation and irrigation, however neither is ideal. CR infects over 500 plant species, including corn, cotton, alfalfa, sorghum, and sunflower and survives multiple seasons as dormant sclerotia. Irrigation suppresses CR symptoms, allowing plants to survive to harvest, but is expensive, doesn't guarantee crop yield, and encourages root-rot. No CR resistance has been identified so traditional crop-crossing from a hardier wild population is not possible. To get CR resistant soybeans, transgenes are needed.

We are developing transgenic soybeans designed to overexpress a soybean glucanase enzyme (naturally expressed at low levels) that is involved in cell wall development. This enzyme is encoded by the gene *Brassinosteroid On Zurek One (BOZO)*. The protein has shown both antibiotic and antifungal properties by inhibiting the growth of gram negative bacteria and CR, respectively. We believe it plays a role in the development of bacterial and fungal cell walls. Some fungal and oomycete plant pathogens display resistance via specific glucanase inhibitors but no such resistance was seen to our protein from CR.

The first attempt at transforming soybeans with our construct was unsuccessful. A literature review has investigated the ideal gene construct and promoter sequence to use for optimal *BOZO* expression in soybean plants. Due to the role of glucanase proteins in cell wall development, it is critical to develop a system with manageable expression to ensure that there is negligible structural or developmental mutations.

The *alcAmin 35S* promoter system is an ethanol-induced platform and shows the greatest potential for successful transformation of *BOZO*. The plant transformation facilities at Iowa State University have a promising history generating transgenic soybeans using *Agrobacterium*-mediated transformations with the pTF102 plasmid.

The current research is a preliminary study for future work regarding protein levels and identifying any negative side-effects overexpression of *BOZO* has on soybean development. If this research is successful we will not only have designed a soybean line resistant to charcoal. Root infection, but may identify a natural antibiotic and antifungal agent that could be used in human application.

Why Students Choose Teaching as a Future Career
Kuralay Kussainova
Human Resource Development

Teachers have a very significant role in the evolution of the world. Understanding what factors motivate college students of education majors to choose teaching as a future career is very important to indicate reasons why students choose this essential profession.

Most education students idealize their future teaching career as fun, rewarding, interesting and meaningful. The problem is that when students face real life teaching they may realize that the results and outcomes of their teaching career do not meet their previous idealized expectations.

The purpose of this proposed study is to explore the motivating factors of education major students to choose teaching as a future career and help the College of Education of Pittsburg State University to prepare their students in realistic future career expectations. Many students who choose teaching as a future career made their choices because of the impact of altruistic-intrinsic factors such as recognition of teaching as appropriate, respectable and blessed work, love to children, and other ideological reasons. They do not consider many factors such as compensation and benefits. The proposed study will attempt to answer the following question:

How and to what extent do students in the education department at Pittsburg State University who plan to become teachers understand the advantages and disadvantages of the teaching profession beyond altruistic-intrinsic reasons?

This exploratory, mixed-methods study will canvas students of the Education Department of Pittsburg State University to identify their reasons behind choosing teaching as a career and factors that influenced their choice. Qualitative and quantitative data will be collected through surveys and interviews. The survey would include multiple choice questions. This data will be used for interviews using open-ended questions to explore relative content from the quantitative data collected through surveys.

The researcher first will analyze the common reasons for choosing teaching as a future career in scholarly resources and then make informed choices for survey questions. Moreover, the data collection would investigate reasons for choosing a teaching career such as willingness to improve education level, willingness to continue the teaching career, the level subjects desired to teach and rate of the order of importance according to Maslow's Hierarchy of needs. For the reliability of the study, the question would be formulated the way subjects would not consider Maslow's theory in the question would be formulated the way subjects would not consider Maslow's theory in the question.

Impact of Part time Jobs on Indian Students' Academic Excellence at
Pittsburg State University (PSU)
Santhosh Kumar Swayampakula
MST

There are several part time employment opportunities for university students. Some students opt for part-time work and some others do not work at all, it depends on their financial status. Many international students are coming from different parts of the world with different currency values. Most of the students are coming from countries with a decrease in currency value compared to the United States currency's dollar value. It would be tough for students to manage their basic necessities here with the currency they brought from their countries, such as educational fees, monthly expenses such as rent, books and fulfilling basic necessities in the United States. The problem is international Indian students with a decrease in currency value are opting for more part time hours which is directly impacting their academic excellence.

The choice to decide whether to work, or not work, how frequently to work and the working environments can have a considerable effect on academic excellence. In order to highlight that problem, the proposed research study assesses the international Indian student's impact of part time jobs on academic grades. This study will use mixed methods research to answer the following research question:

- How and to what extent a part-time job for 20 hours per week will impact Indian student's academic performance in Pittsburg State University?

According to International PSU office, there are about 548 international students in spring 2015 out of them 91 students are from India and within that 85 are graduate students, within that approximately 18 students opted for part time jobs within the university. The proposed study will use mixed methods research which includes face to face interviews and survey questions Face to face interviews will be conducted for part time working Indian graduate students in PSU. The data related to the type of part time job, the hours they are spending on part time work, responsibilities they have at their work place, and how many credit hours they opted during that time will be gathered. The academic information data from the database at the international office at Pittsburg State University will also be gathered. Interviews will be conducted during the break times. Proper approvals from the international office and my instructor will be obtained for conducting face to face interview and survey on Indian part time working students in PSU. The anonymous data will be collected from the students with no part time jobs and students with 0-10, 10-20 and 20 or above part time working hours per week, with differentiating the type of work, credit hours they opted during that time. The data obtained. Will be analyzed and the related statistical figures will be presented.

Importance of Safety of International Female Students at Pittsburg State University
Chandana Phiya Somineni
Technology

Safety is an important factor to be considered especially for international female students studying in colleges. This could be due to more female students going to colleges today than ever before. Also parents living in other countries will be worrying about the safety of their daughters if they are attending late evening classes. If this safety problem is not addressed properly for international female. Students, it would really make a serious concern for the university. It's a basic need for the females to showcase themselves with higher education and make their mark on the society. Providing proper safety for international female students will help parents gain confidence and send their daughters to study.

Whatever the reason, safety is a growing concern that must be addressed by college campuses, particularly by administrators. In order for the college administrators to address safety concerns, they must be aware of the types of safety issues present on their campus. The international female students present in Pittsburg State University are facing safety concerns while attending the late evening sessions. This is because students attending late evening classes don't have transportation to commute between their home apartment and the technology center. Though the university provides all the students with several safety measures like on-campus university police, emergency poles to click on during necessary times, it does not provide transportation for international female students attending classes after 6:30 pm in the evening.

In order to address the problem, the proposed research study will try to answer the following research questions:

- How and to what extent safety is a concern for international female students, attending late evening classes at Pittsburg State University?

The proposed research will use mixed method study to analyze the safety issues faced by international female students who are attending late evening sessions at PSU. The data will be collected from international female students by means of survey and face to face interviews. The details such as number of international female students attending late evening sessions, number of students with lack of transportation after attending late evening sessions will be collected as part of research. The survey and the interviews will be conducted during class break times. With necessary approvals from the international office, the survey and interviews will be conducted. The gathered data will be drafted for the analysis. The analyzed data will be displayed in tabular and statistical report.

Emotions of Change: International Students Relocation to the United States

Teuta Lokai

Human Resource Development

The relocation process associated with international students in the United States generates a number of stressful, unpleasant, complex and unpredictable issues. Based on personal experience and the continued communication with international peers here at Pittsburg State University the most common challenges related to the relocation pertain to emotions. These emotions are primarily tied to who and what the students miss prior to relocating. Furthermore, emotions involve the apprehension of adjusting to different academic practices and expectations that do not translate from previous educational practices. Once the anxiety of the admission to the academic program is overcome, one gets enthusiastic for the upcoming achievement in their life, At this point students rarely contemplate what they need to leave behind to for the purpose of this accomplishment, which often times are important segments of our lives such as a job, close family members, a friendship circle or life pattern. These issues induce a number of emotional discomforts which may greatly affect individual wellbeing, academic achievements and financial loss. The length of the emotional transition process varies from one person to another, depending on the background and the circumstances surrounding the decision for the relocation.

Increased awareness over the emotions at different stages of change will help us understand the relocation as a change process and thus better prepare for it. The purpose of this study is to identify the relationship between the relocation and the emotional stages of the international students pursuing their studies at Pittsburg State University. This study will attempt to answer the following question.

1. How and to what extent could the awareness of the four stages of change help international students adjust to the relocation at Pittsburg State University?

An exploratory, quan-qual mixed method research design will be utilized for the purpose of this study. This study will include 100 participants. The sample will be drawn by a simple random selection of the students from a multicultural population of international students admitted in graduate, undergraduate and intensive English program at Pittsburg State University. A survey instrument will be developed for the purpose of quantitative data collection. The survey will be administered using e-mail invitations via surveymonkey.com by encouraging respondents to answer ten likert-scale, close-ended and short answer questions. For more insightful data over the emotional states at different stages of the change process five purposely random selected students will undergo a semi-structured interview. Potential limitations to the study will be the unidentified participants' background and life experiences along with the cultural background and language limitations.

The emotions that follow the different change stages are evident and their early recognition and the appropriate response to them will support the reduction of the student anxiety and their smooth transition through different stages of the relocation change process. This research will assist among others the Pittsburg State University to improve their step-by-step change planning and the on-boarding practices by making the transitioning process easier for new students and employees, their retention and the overall institutional productivity.

Pedestrian Safety and Traffic Reduction at the Intersections of Joplin and Cleveland Streets at
Pittsburg State University
Alheli Aranda Britez, John S.C. Thorpe, Kachisicho Ogbodo

Safety and extended amount of waiting times are issues faced by PSU students, staff, visitors and faculty crossing the intersection of Joplin Street and Cleveland Street during busy school hours. Considering the growing student population at Pittsburg State University (PSU) and the heavy traffic on peak hours, the study will analyze foot, vehicle and bicycle traffic during Monday and Tuesday between the hours of 8 to 10am, 11 to 1 pm, and 3 to 5pm.

A descriptive study was conducted in order to evaluate the degree of the issues and make recommendations based upon the data collected. Data will be collected through observation and video recording of participants while they are crossing the street. The researchers aimed to accumulate a minimum sample of 367 human subjects that consist of students, staff, and visitors who are pedestrians and motorists, which would consist in a representative sample of the university population. We will focus our attention in answering the following questions:

1. How many students cross the intersection by foot and bicycle during those specific times?
2. How many vehicles cross the intersection at the specific times?
3. How many accidents have been reported at that particular intersection?
4. How much time does it take in average for a car to cross the intersection?

Based upon the data gathered, the researchers will analyze the behavior of pedestrians, drivers and bikers in order to make conclusions and recommendations for resolution of the issues, as well as generate ideas for further study.

Inconvenience Indian Students Feel Because of the Difference in Food in Pittsburg Compared to India
Bindu Ambati and Debanjana Ganguly
Technology and Human Resource Development

India is a diversified country, which has varied palate. Indian cuisine comprises of a wide variety of regional cuisines related to India and varies significantly from each other due to the range of diversity in soil type and climate. The style of cooking and specialties are different from region to region.

American cuisine also varies so much from the typical Indian cuisine. American food consists of different kinds of bread and meat. Most of the food made in this region had its origins from the local fruits, vegetables and animals found in this region. Even though, arrival of immigrants have paved path to different varieties of food, home made food still remains popular. "Kansas city is well known for its barbecue, Chicago for its style of pizza and hot dogs, while the great lakes provide plenty of seafood for the area" (anonymous, n.d., 2015).

There are many factors that create difficulties for Indian students in finding the right food when they first time come to Unites States of America. In grocery stores, vegetables are available but Indians do not get the kind of vegetables they get back in India. There are abundance of chicken, pork, beef and turkey but vegetarians cannot eat non-vegetarian. So they rely on different varieties of vegetables. Also Indians have religious constraints in food such as Hindus cannot eat Beef and Muslims cannot eat Pork. Turkey is very expensive here in United States, so students find chicken as their only option.

The purpose of this study is to reduce the inconvenience Indian students feel because of the differences in the food in the United States compared to India.

We will investigate the following objectives through the course of this study.

1. Determine the demographic information of all the Indian students studying in Pittsburg.
2. Determine the basic information about the food preferences of the student body.
3. Determine the exact differences Indian students face due to the difference in food.
4. Determine the possible solutions to differences or the lack of food choices.

Our study is based on the food choice process model theory. This model is developed by Sobal & Bisogni (2009) about the constructive approach in examining how people make food choices. Our study is based on the framework, "factors that affect food choice and intake" by shepherd (1989).

Therefore, our study will focus on finding solutions for the problems that are discussed above and our research will be a qualitative research. The proposed methodology would be collecting descriptive information about Indian graduate students here. Researchers will study further on the options available here that can solve or dilute the food differences issue.

Lack of Regional Entertainment in PSU
Subhash Chandra Kanth Bolugoddu

Entertainment can bring out the best in any individual especially students. United States of America is one of the best countries for education as it gives more practical knowledge rather than theoretical knowledge. Every international student aspire to study in United States. The students who come from different countries experience many changes in their day-to-day life like climatic conditions, food habits, culture and traditions, native language. Those changes include feeling home-sick, being lonely. As an International student I felt very lonely and home sick for many days. Just communicating with my parents and friends by phone doesn't satisfy me and also I did not find any regional entertainment resources to overcome my boredom and homesick.

There are few reasons for the international students to get emotional and also technical and professional way of education in United States may also make us stressful. In such situations every individual looks out for entertainment. There are many forms of entertainment like a movie show, a concert, dance show, comedy show and so on. From childhood I love watching Indian films on large screens. So I preferred to watch an Indian film here in Pittsburg, unfortunately I did not get any Indian theatres here. This situation hurt me a lot and that made me to take this topics my research topic.

As this is my personal experience, I want to execute my research on the topic called Lack of Regional Entertainment in PSU with a primary question given below:

How and to what extent does lack of regional entertainment for international students interfere with the anxiety associated with transitioning to a rural American University school in Pittsburg Kansas?

In the process of explaining the problem, I would like to state an instance took place here in Pittsburg. Few of my friends went to Kansas City to watch my regional film, with a lot of Indian nativity and culture with an expenditure of \$35 each. The ticket cost is just \$10, but huge amount of the expenditure is spent on fuel and car rent. But here in Pittsburg 8 theatre we can enjoy a movie at a cost of\$ 3.50 per head. This instance made me think a lot about my topic. I would collect data at the situation where students of PSU feeling home sick due to far away from home nation and stress due to new style of education who are in search and missing their regional entertainment on big screens.

In order to overcome this problem I would like survey on my topic with the International students here in Pittsburg in mixed methods of research without any inconvenience, by giving ultimate respect to their opinions and with obtained results. I would like to talk with Pittsburg 8 theatre management which is not only for the sake of international students but also it is type of business by telecasting an international movie at least once a week.

Lack of Economic Motor vehicles for International Students in PSU
Nikhil Deep Takkallapalli
Technology

As everyone knows that education stream in United States of America is leading than other nations with their technological capability and with their research ability skills from ground level. To grab the global exposure of technological skills many students from different nations are looking forward for their Master's program in United States of America. So, as a part of migrating from one nation to another nation can leads to face some problems in our daily life. It may be like adjusting to new nativity of people, climate changes, language, food habits, culture, friends, missing family members, transportation, relatives and many other things have to be adjusted by the people in order to settle down. I personally experienced the above changes when I stepped here in United States of America and after reaching to Pittsburg city.

I personally experienced the problem with economic motor vehicles which Consists of both two wheelers and four wheelers. Economic in sense it includes cost and mileage when compared to Indian motor vehicles. To meet the general needs in our daily life a vehicle has been essential in these present trend. As an international Student I cannot afford much amount on vehicle and I would like to study on How and to what extent lack of economic motor vehicles to international Indian Students will affect them in attending their classes on time in Pittsburg State University without having any kind of public transportation?

As I am from India, we have economic bikes which are cheaper, we got habituated to that kind of environment. We use economic bikes as people here use desktops. Transportation is the key factor for everyone irrespective of the place where they live it might be a small city or big city. As a student I need to attend my classes early morning and late evenings, I could not attend these classes as per scheduled time because of lack of transportation and lack of vehicles. As I am from India, as we don't find any Indian stores here in Pittsburg, in such cases we have to hire a taxi or request friends having cars to travel all along to Kansas city to fulfill our needs. If we have an economic bike here in Pittsburg, we can travel with small amount of \$10 to Kansas City, but by car it fetches \$50 for gas. In an emergency situation, we cannot ask or hire cars at late hours which is a frequent problems faced by lot of international students.

In order to sort out this problem I will survey on my research topic with international PSU students who enrolled for spring 2015 semester with mixed methods and face to face interviews to obtain the results. I will talk with PSU management to provide economic motor vehicles to international students on rental basis for the period of their stay in Pittsburg University with keeping deposit of amount for security.

Fabrication of Spinel One-Dimensional Architectures by Single Spinneret
Electrospinning for Energy Storage Applications
Sara Alkhalaf, R.K. Gupta
Chemistry

A facile and general method is developed to fabricate one-dimensional (1D) spinel composite oxides with complex architectures by using a facile single-spinneret electrospinning technique. It is found that precursor polymers and heating rates could control the structures of the products, such as 1D solid, nanotube and tube-in-tubes structures. Especially, the tube-in-tube structures have been successfully fabricated for various mixed metal oxide, including CoMn_2O_4 , NiCo_2O_4 , CoFe_2O_4 , NiMn_2O_4 and ZnMn_2O_4 . Benefiting from the unique structure features, the tube-in-tube hollow nanostructures possess superior electrochemical performances in asymmetric supercapacitors and Li-O₂ batteries.

The Process of Educating Students Through the Print Media as a Form of
Instructional Technology
Olubunmi Olaitan Adetayo
Graphic Management

In educational sector as of today, there are many things interrupting students to focus on their studies when they use different media, such as video games, Internet, social media and televisions, as a form of instructional technology. To some extent, students can control themselves by ignoring distractions that comes from electronic media while some are tempted to do other things instead for their primary focus. It is a common knowledge that technological advancement in instructional technology has direct effect on learning when it comes to critical thinking, judgment and credibility.

This study will research the process of teaching and educating students: reintroducing print media as a form of instructional technology. A broad base of literature was reviewed while researching the process of educating students through the print media as a form of instructional technology. This was necessary to properly lay a foundation that is supported by sound research in multiple factors that influence teaching and learning of graduate students taking as well as the wide growing variety of media used in different universities. Much of the research has focused either on computer- based learning, Internet, video, television media.

This study is designed specifically to provide students and instructors in Pittsburg State University, MST faculty, HRD 891 the relevance and importance of printed textbooks, journals, magazines, and handouts as a preference over electronic medium as a form of instructional technology. "To what extent does print media (printed textbooks) effect learning in HRD 891 class, MST department, Kansas Technology Center, PSU, when compared to electronic medium as a form of instructional technology".

There are many variables that aid the successful completion of this research, which put into consideration the major question to be answered. These variables would be quantified so that numbers and statistical analysis can be made. A survey of students taking HRD 891 in MST, PSU would be done. Secondly, a method that produces a ratio variable would be used because a questionnaire containing several questions will be given to each participant in the class to fill. These questionnaires would be scored and it will be used to determine quantitatively how much of specific benefits each medium possesses. The variables between percentages of respondents that make use of electronic media would be compared to those that believe print media is the best form of instructional technology for PSU.

At the end of this study there would be clarification on the need and solution to the problem - The process of educating students through the print media as a form of instructional technology: even though research revealed that electronic media poses a major effect on education as an instructional technology, print media is still the best when it comes to learning for critical thinking, judgment and credibility and it offers specific benefits to students.

Effect of Video Games in Learning of Industrial Technology Students
Lakshman Kishore Muppuri
Industrial Technology

The nonimmigrant international students from all over the world coming to United States of America face difficulty in understanding the vocabulary and English language since they are from different style of teaching environment. International students face difficulty and get stressed in learning the subject as they are brought to them in the traditional U.S style of teaching which can lead to negative effects like increase in dropout rates and losing interest in studies. The problem is students feel stressed when they are taught with complicated issues in subjects. A possible solution to overcome this issue is by using strategic games in learning like the WORD SPLASH.

How and to what extent does using Word Splash a strategic vocabulary word game in academic curriculum enhance the learning ability of international students in industrial technology courses at Pittsburg state university?

The problem is that the international students of Industrial technology at Pittsburg state university face are struggling with the language & vocabulary such as not using the correct word or phrase during speaking and writing which is resulting either poor communication or losing the grades by submitting the paper with poor vocabulary. Word Splash is game that can help student improve in learning terminology in comprehension and vocabulary strategy, it is the game which can be played inside the class by having fun among the students. This event also motivates them in order to be attentive in the class to learn more things and to communicate well in the class. The game can be played like before starting a new chapter the new words of it are analyzed and picked by the teacher then words are splashed on the screen of the computer or the sentences whose vocabulary needs to be corrected, then the students have to work on this to correct them when they fit in the right word it gives green tick else they have to try again in the mean they get many suggestions and out comes what can be fit into it.

The type of the research methodology to be used is qualitative which has the sequence as follow, first by selecting the participants and site like international Industrial technology students at PSU. After qualitative observation of selected participants with their permission, then by formulating the standard research questions from my observation the Qualitative interviews like face to face to the participants will be done so with that difficulties can be known by which students are facing due to traditional method of teaching. With the specified questions from above observations and then providing time to play game so that they can feel the difference and take the interviews again to observe the change. Then formulating the documents on all the above process by taking visual materials also into consideration gives proper results to research study by which can be finally concluded.

The Effect on Employee Stress Due to Employers Allowing Dogs into the Workplace
Riley Trowbridge
Human Resource Development

Reducing employee stress in the workplace is a large concern and focus for many organizations in the United States today. With more and more focus on employee stress at work, employers are looking for new and cost effective ways to help reduce this issue. Some of the U.S's top organizations are inputting the idea of allowing employees to bring their personal dogs into the workplace. Many of these organizations have been listed on Forbes top 100 companies to work for, such as Google and Amazon.

Employees who are experiencing stress in the workplace can become inefficient workers, take more sick days, as well as have a bad attitude while in the workplace. These characteristics can harm organizations and lose them both time and money. Since the idea of allowing dogs into the workplace to reduce the stress of employees is so new; many organizations are not aware of the many benefits it can provide. Some of the benefits that research has found are: employees are more productive, efficient workers, healthier, and more willing to work longer hours for less pay.

In order to address the problem of employee stress in the workplace, the proposed research study will try and answer the following research question:

- How and to what extent does bringing a dog into the office space reduce employee stress in the workplace?

The proposed research study will using a mixed method for analyzing the effects on employee stress when a dog is present in the workplace. The data that is collected will be from employers who allow employees to bring dogs into the workplace. The employees stress levels will then be compared to days that their dog is present and days the dog is not present in the workplace. With the consent of participants and proper approvals, interviews with participating employees will be conducted. Seeing how the employees felt their stress levels were when the dogs was present versus when the dog was absent will help to give a correlation of the data.

Electrochemical biosensor based on graphene oxide-Au nanoclusters composites for L-cysteine analysis
Muidh Albalawi, R.K. Gupta
Chemistry

In this paper, a linker-free connected graphene oxide/Au nanocluster (GO-Au NCs) composite was prepared under sonication through electrostatic interactions, and characterized by transmission electron microscope (TEM), atomic force microscope (AFM), ultraviolet-visible (UV-vis) and FT-IR spectrum. The morphological and structural characterizations evidence that the Au NCs can be efficiently decorated on the GO. The electrochemical investigations indicated that GO-Au NCs composite has an important role in the electrocatalytic activity towards the oxidation of L-cysteine (CySH). The GO-Au NCs composite modified electrode shows a large determination range from 0.05 to 20.0 $\mu\text{mol/L}$, a remarkably low detection limit is 0.02 $\mu\text{mol/L}$ and low oxidation potential (+0.387). It was found that metal ions, carbohydrates, nucleotide acids and amino acids had no distinct effect on the determination of L-cysteine. In addition, the sensor has some important advantages such as simple preparation, fast response, good stability and high reproducibility. The direct determination of free reduced and total CySH in human urine samples has been successfully carried out without the assistance of any separation techniques.

Generation of Electricity From Phosphorescent Insects
Bharani Vadde
Engineering Technology

The light that a firefly creates is the result of a combination of four different ingredients. This light is produced through a chemical reaction involving Luciferin, which is a substrate, Luciferase, an enzyme, ATP, and oxygen. The light producing section of the body is located in the sixth or seventh abdominal section of the firefly. It is within this cavity that the two compounds Luciferin and Luciferase are stored. A firefly will draw oxygen in through its complex system of air tubes and expose the oxygen to the Luciferin and the Luciferin will then oxidize and activate the Luciferase. One theory, known as the "Oxygen Control Theory", explains that fireflies can control the length and duration of their light by regulating the amount of oxygen that they intake. Another theory, known as the "Neural Activation Theory" states that fireflies have neural control over the activity of structures called "tracheal end cells". These structures aid in the initiation of the chemical reaction. Whether or not the fireflies have physical or neural control over their ability to produce light, their method of creating the light that emanates from their bodies is extremely efficient. Very little heat is given off of this light which means that not very much energy is wasted at all. **This "cold light" has a 96% efficiency rating; which, when compared to an incandescent light that has only 10% efficiency, is rather impressive.**

The nanorods are composed of an outer shell of cadmium sulfide and an inner core of cadmium selenide. Both are semiconductor materials. Manipulating the size of the core, and the length of the rod, alters the color of the light that is produced. The colors produced in the laboratory are not possible for fireflies. Maye's nanorods glow green, orange, and red. Fireflies naturally emit a yellowish glow. The efficiency of the system is measured on a BRET scale. The researchers found their most efficient rods (BRET scale of 44) occurred for a special rod architecture (called rod-in-rod) that emitted light in the near-infrared light range. Infrared light has longer wavelengths than visible light and is invisible to the eye. Infrared illumination is important for such things as night vision goggles, telescopes, cameras, and medical instruments.

"The nanorods are made of the same materials used in computer chips, solar panels, and LED lights," Maye says. "It's conceivable that someday firefly-coated nano rods could be inserted into LED-type lights that you don't have to plug in." By these firefly-coated nano rods, we can light up our city, homes which conserve energy and also the non-renewable energy resources.