

ANNUAL RESEARCH SYMPOSIUM

April 7, 2016



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PROGRAM

Session S1 (KDM Science Building, S-127)	12:30 PM -- 2:06 PM
Session S2 (KDM Science Building, S-123)	12:30 PM -- 2:06 PM
BREAK	2:06 PM -- 2:30 PM
Session S3 (KDM Science Building, S-127)	2:30 PM -- 4:06 PM
Session S4 (KDM Science Building, S-123)	2:30 PM -- 3:54 PM
Keynote Talk, Awards Dinner, and Presentation of Awards (SRSC Traditions Room)	6:00 PM -- 8:00 PM

SESSION S1

Room: KDM Science Building, S-127

Chair: Dr. Stephen Starnes
Department of Chemistry

- 12:30 PM S1.1 **Mutual Friction in Neutron Star Cores**
Chris Johnston and William Newton
Department of Physics and Astronomy
Undergraduate (College of Science and Engineering)
- 12:42 PM S1.2 **Those Not in the Room**
Joaquin Guerrero and Melissa Arrambide
Department of Educational Leadership
Graduate (College Education and Human Services)
- 12:54 PM S1.3 **Words to Live by: A Persuasive Writing Intervention to Support Rural Middle School Students with Emotional and Behavioral Disorders**
Nelly Shora and Brittany Hott
Psychology, Counseling, and Special Education
Graduate (College of Education and Human Services)
- 1:06 PM S1.4 **The Effect of Shifting Interest Rate on Credit Default Risk**
Nishanth Arepalli, Divya Yerva, and Srinivas Nippani
Department of Economics and Finance
Graduate (College of Business)
- 1:18 PM S1.5 **Effects of a Modified Moore Method College Geometry Course on Students' understanding of Proof Construction: A Case Study**
Janessa Beach and Rebecca Dibbs
Department of Mathematics
Graduate Student (College of Science and Engineering)
- 1:30 PM S1.6 **An Analysis of Effective Professional Development Practices for Sustaining Culturally Diverse School Leaders in Urban Districts**
Cathy Rushing and Melissa Arrambide
Department of Educational Leadership
Graduate (College of Education and Human Services)
- 1:42 PM S1.7 **The Ascension of Texas Female Administrators to the Superintendency**
Tracie Pritchett and Julia Ballenger
Department of Educational Leadership
Graduate (College of Education and Human Services)

1:54 PM S1.8 **Managing Stress with Bio-Touch: A Non-Invasive Tool for Achieving Balance**
Carole A. McKenzie
Department of Nursing
Faculty (*College of Education and Human Services*)

SESSION S2

Room: KDM Science Building, S-123

Chair: Dr. Johanna Delgado-Acevedo
Department of Biological and Environmental Sciences

12:30 PM S2.1 **Design and Implementation of an Automation System for the Texas A&M**
Christopher Voss and Kent Montgomery
Department of Physics and Astronomy
Undergraduate (*College of Science and Engineering*)

12:42 PM S2.2 **Ethnomathematics meets History of Mathematics**
Kelly Lewis and Rebecca Dibbs
Department of Mathematics
Graduate (*College of Science and Engineering*)

12:54 PM S2.3 **A Qualitative Study Analyzing the Imparity of Women in Education Administration through the Exploration of Gender Bias in Male and Female Faculty Perceptions on Female Leadership**
Crystal Deaver and Melissa Arrambide
Department of Educational Leadership
Graduate (*College of Education and Human Services*)

1:06 PM S2.4 **No Good Deed Unpunished: Does Texas Penalize Schools that Serve Minority and Economically-Disadvantaged Students?**
John Kuhn and William Holt
Department of Educational Leadership
Graduate (*College of Education and Human Services*)

1:18 PM S2.5 **Religious Identity vs. Organizational Identity: Influences on Organizational Citizenship Behavior**
Andrea Slobodnikova and Brandon Randolph Seng
Department of Management Department
Graduate (*College of Business*)

- 1:30 PM S2.6 **Object Tracking using SURF Points**
Chetana Nimmakayala and Nikolay Sirakov
 Department of Mathematics
Graduate (College of Science and Engineering)
- 1:42 PM S2.7 **Elementary Principals Influence on Student Achievement**
Renee' Jones and Kemp-Graham
 Department of Educational Leadership
Graduate (College of Education and Human Services)
- 1:54 PM S2.8 **Building Classroom Community in pre-service Teacher Content Courses through Pencasts**
Rebecca Dibbs
 Department of Mathematics
Faculty (College of Science and Engineering)

2:06 PM -- 2:30 PM BREAK

SESSION S3

Room: KDM Science Building, S-127

Chair: Dr. Jason Davis
 Department of Engineering and Technology

- 2:30 PM S3.1 **An Accessibility Analysis of 8th Grade Math Textbooks: Implications for Diverse Learners**
Emily Waddle and Brittany Hott
 Department of Curriculum and Instruction
Undergraduate (College of Education and Human Services)
- 2:42 PM S3.2 **Teaching ESL /ELL to Mono-Dyllabic Tongues**
Thang D. Nguyen and Nate Templeton
 Department of EDAD Social Sciences (Humanities)
Graduate (College of Education and Human Services)
- 2:54 PM S3.3 **Utilizing the Graduate Exit Survey to Investigate Students' Academic Experiences and Texas Core Curriculum Outcomes**
Hari Priya Mamilla, Shonda Gibson, Melissa Crews, and Dan Su
 Department of Computer Science
Graduate (College of Science and Engineering)
- 3:06 PM S3.4 **Evaluation of the Global Competence Aptitude Assessment (GCAA) – Assessment of Validity and Mean Differences Analysis**
Rochana Kaushik, Dan Su, Tabetha Adkins, and Shonda Gibson
 Department of Marketing and Business Analytics
Graduate (College of Business)

- 3:18 PM S3.5 **Ion Mobility – Mass Spectrometry study of the Redox Activity of Methanobactin Analog Peptides**
Yashodha Rani Vytla and Laurence A. Angel
 Department of Chemistry
Graduate (College of Science and Engineering)
- 3:30 PM S3.6 **Rising Interest Rate Risks at US banks**
Giedrius Andriunaitis, Sarosh Kulkarni, and Asli Ogunc
 Department of Economics & Finance
Graduate (College of Business)
- 3:42 PM S3.7 **Study of Zn(II) Binding of an Analog Methanobactin Peptide using Ion Mobility – Mass Spectrometry**
Manogna Deeconda and Laurence A. Angel
 Department of Chemistry
Graduate (College of Science and Engineering)
- 3:54 PM S3.8 **Carbon-Atmosphere White Dwarfs: Stars too Small to Fail?**
Kurtis A. Williams, D. Winget, M. Montgomery, and R. Falcon
 Department of Physics and Astronomy
Faculty (College of Science and Engineering)

SESSION S4

Room: KDM Science Building, S-123

Chair: Dr. Rafael Bakhtavoryan
 School of Agriculture

- 2:30 PM S4.1 **The Effect of the National Society of Leadership and Success Leadership Training Program on Consideration of Future Consequences**
LaToya M. Ellis, Theresa Sadler, Stephen Reysen, and Shonda Gibson
 Department of Psychology, Counseling and Special Education
Graduate (College of Education and Human Services)
- 2:42 PM S4.2 **Incorporating Six Principles of Influence in to Creation of a Marketing Campaign**
Christopher Woodard, Tabetha Adkins, and Shonda Gibson
 Department of Marketing and Business Analytics
Graduate (College of Business)
- 2:54 PM S4.3 **Exploring the Impact of Mentorship on Leadership Programs**
Linda Jena, LaToya Ellis, Theresa Sadler, and Shonda Gibson
 Department of Department of Educational Leadership
Graduate (College of Education and Human Services)

- 3:06 PM S4.4 **Domain Sizes of Nuclear “Pasta” Phases in Neutron Star Crusts**
Sarah Cantu and William Newton
Department of Physics and Astronomy
Graduate (College of Science and Engineering)
- 3:18 PM S4.5 **Evaluation of Study Abroad Students’ Global Competence Aptitude Assessment Scores Pre-departure and Post-reentry**
Natalia Assis and Shonda Gibson
Department of Psychology, Counseling, and Special Education
Graduate (College of Education and Human Services)
- 3:30 PM S4.6 **Analysis of Cu(II) and Zn(II) binding of selected analog methanobactin peptides as a function of varying pH and metal equivalents employing ion mobility mass spectrometric studies**
Shravya Challa and Laurence A. Angel
Department of Chemistry
Graduate (College of Science and Engineering)
- 3:42 PM S4.7 **How Does User Experience Affect Trust in Social Network Sites?**
Bo Han and Alma Mintu-Wimsatt
Department of Marketing & Business Analytics
Faculty (College of Business)

POSTER PRESENTATIONS

KDM Science Building Foyer (1:00 PM -- 4:30 PM)

- P1. **Effects of Equine Appeasing Pheromone on Physiological Coping Mechanisms during Temporary Separation of Equine Preferred Partners**
Hannah Wilson and Petra Collyer
Department of Animal Science
Undergraduate (College of School of Agriculture)
- P2. **Clearing the Way for Mindset Changes through Formative Assessment**
Jennifer Patterson and Rebecca Dibbs
Department of Mathematics
Undergraduate (College of Science and Engineering)
- P3. **Psychological Needs Predict Fanship and Fandom in Anime Fans**
Adam Ray, Courtney N. Plante, Sharon E. Roberts, Kathleen C. Gerbasi, Daniel Chadborn, Natalia Assis, and Stephen Reysen
Department of Psychology, Counseling, and Special Education
Graduate (College of Education and Human Services)
- P4. **Internet of Things and Security**
Mohan Areti and John 'Urcun' Tanik
Department of Computer Science
Graduate (College of Science and Engineering)
- P5. **Myelodysplastic Syndrome Target Identification and Validation Using GRIP**
Sirisha Chakkapalli and Venu Cheriya
Department of Biological and Environmental Science
Graduate (College of Science and Engineering)
- P6. **Brand Level Demand Analysis of Mayonnaise in Northeast Texas**
Ademola Olukanni and Rafael Bakhtavoryan
Department of Agricultural Sciences
Graduate (College of School of Agriculture)
- P7. **Undergraduate Baccalaureate Nursing Students and Disaster Drills**
Bonnie Smithers and Monica L. Tenhunen
Department of Nursing
Faculty (College of Education and Human Services)

- P8. **Authority Dynamics and Groups Norms of pre-service Middle School Teachers during Group Work Pencasts: A Discourse Analysis**
Daniel Rios and Rebecca Dibbs
Department of Mathematics
Undergraduate (College of Science and Engineering)
- P9. **The Effects of High Intensity Interval Training, in Conjunction with Functional Training Equipment, on VO₂max and Peak Power in Recreationally Trained Individuals**
Christopher Sataray and Vipa Bernhardt
Department of Health and Human Performance
Graduate (College of Education and Human Services)
- P10. **G1P3-induced Tubulin Acetylation increases Breast Cancer Cell Migration**
Swati Balluri and Venu Cheriya
Department of Biological and Environmental Sciences
Graduate (College of Science and Engineering)
- P11. **Factors Affecting Distribution of *Scabiosa atropurpurea* L. (Dipsicaceae) in North-Central Texas**
Brandon Belcher, Dean Ransom, Curtis Jones, and Jeffrey Kopachena
Department of Biological and Environmental Sciences
Graduate (College of Science and Engineering)
- P12. **A Market Analysis of *Celosia Argentea* in the Northeast Texas**
Olukunle Kolade, Derald Harp, and Jose A. Lopez
Department of Agricultural Sciences
Graduate (College of School of Agriculture)
- P13. **Cybervation**
James Michael Mondragon and Nate Templeton
Department of Educational Leadership
Graduate (College of Education and Human Services)
- P14. **Reproductive Success of Barn Swallows Nesting on Buildings along the SH 24 Corridor in northeast Texas**
Katelyn Miller, Dean Ransom, Lani Lyman-Henley, and Jeffrey Kopachena
Department of Biological and Environmental Sciences
Graduate (College of Science and Engineering)
- P15. **Highly Mesoporous Catalysts for the Synthesis of Biodiesel**
Mohammed Irfan Zakir Omer, Syed Shah Abdullah Hussaini, Zia Syed, and Ben Jang
Department of Chemistry
Graduate (College of Science and Engineering)
- P16. **Anthelmintic Resistance and the use Of Diatomaceous Earth as an Alternative Anthelmintic in *E. Caballus***
Brandy Spoor and Petra Collyer

Department of Agricultural Sciences
Graduate (College of School of Agriculture)

- P17. **Influencing Undergraduate Nursing Student Attitudes on Older Adults**
Monica L. Tenhunen
Department of Nursing
Faculty (College of Education and Human Services)
- P18. **Sex Steroid Hormone Profiles during the Reproductive Cycle of Zebrafish, *Danio rerio***
Velnesha Rabon and Izhar A. Khan
Department of Biological and Environmental Sciences
Undergraduate (College of Science and Engineering)
- P19. **A Study Describing Special Education Resources For Spanish Speaking Students**
Rosario Klier and Arthur Borgemenke
Department of Educational Leadership
Graduate (College of Education and Human Services)
- P20. **XPS Investigation of Ti-CuO Interface**
Darius Durant and A. R. Chourasia
Department of Physics and Astronomy
Undergraduate (College of Science and Engineering)
- P21. **Synthesis, Characterization and Evaluation of Pd-Ceria Catalysts for Selective Hydrogenation of Acetylene**
Junyi He, WentaoXie, Tengteng Lyu, and Ben Jang
Department of Chemistry
Graduate (College of Science and Engineering)
- P22. **Investigation of the Cu(I), Ag(I), Pb(II), Co(II), Fe(III), Mn(II), Ni(II), and Zn(II) Binding Characteristics of Methanobactin from *Methyosinus trichosporium* OB3b**
Jacob W. McCabe, Rajpal Vangala, and Laurence A. Angel
Department of Chemistry
Graduate (College of Science and Engineering)
- P23. **An Examination of the Testing Effect and Predictions of Learning for Math Facts**
The Metacognition Lab
(Eva Limoges, Cindy Mays, and Corey Grigsby) Beth Nikopoulos, Eva Limoges, Cindy Mays, Corey Grigsby, and Lacy Krueger
Department of PCS
Undergraduate (College of Education and Human Services)
- P24. **Lucky's Choice: A Theory Based Point of Purchase Campaign to Promote Healthy Food and Beverage Purchases**
Andrea Rodriguez and Spencer Willis

Department of Health and Human Performance
Graduate (College of Education and Human Services)

- P25. **Selective Hydrogenation of Acetylene over modified Pd Catalysts**
Arash Mirjalili, Xinxiang Cao, and Ben Jang
Department of Chemistry
Graduate (College of Science and Engineering)
- P26. **G1P3-Induced Mitochondrial Reactive Oxygen Species (mtROS) Increase Histone H3k27 Trimethylation In G1p3 Mediated Breast Cancer**
Nobel Chowdhury and Venu Cheriya
Department of Biological and Environmental Sciences
Graduate (College of Science and Engineering)
- P27. **Age and Gender Classification of Facial Images Using Deep Extraction and Convolutional Deep Neural Networks: Analysis of the Relative Performance with Various Output Activations and Cost Functions and Different Meta-Parameters**
Dhiraj Gharana, Sang Suh, and Mingon Kang
Department of Computer Science and Information Systems
Graduate (College of Science and Engineering)
- P28. **G1P3, a Mitochondrial Localized Antiapoptotic Protein Promotes Breast Cancer Cell Metastasis through ROS**
Jaspreet Kaur, Ashjan Khaleel, and Venu Cheriya
Department of Biological and Environmental Sciences
Undergraduate (College of Science and Engineering)
- P29. **Identification and Validation of Breast Cancer Antiestrogen Resistant Genes using GRIP: A Novel Functional Genomics Strategy**
Zahra Barati and Venu Cheriya
Biological and Environmental sciences
Graduate (College of Science and Engineering)

Keynote Talk

Room: Traditions Room (SRSC, 212)

Time: 6 PM

Chair: Dr. Salvatore Attardo

Making Research Relevant

Dr. Melinda Schlager
Director of the Caruth Police Institute
University of North Texas, Dallas

ABSTRACTS

Mutual Friction in Neutron Star Cores

Chris Johnston

Advisor: William Newton

Department: Physics and Astronomy

College: Science and Engineering

Category: Undergraduate

Neutron stars are the super-dense remnants of stars which had masses of 8-25 solar masses. A typical neutron star has a mass of 1.4 solar masses compressed into a ball having a radius of about 10km. The neutron star core, about 1km below the crust of a NS, is a fluid of protons and neutrons. Due to the motion of this fluid, certain observable effects, such as glitches, can be seen in the behavior of NSs. These effects are believed to occur due to effects such as mutual friction, the interaction between the neutron and proton fluids arising due to nuclear forces. The coupling time constant is related to the mutual friction and is a measure of how tightly the fluid is coupled to the behavior of the crust, and models can be verified by observing effects arising due to this coupling. This project uses widely used classes nuclear models, together with inferences of neutron and proton effective masses at densities typical of nuclei, to estimate the size and uncertainties on the strength of mutual friction and hence the crust-core coupling timescale over a range of densities and proton fractions typical of neutron star cores. This study provides a vital input into hydrodynamic models of neutron star interiors.

Those Not in the Room

Joaquin Guerrero

Advisor: Melissa Arrambide

Department: Educational Leadership

College: Education and Human Services

Category: Graduate

English as Second Language students are struggling while expectations are rising for student performance. Various ESL strategies and theories are reviewed. However, tacit knowledge and experience of teaching and learning ESL from those who have taught it successfully is needed to provide insight to improve outcomes. Interviews of successful teachers and students in ESL programs will help in identifying areas to strengthen weaknesses and leverage strengths in ESL programs for planners and practitioners.

This narrative analysis study includes interviews with an ESL student and teacher with over 30 years of experience and her husband to supply an added perspective as well as his experiences as an ESL student and tutor. A third interview of a Mexican immigrant entering the educational system at the high school level at a different time and place allows the search for commonalities in vastly different experiences. Family and close network involvement and support is shown to be a common determinant of school success. Learning is a frustrating endeavor that requires signals of importance and encouragement to persist. Measurements of family outreach, collaboration, and support should be further studied for relationships to academic success.

**Words to Live By: A Persuasive Writing Intervention to Support Rural Middle School
Students with Emotional and Behavioral Disorders**

Nelly Shora

Advisor: Brittany Hott

Department: Psychology, Counseling, and Special Education

College: Education and Human Services

Category: Graduate

Students with emotional and behavioral disorders (EBD) struggle with skills inherent to the writing process, such as organization, planning, and editing. This single case, multiple baseline study explored a persuasive writing intervention for six rural middle school students with EBD. The intervention significantly improved length and quality of essays. Implications for practice and future research directions will be shared.

S1.4

The Effect of Shifting Interest Rate on Credit Default Risk

Nishanth Arepalli

Advisor: Srinivas Nippani

Co-Author: Divya Yerva

Department: Economics and Finance

College: Business

Category: Graduate

Shifts in interest rates have historically known to cause distortion in leverage induced credit default risk. This paper examines the implications of changing interest rates on corporate leverage and credit default risk. When the firm is over in debt, mild incentives of guaranteeing firms survival gives rise to the question of credit default risk. The firms will be pushed into financing investments with external funding resulting in an increase in the firms leverage ratio above target which they attempt to adjust through retention of earnings over a period of time. Research shows that both rises and cuts increase the aggregate default rate in the short-run. However, a higher interest rate reduces firms' target leverage and hence produces lower default rates in the longer run. This investigation should help rationalize the objective of monetary policy and defend the state's risk-taking channel.

**Effects of a Modified Moore Method College Geometry Course on
Students' understanding of Proof Construction: A Case Study**

Janessa Beach

Advisor: Rebecca Dibbs

Department: Mathematics

College: Science and Engineering

Category: Graduate Student

Proving mathematics ideas is very difficult for students, both in high school geometry and in upper level mathematics courses. Pre-service secondary mathematics teachers, in particular, struggle with composing correct proofs of mathematical statements, thus creating the next generation of mathematics students who struggle with proof. One potential way to improve future teachers' mastery of proof is to use Moore Method, a pedagogy that allows students to work through a carefully constructed sequence of problems and engage in higher level thinking about a particular topic. However, there is little research on how inquiry based learning environments like Moore Method help students build an understanding of proof construction and higher mathematical content. The purpose of this case study is to investigate how students' proof writing and understanding of core mathematical definitions improve through the revision of problems in a Moore Method college geometry course. Every submission of problem sets by two students were copied and analyzed for geometric understanding using the Van Hiele levels and quality of argumentation using Toulmin's framework. The preliminary analysis indicated students' could not identify appropriate times to use proofs in their initial submission, but showed improvement in their understanding and argumentation as the semester progressed.

**An Analysis of Effective Professional Development Practices for Sustaining
Culturally Diverse School Leaders in Urban Districts**

Cathy Rushing

Advisor: Melissa Arrambide

Department: Educational Leadership

College: Education and Human Services

Category: Graduate (Doctoral)

Developing school leaders is imperative to large urban school districts in an education reform environment. This analysis will present information on the effectiveness of identifying leadership development programs, including reflection on school leaders' practices. A question to consider is, "What factors are important to sustain culturally diverse educational leaders?" One study suggested that leadership in schools/districts requires high quality professional training, coupled with on the job application are qualities for effective leadership development (Gray & Bishop, 2009). Comparing how American schools sustain their school leaders versus how other countries sustain their leaders could help give insight to enhance strategies being used. Also, providing mentors to sustain culturally diverse leaders are critical components that not only build relationships, but helps build confidence and serve as a source for constructive feedback on leadership skills. However, mentoring practices may look different in the United States as opposed to other countries, but the main focus is to recruit, prepare and sustain effective school leaders. The results of this study is to offer greater insight into the leadership development practices that includes cultural diversity.

The Ascension of Texas Female Administrators to the Superintendency

Tracie Pritchett

Advisor: Julia Ballenger

Department: Educational Leadership

College: Education and Human Services

Category: Graduate

Purpose of Study and Research Questions

The purpose of this oral history narrative study is to explore the career paths, educational attainment, mentoring support structures and gender, class and racial barriers of Texas female administrators in their ascension to the superintendency in the public school system. Loder (2005) described conflicts contributing to the underrepresentation of women in the superintendency. Copeland and Calhoun (2014) describe the difference in the number of female to male superintendents could be related to mentorships or lack there of for female administrators. This qualitative research study will be guided by the following questions:

1. What professional experiences, positions, and level of education held by Texas female superintendents influenced them along the way to the superintendency?
2. How has mentoring propelled these Texas female superintendents to their ascension toward the superintendency?
3. How barriers such as race, gender and ethnicity, and class hindered these female administrators on their path to the superintendency?

Research Design and Methodology

The researcher will employ the feminist standpoint theory to frame this study. Harding (1991) described this theory as one that focuses on gender differences between women's and men's situations. A standpoint theory must begin with women's lives as an objective location from which research originates. Observation of the world is from the viewpoint of women who live there is important to this research.

Data Collection and Data Analysis

The researcher will examine data collected using Glaser and Strauss (1967) comparative method. This systematic approach includes open coding, axial coding, and selective coding (Fram, 2013). The research will follow an oral history narrative approach as described by Creswell (2009) as gathering personal reflections of events and their causes and effects from one or several individuals. Using an interview guide collecting information from semi-formal interviews with open-ended questions to describe the level of education, professional experiences and positions, mentoring experiences, racial, class and ethnic barriers encountered by Texas female administrators in public school during their ascension to superintendent.

Preliminary Findings

Narrative restory describing the career paths, educational attainment, mentoring support structures and gender, class and racial barriers of Texas female administrators in their ascension to the superintendency in the public school system will be identified through coding to understand the meaning then represented through narration (Creswell, 2007).

Managing Stress with Bio-Touch: A Non-Invasive Tool for Achieving Balance

Carole A. McKenzie

Department: Nursing

College: Education and Human Services

Category: Faculty

Achieving balance in work and life requires multiple approaches to managing stress. Since stress is an underlying causative factor in the development of illness, the management of both life and work stressors becomes an important component to preventing illness and increasing well-being in our patients and managing workplace productivity in our staff.

This research study was conducted to assess the effects of Bio-Touch, a complementary touch therapy that uses butterfly light touch applied to specific points on the human body, on stress and other related factors. Previous research has suggested that Bio-Touch decreases individual stress, pain, restlessness, improve vital signs, increase immune response and the feeling of being cared for.

Senior nursing students at a baccalaureate nursing program in Oklahoma completed a research study utilizing Bio-Touch. A convenience sample was utilized from the university, which included students, staff, faculty and community members. There were 248 participants in the study fairly evenly matched in gender and with an age range of 19-78. A questionnaire to assess pain, restlessness, stress, the feeling of being cared for, and relaxation was completed before and after the receipt of Bio-Touch. Levels of pain, restlessness, and stress were significantly decreased, and the levels of being cared for and relaxation were significantly increased after Bio-touch.

The effects of an inexpensive stress management tool for patients and employees is invaluable to management and to improving quality of life and balance for all. The research can be easily replicated and utilized in any setting. Bio-Touch therapy is easy to do and can be taught to anyone—a health care professional is not required—and there are no adverse side effects.

Design and Implementation of an Automation System for the Texas A&M

Christopher Voss

Advisor: Kent Montgomery

Department: Physics and Astronomy

College: Science and Engineering

Category: Undergraduate

The Texas A&M University-Commerce Observatory telescope can be operated remotely via the Internet, enabling users to observe in a location far from the observatory itself. Unfortunately, the observatory dome cannot be operated remotely; meaning observatory users must be on site to open and close the dome shutter and change the dome's position as the telescope moves. The goal of this Honors Thesis project is to design and implement an automation system for controlling the observatory dome thus allowing users to make observations off-site via the Internet. The most complex problem is connecting a source of electricity to the shutter motor, which is used to open and close the shutter on the dome. This presentation will discuss the various solutions considered and detail the final working solution for providing power to the shutter motor.

Ethnomathematics meets History of Mathematics

Kelly Lewis

Advisor: Rebecca DibbsDepartment: MathematicsCollege: Science and EngineeringCategory: Graduate

Students who give up on STEM careers often do so in middle school. One reason is a lack of STEM role models for women and non-white students, both in the textbooks and in teachers' perception of what a successful mathematics student looks like. Pre-service middle school teachers have two courses that could potentially address this: a multicultural course in the education department. The former course, which all students take, tends to place more emphasis on social science and humanities than mathematics and science. The most popular mathematics history textbooks focus on western civilization and male discoveries, which serves to reinforce teacher's conceptions of what a mathematician looks like. The purpose of this mixed methods case study was to determine which elements from a History of Mathematics course with an emphasis on cultural responsive pedagogy and service learning aided in the increase of intercultural awareness, sensitivity, and competence of pre-service middle school mathematics teachers. Preliminary analysis indicated that providing students with an anonymous discussion board as a safe place to engage in controversial topics is helping students engage more frankly with each other than they would have been willing to do face to face.

**A Qualitative Study Analyzing the Imparity of Women in Education Administration
through the Exploration of Gender Bias in Male and Female Faculty Perceptions on
Female Leadership**

Crystal Deaver

Advisor: Melissa Arrambide

Department: Educational Leadership

College: Education and Human Services

Category: Graduate

The purpose of this qualitative study is to explore both male and female faculty members' perceptions of female leaders to determine if variations are present between the faculty members based on their gender. The research is a primary individual case study in which interviews were conducted for five participants; two males and three females. Interviews were then coded with a focus on key ideas and common ideology and beliefs. Differences in perceptions between male and female participants were noted with one highlight being how male staff members felt female leaders were stricter, the exact opposite of the female staff members' perceptions. Similarities noted between the female and male staff members included their thought of how society's role for women as mothers hindered advancement in the workplace as a result of the lack of time necessary for such a dedicated role as an administrator. Likewise, both genders of the participants stated they rather work for a male boss than a female. With a 47% difference in women in educational leadership and women in the classroom, finding the cause of the disparity is crucial in creating equity for females in education. Women need to be considered for the position based off of their abilities and judged on their competencies, not on their gender.

No Good Deed Unpunished: Does Texas Penalize Schools that Serve Minority and Economically-Disadvantaged Students?

John Kuhn

Advisor: William Holt

Department: Educational Leadership

College: Education and Human Services

Category: Graduate

The state of Texas has for years analyzed student performance outcomes through the lens of specific student subpopulations. These subpopulations include, but are not limited to, African-American students, Hispanic students, white students, and economically disadvantaged students, along with the inclusive “all students” group. The disaggregated results drive an accountability system that determines rewards and punishments/improvement protocols for schools and serves to inform the general public of the relative quality of schools in the state. Despite the state’s longstanding commitment to subpopulation-conscious outcomes analyses (and the advanced development of these techniques), Texas officials have never publicly analyzed school resourcing inputs using the same nuanced lens. Publicly-available school funding reports view all schools in the same monolithic manner, completely concealing demographic differences between the students the schools serve.

The research question of this study is this: Do the discrepant resourcing levels established by the Texas school finance system correlate, in a statistically-significant way, with discrepant enrollment percentages of student subpopulations measured in the state’s accountability system? As resources rise, is there a simultaneous and related increase or decrease in the percentage of a given student subpopulation in enrollment? Put more bluntly, do schools suffer a “pigmentation penalty” or “poverty penalty” when they educate high numbers of minority and/or poor students? If so, how significant is the penalty and does it correlate in a statistically significant way with student outcomes?

This mixed-methods study will utilize a quantitative approach to determine, first, whether there is a positive or negative relationship between resourcing (target revenue level) and the proportion of various student subpopulations enrolled in a school. Secondly, the study will seek to determine the strength of any relationships discovered. As an extension, the study will rely upon a statistical framework developed by Neyman (1990) to consider the target revenue levels of the schools studied as a treatment and student subpopulations’ standardized test performance in reading and mathematics as measurable responses to treatment. In an effort to avoid making unverifiable assumptions, treatment groups will be constructed so that distributions of variables which might affect the response are as similar as possible. This will be done by using the “comparison groups” devised by the Texas Education Agency for grouping of treatment classes. Relatedly, a qualitative approach will utilize surveys to probe students’ and teachers’ awareness of relative resourcing levels in various schools.

Discrepancies in Texas’s school funding system result from a hold-harmless provision in current law intended to protect high-revenue school districts from experiencing excessive resourcing reductions when the law passed. As minority and low-income families in Texas reside disproportionately in zones with lower relative property values, the expected result of this study is that lower target revenues correlate in a statistically significant way with increased

concentrations of minority and economically disadvantaged students, and that these expected funding disparities—dubbed herein, respectively, as the “poverty penalty” and the “pigmentation penalty”—subsequently correlate with decreased performance on state standardized tests. It is further postulated that affected students and teachers are aware of their own schools’ funding realities relative to other schools in the state.

**Religious Identity vs. Organizational Identity: Influences on
Organizational Citizenship Behavior**

Andrea Slobodnikova

Advisor: Brandon Randolph Seng

Department: Management Department

College: Business

Category: Graduate (Doctoral student)

Although organizational citizenship behavior (OCB) is widely known to have a positive impact in work organizations, the causal antecedents that influence the likelihood of such behaviors among employees is understudied. We address this gap by examining the influence of salient religious identity vs. an organizational identity on relevant work-related behavior in a work-type setting using the theoretical frame of the social identity perspective. In order to determine causality, a controlled experimental design was used. We found that students in a university setting, who had a religious identity made salient, exhibited slower helping behaviors toward the organization than those who had a university identity made salient. We demonstrated, therefore, a reduction in OCB when religious social identity was made salient compared to an organizational identity.

Keywords: social identity theory, organizational citizenship behavior, workplace religion

Object Tracking using SURF Points

Chetana Nimmakayala

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Department: Mathematics

College: Science and Engineering

Category: Graduate

For a large class of applications including human-computer interaction, security, surveillance and traffic control, detecting the problem of tracking targets is an essential step. The task becomes more challenging in case of complex scenes where the target disappears for a certain time and appears later. This study is a part of a Master Thesis which aims to spot the target when it occurs after disappearance. For this purpose we use Speeded Up Robust Features (SURF) points. To every SURF point a descriptor is attached. Each of them contains features derived from the image using Gaussian and Laplacian pyramid shape. These feature points are used to locate the target in every frame. To find the target after occlusion we use SURF points descriptor matching. On the base of the theoretical concepts we developed an application of the method in a MATLAB environment to present the findings. Experimental results are conducted on synthetic and real videos.

Elementary Principals Influence on Student Achievement

Renee' Jones

Advisor: Kemp-Graham

Department: Educational Leadership

College: Education and Human Services

Category: Graduate

This narrative qualitative study will explore the influence elementary school principals have on student achievement. Principals are now considered the instructional leader as well as the leader who shares their vision with their staff and students so academic success can be achieved. The purpose of this qualitative narrative study is to gain a deeper understanding of ways elementary principals in high performing schools influence academic achievement of all schools.

There are still gaps in the literature that about student achievement and principal leadership. One of the questions that still must be answered is what principal pathway is used in high performing schools? This qualitative research study will fill this gap by using a narrative analysis to structure and organize the data (Dagmar Strand, 2009). This study explores the relationship of instructional leadership style of principals and student achievement. It will research the characteristics of instructional leadership style and impacts student achievement.

Building Classroom Community in pre-service Teacher Content Courses through Pencasts

Rebecca Dibbs

Department: Mathematics

College: Science and Engineering

Category: Faculty

The first courses for pre-service middle school mathematics teachers have several challenges that are less prevalent in the general mathematics for elementary education majors courses. The general classes may be transferred from most other schools, which often leads to a large variance in student preparation and understanding of classroom norms. Transfer students, especially non-traditional ones, often struggle to adapt to new environments and are reluctant to seek help. Furthermore, the material covered in the early courses is on students' certification exam, but students are at least a year from taking their class. One solution to this problem is the use of Smartpens. The Pencast created by the Smartpen gives students a record of what was said synced with what was written, which provides archival data for preparation for the course tests and the future certification exam. However, research on the use of Smartpens as classroom technology has primarily been used as a way to capture students' metacognitive data or as a means to capture instructor lectures. Although such Pencasts provide archival data, they will not necessarily help a group of diverse transfer students establish a classroom community. The purpose of this case study is to examine how using Smartpens during group work activities in a flipped pre-service elementary education mathematics modeling course fostered classroom community in a pre-calculus course for pre-service middle school mathematics teachers.

**An Accessibility Analysis of 8th Grade Math Textbooks:
Implications for Diverse Learners**

Emily Waddle

Advisor: Brittany Hott

Department: Curriculum and Instruction

College: Education and Human Services

Category: Undergraduate

This study evaluated the frequency of accessibility-related text features in 8th Grade math textbooks. Geometry chapters from three well-known Texas publishers were evaluated. The analyses focuses on visual elements, such as photos and decorative illustrations, as well as the complexity levels of questions, based upon the hierarchy of Higher-Order Thinking Skills (HOTS). The study additionally categorized visual elements based on the relation to the nearby math content to evaluate frequency of distracting visual elements. Results suggest visual elements are often irrelevant to nearby math content, and questioning levels skew heavily towards Lower-Order Thinking Skills. Implications for practice and future research directions will be shared.

Teaching ESL /ELL to Mono-Syllabic Tongues

Thang D. Nguyen

Advisor: Nate Templeton

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College: Education and Human Services

Category: Graduate

This report presents the findings of an objectives-oriented evaluation of the current English as a Second Language program for mono-syllabic tongue (in the Southeast Asia such as Vietnamese, Chinese etc.) students in Texas. Current ESL/ELL programs are designed (or focused) for Latin based languages. ESL / ELL teachers face challenges with finding sound instructions to help students with diverse learning needs. I wish to share some ideas regarding working with mono-syllabic language students. I hope the information I present will bring awareness to the differences between mono-syllabic and poly-syllabic tongues. I also hope my information will help bridge any culture gaps and dispel stereotypes.

Utilizing the Graduate Exit Survey to Investigate Students' Academic Experiences and Texas Core Curriculum Outcomes

Hari Priya Mamilla

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College: Science and Engineering

Category: Graduate

According to Gay (2011), survey research involves collecting data to test hypotheses or to answer questions about opinions on topics or issues. The Department of Institutional Effectiveness and Research at Texas A&M University-Commerce administers the Graduation Exit Survey (GES) every semester to assess students' perceptions in regards to living and study experiences. The current study investigates graduating undergraduates' perceptions of academic experiences and how much progress they felt they made upon graduation in terms of the Texas Core Curriculum Outcomes. There were 1406 students who applied for graduation, of which 1311 completed the survey in Fall 2015, for a response rate of 93%. Of particular interest in the current study, the item construct for academic experiences was measured using a 4-point Likert Scale with choices from *Strongly Disagree to Strongly Agree*; while the Texas Core Curriculum Outcomes consists of nine items utilizing a 5-point Likert Scale with choices from *Poor to Excellent*. Students' responses were positive and encouraging in both academic experiences and in Texas Core Curriculum Learning Outcomes. The overall average rating for both constructs was extremely positive with Academic Experience at 92%, and Texas Core Curriculum Learning Outcomes at 95%. The mean of each individual item along with the percentage of positive feedback will be presented during the session with a variety of visual charts and graphs. This research endeavor has provided a wealth of information, by not only providing evidence to show institutional effectiveness, but also providing in-depth student feedback from the use of the open-ended questions which can be used to improve students' living and study experiences.

Evaluation of the Global Competence Aptitude Assessment (GCAA) – Assessment of Validity and Mean Differences Analysis

Rochana Kaushik

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College: Business

Category: Graduate

The Texas A&M University-Commerce Quality Enhancement Plan (QEP) was created to improve students' levels of global competence, to address employers' calls for improvements to students' knowledge of global dynamics (issues, trends, processes, systems), and to improve students' ability to apply that knowledge of the interconnectedness of global dynamics, and their ability to view themselves as engaged citizens within an interconnected and diverse world. A commonly used measurement instrument of individuals' levels of global competence is the Global Competence Aptitude Assessment (GCAA) (Hunter, 2006), which has been employed by the university as part of the QEP. The GCAA measures two areas of readiness: internal which includes self-awareness, risk taking, open mindedness, attentiveness to diversity; and external readiness, which includes historical perspective, global awareness, intercultural capability and collaboration across cultures. All variables are assessed on scale ranging from zero to 100. All incoming freshmen students are required to complete the GCAA during their first two weeks at the university. In the current study, we have assessed the instrument validity by conducting a correlation analysis for 1819 incoming, first time, full-time students during the fall terms (2014, 2015) and a factor analysis with the data collected from 494 incoming, first-time, full-time freshman students for four colleges and one school (2015). As prior research (Hunter, 2006) and studies have shown, our study supports that the GCAA is a reliable and valid instrument capable of measuring the noted constructs related to global competence. The current study also used an ANOVA to investigate significant mean differences between the five colleges and one school at A&M-Commerce, and found significant mean differences. The current study is important to the continued implementation and assessment of the influence of the QEP and supports the continued use of the GCAA as a reliable and valid instrument.

Ion Mobility – Mass Spectrometry study of the Redox Activity of Methanobactin Analog Peptides

Yashodha Rani Vytla

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Department: Chemistry

College: Science and Engineering

Category: Graduate

The methanobactin (mb-OB3b) produced by *Methylosinus trichosporium* OB3b is currently the best characterized example of a chalkophore, a class of low molecular weight copper-binding oligopeptides similar to iron-binding siderophores, and are hypothesized to mediate copper acquisition from the external environment of the methanotrophs. The redox activity and Cu(I) binding of a series of analog methanobactin (amb) peptides with the sequences acetyl-His₁-Cys₂-Gly₃-Pro₄-His₅-Cys₆ (Mw=694.81Da, amb₁), acetyl-His₁-Cys₂-Tyr₃-Pro₄-His₅-Cys₆ (Mw=800.93 Da, amb₂), acetyl-His₁-Cys₂-Gly₃-Tyr₄-Pro₅-His₆-Cys₇ (Mw=857.99 Da, amb₃) and acetyl-His₁-Cys₂-Gly₃-Ser₄-Pro₅-His₆-Cys₇-Ser₈ (Mw=1032.15 Da, amb₄), were investigated using ion mobility - mass spectrometry (IM-MS). These peptides were studied in binary mixtures to compare their activity. For determining the relation between oxidation of peptide and reduction of metal ion, amb₂ was further investigated by pretreating it with H₂O₂. The Cu(II) titration of amb₄ from pH 3.0 to 11.0 was studied using IM-MS for further determination of redox activity and Cu(I) binding.

Rising Interest Rate Risks at US banks

Giedrius Andriunaitis and Sarosh Kulkarni

Advisor: Asli Ogunc

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College: Business

Category: Graduate

Banks borrow money short term and lend money long term. Due to the interest rate fluctuations on short-term borrowings and long-term loans, the bank might have a risk of losing money if unforeseen changes between two happen. Accordingly, it is important to track the level of risk exposure by banks.

Interest rates have been extremely low an extended period, and once our economy gets stronger, the Fed will be raising interest rates. As a result, US banks should be prepared for it and already start mitigating the interest rate risk.

The purpose of this presentation is to show rising interest rate risk in small and big US banks since the end of 2007 financial crisis. To do that we show an analysis using an economics value Equity (EVA) model and data obtained from Reports of Condition and Income for banks or else known as “Call reports”. The analysis represents only US Commercial banks that reflect the change in EVA as a percentage of total assets with a 2 percent increase in interest rates.

**Study of Zn(II) Binding of an Analog Methanobactin Peptide
using Ion Mobility – Mass Spectrometry**

Manogna Deeconda

Advisor: Laurence A. Angel

Department: Chemistry

College: Science and Engineering

Category: Graduate

Methanotropic bacteria are methane-oxidizing bacteria that produce copper chelating chromopeptides called methanobactins. Methanobactins produced by *Methylosinus trichosporium* [mb-OB3b] is currently best characterized and has been considered as archetype molecule. These modified chromopetides bind Cu(I) with high affinity and are hypothesized to mediate copper acquisition from the environment for the enzyme methane monooxygenase. A synthetic analog of methanobactin is synthesized to determine the effect of amino acid sequence changes on metal binding properties. The Zn(II) binding with analog methanobactin peptide with sequence acetyl-His₁-Cys₂-Gly₃-Pro₄-Tyr₅-His₆-Cys₇ (amb₅) was analyzed as a function of pH using ion mobility-mass spectrometry (IM-MS). Density functional theory (DFT) molecular modeling studies were performed to determine the lowest energy conformational structures for various amb₅ complexes found in IM-MS experiments and their collision cross-sections were compared with cross-sections measured by IM-MS to identify the type of coordination and conformational structure.

Carbon-Atmosphere White Dwarfs: Stars too Small to Fail?

Kurtis A. Williams

Co-Authors: D. Winget, M. Montgomery, and R. Falcon (Univ. of Texas at Austin)Department: Physics and AstronomyCollege: Science and EngineeringCategory: Faculty

White dwarfs are the endpoint of stellar evolution for the vast majority of stars, including our Sun. The vast majority of white dwarfs have masses of around 0.6 solar masses, atmospheres consisting of hydrogen or helium, weak magnetic fields, and rotate on time scales of days to weeks. Yet a small class of white dwarfs, known as Hot DQs, are anomalous in all of these regards. Hot DQs appear to be roughly twice as massive as the typical white dwarf, have carbon-dominated atmospheres, have magnetic fields over a million times stronger than our own Sun, and rotate in a matter of minutes. My collaborators and I have spent nearly a decade trying to determine the origin of these stars, and two viable hypotheses have emerged. Either Hot DQs are the remains of two normal white dwarfs that have merged without a Type Ia supernova explosion, or they are the progeny of stars not quite massive enough for a core collapse supernova. Either way, hot DQs appear to be stars that were just not big enough to fail. I will summarize these ideas and discuss my ongoing and future work that will finally grant us insight into the origins of this anomalous class of stars.

S4.1

The Effect of the National Society of Leadership and Success Leadership Training Program on Consideration of Future Consequences

LaToya M. Ellis

Advisor: Shonda Gibson

Co-Authors: Theresa Sadler and Stephen Reysen

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College: Education and Human Services

Category: Graduate

Research has shown employers spend vast amounts of money on leadership training programs and that productive leader's focus on the long-term goals of an organization. While existing literature has demonstrated that leadership training has a positive impact on behaviors and economic profits, it has not investigated whether or not the training aids leaders in focusing on the organizations' vision. The present study examined the impact of a leadership training program on undergraduate students' consideration of future consequences. Students in an undergraduate leadership course were randomly assigned to participate in a 7-week leadership training program or no program. All participants completed the Consideration of Future Consequences (CFC) scale as a pre-test. The participants in the leadership training condition completed the assigned course work and also participated in The National Society of Leadership and Success. Participants were required to complete an orientation session, a three-hour leadership training session, listen to three speaker events, and engage in three success networking team sessions. Participants in the control condition completed the assigned course work but did not participate in the National Society of Leadership and Success from the onset. Participants completed the Consideration of Future Consequences measure midway through the semester as a post-test. The current study predicted an increase in regard for consideration of future consequences for those participants in the leadership training program. The results indicated the leadership training program significantly increased participants' concern for future consequences but did not have a significant impact on those in the control condition.

Incorporating Six Principles of Influence in to Creation of a Marketing Campaign

Christopher Woodard

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Co-Author: Tabetha Adkins

Department: Marketing and Business Analytics

College: Business

Category: Graduate

Since the initial publication of Robert Cialdini's *Influence: The Psychology of Persuasion* in 1984, the six principles of persuasion have become an integral part of the marketing world's vernacular. Instinctual human reactions and carefully calculated marketing initiatives have been strategically tied together in the principles, and are commonly used in a variety of everyday marketing tactics (Campbell & Kirmani, 2000). In this study, we look at each of the principles of persuasion and show how they can assist in creation and optimization of a university-wide marketing campaign related to improving students' levels of global competence. Hunter (2004) defined global competence as "having an open mind while actively seeking to understand cultural norms and expectations of others, and leveraging this gained knowledge to interact, communicate and work effectively in diverse environments". The Global Competence Aptitude Assessment (GCAA) measures along eight dimensions and provides insight into the relative strengths and the development areas. At Texas A&M University-Commerce the Quality Enhancement Plan (QEP) seeks to enable students to be fully prepared for an interconnected world, and utilizes the GCAA to inform students of their current levels of global competence. The students' personal reports offer insight on how each person might seek to improve their scores. We have utilized the six principles in creation of a marketing plan that is designed to capitalize on persuading students to strategically focus on activities that shown to improve students' levels of global competence. The campaign will be reviewed and discussed during this session. This work is important in providing a marketing campaign that is grounded by solid research theory.

Exploring the Impact of Mentorship on Leadership Programs

Linda Jena

Advisor: Shonda Gibson

Co-Authors: LaToya Ellis and Theresa Sadler

Department: Department of Educational Leadership

College: Education and Human Services

Category: Graduate

Organizations invest billions of dollars in training and development efforts to create effective leaders. Higher education has also developed and implemented innovative leadership programs in an effort to prepare students for the demands of such organizations. From international programs such as the National Society of Leadership and Success (NSLS), to local living-learning community (LLC) programs at Texas A&M University-Commerce such as Freshman Leadership Class (FLC) and Women in Leadership (WIL), a wide variety of approaches have been taken to enable students' early exposure to theoretically based concepts of leadership. These types of programs often claim to cultivate students' leadership ability by exposing them to theory, preparing them for and engaging them in hands on experiences, and by providing continuous feedback and reflection on their leadership skills. Essentially debunking the myth that leaders are simply born, research studies, theory, and programming have all suggested that effective leadership skills can be taught with adequate and appropriate resources. The current study explores one of the key components of leadership programs - that of mentorship. Six essential qualities for successful mentorship in leadership development programs are presented, along with implications of each. The evidence is convincing: A focused, systematic leadership training program has the best chance of a positive outcome when mentorship is at the core.

Domain Sizes of Nuclear “Pasta” Phases in Neutron Star Crusts

Sarah Cantu

Advisor: William NewtonDepartment: Physics and AstronomyCollege: Science and EngineeringCategory: Graduate

Theoretical models suggest the crust of a neutron star contains numerous phases of matter that consist of exotic-shaped nuclei. In order to search for observational evidence from neutron stars, the super-dense remnants of supernovae explosions, the microscopic properties of these so-called “pasta” phases must be calculated. We suggest that, at a given density in the crust, different nuclear shapes coexist in domains, and we go on to estimate the size of those domains. This was done by finding the mean-square displacement of shapes from their equilibrium positions. This displacement vs. density was then compared to energy surface plots, from which the minimum energy needed to change shape was found. This comparison gives the displacement of a particular shape, at a density, when they are “frozen” into that shape.

S4.5

**Evaluation of Study Abroad Students' Global Competence Aptitude Assessment Scores
Pre-departure and Post-reentry**

Natalia Assis

Advisor: Shonda Gibson

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College: Education and Human Services

Category: Graduate

A wide range of researchers and practitioners have pointed to the importance of international experience in fostering global competence development (McDougall, 2009; Niehaus & Komives, 2009; Oddou & Mendenhall, 2008). Research on study abroad has reported a wide variety of positive outcomes. For example, studies have shown that students who have studied abroad have greater cultural knowledge and understanding (Bates, 1997; Drews & Meyer, 1996; Hutchins, 1996; Williams, 2005), demonstrate greater flexibility and adaptability (Black & Duron, 2006; Willard-Holt, 2001), express better ability to recognize and appreciate differences (Bates, 1997; Hutchins, 1996), are more emotionally resilient and independent (Black & Duron, 2006), and express greater desire to learn (Carson & Widaman, 1988; Forgues, 2005; Hadis, 2005; Hutchins, 1996). In the current study 195 students completed a pre-departure assessment of global competence and 182 of those same students completed the post-reentry assessment. Supporting the literature, results illustrate an increase in students' overall awareness (internal and external) after a study abroad experience. Results of the current study could assist in improving students' global learning, understanding, and engagement.

**Analysis of Cu(II) and Zn(II) binding of selected analog methanobactin peptides
as a function of varying pH and metal equivalents employing ion mobility mass
spectrometric studies**

Sravya Challa

Advisor: Laurence A. Angel

Department: Chemistry

College: Science and Engineering

Category: Graduate

Methanobactins (mb) are low molecular mass copper chelating chromopeptides called chalkophores secreted by methanotrophs. Methanotrophs utilize special enzymes known as methane mono-oxygenases for oxidation of methane. Methane mono-oxygenases are copper dependent and so, methanotrophs have developed the copper acquisition strategy by secreting mb's under lower copper conditions which can bind to Cu(I) significantly. mb originated by *Methylosinus trichosporium* (mb-OB3b) is the best chemically characterized methanobactin till date and is being used as prototype molecule. The mbs bind to variety of metals preferentially Cu(I) with high affinity. Our research group have designed a series of peptides based on the structure of mb-OB3b but have replaced the two enethiol-oxazolone groups with the alternative metal binding 2His-2Cys motif. My research involved studies of the Zn(II) binding affinity of the analog methanobactin peptide named amb₃ peptide (acetyl-His₁-Cys₂-Gly₃-Tyr₄-Pro₅-His₆-Cys₇) as function of pH over a range of 3 to 11, and comparing it to the Zn(II) binding of amb₁ (acetyl-His₁-Cys₂-Gly₃-Pro₄-His₅-Cys₆) and amb₅ (acetyl-His₁-Cys₂-Gly₃-Pro₄-Tyr₅-His₆-Cys₇). The Cu(I) binding affinity and redox activity of the analog methanobactin peptide named amb₆ (acetyl-Cys₁-His₂-Cys₃-Gly₄-Pro₅-Cys₆-His₇-Cys₈) titrated with (0.2-1.00) molar equivalents of Cu(II) will also be studied employing ion mobility-mass spectrometry (IM-MS) studies.

How Does User Experience Affect Trust in Social Network Sites?

Bo Han

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College: Business

Category: Faculty

Social network sites have gained tremendous popularity in recent years. Its usage is growing exponentially with a recent report noting that the number of global SNS users is expected to surpass the 2 billion mark in 2016. This is almost a 70% increase from 2012 (Statista, 2015). While there may be hundreds of social network sites, some sites like Facebook and Twitter are notably more popular than others. The popularity of social network sites is mostly driven by users' trust in the site. So, what determines user's trust in social network sites (hereafter SNS) and how does it change over time?

While several factors could potentially impact trust in social media, this study specifically examined how user experience impacts trust in SNS. Here we define experience based on the following dimensions commonly used in the extant literature and popular press: (1) longevity in SNS usage; (2) daily use of SNS; and, (3) user's derived enjoyment from SNS. We explored if a positive relationship exists between the 3 dimensions of experience and trust in SNS. Figure 1 presents the proposed interrelationships.

A survey among college students was conducted. This sample group is ideal since they are generally wide users of SNS. We then used ANOVAs to determine any significant relationships. Our results indicated that an inverted U-shape relationship existed between user's usage longevity and trust in SNS. Additionally, a positive relationship was found between perceived enjoyment derived from using SNS and user's trust. Finally, the length of the user's daily usage did not have a significant effect on the user's trust in an SNS.

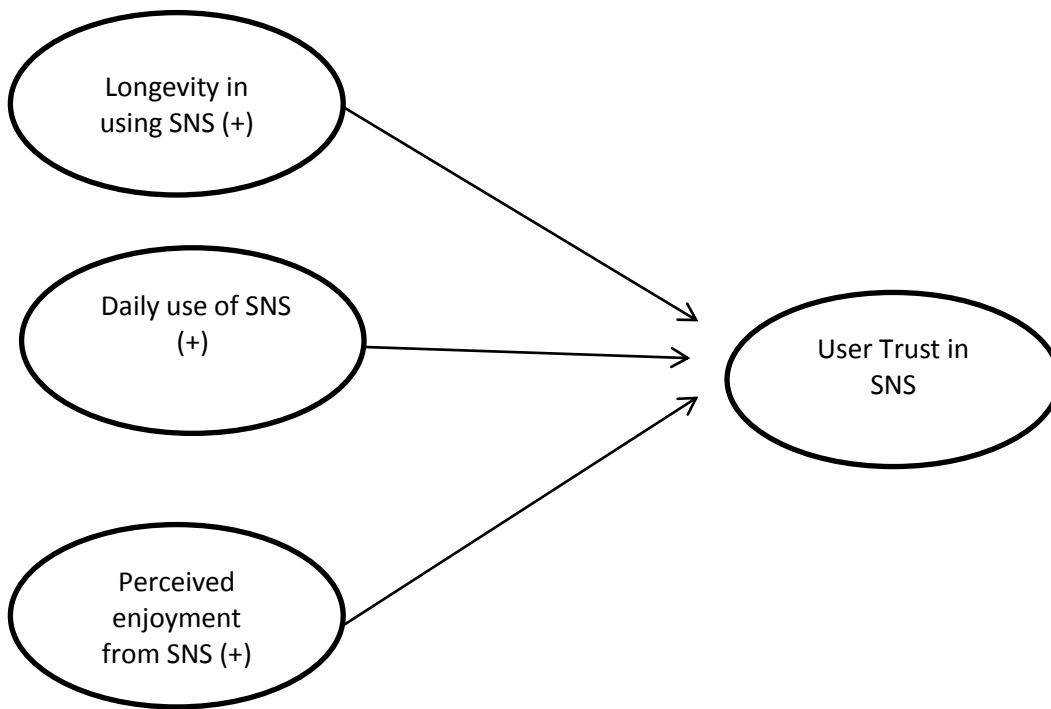
The old adage that "more experience is better" was found to be *partially* true based on our findings. The plateauing effect of years of experience on user trust may be driven by the users' familiarity, knowledge and adaptability with the SNS and its platform. As they become more adept in utilizing social media, we can observe the trust levels. However, overtime users become bored and are bombarded with unnecessary messages from SNS. As result, trust is minimized and eventually diminishes.

We found a positive relationship between enjoyment in SNS usage and user's trust. This suggests that users who enjoy their interaction with SNS are more inclined to trust the site. Positive feelings (i.e., enjoyment) toward the SNS can help build a cohesive relationship between the user and the website. As the relationship evolves, so does the trust building process. Users' trust in SNS is the foundation for their continued utilization of social media.

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Figure 1: Experience Dimensions on User's Trust



**Effects of Equine Appeasing Pheromone on Physiological Coping Mechanisms
during Temporary Separation of Equine Preferred Partners**

Hannah Wilson

Advisor: Petra Collyer

Department: Animal Science

College: School of Agriculture

Category: Undergraduate

Anxiety, more specifically separation anxiety in horses is a common problem in the equine community and can cause both physiological and psychological harm. With today's horses' being kept in more unnatural living conditions, the modern domesticated equine is experiencing many challenges that horses before them have not. Because of this, finding various ways to limit stressors whenever possible would prove beneficial to every horse's well-being. This study examines the effect of Confidence EQ® (Ceva, Lenexa, KS), an equine appeasing pheromone, as an anti-anxiety aid on 8 pairs of closely bonded horses during separation. Following a Latin Square design, each pair is subjected to randomized separation between stable and pasture with either the pheromone or a placebo. Physiological stress levels are assessed with heart rate monitors (Polar Electro Inc, Lake Success NY) for heartbeats per minute and heart rate variability. The hypothalamic-pituitary axis is assessed for salivary cortisol levels, taken with a sublingual swab periodically throughout the assessment, and evaluated with an ELISA (Salimetrics, Carlsbad, CA). Equine Behavior is videotaped throughout the periods of separation, and evaluated through an ethogram. This study is in progress, and presents preliminary data about physiological effects of separation in preferred equine partners.

Clearing the Way for Mindset Changes through Formative Assessment

Jennifer Patterson

Advisor: Rebecca Dibbs

Department: Mathematics

College: Science and Engineering

Category: Undergraduate

One of the main reasons for the exodus in STEM majors can be traced back to introductory calculus curriculum. Although there is evidence that curricula like CLEAR calculus promoted significant gains in students' growth mindset, it is unclear how this curriculum promotes mindset changes. The purpose of this study was to investigate which features of CLEAR Calculus promoted positive changes in students' mindsets. After administering the Patterns of Adaptive Learning Scale to assess students' initial mindset in one section of calculus, four students were selected for interviews. Although participants were selected for maximal variation in their mindset at the beginning of the course, there were a lot of similar themes in their interviews. Students cited that CLEAR Calculus curriculum challenges them in ways that facilitates deeper comprehensive learning than that of a traditional calculus course. Students demonstrated strong growth tendencies regardless of mindset.

Psychological Needs Predict Fanship and Fandom in Anime Fans

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Category: Graduate

We examined whether the psychological needs fulfilled by group membership predicted fanship (identification with a fan interest) and fandom (identification with other fans) among anime fans ($N = 923$). Self-identified anime fans completed measures of fanship and fandom, as well as measures assessing the psychological needs met by their participation in the anime community. The results showed that there are similarities and differences between male and female anime fans in the needs met by fandom participation. Furthermore, these differences in fulfilled needs predicted differences in fanship and fandom scores. However, overall, there existed few differences between male and female anime fans in motivation to engage with the anime fandom.

Internet of Things and Security

Mohan Areti

Advisor: John 'Urcun' Tanik

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College: Science and Engineering

Category: Graduate

IoT is an emerging technology which provides communication and computational ability to physical objects. The potential of IoT is adaptable in various sectors such as HealthCare, Military, Business, Education, Agriculture and many others. IoT devices are collecting and managing the massive amounts of data from a rapidly growing network of devices and sensors, processing that data, and sharing vital information with other connected devices. On one hand IoT is empowering humans in every walk of life, on the other hand it is ringing danger bells by becoming a prey to hackers around the world who are constantly working to compromise and steal sensitive information. Attackers perform many ways to exploit i.e., polymorphic, randomized, zero day, API, protocol, application, hardware and operating system vulnerabilities. To demonstrate the characteristics and security of IoT devices, I have designed a Surveillance camera prototype using Raspberry pi B-model and Camera module. User can access the device via network to view live streaming video. To exploit the security vulnerabilities, I have performed DoS attack, which paralyzed the devices by seizing its functionality.

Myelodysplastic Syndrome Target Identification and Validation Using GRIP

Sirisha Chakkapalli

Advisor: Venu CheriyaDepartment: Biological and Environmental ScienceCollege: Science and EngineeringCategory: Graduate

Myelodysplastic Syndrome (MDS) is a premalignant disorder of hematopoietic stem cells (HSC). Despite recent advances, secondary origin of AML (sAML) arose from MDS remains fetal unless treated with allogeneic bone marrow transplantation, an option not available for patients over age 60 mostly afflicted by this disease. Uncovering the genes and pathways involved in pathogenic progression of MDS to sAML is needed for better prognosis and discovery of new therapeutic drug targets. To identify and validate genes that lead to sAML pathogenesis, we used a novel high genome wide, cell-based functional genomics screen GRIP (Genome Wide Random Insertion of Promoter) that has ability ability to turn on or amplify any gene on genome. In a proof of study, transduction of UT-7, a CD34+ megakaryocyte progenitor cell line, with GRIP vectors resulted in their abnormal proliferation and differentiation. In BFU-GM assay, UT-7 cells transduced with control vector failed to survive, whereas GRIP-transduced cells formed erythroid and megakaryocytic colonies. The 3' RACE analysis identified the GRIP-induction of erythropoietin (Epo) was detected in 2/3 colonies tested. The Cre-mediated excision of GRIP vector not only eliminated the expression of Epo mRNA but also ablated erythroblast formation confirming the ability of GRIP to identify genes with role in HSC differentiation. Having validated GRIP will be deployed on a genome-wide scale to uncover genes and pathways involved in the progression of MDS to sAML.

Brand Level Demand Analysis of Mayonnaise in Northeast Texas

Ademola Olukanni

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College: School of Agriculture

Category: Graduate

Mayonnaise is America's favorite condiment with \$2 billion worth of mayo consumed each year followed by ketchup market that is worth around \$800 million (Quartz, 2014). Health and obesity issues have positively impacted the demand for salad dressing and mayonnaise. The market is expected to grow further due to increase in demand for convenience, ready-to-eat and nutritional food products (Grand View Research, 2016). The main purpose of this study is to estimate the demand for major mayonnaise brands in Northeast Texas using a demand system approach. More specifically, the objectives are to: (1) provide market analysis of mayonnaise industry with an emphasis on competition among major mayonnaise brands in Northeast Texas; (2) compare alternative functional forms of demand systems nested within the Barten synthetic model with the purpose to determine the *best* demand system specification for analyzing the demand for mayonnaise at the brand level; and (3) estimate own-price, cross-price, and expenditure elasticities of demand for major mayonnaise brands.

Undergraduate Baccalaureate Nursing Students and Disaster Drills

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Category: Faculty

Purpose

A tornado disaster drill was developed and implemented at a new northeast Texas baccalaureate-nursing program in 2014. The nursing department in 2015 generated another tornado disaster drill at a larger on-campus location and with more victims from both the nursing department and other healthcare related fields at the university. The purpose of this portion of the project was to obtain student feedback and reflections on the disaster drill they participated in as responders and have their input for possible adjustments to future disaster drills.

The *Essentials of Baccalaureate Education for Professional Nursing Practice* state that graduates should be able to use clinical judgment and make decisions during disaster situations. All nurses need training in emergency preparedness and this should occur during their initial nursing education program declares the International Council of Nurses. The American Nurses Association supports nurses being competent to respond to disasters and provide care.

Methodology

A ten-question survey was developed early in 2015. A 5-point Likert scale with categories from strongly agree to strongly disagree was used for seven of the questions. The other three questions were open-ended and allowed the respondents to provide any information they wanted for their answer. The survey was sent to 44 students via an online free survey platform approximately three months after the disaster drill.

Findings

Fourteen members of the class of 2014 and 21 members of the class of 2015 responded to the survey. From the class of 2014, 79% agreed the disaster drill was realistic while 67% of the class of 2015 felt this way. More than three fourths of each class felt they applied the nursing process during the drill. Thirty-two of the 35 respondents felt they would use the knowledge and skills from the disaster drill in the practice as a registered nurse.

Implications for Nursing

Evaluating student feedback about the disaster drill experience provides faculty information to retain or make modifications in the drill scenario to provide the best experience for future students.

**Authority Dynamics and Groups Norms of pre-service Middle School Teachers
during Group Work Pencasts: A Discourse Analysis**

Daniel Rios

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Category: Undergraduate

In mathematics, negative stereotype threats play a large role in female academic achievement, especially in middle school. However, middle school teachers with low self-efficacy or weak content knowledge can exacerbate this problem. The purpose of this case study was to explore how pre-service middle school mathematics teachers learn and discuss math in a flipped class setting. Using Livescribe SmartPens, students' group classwork was recorded, and one group's (two females and one male) statements during the Pencasts were analyzed for social authority, content authority, and participation in the discussion. Although the male student with high social authority was initially seen as having a high degree of math content authority by peers, by the end of the group's time together in the first unit the three students shared authority and privileged content over social authority. We argue that limiting groups to a single SmartPen and notebook helped to engender this change in authority patterns.

The Effects of High Intensity Interval Training, in Conjunction with Functional Training Equipment, on VO₂max and Peak Power in Recreationally Trained Individuals

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High Intensity Interval Training (HIIT) is a training style requiring maximal effort for a short duration of time followed by an even smaller period of minimal intensity exercise. High intensity interval training using functional training (HIIT-FT) equipment is an alternative mode of exercise than traditional workouts performed at a health club which is not only time saving, but also cost effective and can be performed without leaving home. It was hypothesized that a 6-week HIIT-FT exercise program would significantly increase maximal oxygen uptake and PP in recreationally active, college-aged adults compared to those who did not participate in this particular form of exercise. Twenty-five subjects (13W/12M, 23 ± 3 yr, 165.6 ± 8.7 cm, 72.8 ± 17.6 kg, VO₂max: 3.1 ± 0.9 L/min, PP: 1132.4 ± 356.2 W) were recruited and randomized into two groups: The HIIT-FT group ($n = 13$, 6W/7M) and a control group ($n = 12$, 7W/5M), who maintained their current level of recreational activity throughout the study period. All participants completed a VO₂max test on a treadmill (TrueOne 2400, Parvo Medics) and a Wingate test for PP (Velotron, RacerMate) before and after the intervention. The HIIT-FT group trained for 40 ± 8 min per session (including warm-up and cool-down), 3 times per week for a total of 18 sessions. Total exercise time per session was 11 ± 3 min. There were significant improvements ($p = 0.002$) after the training protocol in the HIIT-FT group in VO₂max (3.4 L/min, 7.7%), but not the control group (2.9 L/min, -3.8%). PP increased in the HIIT-FT group (1194 W, 3.8%) and in the control group (1112 W, 2.4%) with no significant changes following the training protocol or between groups ($p = 0.538$). The results of the current study agree with other similar HIIT studies regarding VO₂max; however, the current study failed to demonstrate increases in PP. HIIT-FT is an effective method to improve aerobic fitness that is time-efficient, cheaper than traditional training programs, and can be performed without ever leaving home.

G1P3-induced Tubulin Acetylation increases Breast Cancer Cell Migration

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College: Science and Engineering

Category: Graduate

The overall objective of this study is to elucidate the role of G1P3 in breast cancer metastasis. Metastatic breast cancer results in ~90% of the breast cancer related deaths. Therefore, delineating mechanisms of metastasis may help to prevent and reverse the metastasis. Although G1P3 is a mitochondrial localized antiapoptotic protein, cytoskeletal elements were remodeled in G1P3 expressing cells (MCF-7^{G1P3}). Additionally, relative to control (MCF-7^{vector}) cells, MCF-7^{G1P3} cells had significantly higher levels of mitochondrial reactive oxygen species (mtROS). Since high levels of mtROS are suggested to increase microtubule acetylation, we hypothesized that G1P3-induced mtROS may increase tubulin acetylation to confer metastatic potential in breast cancer cells. In western blot analysis there was a marked increase in tubulin levels in MCF-7^{G1P3} cells relative to MCF-7^{vector} cells. This was confirmed by immunostaining, which also identified altered microtubule organization in MCF-7^{G1P3} cells relative to MCF-7^{vector}. Moreover, the acetylation of tubulin at lysine 40 was also markedly high in MCF-7^{G1P3} than MCF-7^{vector} cells. In wound-healing assays, MCF-7^{G1P3} cells migrated significantly faster than MCF-7^{vector} cells (1.45 fold, p=0.0441). Additionally, with BML278 treatment (a SIRT activator), the migration in MCF-7^{G1P3} cells significantly decreased (p=0.0152), further suggesting role for G1P3-induced tubulin acetylation in metastasis. Based on these results we suggest that G1P3 promotes metastasis by inducing tubulin acetylation.

**Factors Affecting Distribution of *Scabiosa atropurpurea* L. (Dipsicaceae)
in North-Central Texas**

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College: Science and Engineering

Category: Graduate

Scabiosa atropurpurea L. is a biennial herbaceous plant species from the Mediterranean region of southern Europe, western Asia, and northern Africa. This introduced plant has become invasive in parts of the United States, and the species is now reported from 11 counties in north-central Texas. *S. atropurpurea* reproduces by seed, forming dense colonies along roadsides and old agriculture fields, and may pose a threat to grasslands within the region. This research will establish a clear baseline for future studies by mapping the current distribution of the subject species across north-south and east-west transects through the known distribution. Additionally, soil samples will be collected from 25 roadside locations and compared for differences in texture, pH, and nutrient content. Furthermore, field plots have been established to evaluate whether management techniques (fire, mowing) may impact the spread of *S. atropurpurea*. Finally, the mean number of seeds per plant will be determined, and the germination rate tested, in an effort to understand the fecundity of the species within its new range.

A Market Analysis of Celosia Argentea in the Northeast Texas

Olukunle Kolade

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Category: Graduate

Celosia (*Celosia argentea*) are annuals, used both as ornamental and vegetables, that are well adapted to difficult soil conditions, nutrient deficiencies, and hot weather. It is also called Lagos spinach. Celosia's adaptability to the conditions will make it an advantage for commercial production. This study observes people's reaction towards the vegetable as dietary staples and ornament. The micronutrient that will be considered in the study is Zinc (Zn). This study evaluates the effect of different levels of Zn (0, 50, 100, & 150 mg/kg) on growth and leaf nutrient content of celosia. Sixteen celosia plants were planted at the University of Ilorin (Ilorin, Nigeria). Plants were arranged in a randomized complete block design, with four blocks and each fertilizer treatment level appearing once in each block. Plants at all Zn fertility levels showed increases in plant height, shoot Zn content, and shoot dry matter over the control. Among fertilizer treatments, maximum growth was achieved at 100 mg / kg, with no additional benefits identified at higher fertility levels. The best result is recorded during planting activities for market sales and its analysis. Celosia vegetable is currently being planted at Texas A&M University - Commerce in Commerce, Texas to evaluate the nutrient content of the plant grown. The marketability of the vegetable will be complemented with a tasting experiment. Variables that will be considered are tastes, preferences, color, price, price of substitutes and income in a tasting survey.

Cyberbation

James Michael Mondragon

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Category: Graduate

The Centers for Disease Control postulated the first federal definition of bullying for research and compliance purposes (CDC, 2014). Key components include: unwanted aggressive behavior; observed or perceived power imbalance; and repetition of behaviors or high likelihood of repetition. Bullying in schools is an issue that continues to receive attention from researchers, educators, parents, and students. The concept of bullying at school is not new; however, due to the prevalence and immediacy of social media platforms, incidents of cyber-bullying have increased in recent years (Espelage, Green, & Polanin, 2012).

According to the World Health Organization (2015), 52% of school aged children reported incidents of cyber-bullying. By comparison, 25% of teenagers reported repeated bullying via cell phone or over the Internet. Despite the common assumption that bullying is a normal part of childhood and encompasses minor teasing and harassment, researchers increasingly find that bullying is a problem that can be detrimental to students' well being (Templeton & Hendricks, 2013). Therefore, it is incumbent upon educators to ensure the safety and emotional maturity of students by implementing bullying intervention programs. The purpose of this research is to examine the relationship between the implementation of Bullying Intervention Programs and reported incidents of bullying in two rural schools in northeast Texas.

**Reproductive Success of Barn Swallows Nesting on Buildings
along the SH 24 Corridor in northeast Texas**

Katelyn Miller

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College: Science and Engineering

Category: Graduate

Barn swallows (*Hirundo rustica*) are known for using manmade structures such as buildings, bridges and culverts as nesting sites. The reproductive success under bridges and culverts has shown a decline in northeastern Texas apparently in response to the expansion of cave swallows (*Petrochelidon fulva*) into the area. This is believed to be caused by eviction from nesting sites and an increase in brood loss due to increasing density in mixed species colonies. Despite the marked decline in barn swallows nesting under bridges and in culverts, barn swallows are still common in the area and may be relying more on nesting on buildings than occurred previously. This study will investigate the reproductive success of barn swallows nesting on buildings to determine how well these birds are doing. Ultimately the results will be used to determine whether local populations of swallows are showing a stratification of nesting habitat that results in equal reproductive success or whether this stratification is occurring at the detriment to barn swallows by virtue of forcing them to nest in locations where they experience decreased reproductive success.

Highly Mesoporous Catalysts for the Synthesis of Biodiesel

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College: Science and Engineering

Category: Graduate

The utilization of vegetable oil as a fuel source in diesel motors is as old as the diesel motor itself. In any case, the interest to create and use plant oils and animal fats as biodiesel has been constrained up to these years and now has been put into use. In this paper starch is investigated as the precursor to synthesize various mesoporous catalysts for the esterification of oleic acid with methanol as the probe reaction for the production of biodiesel. The results show that the activity of mesoporous catalysts is a function of surface properties such as surface areas, porosity, acid density, etc. It is concluded that careful attention is needed during each stage of catalyst preparation, such as gelatinization, retrogradation, exchange, drying, and sulphonation, to result in catalysts with high activity for esterification of oleic acid.

**Anthelmintic Resistance and the use Of Diatomaceous Earth
as an Alternative Anthelmintic in E. Caballus**

Brandy Spoor

Advisor: Petra Collyer

Department: Agricultural Sciences

College: School of Agriculture

Category: Graduate

Equine intestinal parasites cause various ailments ranging from chronic weight loss to colic to death. Conventional rotational worming techniques build parasitic resistance, and anthelmintic inefficacy can vary geographically depending on management practices. As a result of growing resistance some owners have turned to diatomaceous earth (DE) as an alternative anthelmintic. The study objectives were to elucidate the level of parasite resistance to ivermectin, and validate DE as an alternative anthelmintic in horses. Fifty-one horses were examined weekly for 8 weeks using the Modified McMaster Technique (sensitivity = 25 eggs/g of feces) after initial treatment with ivermectin. The fecal egg count reduction (FECR) test revealed 100% efficacy of ivermectin in all horses against strongyles. An egg reappearance period (ERP) of six weeks was observed, which indicates developing resistance of parasites to ivermectin in the TAMUC equine herd. Twenty -one horses completed the DE study subsequently, with ten horses receiving the recommended 1.5 cups of DE daily. Fecal samples were collected weekly and analyzed with the McMasters Technique. The data demonstrate no significant egg count reduction; thus DE should not be considered an anthelmintic. Further, our data demonstrate the importance of targeted anthelmintic treatments through visualization of individual horses' responses to ivermectin.

Influencing Undergraduate Nursing Student Attitudes on Older Adults

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College: Education and Human Services

Category: Faculty

Purpose

The purpose of this study is to determine baccalaureate nursing student attitudes toward older adults and whether gerontological nursing education affects those attitudes. As the number of older adults increases, more nurses will be needed to provide care for this part of the population. Education specific to the health care needs of this population should enable nurses to provide safe, quality care by increasing their knowledge and understanding about the older adult.

In the essential competencies for the nursing care of older adults, the American Association of Colleges of Nursing addresses incorporation of attitudes about aging to the education about providing care to this group of patients. The competencies require knowledge regarding the aging process, the increased complexity of these patients and evidence-based practice to provide appropriate care to older adults. The vision of the National League for Nursing on caring for older adults focuses on the requirement to react to population increases and the complexity of care for these patients.

Methodology

A review of the literature was completed using terms “undergraduate nursing,” “attitudes,” and “older adults” from 2008-2015. A total of twenty-six articles and three resources were identified. The articles and resources were reviewed.

Findings

Studies from around the world indicated nursing students do not desire to work with older adults and that their attitudes influence this lack of desire. Gerontological education has been shown to sometimes influence nursing students to increase positive attitudes regarding older adults. Nursing student attitudes on older adults can vary throughout their undergraduate education. Inconsistent attitudes among nursing students with no clear predictors of what influences attitude can make it difficult to determine the best method of improving attitudes. In general, there is limited evidence regarding nursing student attitudes and what and how to influence them.

Implications for Nursing

Further research is needed on influencing attitudes of undergraduate baccalaureate nursing students regarding nursing care of older adults. One challenge is determining the best way to positively influence the attitudes, thereby increasing the number of graduating nurses that desire to work with the growing older adult population.

**Sex Steroid Hormone Profiles during the Reproductive Cycle
of Zebrafish, *Danio rerio***

Velneshia Rabon

Advisor: Izhar A. Khan

Department: Biological and Environmental Sciences

College: Science and Engineering

Category: Undergraduate

Zebrafish have become an alternative vertebrate model for biomedical research. This research sought to validate techniques for measuring sex steroid hormones in water samples after a 60-min fish immersion and to relate sex hormones, such as 11-ketotestosterone (11-KT), testosterone, and estradiol, with different stages of the reproductive cycle of zebrafish. The experiments were conducted using a total of 45 zebrafish of both sexes to determine their sex hormone profiles based on data collected from water samples after immersion of individual fish in 200 ml water for 60 min. After immersion, the fish gonads were removed and their hormones were extracted from the water. Gonadosomatic indices (GSIs) were calculated for all females. The gonadal tissues were preserved in 10% buffered formalin and are being analyzed. The results obtained so far have validated already known facts of zebrafish and a positive relationship between the size of female zebrafish and their GSIs was shown. The sex steroid extracted from the water samples will be analyzed by specific enzyme-linked immunoassays and related to the reproductive stages of individual fish determined by gonadal histology. The steroid profiles in the water-immersion samples can be used reliably as an indicator of reproductive impairment due to exposure to environmental toxicants in future studies in reproductive toxicology.

A Study Describing Special Education Resources For Spanish Speaking Students

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College: Education and Human Services

Category: Graduate

The fast growth of the Hispanic population in the state of Texas presents schools and school districts with the specialized task of finding education that is in the student's native language in order for them to continue their learning. As schools factor services for this population of students, the topic of special education services for non-English speakers is a topic that school administrators and teachers are facing with more frequency. This qualitative study uses an ethnographical approach to describe the services, materials, and perceptions of administrators as well as teachers in schools that serve bilingual students in need of special education services.

Keywords: bilingual education, special education, Spanish resources, ESL learners

XPS Investigation of Ti-CuO Interface

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Category: Undergraduate

The technique of x-ray photoelectron spectroscopy has been employed to study the Ti/CuO interface. Thin films of titanium were deposited on CuO at room temperature by e-beam method. The thickness of the titanium film was varied between 3 Å and 10 Å. The titanium 2p, oxygen 1s and copper 2p regions were investigated by XPS. The spectral data show the reduction of CuO to elemental copper. Titanium is observed to get oxidized to TiO₂. The thickness of TiO₂ depended upon the initial thickness of the titanium overlayer. The reaction is observed to continue until the titanium overlayer is 7 Å thick. Beyond this thickness unreacted titanium is observed. The study provides a means of preparing TiO₂ of nano-dimensions.

Synthesis, Characterization and Evaluation of Pd-Ceria Catalysts for Selective Hydrogenation of Acetylene

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College: Science and Engineering

Category: Graduate

Developing efficient supported Pd catalysts for selective hydrogenation of acetylene in ethylene is a novel and important research on removing traces of acetylene for the polyethylene industry. Based on the new development of ceria for selective hydrogenation, the objective of this study is to synthesize and characterize and evaluate Pd-Ceria catalysts for selective hydrogenation of acetylene in ethylene. Pd-ceria catalysts are prepared via co-precipitation and incipient wetness impregnation methods. The loading of Pd of catalysts is from 250ppm to 1500ppm.

The resulted catalysts are evaluated at temperatures from 50°C to 250°C with a $\text{H}_2/\text{C}_2\text{H}_2/\text{C}_2\text{H}_4$ ratio of 3:1:99 and a GHSV of 60,000 cc/g/h. Catalysts prepared by the incipient wetness impregnation method, even with lower Pd loading, tend to have higher activity and higher selectivity than the catalyst prepared by the co-precipitation method and the traditional Pd/ Al_2O_3 catalyst. Calcination procedure before catalyst evaluation also impacts the catalytic activity and selectivity significantly. The preliminary results of extremely high H_2 chemisorption indicate that hydrogen spillover from Pd to ceria is fast over all calcined Pd-ceria catalysts, which impacts the catalyst performance significantly.

Investigation of the Cu(I), Ag(I), Pb(II), Co(II), Fe(III), Mn(II), Ni(II), and Zn(II) Binding Characteristics of Methanobactin from *Methylosinus trichosporium* OB3b

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The methanobactin (mb) from *Methylosinus trichosporium* OB3b (1154.26 Da) is a member of a class of metal binding peptides identified in methanotrophic bacteria. Methanobactins will selectively bind and reduce Cu(II) to Cu(I), and are thought to mediate the acquisition of the copper cofactor for the enzyme methane monooxygenase. Methanobactins will also bind other metal ions and mediate their solubilization and transportation *in situ*. The structure of mb-OB3b consists of nine amino acids and two modified regions containing enethiol-oxazolone rings, which are the bidentate binding sites for Cu(I). However, the binding sites for Ag(I), Pb(II), Co(II), Fe(III), Mn(II), Ni(II), and Zn(II) have not been determined and the goal of this study is to compare the binding of these metals to $[\text{mb} + \text{Cu(I)} - n\text{H}]^{(n-1)-}$ complex using traveling wave ion mobility mass spectrometry. The arrival times for each $[\text{mb} + M]$ (where M is the respective metal ion) is measured and used to categorize the metal complexes based on their collision cross-section. In addition, collision-induced dissociation of the $[\text{red-mb} + M]$ is used to locate the binding sites of the individual metal ions, and the normalized collision energy, breakdown curve is measured to determine the relative stability of the $[\text{red-mb} + M]$ complexes.

Keywords: native mass spectrometry, collision-induced dissociation, ion mobility, methanobactin, *Methylosinus trichosporium* OB3b, collision cross-section, dithiothreitol, disulfide bond reduction, stability of methanobactin metal complexes.

An Examination of the Testing Effect and Predictions of Learning for Math Facts

The Metacognition Lab (Eva Limoges, Cindy Mays, and Corey Grigsby)

Beth Nikopoulos, Eva Limoges, Cindy Mays, Corey Grigsby,

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Researchers have provided evidence of the benefit of intermediate testing to enhance the long-term memory (e.g., Roediger & Karpicke, 2006). Much of this research has been conducted using verbal materials; therefore, Nikopoulos (2013) investigated the use of testing to enhance long-term recall in mathematics and found that individuals who were repeatedly tested recalled more number facts than those who re-studied items. We sought to replicate this finding and examine individuals' learning predictions, particularly when they were asked to predict how many math facts that they would remember or forget. Testing benefited memory performance, and participants predicted higher rates of forgetting when they were repeatedly tested suggesting that testing and framing made them aware that material can be forgotten.

**Lucky's Choice: A Theory Based Point of Purchase Campaign to Promote
Healthy Food and Beverage Purchases**

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Advisor: Spencer Willis

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College: Education and Human Services

Category: Graduate

Research reveals that healthful modifications to campus food and eating environments can significantly impact eating behaviors among its target audience. Point-of-purchase (POP) interventions, particularly those including printed or posted nutrition education, have made significant contributions to the food environment and have been shown to modify consumer decision-making behaviors, thus resulting in improvements in knowledge and diet quality. With this in mind, we propose a theory based point-of-purchase intervention entitled "Lucky's Choice." The Lucky's Choice intervention will consist of a series of health messages and nutrition education, based on the Transtheoretical Model, which will be displayed via printed material at various points of purchase throughout campus (e.g. vending machines, dining facility, on campus eateries, athletic events, etc.). Through exposure to theory driven health messages, we aim to (1) improve purchases of healthy food/beverages and (2) improve knowledge of nutrient content and importance of food moderation among students, faculty, and staff at A&M-Commerce. Based on previous literature, we anticipate the Lucky's Choice intervention will lead to positive improvements in the campus food environment (e.g. availability and access of healthful foods/beverages) and knowledge and attitudes among campus community members.

Selective Hydrogenation of Acetylene over modified Pd Catalysts

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Co-Author: Xinxiang Cao

Department: Chemistry

College: Science and Engineering

Category: Graduate

For the past decades, polyethylene industry had been really important due to its growing use in everyday life material and devices. Selective hydrogenation of acetylene, which is found as an impurity in ethylene stream, is a crucial industrial process to remove traces of acetylene for polyethylene industry. Reaction results reveal the formation of bimetallic catalysts helps the selectivity comparing to mono metallic Pd catalyst as the reference. Series of modified Pd catalysts will be prepared and are to be tested for acetylene selective hydrogenation; the feed gas is ~1% acetylene in balance ethylene with additional hydrogen for a $H_2:C_2H_2$ ratio of 3:1. Reaction results as well as TPR and Hydrogen chemisorption data are to be used to discuss the effects of different promoters and preparation methods.

G1P3-Induced Mitochondrial Reactive Oxygen Species (mtROS) Increase Histone H3K27 Trimethylation In G1p3 Mediated Breast Cancer

Nobel Chowdhury

Advisor: Venu Cheriya

Department: Biological and Environmental Sciences

College: Science and Engineering

Category: Graduate

Increased ROS is a hallmark of cancers. G1P3, a target of immuno-endocrine signaling is associated with poor outcomes in estrogen receptor-positive (ER+) breast cancer. However, molecular mechanisms were unclear. Based on its inner mitochondrial membrane localization and increased level of mitochondrial ROS (mtROS) we hypothesized that G1P3-induced mtROS acts as a retrograde signal to increase histone H3K27 trimethylation (H3K27me3) in nucleus to promote cancer. To test this hypothesis, using immunoblot & immuno-fluorescence methods, H3K27me3 levels in MCF-7^{vector} & MCF-7^{G1P3} cells were assessed. Compared to vector control cells, H3K27me3 levels were markedly higher in MCF-7^{G1P3} cells. The mtROS were suggested to activate ERK1/2, a cytoplasmic kinase that in turn activates EZH2, a histone methyltransferase that is primarily responsible for H3K27 trimethylation. Therefore, the role G1P3-induced mtROS in ERK1/2 activation and H3K27 trimethylation were assessed. Immunoblot analysis identified phosphorylated forms of ERK1/2 in MCF-7^{G1P3} cells indicating their activation. More importantly, the U0126, a small molecule inhibitor of ERK1/2 not only decreased ERK1/2 activity, but also reduced H3K27me3 in MCF-7^{G1P3} cells. Additionally, Mito-TEMPO, a Mitochondria-targeted antioxidant inhibited mitochondrial ROS production and markedly reduced the levels of phosphorylated ERK 1/2 and H3K27 trimethylation in MCF-7^{G1P3} Cells. Taken together, our study for the first time unravels the role of an interferon stimulated gene in retrograde signaling. Investigation of G1P3 mediated retrograde signaling would identify multiple targets to control breast cancer progression and metastasis.

**Age and Gender Classification of Facial Images Using Deep Extraction and Convolutional
Deep Neural Networks: Analysis of the Relative Performance with Various Output
Activations and Cost Functions and Different Meta-Parameters**

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Category: Graduate

Age and gender classification of faces in digital images is a very active sector in Computer Vision. There is a myriad of applications such as surveillance cameras, mobile security, and the marketing of tailored content to individuals in age and gender classification of faces. Recent years have witnessed great advancements in age and gender classification algorithms using deep learning with feature extraction and convolutional neural networks. Especially, convolutional neural networks have been shifting the paradigm for the face classifications dramatically improving the performance. However, obtaining the optimal model of the sophisticated methods to applications is a challenging problem. In this research project, we implement an age and gender classifier using deep learning with feature extraction and convolutional neural networks. We have conducted intensive experiments with variations in the meta-parameters for the neural network to optimize the model of the age and gender classifier. We have also conducted experiments on the use of different output activation functions and cost functions. We have measured the performance of the neural network classifier using the recall, the precision, the receiver operating characteristic curve, and the execution speed as performance metrics. Our test results indicate performance of deep convolutional neural networks with feature extraction superior to that of the simple multilayer sigmoid neural network model. Our tests also indicate performance fluctuations with the use of different output activation functions and cost functions.

G1P3, a Mitochondrial Localized Antiapoptotic Protein Promotes Breast Cancer Cell Metastasis through ROS

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Category: Undergraduate

Breast cancer is the second most common cause of cancer related deaths among US women. Recently, we associated G1P3, an immuno-endocrine regulated gene, with ER+ breast cancer progression, but, its molecular mechanisms are unclear. In migration assays, MCF-7^{G1P3} cells migrated 1.6x faster than the control (MCF-7^{Vector}) cells ($P < 0.05$). Since G1P3 was found to be localized on the inner mitochondrial membrane, we hypothesized that mitochondrial reactive oxygen species (mtROS) may mediate G1P3's effects on cell migration. Consistent with this hypothesis, measurement of mtROS using reduced form of Mitotracker identified a significant increase of mtROS in MCF-7^{G1P3} than in MCF-7^{Vector} cells ($P = 0.0001$). Moreover, MCF-7^{G1P3} cells invaded through the matrigel 1.7x fold faster than MCF-7^{vector} cells indicating the metastatic potential of MCF-7^{G1P3} cells. Most importantly, removal of mtROS with an antioxidant N-acetyl cysteine (NAC) reversed both G1P3-induced migration and invasion. To decipher cellular mechanisms that mediate G1P3's effects on cell migration, formation of migratory structures was assessed. Staining of filamentous actin using rhodamine conjugated phalloidin identified 2.3 fold more number of filopodia in G1P3 expressing cells ($P = 0.0001$). Additionally, both filopodia and f-actin bundles, structures that support cell migration, were significantly more in migratory MCF-7^{G1P3} cells than in non-migratory cells ($P < 0.05$). Taken together, our results for the first time demonstrate the direct role of an immuno-endocrine induced gene in breast cancer metastasis and inhibition of G1P3-induced mtROS may suppress the metastasis of ER+ breast cancers.

**Identification and Validation of Breast Cancer Antiestrogen Resistant Genes
using GRIP: A Novel Functional Genomics Strategy**

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Text: Despite the efficacy endocrine therapies, ~40% of ER+ breast cancer patients either acquire resistance during treatment or are naturally resistant to antiestrogen. To identify clinically relevant antiestrogen resistant genes, we designed a genome wide functional genomic strategy using a vector system called GRIP (genome wide random insertion of promoter). GRIP vector has strong CMV promoter that can induce the expression of any downstream genes of insertion site in MCF-7 cells. The 3' RACE analysis of two million GRIP transduced cells identified the induction of genes with varying number of exons on different chromosomes confirming random gene activation ability of the GRIP vector. In a proof- of- concept study, GRIP activation resulted in 36 TAM resistance colonies and in one of them PI3K, a kinase that can induce TAM resistance was overexpressed. By removal of the GRIP vector using Cre-Lox, the expression of PI3K was lowered and TAM resistance was reversed. In summary, we designed an innovative functional genomics strategy to identify antiestrogen-resistant genes. Rapid identification and validation of clinically relevant antiestrogen using GRIP strategy will elucidate pathophysiology of ER+ breast cancer recurrence and help design strategies to eradicate resistant tumor cells for a lasting curative effect.