Graduate Student Research Association

2012 Student Research Conference

Saturday, March 31, 2012

Conference Program
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Pre-Conference Reception &
Artists’ Exhibit

Friday, March 30, 2012
6:00 – 8:00 p.m.
Latino Resource Center
515 Garden Road, DeKalb

Join the GSRA Executive Board as we welcome our Conference keynote speaker, Dr. Story Musgrave, and host an exhibit of School of Art students’ artistry!

Light refreshments
Jazz music
Saturday, March 31, 2012
Holmes Student Center
Northern Illinois University

7:30 – 8:00  Conference Check-in and Registration
Capitol Room, Main Level, Holmes Student Center

8:00 – 8:45  Continental Breakfast and Breakfast Chat
Capitol Room, Main Level, Holmes Student Center

Co-sponsored by:  College of Education
College of Engineering & Engineering Technology
College of Health & Human Sciences
College of Liberal Arts & Sciences
College of Visual & Performing Arts

Conference Welcome and Introduction
Lily Malekfar, GSRA Vice-President

Dr. Winifred Creamer
Presidential Research Professor
Department of Anthropology
Northern Illinois University

9:00-11:45:  Research Poster Fair & Artists’ Exhibits
Regency Room, Main Level, Holmes Student Center

Poster Fair & Artists’ Exhibits Co-sponsored by:
Department of Biological Sciences
Department of English
Department of Kinesiology & Physical Education
Department of Physics
Department of Psychology
Department of Technology
College of Visual & Performing Arts
<table>
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<tr>
<th>Poster Number</th>
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| 1             | Gunisha Arora, Department of Biological Sciences  
Knockout mice and cell lines provide insights into potential roles for the GP73/GOLM1 HCC biomarker: Association with sustained cell proliferation | Eligible for Sigma Xi Award |
| 2             | Jesus A. Arriola & Alejandra I. Cano, Program in Public Health  
Call for an increase in developmental programs for underrepresented minority medical students | Eligible for Sigma Xi Award |
| 3             | Manan Bawa, Department of Electrical Engineering  
Performance evaluation of convolutionally-encoded space-time OFDM systems |  |
| 4             | Jessica K. Blanco, Department of Anthropology  
Further analyses of San Marcos subsurface material: What material culture can tell us about demography and social complexity | Eligible for Sigma Xi Award |
| 5             | T.S. Wadhwa, Program in Audiology  
Effects of transient noise reduction algorithms and compression on impulsive environmental sounds |  |
| 6             | Aldo Rodriguez, Department of Counseling, Adult & Higher Education  
The role of homework in developing adults’ self-directivity and self-efficacy |  |
| 7             | Rachel Moran, Department of Biological Sciences  
Mate choice copying in two species of darters | Eligible for Sigma Xi Award |
| 8             | Cristina Escalante & Carol Orrego, Program in Nutrition & Dietetics  
The relationship between acculturation on body image and BMI among Mexican-American college students (cancelled) |  |
| 9             | Asmaa Mustafa, Department of Biological Sciences  
The degradation of rubisco during senescence of soy beans | Eligible for Sigma Xi Award |
| 10            | Brandon Neuhoff, Department of Mechanical Engineering  
Pneumatic conveyance of biomass |  |
| 11            | Matthew Wiesner, Department of Physics  
Are low-mass galaxy clusters over-concentrated? | Eligible for Sigma Xi Award |
| 12            | Larry D. Weas, Department of Counseling, Adult & Higher Education  
Using humor in HRD and training |  |
| 13            | Sabina Walker, Program in Speech-Language Pathology  
What do mothers say when they teach infants representational gestures? |  |
| 14            | Hans Muehsler, Department of Educational Technology, Research & Assessment  
An analysis of a high school faculty stress survey |  |
| 15            | Miranda Foster, Department of Biological Sciences  
Proapoptotic strategy to kill glioblastoma multiforme cells | Eligible for Sigma Xi Award |
| 16            | John-Franklin Dzuryak, Department of Geology  
Geomorphic interpretation and recent geologic history of Lisianski Inlet, and Sitka Sound, Alaska | Eligible for Sigma Xi Award |
| 17            | Kaylee Kuban, Department of Biological Sciences  
A parasitoid wasp finding and choosing a mate | Eligible for Sigma Xi Award |
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<tr>
<th>Poster Number</th>
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| 18            | Siew Lian Lim, School of Art  
Preservation and practice of Wayan Kulit in Mayasia: Interviews with four Dalang |
| 19            | Andrew Thompson, Department of Biological Sciences  
Don’t drink the water: Isolation and molecular serotyping of salmonella spp. in the Yucatan peninsula | Eligible for Sigma Xi Award |
| 20            | Brittany Hoffman, Program in Nutrition & Dietetics  
Barriers to fruit and vegetable intake among young adults |
| 21            | Philip Persino, Department of Biological Sciences  
Lipid extraction from algae as a potential source of biofuel | Eligible for Sigma Xi Award |
| 22            | Kathryn Owens, Department of Biological Sciences  
Necrosis induction by various radiation modalities in human glioblastoma multiform tumor cells versus normal human astrocytes | Eligible for Sigma Xi Award |
| 23            | Karyn Higgs, Department of Psychology  
Does phonological working memory support the comprehension of visual narratives? | Eligible for Sigma Xi Award |
| 24            | Brian Keefe & Zach Davidson, Department of Biological Science  
Growing ankistrodesmus sp. in waste water for use in biofuels | Eligible for Sigma Xi Award |
| 25            | Bob Pulvermacher, Stephanie Orbon, Amanda Durik, Department of Psychology,  
& Thomas Aicher, Department of Kinesiology & Physical Education  
Individual differences in achievement motivation and relationship to outcomes in marathon runners |
| 26            | Beheshteh Abdi & David Shernoff, Department of Leadership, Educational Psychology & Foundations  
Relationships between congruence of academic disciplines and student engagement among first year university students |
| 27            | Robert Williams, Department of Literacy Education  
High achieving African American males: What matters in persistence |
| 28            | Malik Raheem, Department of Counseling, Adult & Higher Education  
Investigating multicultural competence in supervision with counselor educators |
| 29            | Brett Anderson, Department of Leadership, Educational Psychology & Foundations  
Temporally linking classroom contextual factors and instructional practices to procedural and substantive engagement in high school classrooms |
| 30            | JoAnn LoSavio, Department of Anthropology  
An American cultural model of nature: A pilot project in northern Illinois |
| 31            | Catherine Maney, School of Nursing  
The use of guided reflection in high fidelity simulation to develop clinical judgment in pre-licensure nursing students |
| 32            | Linda Anderson, Program in Curriculum & Instruction  
Multiage grouping of 6 week olds to 2 year olds |
| 33            | Susan Robins & Courtney Adams, Program in Family, Consumer & Nutrition Sciences  
Food pantry nutrition education intervention |
Attendees: Please complete the Poster Fair evaluation form and leave it in the box in the Regency Room. Thank you!

We gratefully acknowledge the faculty members who served as judges for the Sigma Xi Science Awards:

- **Dennis Brown**, College of Engineering & Engineering Technology
- **Professor David S. Ballantine**, Department of Chemistry & Biochemistry
- **Board of Trustees Professor David Changnon**, Department of Geography
- **Professor Vey sel Demir**, Department of Electrical Engineering
- **Beth Galliard**, College of Engineering & Engineering Technology
- **Martin Kocanda**, College of Engineering & Engineering Technology
- **Presidential Engagement Professor Clifford Mirman**, Department of Technology
- **Dr. Julia Spears**, Office of Student Engagement & Experiential Learning
- **Professor Joel Stafstrom**, Department of Biological Sciences
- **Professor Suzann Willis**, Department of Physics

9:00 – 11:45 Artists’ Exhibits  
Regency Room, Main Level, Holmes Student Center  
Sponsored by: College of Visual & Performing Arts

**Emily Franklin**, School of Art  
*Pliable reality and the responsibilities of the photographer*

Through my photography, I create illusions of space and emptiness while exploring the reality of experience by using objects to convey narrative. Each image is delicately interrelated to create a complete portrait of an individual psyche. I use both analog processes and digital process to create hybrid work that references photo history as well as contemporary photographic issues.

**Siew Lian Lim**, School of Art  
*Echoing universal balance*

From plastic food wrappers, plastic bottles, aluminum soft drink cans, and other refuse material I create stationary silent shadow puppets that move, breathe, and speak for themselves. They express spirituality in human terms - “Humanistic Spirituality” - concepts of balance between humans and the environment and balance within by taming and training the wild mind. They speak through their materials, their gestures and positioning, and through their shadows. My free-standing crafted pieces and shadow sculptures are inspired by the shadow puppetry of Southeast Asia in which the crafted pieces are used to tell a story. One set of three pieces, Restoring Balance to Gluttony and Waste by Word, is modeled after three major characters from the Hindu myth, The Ramayana – Rama -- his wife, Sita, and the monkey king, Hanuman, as portrayed in Javanese Wayang Kulit shadow puppetry. These figures are made from beverage containers with printed text that encourages excessive consumption -- material that is mindlessly discarded after use. One independent figure portrays the legendary ogre king from The Ramayana, Ravana, as he is portrayed in the Wayang Kulit of Kelantan, Malaysia. His garments are made from the wrappers of a brand of ramen noodle that was recently recalled in Malaysia because of suspected contamination by plastic chemicals. One smaller figure, Rama, as portrayed in the Wayang Kulit of Bali, Indonesia, is made from repurposed plastic file folders. All of these figures tell how we are poisoning ourselves and the environment. The final figure is a life-sized cowgirl representing the first stage of mind training that uses the taming of a wild stallion as a metaphor for the untrained mind to restore inner balance.
Morning Research Paper Presentations

9:00-10:15  Research Paper Session 1: Research on Teachers and Teaching
Lincoln Room, 2nd Floor, Holmes Student Center
Sponsored by: Department of Kinesiology & Physical Education

Session Chair: Brett Anderson, Program in Educational Psychology

Paper 1:  Diana J. Zaleski, Department of Leadership, Educational Psychology & Foundations
Using a multilevel mediation model to examine the effects of national board certified teachers on high school science students’ cognitive engagement

Paper 2:  Kristine Herrell, Department of Leadership, Educational Psychology & Foundations
Using thematic analysis to explore early career teacher experiences in urban schools

Paper 3:  Sue Loeschen, Department of Leadership, Educational Psychology & Foundations
Generating reflection and improving teacher pedagogy through the use of cognitive coaching in a mentor/beginning teacher relationship

Paper 4:  Valerie Pientka, Department of Leadership, Educational Psychology & Foundations
Second-stage teachers and pedagogical content knowledge in a mentoring relationship

Discussant:  Professor Lee Shumow, Program in Educational Psychology

9:00-10:15  Paper Session 2: Research in the Arts, Humanities, and Cultures
Illinois Room, 2nd Floor, Holmes Student Center
Session Chair: Jessica Vivarito, Program in Curriculum & Instruction

Paper 1:  Lael Weinberger, Department of History
Raising the bar in Illinois: An episode in the history of bar associations, bar exams, and legal education

Paper 2:  Morgan Lemmer-Webber, School of Art
Recovering a lost history: Two roman stucco reliefs from the Art Institute of Chicago

Paper 3:  Lily Malekfar, Department of Anthropology
An analysis of the Klasies River hominins using a hybrid model

Paper 4:  Elizabeth Rex, School of Art
Art in everyday places: Transforming adult identities as non-artists

Paper 5:  Amanda Duncan, School of Music
Bridging the gap: Using western pedagogical methods to facilitate learning the Afro-Cuban Oru Seco on Batá drums

Discussant:  Professor Sinclair Bell, School of Art
10:30-11:45 Paper Session 3: Research in Engineering and Technology
Illinois Room, 2nd floor, Holmes Student Center
Session Chair: Robert Williams, Program in Adult Education

Paper 1: Nazanin Zinouri, Department of Industrial & Systems Engineering
Scheduling a batch processing machine to minimize total weighted tardiness

Paper 2: Jingbo Han, Department of Electrical Engineering
Investigation of compact and dual-band design for dielectric resonant antenna

Paper 3: Osamu Chigira, Department of Electrical Engineering
Multifrequency impedance matching

Paper 4: Iamiae el Harrak, Department of Industrial & Systems Engineering
Reduction of quality defects in manufacturing assembly

Discussant: Professor Clifford Mirman, Department of Technology

10:30-11:45 Paper Session 4: Research on Learning Across Diverse Contexts
Lincoln Room, 2nd Floor, Holmes Student Center
Sponsored by: Department of Counseling, Adult & Higher Education
Session Chair: Rachael Rochocki, Program in Speech Pathology

Paper 1: Dennis Awen, Department of Counseling, Adult & Higher Education
Lifelong learning

Paper 2: Jayleen Wangle, Department of Mathematical Sciences
Mathematical beliefs of calculus students

Paper 3: Beheshteh Abdi, Department of Leadership, Educational Psychology & Foundations
A study of the relationship between emotional intelligence and life satisfaction among Iranian female and male high school students

Paper 4: Christine Lagottolla, Department of Leadership, Educational Psychology & Foundations
Outdoor adventure activities as educational experiences for college students

Discussant: Professor James Cohen, Department of Literacy Education

Conference attendees and participants:
Please fill out the Conference Evaluation Form
and return it outside the Capitol Room, GSRA Check-in/Registration Table.

Your feedback will help GSRA plan for the 2013 Research Conference!
11:45-12:45  Conference Luncheon
Duke Ellington Ballroom, Holmes Student Center

NOTICE: Lunch is free for first 100 Conference registrants.
(Must present a ticket for lunch.)

1:00-2:00  Conference Keynote Speaker
Capitol Room, Main Level, Holmes Student Center

Introduction: Cynthia Padilla, Program in Educational Psychology

Dr. Story Musgrave
NASA Space Shuttle Astronaut

“The Beauty and Glory of Spaceflight: Personal Experiences and Reflections”

GSRA gratefully acknowledges the support of the Graduate School Colloquium Committee for funding in support of the keynote speaker event.

Co-sponsors: College of Education
College of Engineering & Engineering Technology
College of Health & Human Sciences
College of Liberal Arts & Sciences
College of Visual & Performing Arts
2:30 – 4:30  Center for the Interdisciplinary Study of Language & Literacy (CISLL) Poster Session
Regency Room, Main Level, Holmes Student Center

Featuring faculty and graduate student research projects that focus on problems and issues in language development and learning, literacy education, and related topics.

CISLL is an interdisciplinary center for the study of lifespan language and literacy across diverse populations and contexts, both regionally and globally, with the commitment to:
  • Engage in basic and applied research in language and literacy,
  • Develop and apply innovative research and assessment methodologies to address complex issues,
  • Identify and promote best practices in language and literacy, and
  • Provide evidence-based outreach that generates results.

Light refreshments available.

Visit the CISLL website at www.niu.edu/cisll
<table>
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<tr>
<th>CISLL Poster Number</th>
<th>Presentation</th>
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| 1                   | **Professor Michael Manderino**, Department of Literacy Education  
*Disciplinary literacy using new literacies: Reading across multimodal texts* |
| 2                   | **Kristin Brynteson, Professor Rhonda Robinson, & Elizabeth Anderson**, NIU Outreach & Department of Educational Technology, Research & Assessment  
*Enhancing multi-literacies through digital story creation* |
| 3                   | **Professor M Cecil Smith & Solanly Ochoa-Angrino**, Program in Educational Psychology  
*High school students’ emotional responses to academic reading engagement in science: Relationships to achievement* |
| 4                   | **Professor Robert V. Reichle**, Department of Foreign Language & Literatures  
*Nativelikeness in second language processing: ERP evidence from French* |
| 5                   | **Christine Librojo & Elias Mellul**, Department of Foreign Language & Literatures  
*Do first languages leave footprints on the brain?* |
| 6                   | **Alexis Reaves, Martha Gajewski, & Trisha Marcum**, Department of Foreign Language & Literatures  
*The evolution of foreign language pedagogical methods and their implications in SLA* |
| 7                   | **Tatanne Butler & David Green**, Department of Foreign Language & Literatures  
*Practicing what is preached: Finding the place for audiolinguaiism (ALM) and communicative language teaching (CLT) in second language acquisition learning* |
| 8                   | **Richard Birmantas & Julie Moteau**, Department of Foreign Language & Literatures  
*Teaching and learning grammar in a second language: A necessary evil?* |
| 9                   | **Ricardo Mejia & Daniel Berrones**, Department of Foreign Language & Literatures  
*Teaching a second language: The communicative approach, the audiolinguial method, and the classical approach* |
| 10                  | **Professor Janet Holt & Professor Vicky Collins**, Department of Educational Technology, Research & Assessment  
*Predictive validity of reading fluency performance level and growth on reading achievement* |
| 11                  | **Professor Joseph Magliano, Meghan Solomon, & Gabriel Radvansky**, Department of Psychology  
*Verb aspect and problem solving* |

**Afternoon Research Paper Presentations**

**2:15-3:15:**  
**Paper Session 5: Research on Economics of Production Processes**  
Illinois Room, 2nd Floor, Holmes Student Center

**Sponsored by:**  
Department of Technology

**Session Chair:**  
Lily Malekar, Program in Anthropology

**Paper 1:**  
**Aaron Call**, Department of Industrial & Systems Engineering  
*Reducing picking time in a warehouse from a dedicated location policy, item families and careful item placement*

**Paper 2:**  
**Peiyong Yu**, Department of Economics  
*Nonparametric methods with application to hedonic pricing models: A case study examining the relationships between wind farm presence and property values*

**Discussant:**  
**Professor Veysel Demir**, Department of Electrical Engineering
2:15-3:30: Paper Session 6: Research on Technology in Learning and Instruction
Lincoln Room, 2nd Floor, Holmes Student Center

Sponsored by: Department of Physics
Session Chair: Diana J. Zaleski, Program in Educational Psychology

Paper 1: Fahad Mohammed AlShahran, Department of Educational Technology, Research & Assessment
Saudi students’ perceptions of the language technology center in an English school

Paper 2: Jonathon Paver, Department of Educational Technology, Research & Assessment
Factors influencing the integration of technology by community college adjunct faculty

Paper 3: Michael Geiger, Department of Educational Technology, Research & Assessment
The effects of participating in a multi-media social skills intervention on the social functioning of three middle school students with IEPs

Paper 4: Kristin Brynteson, Department of Educational Technology, Research & Assessment
Exploring the use of an online support system as a teacher-centered approach to supporting curricular innovation

Discussant: Professor Laura Luetkehans, Department of Educational Technology, Research & Assessment

2:15-3:45 Workshop: A Look at African American Women Organizations on a Predominantly White Campus
Heritage Room, 2nd Floor, Holmes Student Center

Shannice Berry & Linda Davis, Department of Counseling, Adult & Higher Education

This session will highlight how two African American Women Organizations on the campus of a predominantly white institution positively affect retention, persistence, and attrition rates of its members. The session will cover how these organizations influence the development of identity as it relates to student development. The presentation will provide information about the academic and social experiences of women in these organizations. We will discuss how these organizations have aided in the persistence, retention, and attrition of its members. We will also address how these organizations have a graduation rate exceeding 90%.
3:35-5:00  Paper Session 7: Research on Reading and Learning
Lincoln Room, 2nd Floor, Holmes Student Center

Session Chair:  Professor M Cecil Smith, Program in Educational Psychology

Paper 1:  Brent Steffens, Department of Psychology
Task instructions: Interest, motivation, and the potential for bias

Paper 2:  Kristopher J. Kopp, Department of Psychology
Goal driven decisions of a multiple document argumentation task

Paper 3:  Beth McFarland-Wilson, Department of English
Narrative physics and cognitive processes in Richard Powers’ “Prisoner’s Dilemma”

Paper 4:  Michael Henry, Department of Literacy Education
Secondary student self-selected sustained silent reading’

Discussant:  Professor Joseph Magliano, Department of Psychology

1. Eligible for “Research on Adolescence” Award, sponsored by the Collaborative on Early Adolescence. Visit the CEA website at www.niu.edu/cea.

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Information for GSRA Research Conference Participants

Student Presenters!

Make your research presentation a part of the University’s permanent historical record!

You can submit your research paper or poster to be stored as part of a permanent electronic archive! To do so, send your file, in pdf format, to Dr. Drew VandeCreek, Director of Digital Initiatives, University Libraries, drew@niu.edu.

You MUST indicate in your email to Dr. VandeCreek that you are granting permission for the University to include your paper or poster in the Huskie Commons digital archives.

Follow GSRA on Facebook, Twitter, and Blackboard

Get involved in GSRA!

2012-13 GSRA Executive Board elections held in April for all offices:
President
Vice-President
Secretary
Treasurer
Webmaster
Undergraduate Representative

Nominate yourself or another student by sending an email with your name and contact information to gsra@niu.edu.
Student Center Meeting Rooms

Main Floor
- Duke Ellington Ballroom, Capitol Room, Carl Sandburg Auditorium, Regency Room

Second Floor
- Conference Suites - Illinois, Douglas, Lincoln, Heritage, University Suite

Elevators to
- Tower Meeting Rooms
Stairs to South Entrance

North Entrance
West Entry
East Entry
South Entrance

Sandburg Auditorium
Regency Room
Duke Ellington Ballroom
Hotel Desk
Computer Lab
Main Office
Information Desk
Ellington’s Cafe
Gallery Lounge
Capital Room
Hunt Room
Elevator to Tower Meeting Rooms
Illinois Room
Lincoln Room
Heritage Room
University Suite
Duke Ellington Balcony
Research Presentation Abstracts

Abdi, Beheshteh; & Shernoff, David
Department of Leadership, Educational Psychology & Foundations
Adviser: Professor David Shernoff

Relationships between congruency of academic disciplines and student engagement among first year university students

Based on Holland’s personality type theory, individuals and environments can be classified using one or more types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Feldman, Smart, & Ethington (1999) argue that when applied to students in postsecondary education, “congruence of person and environment is related to higher levels of educational stability, satisfaction, and achievement” (p. 643). The person-environment fit construct has been used to predict college outcomes, where students’ environments are determined by their academic major. Student engagement is a broad and multidimensional phenomenon that encompasses academic as well as selected non-academic and social aspects of the student experience (Krause & Coates, 2008). There are limited studies that directly address student engagement in regard to academic major and personality type. So, current research examines the relationships between congruency of personality type - academic majors and Student Engagement among first year university students. For this purpose, fifty first- year students from different majors who are enrolled in general educational course will complete the instruments of the research that are the First Year Experience Questionnaire (FYEQ) of Krause & Coates (2008) and the Self-Directed Search: The SDS (Holland, 1990). The major question of present study examines the extent to which congruency of personality type - academic majors is associated with student engagement. The statistical methods that will be used for analyzing the data are Pearson product moment correlations and multiple regressions.

Abdi, Beheshteh; & Shernoff, David
Department of Leadership, Educational Psychology & Foundations
Adviser: Professor David Shernoff

A study of relationship between emotional intelligence and life satisfaction among Iranian female and male high school students

The purpose of this research was to examine the relationship between emotional intelligence and life satisfaction. A sample of 716 (371 female and 345 male) from Tehran’s secondary schools who were selected using stratified quota sampling completed Modified Schutte Emotional Intelligence Scale (Austin et al., 2004) and Multidimensional Students’ Life Satisfaction Scale (Huebner et al., 1998). Using Pearson correlation analysis of the results obtained showed positive and statistically significant correlations between total and also friends, school, self, environment life satisfactions with the total and appraisal, regulation and utilization of emotions of emotional intelligence. No significant relations found between environment, school and friends satisfactions with the utilization of emotions. Accordingly, regression analysis showed that total emotional intelligence accounted for 10% of the variance in satisfaction with school, 14% of the variance in satisfaction with self and 17% of the variance in total satisfaction with life. Also, Step by step regression revealed that regulation and appraisal of emotions explained 7% of the variance in satisfaction with friends and 16% of the variance in satisfaction with self. Regulation, appraisal and utilization of the emotions altogether explained for the 13% of the variance of the satisfaction with school. Also, regulation of emotions and appraisal of emotions accounted for 19% of the variance in total satisfaction with life. On the other hand, when examining gender differences, girls scored higher than boys on total and subscales of emotional intelligence (except regulation of emotions with no significant differences between two genders). No significant gender differences were found in total and subscales of satisfaction with life. These findings suggest that emotional intelligence and its components are predictors of the high school students’ life satisfaction.
Al Shahrani, Fahad Mohammed  
Department of Educational Technology, Research & Assessment  
Adviser: Professor Laura Ruth Johnson  
*Saudi students' perceptions of the language technology center in an English school*

The Saudi government started a series of scholarships- with a mission to prepare and qualify Saudis in different fields to compete on an international level in the labor market and exchange scientific and cultural expertise from around the world (Education, 2010), to different parts of the world. The United States is the main destination for most of the King Abdullah Scholarship recipients. The program is divided into two stages: the language stage and the specialization stage. In the language stage, the recipients have 18 months to reach the language requirement. This is the critical stage for most students because it is the time where they experience the changes in culture and the educational system. For this reason, the English language stage is extremely important in determining the students’ future. The English Language School (ELS) Language centers are mainly responsible for receiving the students and helping the students gain the English language proficiency needed to start at a university educational program. The ELS delivers many programs and applies different strategies in an attempt to positively affect the students’ English skills. One of those strategies is the use and integration of technology. The Technology Learning Center (TLC) combines both computer supported learning and support from instructors who supervise progress and answer questions (ELS, 2011). Given the above concerns, I undertook a qualitative study, in an attempt to understand the Saudi students' perceptions of the LTC and the integration of technology in the English language program presented by the ELS in a Midwestern town in the United States. The paper attempted to indicate what the students’ understandings of this integration are and how much they believed it may help them improve their overall language level. The paper explored the students feelings and satisfaction with the technology used.

Anderson, Brett  
Department of Leadership, Educational Psychology & Foundations  
Adviser: Professor David Shernoff  
*Temporally linking classroom contextual factors and instructional practices to procedural and substantive engagement in high school classrooms*

The purpose of the proposed study is to improve upon the work of educational researchers Martin Nystrand and Adam Gamoran to identify which features of the classroom context and teacher instructional practices are associated with high school students' procedural and substantive engagement. Such an examination is important because procedural and substantive engagement are two distinct yet often confused forms of student engagement that have divergent effects on learning. Therefore, it is critical that teachers are aware of not only which classroom contextual factors and instructional practices are associated with each form of engagement, but are also able to apply those that cultivate substantive engagement in their classrooms. In pursuit of this inquiry, the proposed study applies an improved methodology to Nystrand and Gamoran's theoretical framework. The integration of survey and observational measures of student engagement taken using the Experience Sampling Method allows for a precise operationalization of both procedural and substantive engagement. In addition, the integration of ESM and classroom video footage allows for the construction of discreet instructional episodes and for the proximal linking of various classroom environmental factors to each form of engagement within these episodes, making it possible to accurately discern which contextual factors and practices are associated with each form of engagement. Specifically, procedural engagement (i.e., behavioral engagement behavioral codings) and substantive engagement (i.e., ESM survey) data were matched for fourteen (N = 14) student participants resulting in twenty-eight (N = 28) individual cases of engagement and seventeen (N = 17) episodes of engagement across five classroom sessions in two high schools. These data were then categorized as one of three forms of engagement: disengagement, procedural engagement, or substantive engagement at both the individual and episode level. Quantitative methods (i.e., multinomial logistic regression) were then applied at the episode level and qualitative methods (i.e., instructional discourse analysis) were applied at the individual level to discern which classroom contextual factors and specific instructional practices were associated with each form of engagement.
Anderson, Linda  
Department of Leadership, Educational Psychology & Foundations  
Adviser: Professor Elizabeth Wilkins  

Multiage grouping of 6 week olds to 2 year olds

The traditional early childhood 1-age-per classroom method of grouping is one way of addressing the needs of young students. Another method is to group children in multiage classrooms. There is a lack of research on quality care in multiage grouping of infant, toddlers, and 2-year-olds. This problem has prompted the researcher to take a closer look through the lenses of developmentally appropriate practices, play-based learning and teacher perspectives of two multiage classrooms. This research specifically contributes to the body of literature available to administrators and practitioners who wish to design their learning environments as multiage classrooms. The methodology used was a qualitative approach conducted as a case study. The two classrooms of 31 girls and boys selected for participation in this study are located in the Child Development Laboratory at Northern Illinois University. Three research questions were answered; 1) what teaching and curricular practices are used in multiage early childhood classrooms that have been found to enhance learning outcomes and reduce disparities amongst diverse aged children (ages six weeks to two years)? 2) How are the components of the developmentally appropriate practice guidelines being utilized in the targeted multiage early childhood classrooms?, and 3) What challenges do early childhood teachers perceive in maintaining play-based learning in developmentally appropriate multiage classrooms? In order to investigate the multiage design for very young children observations, document examination, and interviews were collected for this study. The conclusions of the analysis are that multiage grouping is effective but not without problems. The researcher examines five challenges. Recommendations for practice and research are offered to inform those interested in implementing multiage classrooms for infants, toddlers, and 2-year-olds.

Arora, Gunisha  
Department of Biological Sciences  
Adviser: Professor Barrie Bodie  

Knockout mice and cell lines provide insights into potential roles for the GP73/GOLM1 HCC biomarker: Association with sustained cell proliferation

Golgi Protein – 73kDa (GP73/GOLM1) is a resident cis Golgi Type II membrane protein that is nearly undetectable in normal liver, but whose hepatic expression increases in hepatocellular carcinoma (HCC) and circulating levels increase in the plasma of patients with chronic hepatitis C infection and HCC. As such, it is currently the subject of active clinical trials investigating its use as an improved diagnostic biomarker for HCC. GP73/GOLM1 is cleaved by a proprotein convertase and secreted by proliferating cells – an activity possibly elevated in cancer – yet its biological role in the liver and in the pathogenesis of HCC remains unclear. In order to investigate possible biological roles for GP73/GOLM1, liver-specific GP73/GOLM1 knockout mice (C57BL/6) were generated using the Cre-loxP system, with “floxed” GOLM1 gene and Cre recombinase driven by the albumin promoter. GP73/GOLM1 Cre+/--genotypes were confirmed by PCR analysis. GP73/GOLM1Fl/Fl/Cre(+) animals showed no obvious biological phenotype compared to their Cre(-) littermates. They exhibited normal growth, behaviors, and mated successfully, suggesting that hepatic GP73/GOLM1 is not vital for normal physiological function, as might be hypothesized from its normally low expression in the liver. Previous studies have suggested that GP73/GOLM1 expression is not upregulated in post-hepatectomy liver regeneration, suggesting that activation of its expression in the liver is linked to inflammatory or carcinogenic processes. Examination of GP73/GOLM1 expression in 14 human HCC cell lines revealed that it is equally expressed in epithelial and mesenchymal HCC cells, as well as an SV40-transformed nontumorigenic human liver epithelial cell line. Rodent in vitro models of hepatocellular transformation revealed equal GP73/GOLM1 expression levels in nontumorigenic parent cell lines and their transformed tumorigenic derivatives. Preliminary experiments suggest that GP73/GOLM1 expression is reduced when growth of cells is inhibited by nutrient or serum withdrawal. Collectively, the data from the in vivo and in vitro models thus far suggest that GP73/GOLM1 expression is linked to a sustained commitment to cell proliferation – such as occurs in chronic
inflammation and cancerous transformation. Mechanistic roles for GP73/GOLM1 in HCC development and progression are currently being tested in carcinogenesis models with liver-specific GP73/GOLM1 knockout mice. A website on GP73/GOLM1 has also been established as a resource for the research community interested in the study of this protein.

Arriola, Jesus A.; & Cano, Alejandra I.
Program in Public Health
Adviser:

Call for an Increase in developmental programs for underrepresented minority medical students

There is a shortage of underrepresented minorities (URM) in the health care work force, African Americans, Hispanic Americans, and American Indians comprise 25 percent of the United States Population, increasing to nearly 53 percent by 2050, but only composing 6 percent of its physicians. A similar disparity is seen in the faculties of medical schools where minorities make up less than 4.2 percent. Thus, outlining the limited availability of leaders and mentors in medical schools for underrepresented minorities, which conveys a negative idea to current and future underrepresented minority medical students. There are few successful models of minority medical student development, mentorship, and recruitment efforts despite frequently voiced agreement that this is an issue that can be addressed and solved. This issue also translates to an issue of health care. Underrepresented minority patients experience higher rates of healthcare disparities and inequities. There is a lower quality of healthcare while illustrating higher rates of illness, disability, and premature deaths among minority populations. Underrepresented minority patients are more likely to seek underrepresented minority physicians and more likely to participate in research conducted by underrepresented minorities. In turn, underrepresented minority physicians are four times more likely to practice in underserved communities. Increasing diversity in the health care professions will improve health care access and quality for minority patients and overall improve the healthcare system. There is a necessity for an increase in underrepresented minorities in the medical field in order to improve the quality of minority patient care.

Awen, Dennis
Department of Counseling, Adult & Higher Education
Adviser: Professor Gene Roth

Lifelong learning

My lifelong research interest began after I completed a study abroad trip through NIU’s adult and education department to Japan and Korea (Learning in the Workplace/Fall 2011). My presentation will involve presenting key points in my research paper on lifelong learning. Lifelong Learning Lifelong learning is defined as learning that occurs along a continuum, from elementary and secondary education to undergraduate and graduate education which eventually lasts through the end of one’s career. Lifelong learning has become a necessity in the 21st century. We live in an era of breathtaking change and it impossible to acquire in early life the knowledge that adulthood will require. Changes that take place in our world include Globalization, advances in technology such as the Internet and cell phone, cultural exchanges, and economic interdependence among nations. In order to keep up with those changes, one must be continuously engaged in lifelong learning. Lifelong Learning Communities Lifelong learning is not only an individual activity, but it has become a group or shared learning process that has developed into learning communities across the globe. The learning community plays an important role in expanding lifelong learning ideas in cities, towns, and communities. In order to further illustrate the learning community concept, one can examine the Zhabei District which is one of the 18 districts in Shanghai, China. The aim of the Zhabei Learning Community is to build a harmonious environment for everyone living in their community. For example, a learning community in the Zhabei district used a strategy where certain businesses e.g., hospital, company, school, etc. opened their educational facilities to each other and shared learning resources.
Bawa, Manan  
Department of Electrical Engineering  
Adviser: Professor Mansour Tahernezhadi  
*Performance evaluation of convolutionally-encoded space-time OFDM systems*

Orthogonal frequency division multiplexing (OFDM) is a broadband multicarrier modulation technique that carries a large amount of data over orthogonally parallel subcarriers. The higher data streams are divided into lower data streams, which are transmitted over multiple subcarriers. Space diversity is applied to OFDM for overall improvement of the system performance. The signals transmitted through the time-varying channel experiences multipath fading and results in burst error condition. This burst error degrades the performance of the system and should be overcome by appending a convolutional encoder and an interleaver at the transmitter end and similarly using a deinterleaver and a Viterbi decoder at the receiver end. The transmitted signals also experience intercarrier interference (ICI). To combat ICI, estimation of the channel parameters should be done. Another method which does not require channel estimation to overcome ICI is called differential detection. This technique is only valid for low Doppler. For high Doppler conditions, differential detection is combined with channel estimation for space time OFDM for improving the performance of the system. The channel estimation is performed using modified local splines method. In this paper, we propose a technique in which convolutional encoding and interleaving are combined with partial differential space time OFDM. The estimation of the channel parameters is done using modified local splines method. The performance evaluation of the proposed scheme is simulated for various Doppler conditions. The results show that the proposed technique has improved performance over the pilot-assisted partial differential space time OFDM at high Doppler. However, there is a decrease of 2db in the performance when compared to convolutional encoded coherent space time OFDM.

Berry, Shannice & Davis, Linda  
Department of Counseling, Adult & Higher Education  
Adviser: Professor Brian Hemphill  
*A look at African American Women Organizations on a Predominantly White Campus (WORKSHOP)*

African American Women Organizations (AAWOs) on the campus of Northern Illinois University (NIU) serve as catalyst in the development of personal and professional growth to undergraduate women on campus. Each of these organizations emphasizes the positive development of self, leadership, sisterhood and service to the African American community. This session will highlight how two AAWOs on the campus of a predominantly white institution positively affect retention, persistence, and attrition rates of its members. The session will also cover how these organizations influence the development of identity as it correlates to student development. This presentation will provide information about the academic and social experiences of women in these organizations. We will discuss how these organizations have aided in the persistence, retention, and attrition of its members. We will also address how these organizations have a graduation rate exceeding 90%. Findings will be presented from a survey of members of these organizations addressing how the organization has benefitted them, what they find to be unique, and why the organization is important to them. This session will be interactive and presenters will share appropriate, practical information, and encourage audience members to present challenges or questions pertinent for dialogue by the presenters and other participants.
Blanco, Jessica K.
Department of Anthropology
Adviser: Professor Winifred Creamer
*Further analyses of San Marcos subsurface material: What material culture can tell us about demography and social complexity*

The large archeological site of San Marcos Pueblo, located in the Rio Grande Valley, has been left out from a majority of articles discussing either social complexity or demography in the Protohistoric period (AD 1325-1680). My research examines these two topics through the comparison of subsurface material culture among roomblocks at the site, specifically glaze-ware ceramic rims. Surface material has been analyzed for part of the site, providing a comparison to subsurface material. The material from each roomblock will be analyzed individually, including ceramics, bone, and other miscellaneous artifacts. Mera’s glaze-ware classification will be used in identifying the type of glaze-ware and corresponding date. Microsoft Excel will be used to input the data and better compare roomblocks. Spatial distribution analysis will be the method by which settlement patterns and complexity are identified between 1325 and 1680. This research will provide further information about the site of San Marcos and its history. Furthermore, the research is intended to encourage other scholars who focus on the Protohistoric Southwest to include and examine the San Marcos site in order to provide a broader understanding of regional complexity and settlement of the Rio Grande Valley. I expect to find slight difference between roomblocks indicating shifts in settlement patterns over time. Specifically, demography will show occupation of roomblocks while complexity will show roomblock function. Depending on the dates associated with the glaze-ceramics from each roomblock, the dates may provide a chronology of the site. Currently, I am in the process of both analyzing roomblock material and putting data into Excel. The data from six roomblocks has been entered and day by day we continue to make progress.

Brynteson, Kristin
Department of Educational Technology, Research & Assessment
Adviser: Professor Rhonda Robinson
*Exploring the use of an online support system as a teacher-centered approach to supporting curricular innovation*

This presentation will summarize the findings of a one-year case study on K-12 teachers’ use of an online support system. Teachers in K-12 schools are constantly being challenged to find new and engaging ways to teach students and help them gain the proficiencies needed to be successful in school and the world around them. According to education experts, these skills can include using technology to create, collaborate, and communicate (Ohler, 2008; Partnership for 21st Century Skills, 2004; Robin, 2006; Conley, 2007). Integrating the technology needed to help students gain these new skills can be difficult when the teachers themselves are struggling to keep their own technology skills up to date (Zhao, et.al. 2002). Current research indicates that online tools designed to provide just-in-time support and access to resources can be effective in helping teachers increase their comfort level with technology (Graves, et.al., 2009; Kopcha, 2008; Whipp et.al., 2005; Anderson &Wood, 2009). During the 2010-2011 school year, five elementary school teachers and one middle school teacher in a rural school district were asked to implement a new six week digital story creation activity that included research, writing, artistic expression, technology and student collaboration activities all linked to one of the core content areas; namely science or social studies. Instead of using a traditional one-time workshop professional development approach, an online support system was developed to provide the teachers with just-in-time access to valuable resources. The online support system included a resource website, discussion group, community email and Facebook group. This presentation will summarize how the teachers utilized the different elements of the online support system over the course of the school year and how the system helped them develop the skills and knowledge they needed to successfully implement the new interdisciplinary activity.
This paper presents the various strategies implemented at a warehouse to reduce the order picking time. The warehouse considered for this study was an old factory with many poles and walls which get in the way of storing and retrieving items. Many of the loading and unloading docks were also unusable. The items stored in the warehouse were highly seasonal. Most of the items were stored on the floor and stacked one over another. The objective of this research was to improve the order picking time. The layout of the entire warehouse was redesigned – storage locations and their orientations were modified, lane depths were optimized, new racks were introduced, items were re-slotted, etc. A combination of mixed-integer linear programming and other industrial engineering tools (such as product family classifications, Pareto charts, etc.) were applied to minimize the order picking time. After the proposed changes were implemented the order picking time reduced by roughly 33%. This paper will present the systematic procedure followed in the project to reduce the order picking time.

The design of matching circuit is discussed in many places, and the formulas for designing such circuits, for example, the formulas for the distance of a stub from the load, and the length of a stub in order to obtain the desired input impedances are derived. However, these design procedures are mostly applicable at only a single frequency. The derivation of these mathematical formulas in closed-form expressions of a two-section line is available in the literature, where the discussion is developed with the assumption that the load impedance is purely real. In this research, first of all, without the assumption that the load impedance is purely real, mathematical formulas in closed-form expressions form of a two-section line will be developed. Also, mathematical procedures will be found for designing the matching circuit not only for dual frequencies but multifrequencies. In this case, mathematical closed-form expression might not be found, however, the method for designing multifrequency matching circuit will be developed by using some optimization techniques. The goal of this research is to develop a procedure to match a frequency dependent load to a desired input impedance at multiple frequencies with any load impedance in a form of a complex number. Mathematical procedures will be developed to find the right transmission line geometry including lengths and characteristic impedances to achieve multifrequency matching.

The purpose of this research paper is to examine methods of learning batá drums, the instruments used in bembé, a structured Afro-Cuban musical style consisting of singing, dancing, and drumming. Two specific learning methods are discussed: learning through the traditional rote/aural approach and learning through Western written transcription. Embedded in Santería ceremonies, the practice of bembé shows a strong Afro-Cuban culture that ties its Yoruba root closely with Catholic elements. Both the musical style of bembé, a ritual and musical setting demanding group participation, and its traditional learning approach, which focuses on master-apprentice relationship, reflect the prominent social-cultural function bembé plays in traditional Afro-Cuban society. This particular social and cultural embedment of music determines the way musicians learn...
in traditional context. In order to become a bembé musician, one has to be part of the Santería community for an extensive ritual immersion to observe and carry out both religious and musical practices. However, the traditional rote/aural approach, a learning method natural to Afro-Cuban musicians, has created obstacles for Western-trained musicians who wish to master this complex and profound musical style. Negotiations and compromises have been made by musicians of both traditions to help bridge the gap between these two approaches. In this paper, I attempt to analyze existing pedagogical materials, including methods books and information learned from multiple master classes, to better understand how bembé can be taught and learned efficiently in a non-Cuban cultural context.

Dzuryak, John-Franklin  
Department of Geology  
Adviser: Professor Ross Powell  
*Geomorphic interpretation and recent geologic history of Lisianski Inlet, and Sitka Sound, Alaska*

During the Last Glacial Maximum (LGM) the Cordilleran Ice Sheet (CIS) advanced to the coast along southern Alaska, but not to Sitka Sound. Bathymetry, seismic reflection profiles, a piston core, and geologic map data collected in and around Sitka Sound reveal a lack of glacial features through the outer sound. Instead, volcanic features produced by Mt. Edgecumbe and influenced by changes in global sea level during the LGM dominate. Glacial activity occurred to the N and E of Sitka Sound, and Lisianski Inlet, 130 km to the NNW, is one example. It was covered by the CIS during the LGM and on retreat, ice thinned and split, retreating in two directions up and down the inlet. Current bathymetric features are being influenced by tidal activity and seasonal variations in marine productivity.

el Harrak, Lamiae  
Department of Industrial & Systems Engineering  
Adviser: Professor Purush Damodaran  
*Reduction of quality defects in manufacturing assembly*

The presentation is related to my work as an engineer in residence at Caterpillar’s Aurora (IL) facility. I will present on the different process improvements implemented in the assembly lines at Caterpillar and the six sigma project performed to reduce quality defects.

Escalante, Cristina; & Orrego, Carol  
School of Family, Consumer & Nutrition Science  
Adviser: Professor Josephine Umoren  
*The relationship between acculturation on body image and BMI among Mexican-American college students*

The U.S. has become increasingly diverse, where Latinos form part of the largest minority group. Increased diversity is related with an increase in health care related disparities. This proposed study will add to previous studies on acculturation and diet by filling the gap in knowledge, about Latinos, particularly Mexican females, as this is essential to develop culturally appropriate nutrition interventions. The purpose of this study will be to examine the relationship between acculturation and BMI (body mass index) of Mexican female college students. Several hypotheses will be considered in this study. Hypothesis #1: Current healthy eating practices of Latino immigrants will vary depending upon time spent in the U.S.; those with longer residency will demonstrate greater change. Hypothesis #2: Latino immigrants who are strongly acculturated will consume more US foods and fewer foods from their original country. Hypothesis #3: BMI of Latinos will increase with more acculturation. Furthermore, researchers have found an interest in body image in the past two decades. It is imperative to study body image since it can be a strong predictor to disordered eating as well as depression. One drawback to body image data is that it has been dominantly used in the Caucasian population. Research suggests that some Latinas may feel the pressure to be thin in the American society whereas in their Hispanic
countries the ideal is a large full bodied woman. These ideals can create confusion for some acculturated Latinas. A possible hypothesis will be to see if levels of acculturation can impact the level of body image dissatisfaction in Latina college students. Our poster session will include both of our research proposals. Methods to our study will include a survey to ask NIU Latina college students questions on acculturation, body image and weight based on a Tanita scale.

Foster, Miranda
Department of Biological Sciences
Adviser: Professor Linda Yasui
Proapoptotic strategy to kill glioblastoma multiforme cells

A proapoptotic therapy pathway is desired in the treatment of glioblastoma multiforme (GBM) in order to minimize the inflammation response of the patient that is a consequence of a necrotic mode of cell death. We propose to achieve this by using a combinatory treatment plan involving gamma radiation and cisplatin. Survival data, HMGB1 localization, caspase levels, annexin binding and expression of proapoptotic genes will be used to investigate the interaction between cisplatin and gamma radiation in U87 and U251 GBM cell lines. These results will help to determine if cisplatin is a proapoptotic chemotherapeutic agent that can be used in conjunction with radiotherapy to induce cancer cell death and potentially reduce inflammation that would occur after a radiotherapy-only treatment of GBM.

Franklin, Emily
School of Art
Adviser: Professor Andrew Liccardo
Pliable reality and the responsibilities of the photographer (EXHIBIT)

Through my photography, I create illusions of space and emptiness while exploring the reality of experience by using objects to convey narrative. Each image is delicately interrelated to create a complete portrait of an individual psyche. I use both analog processes and digital process to create hybrid work that references photo history as well as contemporary photographic issues.

Geiger, Michael
Department of Educational Technology, Research & Assessment
Adviser: Professor Lara Luetkehans
The effects of participating in a multi-media social skills intervention on the social functioning of three middle school students with IEPs

Students with emotional disturbance exhibit difficulty interpreting and responding appropriately to social situations occurring in the community, home, and school (Crick & Dodge, 1994; Gresham, 2004). Interactive multimedia instruction has advanced to the degree that it is possible to create learning environments that encourage active problem-solving and knowledge construction (Cummings, Higgins, Pierce, Miller, Boone, & Tandy, 2009). This paper will present the findings of the implementation of a specific software program, Harmony Island, and its effect on the social behavior of three adolescent males with IEPs receiving special education, assigned to a self-contained supported study hall. Using a single subject, AB, pre-post experimental design, the effect Harmony Island had on each participant’s social behavior from the perspective of multiple data sources was evaluated over three research phases (e.g. Baseline, Intervention, and Follow-up). Results of the teacher and student versions of the Social Skills Rating System (Gresham & Elliott, 1990), number of excused and unexcused absences, number of office discipline referrals, number of periods in alternative learning environment, number of points earned on performance improvement sheets plus the scores of a 4-item pre- and post-assessment were tabulated. Upon the completion of Harmony Island, each participant rated the program using a 12-item post-test debriefing assessment and a three-item post-test oral assessment. The two post-assessments provided data used to evaluate how each participant rated his interaction with this
interactive multimedia program. The results of the data evaluation were inconsistent as to the effectiveness of Harmony Island on the three participants' social behavior. Some data seems to indicate positive effects related to the development of appropriate social interactions and other data seems to indicate no improvement. The data sources evaluated were very dynamic and showed that Harmony Island may not have had any effect on the social behavior of the three participants. Future research may look to evaluate this program with a larger sample size in a more stable environment.

Han, Jinbo  
Department of Electrical Engineering  
Adviser: Professor Veysel Demir  
**Investigation of compact and dual-band design for dielectric resonant antenna**

My research is a dual band circularly polarized antenna with a small ground. The size of this antenna must be confined within 25mm×25mm with a ground plane which is smaller than 35mm×35mm. This antenna will be installed in handset equipment for Compass navigation system.

Henry, Michael  
Department of Literacy Education  
Advisers: Professors Susan L’Allier & M Cecil Smith  
**Secondary student self-selected sustained silent reading**

Secondary student self-selected sustained silent reading (S6R) was a single-case study classroom reading intervention program implemented in a ninth-grade reading class at a diverse Chicago, suburban high school. Six active participation procedures were critical to the intervention and, thus, were conducted every school day. They were (1) 100% book reading choice, (2) significant class time for reading plus 20 minute at-home reading requirement, (3) easy access to books of a variety of genres, (4) written and video recorded reading journal entries, (5) teacher modeling, and (6) small-group book sharing. Participants in the study were 21 students from a variety of backgrounds. Of the 21 students, 48% were of Latino descent; 25% were of Middle Eastern descent; 15% were first-generation Polish-American. Additionally, 19% were still participating in ELL coursework; 60% spoke a language other than English at home; 29% were receiving special education services; and 40% were on free or reduced lunch. All participants in S6R scored below average, most in the lower quartile, amongst students their age according to the Stanford Diagnostic Reading Test 4th Edition (SDRT4). Pre and post intervention data were gathered using the SDRT4 to determine literacy improvement in (1) reading comprehension and (2) vocabulary. Furthermore, pre and post qualitative teacher observation data were collected, and student self-report data were gathered through (1) metaphor completion, (2) the Rhody Secondary Reading Attitude Assessment (Rhody & Alexander, 1980), and (3) an open-ended reading questionnaire (Atwell, 2007). It became apparent early in the data analysis process that data would need to be presented in such a way to make clear S6R’s influences on (1) student reader identity, (2) student reader self-efficacy, and (3) student transactional reading, as student responses reflected these categories, and these have been shown to increase reading motivation and time spent reading.

Herrell, Kristine  
Department of Leadership, Educational Psychology & Foundations  
Advisers: Professors David Shernoff (NIU) & Elisa Shernoff (University of Illinois-Chicago)  
**Using thematic analysis to explore early career teacher experiences in urban schools**

High rates of teacher attrition and mobility occur within the first five years of teaching (Guarino et al., 2006; Ingersoll, 2001; NCES, 2009). This problem is exacerbated in urban communities, with one-third to one-half of teachers leaving within the first five years (Barnes et al., 2007). Early career teachers need support to remain within their school and the teaching profession. Yet, few studies have examined general experiences and the types of supports in place from the perspective of early career teachers in urban communities (Ramley,
The purpose of this study is to describe the process of analyzing qualitative interviews to examine early career urban teachers’ experiences. Early career teachers (N = 14; Mean years of teaching experience = 2.3; SD = 1.78) were recruited to participate in a larger federally funded project. Teachers participated in 60-90 minute semi-structured interviews focusing on effectiveness of teacher preparation, current challenges, perceptions of efficacy, and supports/resources available to new teachers. Interviews were recorded, transcribed, and segmented into coherent ideas. Using an iterative coding process, a codebook was developed (Fonteyn et al., 2008). The results highlight the process of applying the first two of six steps used in thematic analyses of the semi-structured interviews (Braun & Clarke, 2006). Specifically, the first two steps require getting to know the data and then generating and applying codes to the data. Each interview was coded independently by pairs of coders. Results will highlight the creation of a codebook, initial coding activities to enhance calibration of codes between coders, and examining agreement between coders by computing Kappa coefficients. Implications for using thematic analyses to explore urban early career teachers’ experiences will be discussed.

Higgs, Karyn
Department of Psychology
Adviser: Professor Joseph Magliano
Does phonological working memory support the comprehension of visual narratives?

A great deal of research has looked at how readers of narrative texts construct the mental representations that support comprehension. Some findings show that construction of these representations may be supported by processing in both visual and verbal working memory systems. In contrast, relatively little is known about the comprehension of visual narratives (e.g. picture stories with no words). It is unknown whether verbal working memory systems support visual narrative comprehension. This study will use an articulatory suppression paradigm to explore if verbal working memory systems are involved when viewers comprehend visual. Articulatory suppression tasks involve repeating a simple word, which utilizes limited verbal working memory resources. Engaging in articulatory suppression concurrently with a main task that also requires verbal working memory resources typically results in impaired performance on the main task. In this study, participants will view four picture stories in one of three conditions. The articulatory suppression group will repeat the word ‘the’ while viewing the narrative. Participants in the tapping condition will tap their finger while viewing the narratives. A control group will view the narratives with no secondary task. Impaired comprehension in the articulatory suppression condition compared to control conditions, will suggest that verbal working memory systems are involved in visual narrative comprehension.

Hoffman, Brittany
Program in Nutrition & Dietetics
Adviser: Professor Josephine Umoren
Barriers to fruit and vegetable intake among young adults

The objective of my research was to examine which factors negatively affect the purchase and thus consumption of fresh fruits and vegetables among young adults. My hypothesis stated that cost of fresh produce would be seen as the main barrier of purchases among participants. I designed a five-question survey in order to examine the types of fresh produce purchased by the young adults. The survey also helped determine the daily number of servings from fruits and vegetables they typically consume and what they perceived as barriers to their purchases. The surveys were conducted in a local popular department store break room. I briefly explained the purpose of the survey was to examine fruit and vegetable consumption. The participants were asked to complete the survey during their break-time or after they completed their shift. Fifty employees from one of the local chain department store were recruited to participate in the study. A total of thirty employees agreed to participate in the study, resulting in a response rate of 60%. Analysis of the data from the survey revealed that a variety of factors negatively affected purchases of fresh produce. The top barriers to fresh fruit and vegetable purchases included cost, storage, and flavor. Cost had a response rate of 47.8%, storage had a response rate of 34.7%, and flavor had a response rate of 26%. The fruits and
vegetables participants reported as most frequently purchased and consumed were the lower-cost items, which included apples, bananas, carrots, and lettuce. Each produce item had a response rate of 80%, 60%, 46.6%, and 36.6%, respectively. I concluded that within this small group of young adults, cost was shown to be the main barrier to fruit and vegetable consumption, therefore, agreeing with the hypothesis. More research and a larger group of participants could help strengthen these results.

**Keefe, Brian, & Davidson, Zach**  
Department of Biological Sciences  
Adviser: Professor Gabriel Holbrook  
*Using microalgae in waste water as feedstock for biofuels*

We extract the lipids in microalgae to make biodiesel fuel by growing them in 100 gallon pools of effluent until they get to a good density. The effluent is obtained from the water treatment plant and is generally high in nutrients like phosphate and nitrate. Measurements of algae density are taken using a secchi depth, absorption at 680nm, and hemocytometer readings. Nutrients readings of phosphate and nitrate are obtained to see how fast the algae are using up its nutrients. Ferric chloride is used filter out the algae, which is then dried extractions are run on it using methanol, hexane, ethanol or other solvents to extract lipids. The research shows promise with methanol and hexane or some combination of both. The goals of my research is to continue to find a better way to grow the algae at higher densities in an open environment and find species which give a good balance between predator resistance and oil percent, and find a way to extract the lipids at a higher yield.

**Kopp, Kristopher J.**  
Department of Psychology  
Adviser: M. Anne Britt  
*Goal driven decisions of argumentation*

In academic settings, reading is often done with the goal to complete some task such as to study for a test, prepare for a lecture, or gather information to write an essay (Snow et al., 2002). Such tasks usually require students to use multiple sources of information. For example, to complete an essay assignment, a student may turn to the internet and they may find multiple websites that could contain useful information. As such, it is helpful to have goals that could drive decisions regarding things like the type of information to use, where to find this information, and how the information would be used to complete the task (Rouet & Britt, 2011). The intent of this study was to provide a descriptive landscape that depicts the types of goals that readers have when they engage in a task that requires them to use information from multiple sources to write an argumentative essay. All participants were asked to write an argumentative essay on a current and controversial topic. They were provided with a set of documents that provided them with information on the topic from a variety of sources. A pre and post-essay goal inventory assessed the types of things that readers used to guide their decisions regarding relevant information. Preliminary results suggest that prior to the essay task readers were heavily focused on finding information that would support their side of the argument from unbiased sources. After the task, the goals seemed to expand to considering the counter arguments and additional source features (e.g., corroboration, date, expertise). These results will be discussed with regard to the types of documents that readers with varying goals selected and the type of information that they chose to use in their essays.
Kuban, Kaylee  
Department of Biological Sciences  
Adviser: Professor Bethia King  
*A parasitoid wasp finding and choosing a mate*

Many animals reproduce sexually, which requires locating and choosing a mate. In this study, we looked at several ways that the parasitoid wasp *Urolepis rufipes* potentially finds and chooses a mate. *U. rufipes* males drag their abdomens along a substrate, making marks that may contain a sex pheromone. When not allowed to contact marks, virgin females preferred the side of a T-olfactometer containing marks at 10 min, but not at 24 h. However, virgin males did not respond to marks at any of the tested times. Hosts are often clumped so, where one wasp has emerged (i.e., a potential mate) it is likely that another will. Both virgin and mated males spent more time on hosts that males emerged from than hosts that females emerged from. In contrast, females did not distinguish between such hosts. The presence of a host from which a male emerged also caused virgin males to mark more, whereas mated male marking was unaffected. Finally, parasitoid wasp mating behavior after a mate is located was examined. With live females, a male’s mating status did not affect how quickly he mated. However, mated males were quicker than virgin males to contact and mount a dead female, suggesting an affect of female behavior. Mating behavior was also tested by looking at the second-to-mount male’s ability to copulate with a female. Often when one male has mounted a female, a second male will simultaneously mount the first mounting male. Who succeeds in copulating with the female? Being first to mount was no guarantee that a male would have exclusive access to a female even when he remained on her. Second mounting males were often still able to copulate with the female despite the first male’s presence.

Lagattolla, Christine  
Department of Leadership, Educational Psychology & Foundations  
Adviser: Professor Jennifer Schmidt  
*Outdoor adventure activities as educational experiences for college students*

The purpose of this study was to elicit participants' expectations, experiences, and reflections pertaining to a voluntary outdoor adventure (OA) trip and to discern whether self-determination theory is applicable for framing participants' responses. This study explored themes of autonomy, competence, and relatedness which are deemed by self-determination theory to be critical for students' psychosocial development. Data were collected from seven participants on a 6-day collegiate rock climbing and backpacking trip in the midwestern US. Data were collected using interviews conducted before, during, and after the trip; focus groups; program evaluations; and participant observations. Autonomy, competence, and relatedness varied for each participant before, during, and after the trip and relatedness was a dominant theme. Results suggested that OA could provide opportunities for participants' development of self-determination. Self-determination theory was demonstrated as a valid theme for understanding outdoor adventure activities. Implications for the field of adventure programming are discussed.

Lemmer-Webber, Morgan  
Program in Art History  
Adviser: Professor Sinclair Bell  
*Recovering a lost history: Two roman stucco reliefs from the Art Institute of Chicago*

This study considers the history and iconographic significance of two Roman stucco reliefs in the Art Institute of Chicago’s Ancient art collection. The design and composition of these little known works makes them of interest to a wider audience. However, the Institute possesses astonishingly little information regarding their subject matter, medium, function, or provenance and no research on them has been published to date. The goal of this study is first to attempt to fill in these gaps and second, and more broadly, to open a dialogue about the current state of research on these and related images. The primary difficulty in researching these works, as in so much ancient art, is their unknown provenance. Since these images were donated from a private
collection, the history of the reliefs before their arrival at the museum is vague. While the lack of provenance is a hurdle to understanding any artwork completely, it is particularly detrimental in the case of stucco reliefs as they were never intended to be seen outside of their original viewing context. Crucial information regarding their date, the nature of their imagery, source of patronage and function were lost when they were cut from the walls. Lacking this information, we are left instead to fill these gaps through comparison with the materials, style, craftsmanship and subject matter of other extant Roman reliefs. The reliefs in the Art Institute are both white stucco figural reliefs on a blue background. The first depicts a woman flanked by two stags in a heraldic pair, while the second depicts a seated woman facing a griffin. The iconography of these figures is perplexing, the pictorial tradition with which they most resemble is that of maenads, the female followers of Bacchus; however, these reliefs lack the standard attributes of maenads.

Lim, Siew Lian  
School of Art  
Advisers: Professors Lee Sido & Eric Jones  
Preservation and practice of Wayan Kulit in Mayasia: Interviews with four dalang

This field research on Wayang Kulit Shadow Puppet Theater in Malaysia, from June 3 to June 27, 2011, consisted of interviews with four practicing puppeteers (dalang) who perform Wayang Kulit, to determine its status in contemporary Malaysia, where it has been seen as dying. One puppeteer, Pak Majiid from the state of Kedah; performs a Malay version of Thai shadow puppetry. The other three puppeteers were from Kelantan - Pak Dain, Eyo Hock Seng, and Pak Soh - all who perform variations of Traditional Kelantanese Shadow Puppet Theatre. These interviews covered how each puppeteer was trained, how closely they follow their traditions as opposed to adapting their performances for modern audiences, and their prognosis for Wayang Kulit’s survival in modern Malaysia. During this field study, the researcher had the opportunity to observe a Wayang Kulit performance, take photographs, and participate in a crafting and performance workshop with one puppet master. All of the puppeteers include traditional stories from the Malay version of the Hindu myth The Ramayana in their repertoire. But Pak Majiid and Eyo Hock Seng also perform modern stories utilizing improvised clown puppets that appeal to modern audiences with humor, and they receive many invitations to perform at various public events. The main problem facing Wayang Kulit is not how to attract audiences, but preparing a new generation of puppeteers to continue this tradition, Young people are discouraged by a lengthy apprenticeship to a senior puppeteer. Some puppeteers train students from other countries, who perform and teach the art back in their homelands. Others teach aspects of this art form in universities and other educational institutions with government sponsorship. The key to survival of Wayang Kulit in Malaysia is to create awareness and appreciation of this localized art form in the modern country at large and internationally.

Lim, Siew Lian  
School of Art  
Adviser: Professor Lee Sido  
Echoing universal balance (EXHIBIT)

From plastic food wrappers, plastic bottles, aluminum soft drink cans, and other refuse material I create stationary silent shadow puppets that move, breathe, and speak for themselves. They express spirituality in human terms - “Humanistic Spirituality” - concepts of balance between humans and the environment and balance within by taming and training the wild mind. They speak through their materials, their gestures and positioning, and through their shadows My free standing crafted pieces and shadow sculptures are inspired by the shadow puppetry of Southeast Asia in which the crafted pieces are used to tell a story. One set of three pieces, Restoring Balance to Gluttony and Waste by Word, is modeled after three major characters from the Hindu myth, The Ramayana, - Rama. His wife, Sita, and the monkey king, Hanuman, as portrayed in Javanese Wayang Kulit shadow puppetry. These figures are made from beverage containers with printed text that encourages excessive consumption -- material that is mindlessly discarded after use. One independent figure portrays the legendary ogre king from The Ramayana, Ravana, as he is portrayed in the Wayang
Kulit of Kelantan, Malaysia. His garments are made from the wrappers of a brand of ramen noodle that was recently recalled in Malaysia because of suspected contamination by plastic chemicals. One smaller figure, Rama, as portrayed in the Wayang Kulit of Bali, Indonesia, is made from repurposed plastic file folders. All of these figures tell of how we are poisoning ourselves and the environment. The final figure is a life-sized cowgirl representing the first stage of mind training that uses the taming of a wild stallion as a metaphor for the untrained mind to restore inner balance.

Loeschen, Sue
Program in Curriculum & Instruction
Adviser: Professor Elizabeth Wilkins
Generating reflection and improving teacher pedagogy through the use of cognitive coaching in a mentor/beginning teacher relationship

The purpose of this phenomenological study was to explore the mentor experience using the Cognitive Coaching process (Costa & Garmston, 2002) to gain insight as to how this process influences pedagogical proficiency. This study examined whether there was an increase in critical self-reflection resulting in a refinement in teacher pedagogy.

LoSavio, JoAnn
Department of Anthropology
Adviser: Professor Giovanni Bennardo
An American cultural model of nature: A pilot project in northern Illinois

The poster presented summarizes the current stage of a progressive multi-year URAP linguistic study on the perceptions of nature and the environment held by Americans. Under the supervision of Dr Giovanni Bennardo, undergraduates Maria Rangel, Curtis Valasek and JoAnn LoSavio carried out this study. The objective of this study is to tease out the American Cultural Model of Nature, using Northern Illinois University (students) as a pilot case. From transcribed interviews, we performed a key word analysis, gist analysis and a metaphor analysis. These analyses inform the cultural model of nature we have found. At this stage, the study is currently ongoing and our final conclusions have not yet been made. In the final stages of this study, we will check the cultural model against reasoning passages and conduct a consensus analysis. The results of this study will contribute to our society in multiple ways, direct and indirect. In the former, our preliminary results confirm past studies and thus add to the growing scholarship on environmental studies. In the latter, our study draws attention to the growing need for concern regarding the health of our environment.

Malekfar, Lily
Department of Anthropology
Adviser: Professor Daniel Gebo
An analysis of the Klasies River hominins using a hybrid model

Current research indicates that modern Homo sapiens originated in East Africa and then migrated across Africa as well as out of Africa, where they encountered archaic hominins. The Klasies River Main site (KRM) in South Africa is one location where there is evidence that modern and archaic Homo sapiens may have interacted. As Smith and other researchers have suggested, the KRM mandibular sample, in particular, exhibits significant size and morphological variability, which counters claims that the KRM specimens are fully modern. The null hypothesis predicts that KRM’s range of variation does not significantly differ from the ranges of variation indicated in the comparative samples, including Sima de los Huesos, Krapina, Skhul, Qafzeh, and the Northern Illinois University (NIU) Collection, the latter containing specimens classified as modern Homo sapiens from India. If the null hypothesis is rejected, this would be tentative support that the KRM sample may possibly be a hybrid sample. This study examines first and second mandibular molar lengths and widths as well as mandibular corpus height and breadth in adult hominins. Molar and mandibular dimensions in the KRM
sample and NIU Collection are measured using manual and digital Mitutoyo calipers to ensure values are read correctly. Measurements for the remaining samples are obtained from the literature. The results demonstrate that the KRM sample is markedly more variable than the comparative samples. Future research can shed further light on KRM’s variability once mandibular specimens are uncovered at African sites, including Elandsfontein, Florisbad, Jebel Irhoud, and Laetoli.

Maney, Catherine  
Department of Educational Technology, Research & Assessment  
Adviser: Professor Pi-Sui Hsu  
The use of guided reflection in high fidelity simulation to develop clinical judgment in pre-licensure nursing students

In 2010, the Institute of Medicine released a report on the status of nursing education in the United States. Recommendations were based on the fact that the health care environment is rapidly becoming increasingly complex, and that professional nurses must have the skills to meet the needs of patients who are more acutely ill. This can be accomplished through the acquisition of increased collaboration, teamwork, and decision-making skills. Dr. Christine Tanner has defined clinical judgment in nursing as a skill that requires an interpretation or conclusion about a patient’s needs, concerns or health problems, and/or the decision to take action (or not), to use or modify standard approaches, or to improvise new ones as deemed appropriate by the patient’s response. High Fidelity Simulation (HFS) is a learning method that employs high fidelity simulators (manikins) to mimic realistic human functions, such as heart sounds, respirations, pulses, and eye blinking. During HFS, students are expected to solve a health problem that is manifested by the simulator as they work in teams. Following the simulation, students are led in discussion (facilitated debriefing) by a faculty member using guided reflection. This study proposes an experimental design to determine to what extent the use of guided reflection helps develop clinical judgment in pre-licensure nursing students. Pre-licensure students in the first semester of their nursing program will be randomly assigned to two groups. The control group will receive a lecture based method of debriefing, while the treatment group will participate in a guided reflection debriefing. Pre and post-test measures of clinical judgment will be obtained to determine whether clinical judgment resulted in a statistically significant gain in clinical judgment. Data will be analyzed using a dependent samples t-test.

McFarland-Wilson, Beth  
Department of English  
Adviser: Professor John V. Knapp  
Narrative physics and cognitive processes in Richard Powers’s ‘Prisoner’s Dilemma’

Although questions about authorial intention often and quickly end a literary conversation, Richard Powers’s novel, Prisoner’s Dilemma, provides a means by which we may address the subject more willingly. Using a family systems interpretation and also Alan Palmer’s theoretical model of social minds in fiction to describe what I call the narrative physics of Powers’s story, I explain how the author’s purposes are revealed. Family systems theory, a sociological model describing the matrices of human transactions within the family, first helps to explain the Hobson family’s behavior throughout the novel. I also rely upon Palmer’s narratological theory to establish how the author, fictional characters, and the reader cognitively process narratological events to create meaning. Then, I decrypt the disjuncture in the novel’s narrative layers and unravel a critical question about the work: Who is the fifth child in the story’s family of four children? In doing so, I explore how Powers movingly inserts his own voice into the Hobson family dynamic as he responds to their collective character. In blending and delimiting himself as author, narrator, character, and person, Powers creates a Möbius effect of dynamic constructs through which the multiple voices of the narrative meld with his own life and voice. Ultimately, in applying family systems theory and Palmer’s explanations of the fictional social mind, I show that Powers’s intention is relevant to how we interpret and evaluate the form, structure, and thematic contexts of his novel. In an age where critical analysis is inclined to divest a work of its creator, Powers takes a bold step in connecting his life with his art. His authorial intrusion into his novel reminds us that a literary
work can have everything to do with text and audience and author, and that assessing authorial intention is an illuminating and legitimate critical approach.

Moran, Rachel  
Department of Biological Sciences  
Advisers: Professors Carl von Ende & Bethia King  
*Mate choice copying in two species of darters*

One of the fundamental questions in the study of sexual selection is how an individual chooses a mate. An individual’s fitness is most frequently quantified by reproductive success, so determining who to mate with may be the most important choice an animal will make in its life. Mate choice copying can be defined as an increased likelihood of choosing a prospective mate due to an observed sexual encounter between that prospective mate and another individual of the opposite sex. Mate choice copying has been traditionally thought of as an act carried out only by females, since females invest the most into mating by carrying the eggs and caring for offspring in many taxa. However, the sex which is the choosiest has been shown to differ in several species of fish, depending on which sex has the most to lose from choosing a less fit mate. Darters in the genera Etheostoma (Teleostei: Percidae) have become popular research subjects in the area of sexual selection. Darter spawning behavior can be divided into four categories based on egg deposition: buriers, attachers, clumpers, and clusterers. Only clumpers and clusterers provide male parental care. Using E. zonale and E. flabellare, two species of closely related darters with different levels of parental care, I will test whether an initially less preferred male or female can be made more attractive to the opposite sex by showing the less preferred individual associated with a prospective mate using dichotomous mate choice trials for both males and females. Differential investment in reproduction between the sexes in both of these two species and previous evidence supporting mate choice copying in species with high cost of reproduction lead to two independent predictions: mate choice copying in both sexes of E. flabellare but only in females or in neither sex in E. zonale.

Muehsler, Hans  
Department of Educational Technology, Research & Assessment  
Adviser: Professor Thomas J. Smith  
*An analysis of a stress staff survey at a large suburban high school*

During the spring of 2011, a stress survey was administered to the staff of a large suburban high school. Quantitative analyses were performed on the data. Seven research questions were developed and answered. Only four will be discussed in this presentation, however. The research questions centered on individual stressors and corresponding demographics, agreement between job satisfaction and stress level, which stressors fit well together, and which stressors relate well to the overall stress level. The common emergent themes were time, change, respect, and communication.

Mustafa, Asmaa  
Department of Biological Sciences  
Adviser: Professor Gabriel Holbrook  
*The degradation of rubisco during senescence of soy beans*

My research is in the field of plant physiology and plant biochemistry. I am monitoring the activity of CA1P, a competitive inhibitor of rubisco. Rubisco is a very important plant enzyme that is involved in the first step of photosynthesis, and it is also the most abundant protein in the world. CA1P competes with RuBP for the same active site on rubisco in the absence of light. The ability for CA1P to bind so greatly to rubisco is what makes this substrate of such interest. Leaves of a pea plant and pinto bean plant of similar age are cut and placed with water in petri dishes. Two petri dishes from each plant will be taken, one dish placed in complete darkness and the other in complete light for different times over the span of a week. After each time chosen is
finished the leaves will be placed in liquid nitrogen to keep the plant and enzymes from degrading, and then a bioassay will be performed and enzyme activity will be recorded using radioactive carbon. This is done to see if the leaves senesce more or less in light versus dark environments, and if CA1P’s inhibition can be useful or harmful. Information on how plant enzymes and inhibitors work are very important in agriculture because knowledge of their benefits can lead to greater crop yields and thus less world hunger.

Neuhoff, Brandon  
Department of Mechanical Engineering  
Adviser: Professor Nicholas Pohlman  
**Pneumatic conveyance of biomass**  
The Illinois Department of Agriculture, in collaboration with NIU’s Mechanical Engineering Department, is investigating a variety of methods for conveying biomass. Biomass is used as a fuel in the gasification process—an alternative to combustion where fuel is converted more efficiently into heat energy. Additionally, gasification produces far less of the harmful particulate matter emissions that are produced as a result of combustion. This biomass is considered waste on most conventional farms, and is simply left to naturally decay in fields. Currently, the problem is that biomass has such low energy density. Transporting over 150 miles to a central facility is neither cost effective nor energy sustainable. Thus, the goal of this project is to develop an automated pneumatic system for conveying the biomass that can be implemented at the local farm level. The conveyor system consists of 4 main components: a blower, a particle separator, ducting, and an end effector. The biomass begins in an arbitrary storage container, and is first extracted into the end of the conveyor. A variety of end effectors are being investigated, in order to determine the optimum size and orientation. The biomass will then travel though a brief portion of ducting before entering the particle separator. The particle separator removes the biomass from the conveying fluid (air). The air returns to a filter and back to open atmosphere. The biomass particles drop into a storage location where the mass is measured with respect to time. In order to establish the design parameters for an optimized pneumatic conveyor, a variety of parameters will be investigated. There will be multiple duct diameters and nozzle sizes tested for performance and efficiency. Additionally, the system is design to traverse through an x, y, and z axis. Assuming the surface is level, the end effector will traverse over the entire surface in a pre-determined path, then increment down and remove subsequent layers. Also, sensors are being implemented to recognize gradients in the surface of the biomass particles, which will allow the conveyor to traverse over uneven surfaces without clogging.

Owens, Kathryn  
Department of Biological Sciences  
Adviser: Professor Linda Yasui  
**Necrosis induction by various radiation modalities in human glioblastoma multiform tumor cells versus normal human astrocytes**  
A morphology of cell death (MCD) data base was generated to determine the mode of cell death induced in normal human astrocyte (NHA) and brain cancer (glioblastoma multiforme or GBM) cells. Inducers of cell death included gamma irradiation, fast neutron irradiation, a mixed neutron beam containing thermal neutrons and gadolinium neutron capture. Analysis of the MCD database has already yielded significant therapeutic implications; fast neutron irradiation induces necrosis which likely contributes to a lethal side effect called radiation gliosis while the other radiation modalities do not induce necrosis above background levels. The highest clonogenic cell death was observed for GBM cells irradiated using gadolinium neutron capture. These data suggest that gadolinium neutron capture is the most effective of the 4 radiation modalities tested at killing GBM cells and it does not induce necrosis. The lack of radiation-induced necrosis should benefit patients by reduction or elimination of a lethal side effect, radiation gliosis.
Paver, Jonathan  
Department of Educational Technology, Research & Assessment  
Adviser: Professor Wei-chen Hung  
Factors influencing the integration of technology by community college adjunct faculty

Educational technology has fueled instructional innovation at community colleges by creating engaging and collaborative learning environments, enhancing instructional methods, and providing greater access to instructional materials (Green, 2007; Jackowski & Akroyd, 2010). Although there have been a substantial number of studies on technology integration in education with a variety of populations (cf. Ajjan & Hartshorne, 2008; Inan & Lowther, 2010; Yuen & Ma, 2008), there is a significant gap in the literature related to understanding why community college adjunct faculty integrate educational technology. Given the large number of adjunct faculty teaching at community colleges and the benefit of using technology for instruction, it is important for the field of educational technology to understand more than if adjunct faculty are using educational technology, but why they are using technology for instruction. The purpose of this correlational study was to examine the factors that predict intention to integrate technology into instruction by community college adjunct faculty using the decomposed theory of planned behavior. The decomposed theory of planned behavior measures the strength of specific constructs as predictors of intention to perform a certain behavior. The specific behavior under consideration in this study was the integration of technology into instruction within the next year. The dependent variable was defined as the intention to integrate technology into instruction beyond simple occasional use. The major constructs of the decomposed theory of planned behavior model served as the independent variables and were defined as attitude, subjective norm, and perceived behavioral control. Additionally, this study explored the influence of demographic characteristics on the intention to integrate technology for instruction by community college adjunct faculty. Initial findings of this dissertation research study will be presented.

Persino, Philip  
Department of Biological Sciences  
Adviser: Professor Gabriel Holbrook  
Lipid extraction from algae as a potential source of biofuel

The use of biofuels from renewable resources is a popular topic of contemporary times. The growing need for a renewable energy source is ever pressing on the modern petroleum producer and consumer alike. The use of heterotrophic microalgae and filamentous algae as an oil source in the production of biodiesel is a very feasible option. Oil extraction from these algae can be done in a myriad of ways. Experiments in our lab have been performed on oil extraction by oil press and also by numerous different solvent systems. The oil obtained from these experiments has been quite dirty, which poses a great challenge in the conversion to biodiesel. Ongoing experiments are attempting to clean the oil without removing any of the necessary components. The quality of these different extraction and cleaning processes have been closely monitored with the use of Thin Layer Chromatography. The need for clean oil is vital in the final step of the conversion of it. Biodiesel is produced by the transesterification of mono/di/triacylglycerols. This transesterification is typically done in either acidic or basic conditions, along with and alcohol reactant (methanol). The end product of these reactions is a fatty acid methyl ester, or more commonly known as biodiesel. It is important to have mainly substituted glycerol molecules with the reaction. Other compounds, such as free fatty acids, can cause saponification reactions which hinder the quality of the fuel produced. The extraction, cleaning, transesterification and most efficient way of doing all of this is still an ongoing affair within the laboratory.
Pientka, Valerie
Program in Curriculum & Instruction
Adviser: Professor Elizabeth Wilkins
Second-stage teachers and pedagogical content knowledge in a mentoring relationship

The purpose of this phenomenological study is to examine the pedagogical content knowledge (PCK) of second-stage (years 5-10) teachers involved in mentoring relationships with beginning teachers. This study aims at identifying how second-stage mentor/teachers view, interpret and construct their PCK; what themes emerged during a student work sample analysis, and the aspects of the mentoring relationship that promote PCK development for the second-stage teachers. Three theoretical lenses were used for this study: social constructivism, teacher development theory and pedagogical content knowledge. Vygotsky’s (1978) socio-cultural perspective, the zone of proximal development (ZPD), provides the context for understanding the teacher/mentor role in the mentoring relationship. Black and Ammon’s (1992) teacher development model was selected as the teacher development theory because of its’ systems thinking format and constructivist approach. Shulman (1986) defines PCK as a deep understanding of content, connections with concepts across disciplines and with everyday life, and common student misconceptions. Four, second-stage teachers participated in this qualitative study that utilized Seidman’s interview protocol. The focus for discussion during interviews was a student work sample analysis that occurred between the second-stage teacher/mentor and the beginning teacher. The student work sample analysis is an interactive, objective, data-based, teacher-driven activity that engaged the mentor as facilitator while enabling the beginning teacher to reflect upon student performance indicators. Data revealed that each study participant built their PCK understandings on personal educational experiences, either prior to their teaching career or during the first year of teaching. These PCK perceptions then became the primary lens used to guide their mentoring relationships with beginning teachers. Generally, participants also identified the mentoring relationship as an important factor in strengthening their understanding of PCK components.

Pulvermacher, Bob; Orbon, Stephanie; Durik, Amanda; & Aciher, Thomas
Department of Psychology
Adviser: Professor Amanda Durik
Individual differences in motivation and relationship to outcomes in runners

The purpose of this study was to examine whether individual differences in achievement strivings predict the ways in which individuals identify with and experience an athletic leisure activity (McClelland, Atkinson, Clark, & Lowell, 1958). This study investigated the relationship between need for achievement and fear of failure, and several variables related to motivation for running. Respondents were members of running clubs preparing for a marathon (N = 122; 70% women). They completed the measures online after being contacted through surveys for running groups in the Northern Illinois area. Participants first completed the trait measures and then several measures tapping into attitudes towards running, including commitment to running, identification as a runner, and ability to bounce back from injuries and set-backs. Correlations showed that need for achievement was positively associated with identity as a runner (p < .05), whereas fear of failure was negatively associated with commitment to running. In other words, these achievement traits may shape whether individuals see themselves as part of achievement activities and the depth with which they are willing to commit. Moreover, fear of failure negatively predicted runners’ ability to “bounce-back” from setbacks that runners face (e.g. injury, loss of motivation (p = .04)) but need for achievement did not (p > .05). Individuals who are concerned with failure may have problems responding to typical setbacks, which could impact their long-term engagement (Elliot & Church, 1997). Taken together, the separate relationships observed for need for achievement and fear of failure suggest that both achievement traits contribute uniquely to understanding how individuals conceptualize and experience running as an activity.
Raheem, Malik  
Department of Counseling, Adult & Higher Education  
Advisers: Professors Scott Wickman & Charles Myers  
*Investigating multicultural competence in supervision with counselor educators*

In this study, the relationship between racial/ethnic identity development, multicultural competence and comfort, and awareness of racial microaggressions with counselor educators is being studied. Counselor educators are responsible to train and evaluate counselors-in-training to be competent in providing multicultural competent counseling services to clients and to ensure that their counselors-in-training are multiculturally-competent counselors. A hierarchical linear regression model was created on 120 counselor education and supervision doctoral students and counselor educators within three years of completing the requirements of their doctorate to investigate relationship between the various variables. For over 30 years, the American Counseling Association (ACA) and the Council for Accreditation of Counseling Related Educational Programs (CACREP) accredited programs have emphasized multiculturalism and social justice in preparation in the counseling profession (ACA, 2005). Multicultural counseling movement has revolutionized the way that counselors have traditionally been trained to think about mental health and approach clients (D’Andrea & Heckman, 2008). In training counselors, focus is placed on helping clients examine their issues in counseling. The emphasis in multicultural counseling competence is facilitating students that are fearful and unaware in addressing personal biases by assisting students to confront personal biases (Arredondo, Tovar-Blank, & Parham, 2008). The primary focus of this study is counselor educators and supervisors and counselor educators and supervisors-in-training. A counselor educator and supervisor, for the purpose of this study, is an individual that has completed advanced professional preparation in counseling and has earned a doctorate degree with the intention of becoming a university faculty in counselor preparation or an advanced clinical counselor and supervisor (ACA, 2005). A counselor educator-in-training, for the purpose of this study, is an individual currently in the process of completing the academic requirements for the doctorate in counselor education and supervision (ACA, 2005). I will use two instruments to measure the constructs of ethnic identity and multicultural competence. Ethnic identity will be measured with the Multi-group Ethnic Identity Measure (Phinney, 1992). Multicultural competence and comfort will be measured with the Multicultural Supervision Scale (Sangganjanavanich, 2008). The variable of racial microaggressions will be measured with vignettes created from the literature and based on Racial Ethnic Microagggression Scale (REMS) created by Kevin Nadal (2011).

Rex, Liz  
School of Art  
Advisers: Professors Kryssi Staikidis & Kerry Freedman  
*Art in everyday places: Transforming adult identities as non-artists*

Adult assumptions about their identities as artists provide insights into the far-reaching effects of formal and informal art education experiences. The purpose of this study is to determine if participation in a curriculum that broadens traditional definitions of art to include everyday artistic behaviors of making special, art in everyday places, and vernacular art environments will positively affect adult connections to art. The main research question that will be addressed through this study is 1. What is the effect of a vernacular art curriculum and teaching on adult identities as artists? For this research, a phenomenological case study will be used to do an in-depth analysis of the experiences of a particular group of adults who identify as non-artists. Participants for this study are adults who choose to take part in an art class offered and designed by the researcher. Pre- and post-interview surveys will be used to determine if participants’ artistic identities are transformed through their experiences in the class. Additional qualitative data collection strategies that will be used for this research include researcher field notes, video documentation of class sessions, and video documentation of one-on-one interviews as well as elicited participant reflective journals, art objects and photographs. Data collected will be analyzed on an ongoing basis through transcription, data reduction, and coding for emerging themes. The findings from this study will provide insights into the formal and informal educational experiences that have affected adult identities as non-artists. Participant reports on the educational situations that have contributed to
their development as artists in adulthood may provide the field with an understanding of the long-term effects of art education experiences. Participants’ reported transformations might provide the field of art education with insights into the types of learning that encourage a lifelong engagement with art.

Robins, Susan; & Adams, Courtney  
School of Family, Consumer & Nutrition Science  
Adviser: Professor Amy Ozier  
Food pantry nutrition education intervention

The purpose of this quasi experimental study is to provide healthful recipes and nutrition education to a food pantry population to identify if knowledge and perceptions of healthful foods and recipes changes, and if self efficacy related to making healthful meals improves post intervention. This study is needed because currently, healthful foods and nutrition education in food pantries is not greatly utilized. The hunger obesity paradox exists in this population where there are times when pantry clients are food insecure and/or hungry, yet they are also chronically overweight or obese. This study can provide evidence that public health initiatives focusing on providing increased nutrient dense foods and nutrition education in this population impacts behavior change. The intervention was conducted at a food pantry associated with the Northern Illinois Food Bank. A sample of a recipe featuring a whole grain ingredient and nutrition education focusing on whole grains was provided as clients waited to receive their food. Participants were provided with the recipe ingredients and recipe card to encourage them to make the recipe at home. Three evaluations were implemented. A pre intervention questionnaire was used to measure clients’ opinions on the recipe, and determine baseline self efficacy for cooking healthful recipes when they received the sample recipe but before they received any nutrition education. A second evaluation was implemented one week after the recipe intervention. This evaluation provided feedback on the recipe itself, cooking difficulty or ease, and to determine any change in cooking whole grain self efficacy and knowledge gain. The final evaluation, given five weeks after the original recipe sample, determined any improvements or retentions to self efficacy or knowledge. A control group from a different pantry was used to provide a comparison for baseline self efficacy and knowledge. If this is a successful study, this type of intervention can prove to be a model for other food pantries. The information from the study will potentially help improve the services offered at the food pantry.

Rodriguez, Aldo  
Department of Counseling, Adult & Higher Education  
Adviser: Professor Jorge Jeria  
The role of homework in developing adults’ self-directivity and self-efficacy

The presentation focuses on the impact of homework on adult learners’ self-directivity and self-efficacy. The research has two dimensions: a vast literature review on the topic and a quasi-qualitative research in a specific country: Uruguay. In the literature review, the aim is to understand the rationale of homework in adult education instruction and the swinging among scholars between favoring it and discarding it. The characteristics of homework are also explored and contrasted with the characteristics of adult learners to see how they both fit. This literature review provided the research with a compilation of the literature on the topic that was scattered and did not address the topic directly. In the quasi-qualitative research all the educational actors in the public educational system of adult learners in Uruguay were interviewed or surveyed. The Uruguayan government supported this research as part of the policies they are creating to improve the educational system. The students and teachers were given a questionnaire whose questions’ goals were to see the connection between classroom teaching and homework, the promotion of self-regulation, and if by doing homework the learners had better performance. The mentor teachers, supervisors and school principals answer questions based on their observations of classroom work, class management, and student’s performance. As a conclusion there were many topics for discussion that resulted from the research project such as the dichotomy between theory and practice, the multi-dimensional perspective teachers and administrators have, or the different purpose of homework among the actors intervening in the teaching/learning transaction.
Steffens, Brent  
Department of Psychology  
Adviser: Professor M. Anne Britt  
Task instructions: Interest, motivation, and the potential for bias

An emergent pedagogical technique being used by history teachers is for students to practice comprehending and integrating information across multiple source documents that were written for different purposes and from varying perspectives (primary, secondary, personal accounts). One major influence on a student’s reading strategy is the type of task that is being completed (McCrudden, Magliano, & Schraw, 2010; McCrudden & Schraw, 2007). Tasks must be constructed carefully because they will guide relevancy decisions, which in turn will decide what information will be deeply processed and integrated (Rouet & Britt, 2011). The current study explored the effects of being given instructions to “take a side” (De La Paz & Felton, 2010) versus “understanding the different perspectives” on comprehension and intra-textual integration (non-explicit between text connections), as well as interest and motivation. Preliminary results from 66 undergraduates suggest that prompting students to take a side is less effective at creating a more complete mental representation than prompting students to consider different perspectives about a historical event. There were no differences in interest and motivation. We will discuss the results of these and other manipulations and how they seem to help high school students to integrate information across multiple documents.

Thompson, Andrew  
Department of Biological Sciences  
Advisers: Professors Melvin Duvall & Melissa Lenczewski  
Don’t drink the water: Isolation and molecular serotyping of salmonella spp. in the Yucatan peninsula

Because of the karst geography of the Yucatan Peninsula area, very little filtration of water occurs as it soaks into the ground. This causes any contaminants, such as chemicals, bacteria, and other pollutants, to be transported directly into the underground water systems from which the drinking water for the region is derived. While some research has been done on the types of contaminants, very little has been done on the strains of Salmonella—of which only some are pathogenic. By identifying common strains of Salmonella in the region, steps can be made to assess the threat levels of certain regions and work towards cleaning them up. To do this, samples were collected from several drinking wells, water treatment plants, and cenotes (sinkholes) and tested for the presence of Salmonella by using biochemical media as well as polymerase chain reaction (PCR) on DNA extracts. Both were used because the media is more of a qualitative method with can have confusing or false positive. By taking the colonies that are indicated as Salmonella, the DNA can be extracted and, through PCR, be confirmed as Salmonella or not. Additionally, using the PCR method, the specific serovars (serotype variation) can be determined, which reveals more information about the bacteria—specifically its pathogenicity (e.g Salmonella (Genus) enterica (species) enterica (subspecies) typhi (serovar) is Typhoid Fever). Although the results are still preliminary and further research is being done, six of the eighteen sampled site have been positive for S. enterica subsp arizonae (reptile-carried pathogen), S. enterica subsp houtenae (associated with bacterial meningitis and opportunistic pathogen), and several others that are waiting identification. Further work will attempt to develop quicker methods for Salmonella identification by means of electrospray ionization (ESI) or matrix-assisted laser desorption/ionization (MALDI) mass spectrometry using the lipopolysaccharides containing serovar-specific antigens.

Wadhwa, T.S.  
Program in Audiology  
Adviser: Professor King Chung  
Effects of transient noise reduction algorithms and compression on impulsive environmental sounds

Recently, hearing aid manufacturers have developed and implemented transient noise reduction algorithms (TNRs) to reduce the undesirable effects of impulse noises. As a previous study indicated that compression may change the amount of noise reduction provided by noise reduction algorithms, the purposes of this study
will be to examine the effectiveness of three TNRs and to investigate the interactions between TNRs and wide dynamic range compression on the acoustic characteristics of environmental impulse noises at the hearing aid output. Impulse noises that frequently occur in real life environment were identified and recorded. Three behind-the-ear digital hearing aids – Widex clear 440, Phonak Ambra and Siemens Pure 701 having transient noise reductions algorithms will be used. Recordings of the hearing aid output will be made using a Knowles Electronic Manikin for Acoustic Research (KEMAR) fitted with digital hearing aids and placed in the center of a sound field with three-loudspeaker array located at 0°, 60° and 120° azimuths. Hearing aid outputs will be recorded in conditions with and without transient noise reduction algorithms when concatenated speech signals along with two types of noises – impulse noise and speech spectrum noise will be presented to KEMAR with hearing aids programmed to 1:1 or 3:1 compression. Data analyses will be carried out to compare the spectral and temporal characteristics of all the conditions to examine the effectiveness of TNRs and interactions between wide dynamic range compression with TNRs.

Walker, Sabina
Program in Speech-Language Pathology
Adviser: Professor Janet Olson

What do mothers say when they teach infants representational gestures?

The study will address the following questions: When mothers teach their infants representational gestures, how often are they simultaneously presenting verbal words along with the gestures? What are the structural characteristics of the utterances that mothers pair with the representational gestures? These questions are important because there are many popular programs, such as Baby Signs® and Baby See ‘N Sign®, that advocate for teaching representational gestures to young infants. Current research has demonstrated that exposure to representational gestures may help facilitate the acquisition of first words and may stimulate further language development (Goodwyn, Acredolo, & Brown, 2000). However, no study has examined how the mothers teach representational gestures and what they say as they teach these gestures. To examine how mothers use words when they teach representational gestures, the current study will employ an existing data set collected from 16 mother-infant dyads at 13 months as they looked at a book depicting 5 representational gestures. The mothers were first shown how to make the representational gestures. They were then instructed to teach their infants the gestures while looking at the book. For the current study, mothers’ representational gestures will be identified along with any utterances produced simultaneously. The current study will further code the following characteristics of mothers’ utterances that occur simultaneously with their presentation of representational gestures: mean length utterance (MLUw), number of one word presentations, number of times target words are presented, number of target words in sentence final position, and the presence of exaggerated intonations. Analyses will be completed to determine how often mothers pair words with representational gestures and to describe the utterances mothers use as they teach representational gestures to their infants.

Wangle, Jayleen
Department of Mathematical Sciences
Adviser: Professor Alan Zollman

Mathematical beliefs of calculus students

The purpose of this study is to explore calculus students’ beliefs about the nature of mathematics and listen to their stories concerning their prior mathematical experiences. It is hoped that such a study can provide teachers with insight concerning the types of experiences that encourage students to develop a rich view of the subject of mathematics. Research shows beliefs are important to investigate because students’ beliefs influence their mathematical understanding, and the manner in which they approach solving mathematical problems. So in order to help students effectively solve mathematics problems, educators need to provide opportunities for students to change their views of mathematics from one about rules to one that is centered on making sense of the topics. The first step in this process is finding out about the common beliefs of students and asking students about their previous mathematical experiences including what role those experiences
are believed to have played in the formation of their beliefs. Based on responses from a written questionnaire, five students were chosen to be interviewed. Students’ beliefs varied from “mathematics is numbers,” to “mathematics is logic.” Some calculus students continue to view mathematics as procedural, whereas others have a more mature understanding of the nature of mathematics. Future research is needed to determine if and how the beliefs about mathematics held by calculus students influence their conceptual understanding of foundational topics.

Weas, Larry D.
Department of Counseling, Adult & Higher Education
Adviser: Professor Gene Roth
Using Humor in HRD & Training

Humor in human resource development (HRD) and training is a valuable teaching tool for establishing a climate conducive to adult learning for new employees. This study looks at how using humor can enhance the effectiveness of adult learning with today’s students in the classroom as well as the workplace. Opportunities to incorporate humor in the classroom can take many forms. Many instructors classify humor in lectures as jokes, riddles, puns, funny stories, humorous comments and other humorous items produced. Corporate Trainers have discovered the benefits by creating ways to incorporate humor in training classes such as cartoons, top ten lists, comic verse, and phony or practical experiments. Appropriate and timely humor in the training classroom can foster mutual openness and respect and contribute to overall learning effectiveness in employees. Considerable research conducted has identified the relationship between an instructor’s use of humor in the classroom and learning outcomes. The purpose of this presentation is to display and present some of the psychological and sociological perspectives in research and identifies opportunities for incorporating humor into the classroom. Looking how humor and laughter are beneficial to both the instructor and the student and can help reduce the ‘distance’ between instructors and students in education as well as the workplace. Reviewing research related to humor in the classroom have all alluded to the benefits of humor: (1) identifying the characteristics of humor used in the classroom, (2) understanding the physiological and psychological benefits of humor, (3) knowing the effects of humor in learning in the environment, (5) applying humor in education and training, and (6) providing recommendations for further research. In summary, the researcher will present and discuss the effects and impact of humor on learning outcomes, and suggests guidelines for the appropriate use of humor in training today’s workforce.

Weinberg, Lael
Department of History
Adviser: Professor James Schmidt
Raising the bar in Illinois: An episode in the history of bar associations, bar exams, and legal education

The late nineteenth century witnessed the increased professionalization of the American bar. Factors in this process were the rise of professional societies and associations, the standardization of formal legal education, and the institution of rigorous bars to entry into the profession—the most iconic being the bar examination itself. Yet much of the literature on this subject lacks the depth of perspective that can only be filled in by local and regional analysis. In an attempt to fill this gap in the literature on legal education and professionalization, this paper offers a study of how bar admissions standards were modernized in nineteenth-century Illinois. Beginning with the rise of Illinois’s two most important legal associations, the Illinois State Bar Association and the Chicago Bar Association, this article chronicles their efforts to change the rules governing bar admission in Illinois. In the process, this paper provides a case study in nineteenth-century attitudes regarding professional self-regulation, education, standardized examination, and the aspirations of the legal profession.
Wiesner, Matthew  
Department of Physics  
Adviser: Professor Michael Fortner  
*Are low-mass galaxy clusters over-concentrated?*

The Sloan Bright Arcs Survey (SBAS) at Fermilab has discovered and confirmed 19 strong-lensing systems in the Sloan Digital Sky Survey. We used the WIYN telescope to take follow-up data on 10 of these systems, studying both the properties of the galaxy clusters and the properties of the strong gravitational lenses. In our analyses, we have found that most of our 10 systems are low-mass clusters. Using this data we have found evidence to support other groups’ findings of an overconcentration problem among galaxy clusters, the idea that galaxy clusters are more concentrated than ΛCDM would suggest. It has recently been suggested that the overconcentration problem is most significant among low-mass clusters. We present our results for the relation between Einstein radius of the strong lenses and cluster mass (M200). We show that the Einstein radii of the clusters are typically larger than would be expected based on current models, suggesting that the clusters are overconcentrated.

Williams, Robert  
Department of Literacy Education  
Adviser: Professor Carol Patitu  
*High achieving African American males: What matters in persistence*

Postsecondary literacy professionals, educators, and instructors quarrel about language and terminology that describe learners in developmental education. A number of literacy professionals suggest definite short expressions (e.g., at-risk, high-risk, remedial, and underprepared) create confusion inside the profession and in the public sphere. Literacy representatives advocate certain formal jargon place blame on learners (e.g., remedial) and are ‘offensive’, and on the other, some place blame on learners’ past institutions, (e.g., underprepared). Furthermore, the prescribed term ‘at-risk’ explicitly tags learners as being ‘different’ and a high threat for failure; this is highly inflexible as various literacy professionals attest. Literacy educators, too, cite brief descriptors (e.g., at-risk, underprepared) as culturally laden as well as awkward. As a result, they conclude, developmental education official dialect and vocabulary denote ambiguous connation that may elicit unintended consequences. This study seeks to examine how formal language and terminology affect minority learners (e.g., Blacks, Latinos) in developmental education. The study hypothesizes certain vernaculars (e.g., at-risk, marginal) have tremendous affective significances for students within those classifications. As such, the primary goal is to scrutinize official terms’ (e.g., high-risk, transitional) impact on minority learners’ self-efficacy and motivation. The project will conduct case studies with 10 minority first-year learners in several developmental reading and writing programs at a Midwest predominantly white institution (PWI). The theoretical framework shaping the scholarship is Critical Race Theory, which concedes the significance of race in every aspect of culture in the United States, including higher education. The final goals of the project are to: (a) help excavate deficit and blame phrases from developmental education profession and practice, (b) assist to centralize affirmative vernaculars that promote high expectation and achievement, and (c) help shape future research in areas of minority learners’ motivation and resiliency. The duration of the project will be 18 months starting from the approval date.

Yu, Pelyong  
Department of Economics  
Adviser: Professor Jeremy Groves  
*Nonparametric Methods with Application to Hedonic Pricing Models*

This is a case study examining the relationships between wind farm presence and property values. This empirical study examines the impact of Mendota Hills Wind Farm on the values of nearby residential properties using nonparametric methods due to the spatial dependence and spatial heterogeneity. By using Geographical Information Systems (GIS) and data samples from Lee County Office in Illinois, USA, for the period of 2002-
2010, the impacts are estimated in both a linear regression and nonparametric regression, which is designed to capture the contributions of structure and location attributes on property values. The semi-parametric models show the same result as OLS but the signs of the weighted average coefficient are different, and the result is that the Mendota Hills Windfarm has no impact on the property values nearby; however, the conditionally parametric models show that under the window size of both 35 percent and 75 percent, the Mendota Hills Windfarm has a negative impact on the property values since the coefficient signs are positive, which indicate that the farther away from the windfarm, the higher the property values are. The complete nonparametric method poses windfarm as a negative externality to the property values. My contribution of my research is that by using nonparametric method to take the nonlinearity and spatial heterogeneity into consideration, the estimate results are more pertain to the reality, all the other studies on wind farm use simply OLS method imposing an arbitrary function form in the hedonic price model.

Zaleski, Diana J.
Department of Leadership, Educational Psychology & Foundations
Adviser: Professor Jennifer Schmidt
Using a multilevel mediation model to examine the effects of national board certified teachers on high school science students’ cognitive engagement

This study had two aims: 1) to examine the direct and indirect effects of teachers’ National Board Certification on the momentary cognitive engagement of high school science students; and 2) to explore the relationship between cognitive engagement and student achievement in science. The study is unique in that it employs three-level mediation models (Krull & MacKinnon, 2001; Pituch, Murphy, & Tate, 2010) to examine National Board Certification effects on students’ daily experience using repeated measures data. Students of NBCT were found to be more cognitively engaged in science than students of non-NBCT, and cognitive engagement was found to positively predict student achievement. These findings support the proposition that the National Board certification process identifies effective science educators.

Zinouri, Nazanin
Department of Industrial & Systems Engineering
Adviser: Professor Purushothaman Damodaran
Scheduling a batch processing machine to minimize total weighted tardiness

A batch processing machine (BPM) can process several jobs simultaneously. This study was motivated by a practical application observed at an electronics manufacturing facility; BPM is used to test electronics assemblies for detecting component level failures. The BPM can process a batch of jobs provided the machine capacity is not violated. Given a set of jobs and their characteristics (i.e. processing times, ready times, sizes, weights, and due dates), the objective is to group the jobs into batches and schedule the batches formed to minimize the total weighted tardiness. Once the jobs are grouped the batch processing time is equal to the longest processing time of the job in the batch. Similarly the batch ready time is equal to the latest ready time of the job in the batch. In this paper a mixed integer linear programming formulation is proposed. As the problem under study is NP-hard, a heuristic to solve the linear programming formulation is proposed. The results are compared to several batching and dispatching rules. An experimental study was conducted on problem instances ranging from five to 200 jobs. The experimental study helps to conclude that the solution approaches presented in this paper are favorable.
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