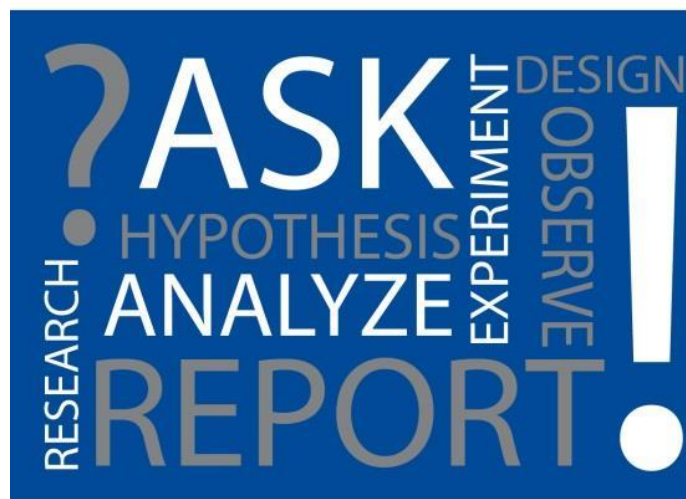


1st Annual
**Research and Creative Activity
SYMPOSIUM**



April 23, 2015 | Lumpkin Hall

Presented by

Message from the Dean:



Welcome to the First Annual LCBAS Research and Creative Activity Symposium!

The Lumpkin College of Business and Applied Sciences First Annual Research Symposium serves as a day for celebrating academic engagement and excellence at Eastern Illinois University. The 52 undergraduate and graduate student participants, under the mentorship of our distinguished faculty, are showcasing their hard work, creativity, and commitment to inquiry in their chosen discipline. The faculty should be proud of their efforts in supporting their students in this important college-wide initiative.

Today is an opportunity for students from the School of Business, School of Family and Consumer Sciences, and the School of Technology to present their projects which demonstrate mastery in their subject-matter and the development of critical thinking skills. Hopefully, other students in attendance, not yet engaged in research and creative pursuits, will be inspired by the intellectual interests of their fellow students.

It gives me great pleasure to welcome you to the First Annual LCBAS Research and Creative Activity Symposium!

A handwritten signature in black ink, appearing to read 'Mahyar Izadi'.

Mahyar Izadi
Dean

Acknowledgments:

The Dean's Office would like to especially thank Dr. Isaac Slaven and Mr. Gabe Grant for their assistance with marketing the Research and Creative Activity Symposium. Also, a special thank you goes to all of the faculty mentors for supporting and encouraging their students to present their work.

SYMPOSIUM SCHEDULE

Opening Remarks By Dean Mahyar Izadi and Provost Blair Lord Presentation of the Dean's Undergraduate Mentor Award (Roberson Auditorium, 2030 LH)	9:00-9:15 am
Oral Presentations (Roberson Auditorium, 2030 LH)	9:15 am-4:30 pm
Poster Session I (Student Lounge, Lumpkin Hall)	9:30-10:30 am
Poster Session II (Student Lounge, Lumpkin Hall)	2:00-3:00 pm

ORAL PRESENTATIONS

9:15 am – 4:30 pm

9:15 AM

Arduino Board and Arduino Integrated Development Environment

Rajasri Pingili, Graduate Student, Sustainable Energy and MBA

School of Technology & School of Business

Faculty Mentors: Dr. Peter Ping Liu, Dr. Rendong Bai

Need: Arduino is an open source hardware which means that all the design files for the Arduino board are made public. So anybody can go and make clones of the Arduino. Lots of people have made clones of Arduino and sold them and lots of the clones are really good. That's kind of idea that open source hardware is your opening step so people can share. Arduino is an interface board which provides efficient and effective technology with low cost in order to create micro controller related projects. Arduino programming is quite simple and easy to understand, circumvent the difficulties and challenges of uncooperative coding. Arduino consists of Universal Serial Bus and micro controller board which are plugged in to computer using external electronics. The design of Arduino board is open source so anyone can use it. Arduino is best and reliable choice for people who are passionate to develop electronic projects. Arduino is connected to electronics using its pins to control the things such as turning on and off motors or lights and sensing temperature and light.

Overview: The Arduino Uno is the most recent innovative and mostly used as well as by far the best and well known series of Arduino boards. The major difference between older Arduino boards and Arduino Uno is the usage of different kinds of USB chip attached to their respective controllers. This difference of using different kind of USB chips primarily helps their users in terms of easy installation of Arduino software and allowance of higher speeds of communication with respective computers. Micro controller is the core component in the Arduino board. One of the best things about the Arduino platform is how easy it is to get started. The software that gets installed in the computer is completely free and it is designed specifically for ease of use. Integrated Development Environment runs like a text editing program on the computer connects to Arduino. Now with any software installed you may have particular things working on your computer that could hinder a smooth installation.

Major Points

- Arduino board major hardware and software components.
- Importance of micro controller in Arduino.
- How to connect Arduino board and Arduino IDE
- Flow the process of uploading and executing the sketch from Arduino IDE to board

Summary: Arduino is an open source environment and it is very easy and available to everyone. This presentation introduces the audience to Arduino hardware, and its integrated development environment (IDE) interface tool for software development. A simple example will be demonstrated on how to program an Arduino controller.

9:30 AM

An empirical study of factors affecting consumers' repurchase intention within the context of mobile commerce

Zhentu Huang, Graduate Student, MBA

School of Business

Faculty Mentor: Dr. Chao Wen

Researchers have intensively examined the potential factors that influence consumers' adoption behavior of using mobile commerce, but further investigation of factors affecting consumers' repurchase intention using mobile commerce is critical, considering the quickly developing technology of mobile devices and apps, and increasing number of customers who are familiar with shopping in virtual stores. In this paper, we begin with a comprehensive literature review of mobile commerce within the context of consumer behavior and a summary of influential factors that affect the consumer's intention to adoption and/or continuance to use of mobile commerce. In addition, based on the expectation confirmation model, an integrated framework was developed to explore the effect of consumers' extrinsic (utilitarian), intrinsic (hedonic) motivations, and social relation on consumers' beliefs including perceived value and perceived enjoyment, which in turn will influence customers' satisfaction and repurchase intention. To test the model, an online survey was designed and distributed through Amazon Mechanical Turk for data collection. Based on survey data from 298 m-commerce shoppers, the data analysis results indicate that: (1) extrinsic motivation (e.g. convenience, information quality, information seeking, and efficiency) has significant impact on perceived value; (2) both intrinsic motivation (e.g. value motivation, role motivation, adventure motivation, gratification motivation, and idea motivation) and social relationship (e.g. social motivation, subjective norm, critical mass, and peer influence) have a significant impact on perceived enjoyment; (3) both perceived value and perceived enjoyment significantly influence customers' satisfaction, which in turn determine customers' repurchasing intention.

9:45 AM

Discrimination in Supportive Resources for Same-sex Couple Intimate Partner Violence

Joshua Fourman, Graduate Student, Family and Consumer Sciences

School of Family and Consumer Sciences

Faculty Mentor: Dr. Lisa Moyer

The Domestic Violence Prevention Act of 1985 and the Violence against Women Act of 1994 and 2013 are social policies that were created to provide support for victims of intimate partner violence (IPV). Such support includes shelters, hotlines, grant money for research, and stronger legal measures to protect victims of IPV from their abusive partners (Tesch, Bekerian, English, & Harrington, 2010). But while the policies were meant to apply to all victims of IPV, including same-sex couples, they were originally designed with heterosexual couples in mind, without taking under consideration the different contextual factors affiliated with same-sex IPV. For example, same-sex marriage is not yet legal in all 50 states and many states still allow employers and landlords to openly discriminate against others based solely on sexual orientation. Sexual orientation is often assumed based upon how individuals present themselves to the public; so many times people are discriminated against because of their perceived sexual orientation. Same-sex couples experience specific vulnerabilities like the lack of adequate legal protection that interact with the lack of resources and can result in more oppression than that experienced by heterosexual couples. This study will explore how same-sex couples perceive resources designed to assist individuals coping with IPV.

10:00 AM

Applying Family Stress Theory to Poverty Stricken Female-Headed Households

Michelle Morgan, Junior, General Studies/FCS Minor

School of Family and Consumer Sciences

Faculty Mentor: Dr. Kathleen O'Rourke

This paper explored the impact of poverty on the well-being of a single-parent family in a female-headed household. A fictitious case scenario was developed and includes a divorced mother and her two young daughters. Family stress theory was applied to the case scenario to analyze stressor events, resources, perceptions, coping mechanisms, and types of adaptation within the family. Concepts of normative and non-normative stressors, pile-up, crisis, and adaptation are illustrated. An assumption of family stress theory is that stress is a norm in family life and individuals adapt to stress in both positive and negative ways. However, pile-up of multiple stressors can disrupt the equilibrium of a family and lead to crisis if stressors are not dealt with effectively. It can be concluded that healthy and resilient coping mechanisms and positive adaptive responses to stress can promote more optimal balance in a family. Furthermore, individual perceptions of stressor events and resource availability will influence coping and adaptation.

Keywords: poverty, single-parent family, female-headed household, family stress

10:15 AM

Testing the Durability of Finishes on 4140 Steel

Daniel Stock, Junior, Applied Engineering and Technology

School of Technology

Faculty Mentors: Dr. Isaac Slaven, Dr. David Melton

This study looks at the common steel coatings used in the firearms industry to protect against corrosion, impact, and many other things. These coatings include manganese parkerizing, DuraCoat, and bluing. This was done by putting specimens of 4140 steel, an industry standard material for firearm receivers, with these coatings through a variety of treatments, such as freezing temperatures, high temperatures, sand, mud, gravel, and a highly corrosive environment. To measure the effect the coatings have on the metal, two tests were used: Rockwell Hardness and Charpy impact. The Rockwell hardness test was used multiple times throughout the research to track the progress of the steel. The Charpy impact test was the final test that the specimens went through to see how the steel was affected during the treatments.

10:30 AM

Cybersex Collective: Addictions, Family, and Taboo

Ben Wilburn, Graduate Student, Family and Consumer Sciences

School of Family and Consumer Sciences

Faculty Mentor: Dr. Crystal Duncan Lane

The purpose of this presentation is to explore the social stigma surrounding cybersex addiction and the role it plays in the family. Although cybersex is seen widely as taboo, research both qualitative and quantitative in nature exists. In this presentation the audience will become familiar in two current studies being used to treat cybersex addiction. These studies will pin point surveys used in online portals, secondary education, and higher education. Further, we will examine the reasons why individuals seek out relationships, sex, and love online. As technology becomes a greater influence in

our lives, practitioners, researchers, and educators alike must accommodate changes in addiction and those who consume explicit material. In viewing the current research the audience will understand the integrative nature used throughout family services, social science, and technology.

10:45 AM

Developing Opportunity: Building pathways to employment for homeless persons

Kristin Davis, Graduate Student, Family Services

School of Family and Consumer Sciences

Faculty Mentor: Dr. Katherine Shaw

The purpose of this study is to identify the perceived barriers to employment of unemployed and underemployed homeless persons while building relationships with local employers. Rationale: Homeless persons are faced with multiple barriers to employment; often lacking resources, skills, and knowledge of the employment process. Lack of employment and less secure jobs directly contribute to the growing homeless population.

Methodology: Interview unemployed or underemployed homeless persons to identify perceived barriers to employment. Interview local employers to identify specific skills necessary for local jobs. Presentation to local employers to educate on the specific barriers to employment and develop strategies to close gaps for homeless.

Findings: Collected information will provide training and educational guidance to obtain employment. Development of an electronic employer data base and resource binder will provide information including job skills, interview preparatory information and expectations for dress specific to each employer. An employment clothing closet will provide job search, interview and employment attire suitable to various positions. The education of local employers of the specific needs of the homeless population will decrease barriers to employment.

Conclusions: Development of a resource binder and electronic employer data base will support underemployed and unemployed homeless persons by giving a directory of employers and knowledge of skills necessary for employment. The development relationships with local employers will reduce gaps in the employment process.

Implications: Practitioners can use this model can be used to develop vocational education programs for homeless persons and provide a resource to other social service agencies.

11:00 AM

Alleviating Poverty

Kayla Spencer, Graduate Student, Family Services

School of Family and Consumer Sciences

Faculty Mentor: Dr. Crystal Duncan Lane

I currently work with the homeless population in this area and have found that a fear I have developed is doing more harm than good through my attempts to assist people. From what little experience I have gained thus far, I can also identify in others this need to better understand the population they are working with. The purpose of this study is to gain as much understanding on the mindset and barriers of

poverty, as well as effective tools, programs, and strategies that can assist a professional in this field. Literature on these topics is being studied and applied. The focus with many organizations is relief, when restoration/rehabilitation and development are the effective solutions. The goal is to gain and teach this base of knowledge that allows professionals to develop programs focused on long-term solutions for individuals in poverty. Sharing this information with the general public will allow others to work more effectively with individuals and families in poverty.

11:15 AM

Examine Energy Losses in extra high voltage (EHV) Transmission Lines

Sai Kumar Guniganti, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Isaac Slaven

Losses in transmission lines play a major role in the economic viability of power system operation. If the length of the transmission line is increased then energy losses will be increases. There are very limited suitable meters are available presently to estimate these losses. Practical experience in one of the distribution companies show that reliability of load survey type energy meters used to record energy input to the distribution feeders is poor. So The main objectives of this paper are:

Study of total energy loss in (EHV) transmission lines. Determine the causes of losses in (EHV) transmission lines. Recommend methods for minimization of the losses. Lines losses are mainly depend on resistance of the conductor, size of the conductor, type of the conductor and length of the line. Pure annealed copper is the best conductor of electricity. Aluminum and Aluminum alloy conductors (ACSR & AAAC) widely using in transmission lines. Here we are taking a 220KV sub-station as an example to study the energy losses in Extra High Voltage (EHV) transmission lines by duly considering monthly energy readings of imports and exports at this sub-station. By observing the study of EHV transmission line losses we can conclude that where the generating station is near to the sub-station there the losses are less. In other words losses in the lines are directly proportional to the length of the transmission line.

$P = I^2R$

11:30 AM

Research tracking Application

Shyam Gurram, Graduate Student, Technology

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Toqeer Israr

There is a need for a secure task management and collaboration amongst researchers at any given university. Students are being assigned work by their supervisors/professors, yet there is no method of tracking their progress. Furthermore, should the student require collaboration in any given research area, no formalized framework exists to facilitate such collaborations.

We propose a Research Forum, an online presence, where students, professors and other scholars may get together from various parts of the world to collaborate.

In this Research Forum, students of various professors organized by their research areas are expected to post their daily work updates. This would enable the professor in identifying the researchers' accomplishments dynamically.

Also, this portal would be an online place for collaboration, where students and other researchers may post their queries so that their issues can be addressed by accomplished scholars, and thus increasing the efficiency of the work done by the researcher.

We are in the process of acquiring customer requirements and designing the portal and accordingly, it will be implemented in Java, PHP and Oracle.

11:45 AM

Single Line Portal

Shyam Gurrām, Graduate Student, Technology

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Toqeer Israr

Eastern Illinois University is having multiple logins (PAWS, Panther mail, D2L) for a single student (user). As a student, if I want to check my EIU mails I need to login to the Panther mail with my credentials, if I (same user) want to check my PAWS account once again I need to login to the PAWS page. This may be time taking process for the student.

We are proposing a solution for this problem. Instead of multiple login, if we have a single login to all the various accounts, then this will be an easy process for all of the students and for the faculty also who are a part of Eastern Illinois University. Many other Universities are following the same concept of single login. With this concept the student will login once to his/her account, then after we have links for the various account.

The Advantages with this application are, the most valuable thing in the universe is time we can save precious time of the student and as well as Professor. There is a chance of forgetting the credentials of the accounts because of multiple logins, by using this application we can avoid those problems.

12:00 PM

Comparing Laboratory Degraded Ropes with Field Rejected Ropes Using a Fatigue Machine

Dylan Koeppen, Junior, Applied Engineering and Technology

School of Technology

Faculty Mentor: Dr. Isaac Slaven

This project tests life safety ropes that have been rejected by field inspections and uses those results to develop a predictive model to improve the effectiveness of laboratory simulations. This research provides information to design protocols for the School of Technology's new fatigue testing machine so that the machine tests can more closely simulate the degradation effects on field-rejected ropes. The data from each will be analyzed with linear regression models. The resulting data will help determine a final predictive model so that estimates can be more reliable for future testing with this machine.

12:15 PM

Emission Analysis for Biomass Renewable Energy Production

Ramadevi Sagi, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

The change in climate caused by humans has turned into a significant and growing problem that should be addressed in order to avoid terrible effects both locally and globally. The change in climate is due to several greenhouse gas emissions released into the atmosphere such as carbon dioxide, carbon monoxide, hydrogen sulphide, and nitrogen dioxide which have a heat trapping effect on the atmosphere. Basically, carbon dioxide and nitrogen dioxide as the major pollutants are the products of combustion reactions in both renewable and non-renewable energy fuels. However, emission from renewable energy fuels are one of the key factors we need to analyze the overall carbon offsetting as the initial goal of using the renewable energy resources. Particularly, syngas production from biomass feedstock is one of the research projects conducted at Center for Clean Energy Research and Education (CENCERE) of Eastern Illinois University. Emission assessment is a significant part of the project towards a high quality syngas production for renewable energy.

A pilot downdraft gasifier is considered for the syngas production using different biomass feedstock such as woodchips and switchgrass. Basically, the produced syngas is continuously burned in a flare in order to check the status of gas production based on the flame conditions. Therefore, a portable combustion gas analyzer is installed at the top of the flare in order to simultaneously record the combustion products especially the emitted greenhouse gases. Technically, the gas analyzer is equipped with two types of sensors including electrochemical and non-dispersive infrared (NDIR) sensors to detect the combustion products. Basically, NO₂, SO₂ and H₂S are detected by the electrochemical and CO₂, CO and hydrocarbons are detected by the NDIR sensors. The recorded data are sent to a PC in order to analyze and compare the greenhouse gas emission under different conditions in terms of temperature, pressure and feedstock of the gas production.

12:30 PM

Key Factors towards Customer Satisfaction in PV Solar Manufacturing and Related Market

Syedramin Khalilnejad, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

Customer satisfaction is one of the critical goals in green power generation not only for renewable energy markets but also for establishing a green culture across the country. Particularly, PV solar is one of the fastest-growing markets in the United States that needs special focus on customer expectations in order to shape a trustful market for future demands and related services. Basically, financial benefits, energy independency and carbon offsetting are the major targets in PV solar market to build the desired trust and satisfaction among the customers. Therefore, comparing PV solar manufacturers in terms of materials, manufacturing, efficiency and durability would give energy consultants the key indicators for selecting the best systems based on customer expectations and related budget. Basically, the paper would try to end up with an applicable guideline for PV solar operation and related power monitoring based on a practical study directed by Center for Clean Energy Research and Education (CENCERE) in Eastern Illinois University. Eventually, the paper would discuss the technical issues in PV solar manufacturing in order to suggest possible solutions towards customer satisfaction as the key element for developing a successful Total Quality System (TQS) in the market.

12:45 PM

The Impact of the Money Smart for Older Adults Program on Perceptions of Financial exploitation.

Charles LeGrand, Graduate Student, Gerontology

School of Family and Consumer Sciences

Faculty Mentor: Dr. Jacquelyn Frank

A research team at EIU conducted a study to examine older adults' awareness of and concerns about financial exploitation. A pre-posttest study design was used to gather data from older adults before and after participating in the Money Smart for Older Adults education program. This session will present the findings from this study.

The Money Smart educational sessions began during the spring of 2014 and are ongoing through fall 2014 in many communities throughout central Illinois. Highlighted during the workshop session will be the following results from the research study:

- 1) Seniors beliefs about being a victim of financial exploitation before and after participating in the Money Smart for Older Adults program.
- 2) Their primary financial concerns with respect to age and gender.
- 3) What role participants' perceptions play in regard to financial planning and decision-making?

1:00 PM

Development of a UV Dosimeter for Applications on Synthetic Equipment

Stephany Fonseca, Senior, Applied Engineering and Technology

School of Technology

Faculty Mentor: Dr. Isaac Slaven

This project collected observed derogation of synthetic yarn caused by UV exposure. Data was collected for the time and amount of exposure to UV and the change of the yarn's strength before and after exposure. The UV exposure was controlled by a UV exposure chamber. The project focused on collecting the derogation of synthetic yarn cause by UV light to help with developing the indicators and corresponding the color-fade to the derogation. The results help to develop color-fade indicators that correspond with the derogation of life safety rope. The end point of this project will be valuable and important to users of life safety rope for being able to make an informed decision when to stop the use of their lines due to unsafe amount UV exposure to the rope.

1:15 PM

Break

1:30 PM

A Study of Effect of Surface Condition on Energy Production of Photovoltaic Solar Arrays

Arif Jalbani, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

Need: Solar is one of the best renewable energy resources. Data from the field about the energy losses due to surface soiling of PV plants are scarce. The study of type of dirt and its accumulation on surface of

solar panels vary from one location to other. The characteristics of climate (Rain fall, amount of dirt in the air etc.) are important factors and are site specific. This paper will focus the field measurement of dirt energy losses (dust) and irradiance incidence angel losses since inception to date on a Solar PV plant located at Center for Clean Energy Research and Education, Eastern Illinois University. This study will help us to understand the performance of solar panels. The variations in energy production of each sub panel. The study conducted will help us to understand per day, monthly and annual production of each panel, and to estimate the annual energy losses due to dirt and irradiance incidence angel. This paper will further suggest the proposed techniques to be implemented to avoid such energy losses.

Overview: Surface soiling is the 3rd most important PV performance factor, after insolation and temperature. This study has been designed to study the effect of soiling on energy production. Typical factors of soiling shall be studied in detail during this research project. The most important factors include Site Characteristics (vegetation, traffic air, pollution), Ambient temperature and humidity, PV system tilt angle and orientation (include exposure to sun and wind), Dust properties (include type, shape, size and weight), Wind velocity, Glazing characteristics (texture and coating). After identification of factors which impact the soil accumulation, this study will study the percent of energy loss due each factor. This research will evaluate and measure the impact of soil accumulation on the existing PV system installed at Center for Clean Energy Research and Education, Eastern Illinois University, as well as will predict soiling impacts on future PV plant energy generation.

Summary: Solar as the renewable energy source, is expected to help reduce the nation's dependency on foreign oil or other fossil fuels. The world is moving towards more solar energy, the pace is improving day by day. It is important to study the factors which influence the performance of solar PV systems. This Study will help identify impact of dust accumulation on efficiency of PV plant. This study will further identify the suitable methods to avoid these energy losses of this PV plant and all other PV plants to installed having the same environmental conditions and their impacts.

1:45 PM

Application of Online Gas Analyzer to Monitor Quality and Quantity of Syn-gas Production for Renewable Energy

Ernest Echefu, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

Experimental studies show that the net total production of the electricity generated from biomass feedstock, through combustion is commonly low in ranges from 20 - 40%. The amount of biomass burnt in existing combustors is usually limited to 5 – 10% of the total feedstock (wood chips and switch grass) due to the concerns about plugging of the existing feed systems. Pyrolysis converts biomass to bio-oil in the absence of oxygen. Biomass undergoes the process of thermochemical conversion of feedstock through drying, pyrolysis and gasification, in a typical gasification process. Gasification converts biomass through partial oxidation into a gaseous mixture of syngas (synthesis gas) consisting of hydrogen (10 – 20%), carbon monoxide (15 – 30%), methane (2 – 4.5%), carbon dioxide (5 – 15%), nitrogen (45 – 60%) and water vapor (6 – 8%). This paper gives an insight to the application of the inline gas analyzer (Gasboard) being used in monitoring the quality and quantity of syngas production using a solid fuel of 50% woodchips and 50% switch grass for renewable energy.

2:00 PM

Media Portrayal of Eating Disorders

Cierra Rains, Senior, Family Services

School of Family and Consumer Sciences

Faculty Mentor: Dr. Kathleen O'Rourke

This project was specifically focused mainly on how--if at all--the media influences/triggers eating disorders and how it depicts body image. An array of facts, statistics, and definitions are also discussed within the presentation. Because I personally feel strongly about early prevention and noticing possible signs and symptoms, signs and symptoms to look for when one may be dealing with an eating disorder are also briefly elaborated throughout the presentation as well. The prevalence and who seems to be more susceptible to having an eating disorder is also within the discussion topic. The media and how it depicts behaviors and thoughts of those dealing with an eating disorder is the main and most talked about theme throughout the presentation.

2:15 PM

*Family and Consumer Sciences Undergraduate Merchandising/Apparel and Textile Design Student
Awareness of African Textile Industry*

Kayla Garner, Senior, Merchandising

School of Family and Consumer Sciences

Faculty Mentor: Dr. Katherine Shaw

Evaluating Family and Consumer Science (FCS) merchandising students on their knowledge and awareness of the African Textile Industries is very important to the global interdependent world we live in. It is important for FCS scholars and professionals to consider factors of other cultures in order to further the mission of FCS. "No matter what the setting, the end goal for the work of FCS professionals is to help individuals, families, and communities make informed decisions to improve their quality of life" (AAFCS 2014). Textile and retail industries are labor intensive and could provide growth and economic opportunity for citizens to improve their standard of living. Knowledge is power, and without it future FCS professionals are unable to aid families in need.

The Purpose of this study is to examine FCS merchandising students' knowledge of the African textile industry. The study also seeks is to analyze FCS merchandising students' knowledge and attention to global citizenship issues.

Objectives include:

1. Assess FCS merchandising students on their knowledge of the African textile industry.
2. Assess FCS merchandising students on their knowledge and value of global citizenship issues.

This non-experimental design integrated qualitative methods by including focus group interviews from a Midwestern university consisting of FCS undergraduate students who are within the merchandising and textile/ apparel design concentrations.

The study gathered the samples/ subjects by using a focus group with open-ended questions. The primary demographic profiles of the sample population of 10 college aged Family and Consumer Sciences students in undergraduate merchandising or textile design concentrations. They represent a diverse amount of ethnicities.

The length of time for participation in this study was a one time, 50-minute focus group question and

answer session. Subjects were asked to watch video clips and provide initial verbal responses and answer questions. Subjects were audio taped by the use of voice recorder for data collection, uploaded to a computer, and transcribed.

FCS merchandising and textile design students should be exposed to several other countries' textile industries. A Global-Textile Industry course would be a great asset to any FCS program for merchandising and textile design students. This increases their global competency in their concentration and also increases awareness of diverse career opportunities. By incorporating a global curriculum in the classroom it prepares students to be global citizens. It eradicates the limits of their capabilities to make individuals, families, and communities better, not only America, but around the world.

2:30 PM

Life Cycle Analysis (LCA) for Renewable Energy Center at Eastern Illinois University; Energy production and environmental impact

**Sailesh Adhikari, Graduate Student, Technology
School of Technology**

Faculty Mentors: Dr. Chao Wen, Dr. Peter Ping Liu

Overview: Audience will be informed about a different renewable biomass energy sources as input of biomass gasification, basic biomass gasification process, atmospheric emission and solid waste management. Simultaneously audience will be able to know about overall supply chain of Renewable Energy Center energy sources. The research will offer brief knowledge on biomass utilization and its importance to greenhouse gas reduction in first stage. To promote sustainability, this research also explain, how cradle to grave approach of natural source utilization can be modified to Cradle to Cradle (C2C) in biomass gasification process. Finally, audience can be aware of emission control practice and ash utilization from biomass gasification.

Major points

- Energy and fuel consumption for a university campus;
- Quantifying emission from Renewable Energy Center
- Approach to reduce greenhouse gas emission
- Promote renewable energy sources
- How to extract high energy from biomass with low air emission
- Utilization of biomass by-products

The Life Cycle Assessment of a new Renewable Energy Center on campus of Eastern Illinois University assess the emission from biomass gasification process and compares the result with natural gas and coal firing process. Also audience will be informed about the variation of emission and approach to reuse the byproduct of gasification process. This research will explain how the supply chain of REC is important for this process to be more sustainable.

2:45 PM

Validating the effectiveness of a home-made energy meter for use on renewable energy sources

**Bret Lacey, Senior, Applied Engineering & Technology
School of Technology**

Faculty Mentor:

This study uses research examining the return on investment on a home built wind turbine as a method to determine the efficacy of a do-it-yourself energy meter. The research project focuses on the speed of the wind itself and the power generated by the turbine to develop a power curve for predicting energy output. The results home-made energy meter is validated based upon published power curves from commercially available wind generators. After validation it is used to measure the output from the home-made generator.

3:00 PM

Increasing miscanthus pellet production through the direct introduction of soy into the pellet process.

David Conwell, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

This research aims to increase the amount of pellets produced to the amount of miscanthus processed. Non-pellet biomasses are designated as fines, and are typically reprocessed by the pellet mill. During this study the research group experimented with a various miscanthus moisture levels and a decreasing percentage of soy by weight. By reducing the amount of fines produced this method will reduce the energy consumed to process miscanthus into pellet form.

3:15 PM

Wind Turbine Safety

Kevin Hogan, Senior, Applied Engineering & Technology-Construction

School of Technology

Faculty Mentor: Dr. Isaac Slaven

Wind Turbine construction, an industry that has exploded since the 1970's is a growing issue in regards to occupational safety. My overall goal is to research the most common hazard on a wind turbine erection site as well as the best potential method of constructing a wind turbine.

In order to accomplish my goals I will further my knowledge on the construction of wind turbines and the different methods of assembly. In relation to the process I will then examine what the greatest hazards are and what the best solutions will be to properly address them. After my extensive research I will examine the best methods to erect a wind turbine safely. This information will allow me to prepare for my position as Safety Engineer in the wind energy group and use my results to improve site safety across America.

3:30 PM

When in Rome: The Role of Leadership Culture on Social Entrepreneurship

Kelly Valle, Graduate Student, MBA

School of Business

Faculty Mentor: Dr. Keshia Coker

Based on the definition of social entrepreneurship as "the entrepreneurial activity with the explicit objective of addressing societal problems" (GEM 2009, p.8) and in answering the call in the literature for a deeper study of issues in social entrepreneurship, this paper presents a cross-national analysis of the

integral role of the leadership style of the social entrepreneur in the social context where he or she engages in entrepreneurial activity. This paper tests the propositions posed by Valle, Coker, Flight (2015) and hypothesizes national leadership culture as a social contextual factor surrounding social entrepreneurs' likelihood to emphasize social goals in their entrepreneurial ventures. It is hypothesized that entrepreneurs who score higher on charismatic/value based leadership, team-oriented leadership, participative leadership, and humane leadership will place more emphasis on social goals. However, those with higher scores on self-protective leadership and autonomous leadership will place lower emphasis on social goals. Implications of the results of the testing of these hypotheses, placing emphasis on contributions of this research to entrepreneurial marketing and public policy, as well as, future directions for research on leadership in social entrepreneurship are also discussed.

3:45 PM

Determining the Irradiance of Harmful RF Radiation with Respect to Permissible Exposure Limits on EIU's Campus

Victor De La Torre, Senior, Applied Engineering & Technology

School of Technology

Faculty Mentor: Dr. Isaac Slaven

The dangers of exposure to certain radio frequencies (RF) are so apparent that organizations such as the Occupational Safety and Health Administration (OSHA) and the Federal Communications Commission (FCC) have set exposure limit standards. This research evaluated the dosages of harmful radio frequencies being emitted from a telecommunications tower on the campus of a small Midwest university. The tower is located at the heart of campus, and only meters away from walkways, offices, and classrooms. With knowledge of the harmful effects of RF exposure and the close proximity of the tower to the general public, the tower is of concern. It is for this reason that we must regard the safety of staff and students and evaluate the tower. This project provides data regarding the RF levels that are being emitted from the tower at various locations. Additionally, this research provides a foundation for recommendations for actions from the campus for a safer workplace and campus environment.

4:00 PM

The Effects of Correct Truss Installation

Holden Reel, Senior, Applied Engineering & Technology-Construction Management

School of Technology

Faculty Mentor: Dr. Isaac Slaven

This research project looks into typical truss construction fasteners and how they react to typical situations. There are many different ways to set trusses and every application can use a different option. Typical gussets will have a rated breaking strength and load capacity that can be met and exceeded in different ways. The truss can shake, a large live load such as snow can push down, and high winds can pick up the roof. The point of this research is to see if the gussets hold up in those types of situations and also whether or not the hurricane straps from the truss to the top plate of the wall can hold up. Another part of the research is how hurricane straps compare to toe-nailing trusses in an uplift situation. Many contractors will not use hurricane straps because they are not needed in the building code. This research shows the difference between the two.

4:15 PM

Game Development Using Unity3D

Nagaraju Nandagiri, Graduate Student, Computer Technology

School of Technology

Faculty Mentor: Dr. Rendong Bai

Need: With the thriving of video game industry both in the United States and around the world, one of today's most popular fields of study among students is video game development. The reasons of studying video game development vary, but the great prospects for careers in video game industry play a key role in drawing students to the field. A game engine is a software framework designed for the creation and development of video games. Unity3D is an integrated cross-platform authoring tool for creating 3D video games or other interactive content such as architectural visualizations or real-time 3D animations. Unity3D is developed by Unity Technologies and includes a game engine and an integrated development environment (IDE). We can use Unity to develop video games for web sites, desktop platforms, consoles, and mobile devices. Unity game engine includes 3D objects, physics, animation, scripting. Unity3D uses the following graphics engines for different kind of operating systems: DirectX for Windows and Xbox 360, OpenGL for Mac operating system. Unity supports three types of scripting: JavaScript, C#, and Boo. We can use different scripts to support parallel processing. Unity is asset centered rather than code centric.

Overview: In this presentation, we will elaborate the gaming platform Unity3D, which has a lot of scope in present days. Unity is a game engine with integrated development environment attached to it. This game engine is developed by Unity technologies. It is used to develop games in multiple platforms like web browsers, PC, Mac, mobile devices and gaming consoles. Unity is available in free and paid versions. Unity Pro is paid version which costs around \$1,500 and it has more interactive content. Unity consists of basic tutorials which can be helpful from beginners to the professionals. Unity won the Best Engine award in UK Excellence awards. Some of the famous games like Temple Run, Subway Surfers, and Angry Birds are developed using Unity game engine.

Major Points:

- Video game industry and game development.
- Unity is multi-platform. If we develop the game in one platform, it supports other platforms.
- Unity is a combination of assets, inspector, scenes, game objects. To develop 3D objects, prefabs, 3D models, we use Maya and blender software.
- Unity has sample games on their own website. From the examples we can learn some of the basic concepts player model, player controlling, enemy artificial intelligence.

POSTER PRESENTATIONS

(alphabetical by student's last name)

Posters available for viewing all day. Students present during one or both poster sessions.

Poster Session I (9:30-10:30 am)

Poster Session II (2:00-3:00 pm)

Life Cycle Analysis (LCA) for Renewable Energy Center at EIU

Sailesh Adhikari, Graduate Student, Technology

School of Technology

Faculty Mentors: Dr. Chao Wen, Dr. Peter Ping Liu

Overview: Audience will be informed about a different renewable biomass energy sources as input of biomass gasification, basic biomass gasification process, atmospheric emission and solid waste management. Simultaneously audience will be able to know about overall supply chain of Renewable Energy Center energy sources. The research will offer brief knowledge on biomass utilization and its importance to greenhouse gas reduction in first stage. To promote sustainability, this research also explain, how cradle to grave approach of natural source utilization can be modified to Cradle to Cradle (C2C) in biomass gasification process. Finally, audience can be aware of emission control practice and ash utilization from biomass gasification.

Major points

- Energy and fuel consumption for a university campus;
- Quantifying emission from Renewable Energy Center
- Approach to reduce greenhouse gas emission
- Promote renewable energy sources
- How to extract high energy from biomass with low air emission
- Utilization of biomass by-products

The Life Cycle Assessment of a new Renewable Energy Center on campus of Eastern Illinois University assess the emission from biomass gasification process and compares the result with natural gas and coal firing process. Also audience will be informed about the variation of emission and approach to reuse the byproduct of gasification process. This research will explain how the supply chain of REC is important for this process to be more sustainable.

Booklet Educates Undergraduate Students on Calcium by Making Analogies to Personal Finance

Jennifer Ashley, Graduate Student, Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Melanie Burns

There is a need to reach college students about the importance of adequate calcium intake. This is a critical age for building peak bone mass, but the population consumes too little calcium. The objective of this project is to develop a booklet that would educate college students about calcium by making analogies to financial savings. Additionally, these analogies will reinforce financial management principles. The theoretical basis is the Knowledge-Attitude-Behavior model. By providing students with information on the importance of adequate calcium intake, along with information to increase their

consumption, their attitudes can be changed and their behavior altered to improve their calcium intake.

An expert panel examined the booklet for face validity and found that the booklet fit its purpose and is appropriate for the target audience. Based on the review, more information was added and the page order was reformatted. A pilot study was then performed with first year graduate dietetics students. Six analogies were reworded to be clearer or culturally sensitive, with sources of calcium changed into a table format. Based on the review and pilot study, this booklet can provide a creative tool for engaging the population and increasing knowledge of bone health and calcium intake.

Body Image in Adolescence

**Keithara Baker, Graduate Student, Family Services
School of Family and Consumer Sciences
Faculty Mentor: Dr. Jaimee Hartenstein**

The research will discuss the issue of body image in the developmental stage of adolescence. Body image is a growing issue for many adolescents with parents, educators and others feeling uncertain on how address the concerns of body image among adolescents. Statistics and a brief literature review will be discussed to examine the topic in further detail. In order to examine the issues of body image in adolescence theories will be applied to gain a deeper understanding and examine the issue from a different perspective. Recommendations for researchers and practitioners will be provided. Also, a discussion of the future of the issue will be explored.

The Role of B Vitamins in Depression

**Katharine Beberman, Graduate Student, Nutrition and Dietetics
School of Family and Consumer Sciences
Faculty Mentor:**

Major Depressive Disorder is one of the most common mental disorders, affecting nearly 15 million Americans each year. Depression is believed to be influenced by biological factors, psychosocial, and environmental influences. Many of those suffering from depression are treated with pharmacological antidepressants, however the majority of those taking antidepressants have an inadequate response and/or experience negative side effects. This has led people to turn to supplements and nutrition for a solution when treating depression.

Researchers have found strong correlations between B-Vitamins, specifically folate and B12, in the pathogenesis and treatment of depression. Folate and B12 are required for the synthesis of norepinephrine, serotonin, and dopamine, neurotransmitters affecting mood and cognition. It has been found that low serum folate and B12 levels and intake increases one's susceptibility to depression, can hinder the effectiveness of antidepressant treatments, and may contribute to a relapse in depression. It is important for RD's to understand how these deficiencies contribute to the treatment and onset of depression, and recognize populations that may have an increased risk for these deficiencies.

Consumers' Perceptions on Dietary Risk Factors involved in the Development of Heart Disease

Claudia Bueno, Graduate Student, Nutrition and Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Jim Painter

Background: The 2015 Dietary Guidelines suggest that total dietary fat (DF) intake and dietary cholesterol (DC) intake are much less significant in the development of heart disease (HD) as once thought.

Methods:

Subjects were a convenience sample of college students (n=40), faculty (n=17), and consumers at a grocery store (n=39). A survey was administered consisting of an open-ended question regarding perceived dietary changes to reduce the risk of HD and two additional questions where subjects ranked their level of agreement on DF and DC as risk factors of HD on a 7- point Likert Scale (7= strongly agree, 1= strongly disagree). The university's IRB approved the study.

Results: Approximately 46% of participants indicated that lowering fat intake would prevent HD. About 91% of participants felt that DF was a risk factor for HD, and 82% felt that DC was a risk factor of HD. T-test results showed that there were no significant differences ($p>0.05$) between the three groups demonstrating they all had similar beliefs.

Discussion/Conclusion: As hypothesized, the majority of people continue to believe DF and DC should be avoided. Nutrition education needs to be aimed at eliminating the misconception that DF and DC are risk factors of HD.

Measuring the Effectiveness of Gardens as a Nutrition Education Strategy in Elementary Schools

Claudia Bueno, Graduate Student, Nutrition and Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Melanie Burns

Childhood obesity is a current issue and, according to the Academy of Pediatrics, it is related to the lack of intake of fruits and vegetables. Nutrition education strategies in schools may be ineffective primarily because the insufficient amount of time dedicated to teaching children about healthy eating, and the inadequate quality of the nutrition education programs. School gardens may be an effective strategy used to educate children on healthy eating and increase fruit and vegetable intake. The purpose of this research was to measure the effectiveness of school gardens on knowledge, attitude, and consumption. A literature review of 18 articles was conducted by systematically searching various databases. Sixty percent of studies that evaluated intake indicated that the use of gardens increased consumption. Also, 100% of studies indicated an increased preference for vegetables. Lastly, 100% of studies indicated an increase in knowledge after a garden-based intervention. Dietitians and health educators need to learn effective education strategies that are powerful enough to improve knowledge, increase consumption of fruits and vegetables, and provide the motivation to be healthy. The use of gardens may be a promising intervention for improving the nutrition and health of children.

Measuring the Effects of a Pre-Meal To-Go Box on Consumption and Satiety

Claudia Bueno, Graduate Student, Nutrition and Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Jim Painter

Learning Objective: Compare the effects of offering a to-go box prior to a meal in contrast to after a meal on consumption.

Background: Restaurants offer portions larger than recommended by the USDA. This can lead to portion size distortion among consumers and increased consumption.

Methods: Subjects were a convenience sample of diners (n=35) at a Midwestern university. Participants in the first group (n=18) were offered a to-go container before consuming their entrée. Participants in the second group (n=17) were offered a box after consuming their entrée. All food was weighed before and after the meal to measure consumption. The university's IRB approved the study.

Results: There were no significant differences in the consumption of the entrée ($p > 0.05$) between the groups.

Discussion: The results of the study did not support our hypothesis of reducing consumption by offering a to-go box before a meal. This could have been due to confounding factors, such as the significant difference in age ($p = 0.007$) between the groups and diners' unfamiliarity with receiving a box before the meal.

Conclusion/Application: Offering a to-go box before the entrée did not decrease consumption. Replicating the study with a better representative sample could possibly yield significant results. Educating consumers on adequate portion sizes could increase awareness.

Determining the Irradiance of Harmful RF Radiance with Respect to Permissible Exposure Limits on EIU's Campus

Victor De La Torre, Senior, Applied Engineering & Technology

School of Technology

Faculty Mentor: Dr. Isaac Slaven

The dangers of exposure to certain radio frequencies (RF) are so apparent that organizations such as the Occupational Safety and Health Administration (OSHA) and the Federal Communications Commission (FCC) have set exposure limit standards. This research evaluated the dosages of harmful radio frequencies being emitted from a telecommunications tower on the campus of a small Midwest university. The tower is located at the heart of campus, and only meters away from walkways, offices, and classrooms. With knowledge of the harmful effects of RF exposure and the close proximity of the tower to the general public, the tower is of concern. It is for this reason that we must regard the safety of staff and students and evaluate the tower. This project provides data regarding the RF levels that are being emitted from the tower at various locations. Additionally, this research provides a foundation for recommendations for actions from the campus for a safer workplace and campus environment.

Family and Consumer Sciences Undergraduate Merchandising/Apparel and Textile Design Student Awareness of African Textile Industry

Kayla Garner, Senior, Merchandising
School of Family and Consumer Sciences
Faculty Mentor: Dr. Katherine Shaw

Evaluating Family and Consumer Science (FCS) merchandising students on their knowledge and awareness of the African Textile Industries is very important to the global interdependent world we live in. It is important for FCS scholars and professionals to consider factors of other cultures in order to further the mission of FCS. “No matter what the setting, the end goal for the work of FCS professionals is to help individuals, families, and communities make informed decisions to improve their quality of life” (AAFCS 2014). Textile and retail industries are labor intensive and could provide growth and economic opportunity for citizens to improve their standard of living. Knowledge is power, and without it future FCS professionals are unable to aid families in need.

The Purpose of this study is to examine FCS merchandising students’ knowledge of the African textile industry. The study also seeks is to analyze FCS merchandising students’ knowledge and attention to global citizenship issues.

Objectives include:

1. Assess FCS merchandising students on their knowledge of the African textile industry.
2. Assess FCS merchandising students on their knowledge and value of global citizenship issues.

This non-experimental design integrated qualitative methods by including focus group interviews from a Midwestern university consisting of FCS undergraduate students who are within the merchandising and textile/ apparel design concentrations.

The study gathered the samples/ subjects by using a focus group with open-ended questions. The primary demographic profiles of the sample population of 10 college aged Family and Consumer Sciences students in undergraduate merchandising or textile design concentrations. They represent a diverse amount of ethnicities.

The length of time for participation in this study was a one time, 50-minute focus group question and answer session. Subjects were asked to watch video clips and provide initial verbal responses and answer questions. Subjects were audio taped by the use of voice recorder for data collection, uploaded to a computer, and transcribed.

FCS merchandising and textile design students should be exposed to several other countries’ textile industries. A Global-Textile Industry course would be a great asset to any FCS program for merchandising and textile design students. This increases their global competency in their concentration and also increases awareness of diverse career opportunities. By incorporating a global curriculum in the classroom it prepares students to be global citizens. It eradicates the limits of their capabilities to make individuals, families, and communities better, not only America, but around the world.

Nutritional Implications of Autism Spectrum Disorder

Richelle Gomez, Graduate Student, Dietetics

School of Family and Consumer Sciences

Faculty Mentor:

Autism Spectrum disorder (ASD) is one of the most common disorders of brain developments affecting 1 in 68 Americans every day. The etiology of ASD is not fully understood but there is consensus that genetics and environmental factors interact to play a role in its development. Evidence from many fields of medicine have determined that the behavioral and metabolic disturbances common in ASD put individuals at an increased nutritional risk. Common nutrition interventions include mineral and vitamin therapy, and elimination diets such as gluten free and casein free diets, allergy free diets, supplementation with essential fatty acids, and megavitamins.

Examine Energy Losses in extra high voltage (EHV) Transmission Lines

Sai Kumar Guniganti, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Isaac Slaven

Losses in transmission lines play a major role in the economic viability of power system operation. If the length of the transmission line is increased then energy losses will be increases. There are very limited suitable meters are available presently to estimate these losses. Practical experience in one of the distribution companies show that reliability of load survey type energy meters used to record energy input to the distribution feeders is poor. So The main objectives of this paper are:

Study of total energy loss in (EHV) transmission lines. Determine the causes of losses in (EHV) transmission lines. Recommend methods for minimization of the losses. Lines losses are mainly depend on resistance of the conductor, size of the conductor, type of the conductor and length of the line. Pure annealed copper is the best conductor of electricity. Aluminum and Aluminum alloy conductors (ACSR & AAAC) widely using in transmission lines. Here we are taking a 220KV sub-station as an example to study the energy losses in Extra High Voltage (EHV) transmission lines by duly considering monthly energy readings of imports and exports at this sub-station. By observing the study of EHV transmission line losses we can conclude that where the generating station is near to the sub-station there the losses are less. In other words losses in the lines are directly proportional to the length of the transmission line.

$P = I^2R$

Research Tracking Application

Shyam Gurram, Graduate Student, Technology

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Toqeer Israr

There is a need for a secure task management and collaboration amongst researchers at any given university. Students are being assigned work by their supervisors/professors, yet there is no method of tracking their progress. Furthermore, should the student require collaboration in any given research area, no formalized framework exists to facilitate such collaborations.

We propose a Research Forum, an online presence, where students, professors and other scholars may get together from various parts of the world to collaborate.

In this Research Forum, students of various professors organized by their research areas are expected to post their daily work updates. This would enable the professor in identifying the researchers' accomplishments dynamically.

Also, this portal would be an online place for collaboration, where students and other researchers may post their queries so that their issues can be addressed by accomplished scholars, and thus increasing the efficiency of the work done by the researcher.

We are in the process of acquiring customer requirements and designing the portal and accordingly, it will be implemented in Java, PHP and Oracle.

Single Line Portal

Shyam Gurram, Graduate Student, Technology

School of Technology

Faculty Mentors: Dr. Peter Ping Liu, Dr. Toqeer Israr

Eastern Illinois University is having multiple logins (PAWS, Panther mail, D2L) for a single student (user). As a student, if I want to check my EIU mails I need to login to the Panther mail with my credentials, if I (same user) want to check my PAWS account once again I need to login to the PAWS page. This may be time taking process for the student.

We are proposing a solution for this problem. Instead of multiple login, if we have a single login to all the various accounts, then this will be an easy process for all of the students and for the faculty also who are a part of Eastern Illinois University. Many other Universities are following the same concept of single login. With this concept the student will login once to his/her account, then after we have links for the various accounts.

The Advantages with this application are, the most valuable thing in the universe is time we can save precious time of the student and as well as Professor. There is a chance of forgetting the credentials of the accounts because of multiple logins, by using this application we can avoid those problems.

Smart Home Automation Project

Ahmad Hakami, Graduate Student, Computer Technology

School of Technology

Faculty Mentor:

As technology students we often are reading and studying different topics associated with Technology. For this research project I believe I will focus on a topic that allows me to work on a research which will result a physical project to design and develop a physical solution based on my studies in the Masters of Technology program. This project will be based on the concepts learned during both my graduate and undergraduate studies, with some inclusion being drawn from the many experiences and interests gathered during my life.

Smart Home Automation will be the basis of this capstone project. The idea will be the creation of a device that can be used by the elderly, disabled and other associations that depend on the need to control lighting through the advancements of technological devices. The devices being discussed will be

powered through a standard 110/220 voltage system which can be controlled through the web via any I-product or computer browser.

The idea or technique of controlling electronic sources will be as simple as using an “ON/OFF” button and A/C automatic controlling by a temperature sensor and those are accessible through the web and connected via any network around the globe. The project will focus on those programming courses taken during my studies within my field of study and researched during the Graduate Research course. Furthermore the techniques and skills I have developed will allow me to develop such device, while documenting my findings through this project. Finally, I hope to draw on both my educational and personal experiences to develop a device that will both affordable and assessable to the end user.

Here is a list of the project requirements associated with the technologies: Arduino Microcontroller; Arduino Ethernet Shield, Arduino programming Code which is set of C/C++ functions, to program the microcontroller, relays and LCD screen and 5-HTML programming to build the website interface.

Women’s Wages

Kayla Horner, Senior, Family Services
School of Family & Consumer Sciences
Faculty Mentor: Dr. Kathleen O’Rourke

My presentation is on how women’s wages have been perceived through society in comparison to men in the workforce. My topic covers statistics and up to date data from 2013 to today on women’s wages to men’s wages. Also, I have provided a map of the United States that shows what percentage does a woman make compared to me of different races. I show through research what does the wage gap do to families and how it is impacted by age and use statistics to prove how important it is to understand the gender gap in pay. There are also notes on the equal pay act and how media portrays the impact of the equality of equal pay. This then brings in the question of is it the workforce that causes this pay gap or is it women and their job of choice?

Everyone Deserves a Chance! Educational Options for Incarcerated Individuals

Dawn Howe, Graduate Student, Family Services
School of Family & Consumer Sciences
Faculty Mentor: Dr. Michelle Sherwood

According to the Illinois Department of Corrections (IDOC) there are approximately 50,000 incarcerated individuals in the state of Illinois at any given time. It is also important to consider the fact that special populations of emerging adults are disproportionately represented in the incarcerated population. Combat veterans and African American males make up more of the prison population than their share of the general population. In fact, more African American males are currently in prison than in college. The mission of the IDOC is to protect the public from criminal offenders through a system of incarceration and supervision which securely segregates offenders from society, assures offenders of their constitutional rights and maintains programs to enhance the success of offenders' reentry into society. However, in reality individuals incarcerated in Illinois have little to no chance to obtain a four-year degree. DIU and drug laws have changed the demographics of the incarcerated, filling facilities with middle-class emerging adults that have long associated education with success and their needs are largely ignored.

This project consists of an extensive literature review, data from a study of current educational offerings in correctional facilities in the state of Illinois, and personal narratives regarding the meaning of education in the lives of incarcerated individuals.

A Study of Effect of Surface Condition on Energy Production of Photovoltaic Solar Arrays

Arif Jalbani, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

Need: Solar is one of the best renewable energy resources. Data from the field about the energy losses due to surface soiling of PV plants are scarce. The study of type of dirt and its accumulation on surface of solar panels vary from one location to other. The characteristics of climate (Rain fall, amount of dirt in the air etc.) are important factors and are site specific. This paper will focus the field measurement of dirt energy losses (dust) and irradiance incidence angel losses since inception to date on a Solar PV plant located at Center for Clean Energy Research and Education, Eastern Illinois University. This study will help us to understand the performance of solar panels. The variations in energy production of each sub panel. The study conducted will help us to understand per day, monthly and annual production of each panel, and to estimate the annual energy losses due to dirt and irradiance incidence angel. This paper will further suggest the proposed techniques to be implemented to avoid such energy losses.

Overview: Surface soiling is the 3rd most important PV performance factor, after insolation and temperature. This study has been designed to study the effect of soiling on energy production. Typical factors of soiling shall be studied in detail during this research project. The most important factors include Site Characteristics (vegetation, traffic air, pollution), Ambient temperature and humidity, PV system tilt angle and orientation (include exposure to sun and wind), Dust properties (include type, shape, size and weight), Wind velocity, Glazing characteristics (texture and coating). After identification of factors which impact the soil accumulation, this study will study the percent of energy loss due each factor. This research will evaluate and measure the impact of soil accumulation on the existing PV system installed at Center for Clean Energy Research and Education, Eastern Illinois University, as well as will predict soiling impacts on future PV plant energy generation.

Summary: Solar as the renewable energy source, is expected to help reduce the nation's dependency on foreign oil or other fossil fuels. The world is moving towards more solar energy, the pace is improving day by day. It is important to study the factors which influence the performance of solar PV systems. This Study will help identify impact of dust accumulation on efficiency of PV plant. This study will further identify the suitable methods to avoid these energy losses of this PV plant and all other PV plants to installed having the same environmental conditions and their impacts.

General Electric Light Bulb

Jasmine Jones, Senior, Applied Engineering & Technology-Manufacturing

School of Technology

Faculty Mentor: Dr. Wutthigrai Boonsuk

With every production system there will be waste, time delays and production layout malfunctions. In our research we will be contacting General Electric to analyze their light bulb production system to determine whether or not certain components/ strategies are detrimental to their light production.

Thus far there has been a problem with the waste of leads, wires and glass. As future technologists it is our duty to create a lean way to produce products and get them to the distributors effectively and efficiently. Of course, there are various ways to go about this project; nonetheless, our group will approach this research with a lean manufacturing approach because of its growing popularity in the industrial world.

As part of our research we will suggest different strategies while taking into consideration the wants of the company so that the research is not in vain. The best research and design are those that are practical rather than impractical. We hope to attain ideas that contribute better quality and production to the General Electric Corporation while learning the ins and outs of a production facility.

Key Factors towards Customer Satisfaction in PV Solar Manufacturing and Related Market

Syedramin Khalilnejad, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

Customer satisfaction is one of the critical goals in green power generation not only for renewable energy markets but also for establishing a green culture across the country. Particularly, PV solar is one of the fastest-growing markets in the United States that needs special focus on customer expectations in order to shape a trustful market for future demands and related services. Basically, financial benefits, energy independency and carbon offsetting are the major targets in PV solar market to build the desired trust and satisfaction among the customers. Therefore, comparing PV solar manufacturers in terms of materials, manufacturing, efficiency and durability would give energy consultants the key indicators for selecting the best systems based on customer expectations and related budget. Basically, the paper would try to end up with an applicable guideline for PV solar operation and related power monitoring based on a practical study directed by Center for Clean Energy Research and Education (CENCERE) in Eastern Illinois University. Eventually, the paper would discuss the technical issues in PV solar manufacturing in order to suggest possible solutions towards customer satisfaction as the key element for developing a successful Total Quality System (TQS) in the market.

Links between Sleep and Nutrition in Children and Adolescents

Haleigh Kneebone, Graduate Student, Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Melanie Burns

The prevalence of overweight and obesity has increased worldwide over the years, leaving no race, sex, age, or socioeconomic group unaffected. Rates of overweight and obesity among children and adolescents are particularly a large concern. Over the past three decades, obesity has more than doubled worldwide, with around 43 million children younger than 5 years considered overweight (Landhuis, Poulton, Welch, & Handcox, 2008). The increased frequency of seeing younger individuals with obesity is linked with an increase in obesity-related comorbidities like diabetes and cardiovascular disease at a younger age (Landhuis et al., 2008). One factor that has been taken into consideration is quality and quantity of sleep which has simultaneously decreased in all ages. Due to the 24/7 pace of people's lives, technology, and eating habits, people are getting less sleep over time. Sleep restriction has been found to impair glucose metabolism, increase energy intake and reduce energy expenditure (Luyster, Strollo, Zee, & Walsh, 2012). Insufficient sleep causes this to happen through activation of

hormonal responses such as reciprocal changes in leptin and ghrelin, along with changes in the levels of insulin, cortisol, and growth hormone which can lead obesity and other chronic diseases (Taheri, Lin, Austin, Young, & Mignot, 2004). Dietitians are in the perfect position to begin evaluating the sleep habits of clients who are battling with their weight and are at high risk of developing chronic diseases. It would be beneficial for dietitians to ask children and adolescents questions about their sleep, eating, and exercise habits, so the problem can be changed early on and not continue into adulthood.

Theoretical Application: Financial Pressures on Families during the Holidays as a Result of the Retail Industry

Mariah Layman, Senior, Merchandising
School of Family and Consumer Sciences
Faculty Mentor: Dr. Kathleen O'Rourke

The purpose of this assignment was to choose a topic/issue to research, take said topic/issue and relate it to a case scenario, apply a theory that has previously been studied during the class course, and then explain how the chosen theory correlates to the issue. The issue I chose was the financial pressures that are put on families during the holidays as a result of the retail industry, the case scenario I implemented within my theoretical application was the consequences that families and retail employees have to face and endure at the hands of the retail industry during the holiday season, and the theory I chose to apply to correlate to my issue was the Family Stress Theory.

The Impact of the Money Smart for Older Adults Program on Perceptions of Financial Exploitation

Charles LeGrand, Graduate Student, Gerontology
School of Family and Consumer Sciences
Faculty Mentor: Dr. Jacquelyn Frank

A research team at EIU conducted a study to examine older adults' awareness of and concerns about financial exploitation. A pre-posttest study design was used to gather data from older adults before and after participating in the Money Smart for Older Adults education program. This session will present the findings from this study.

The Money Smart educational sessions began during the spring of 2014 and are ongoing through fall 2014 in many communities throughout central Illinois. Highlighted during the workshop session will be the following results from the research study:

- 1) Seniors beliefs about being a victim of financial exploitation before and after participating in the Money Smart for Older Adults program.
- 2) Their primary financial concerns with respect to age and gender.
- 3) What role participants' perceptions play in regard to financial planning and decision-making?

Nutrition Related Comorbidities in Children with Cerebral Palsy: Dysphagia, Malabsorption, and Constipation

Lauren Lippert, Graduate Student Dietetics
School of Family and Consumer Sciences
Faculty Mentor:

Cerebral palsy is the most common cause of childhood disability in the world, affecting four out of every 1,000 births (CDC, 2015). The comorbidities of cerebral palsy that have an impact on nutrition status in children include dysphagia, malabsorption, and constipation. The poster will depict the different types, causes, and characteristics of cerebral palsy. Evidenced-based research studies will review successful interventions found from improved nutrition support and enteral feeding formulas, an oral device used to prevent dysphagia, and constipation prevention in children with cerebral palsy. The purpose of this poster is to represent the nutrition-related comorbidities in children with cerebral palsy and interventions that are proven to reduce or eliminate them.

The effects of pilot financial deregulation in China: Evidence from Shanghai's free-trade zone

Yifan Liu, Graduate Student, MBA
School of Business
Faculty Mentor: Dr. Ingyu Chiou

On September 27, 2013, the Chinese government officially launched a new free-trade zone (FTZ) in Shanghai as a laboratory for remaking the country's financial and other sectors. This paper uses the event-study methodology to investigate how the stock prices of 16 Chinese banks are affected before, at, and after the announcement of the FTZ. Our findings are as follows. First, the mean abnormal return of 16 sample banks in each of the [-1, 0] and [0, 0] windows is positive but not statistically significant. This is not consistent with our hypothesis that financial deregulation tends to increase bank value. We suggest that reform uncertainty, increased competition, and information leakage may be possible explanations. Second, in each of the [-1, 0] and [0, 0] windows, the average abnormal return of regional banks is higher than that of Big 4 banks. This is not consistent with our prediction that financial deregulation often benefits large banks more than small banks. This inconsistency may be due to the fact that regional banks are normally more innovative and have more strategic freedom. Finally, in cross-sectional analysis, we find that the total assets (size) variable has little to do with the abnormal return and that the abnormal return is inversely related to the return on equity (profitability) variable. These two results are not consistent with our hypotheses.

Home Brew Wind Energy

Alex Markwell, Senior, Applied Engineering & Technology
School of Technology
Faculty Mentor: Dr. Isaac Slaven

The purpose of this independent study was to: research, acquire, and build a wind turbine from common materials. This study was to determine the power curve and return on investment of home built wind turbines compared to manufactured turbines. The study began with research for tested and proven designs of home built wind power. This information was used to develop a design for the study's wind turbine.

Media Portrayal of Eating Disorders
Cierra Rains, Senior, Family Services
School of Family and Consumer Sciences
Faculty Mentor: Dr. Kathleen O'Rourke

This project was specifically focused mainly on how--if at all--the media influences/triggers eating disorders and how it depicts body image. An array of facts, statistics, and definitions are also discussed within the presentation. Because I personally feel strongly about early prevention and noticing possible signs and symptoms, signs and symptoms to look for when one may be dealing with an eating disorder are also briefly elaborated throughout the presentation as well. The prevalence and who seems to be more susceptible to having an eating disorder is also within the discussion topic. The media and how it depicts behaviors and thoughts of those dealing with an eating disorder is the main and most talked about theme throughout the presentation.

Testing the Efficacy of Rope Washing in Improving the Performance Strength of Life Safety Ropes
Nathan Rhebergen, Senior, Applied Engineering and Technology
School of Technology
Faculty Mentor: Dr. Isaac Slaven

This research studied the effect of marketed rope cleaner on engrained sand that is known to have negative effects on the breaking strength of life safety rope. Using a sample size of 5 ropes, the study compares untreated samples, samples engrained with sand, washed non-engrained samples, and wash engrained samples. Each of these tests was completed using two different types of knots: the double figure-eight and the Slaven knot as the Slaven knot had previously demonstrated better performance with engrained sand. The data was analyzed using two-way ANOVA.

The Effects of Small-Radius Edges on the Strength of Life Safety Ropes
Cody Robinson, Senior, Applied Engineering and Technology
School of Technology
Faculty Mentor: Dr. Isaac Slaven

The research the effect on rope strength when applying load over a corner as might be experienced in field use. Using a tensile test machine with an in-line obstacle, tests were done to determine the negative effects on the pulling capacity of the ropes. The pull tests were done on static, low-stretch, and dynamic ropes. The tests used a sample size of five ropes per test. Each test treatment is compared to a baseline, straight pull test of the same rope to determine the coefficient of strength reduction. The result I gather will develop recommendation on how a rope can safely handle activities like climbing or rappelling from or over points that put an angle on the rope compromising the user's safety.

Emission Analysis for Biomass Renewable Energy Production

Ramadevi Sagi, Graduate Student, Sustainable Energy

School of Technology

Faculty Mentor: Dr. Peter Ping Liu

The change in climate caused by humans has turned into a significant and growing problem that should be addressed in order to avoid terrible effects both locally and globally. The change in climate is due to several greenhouse gas emissions released into the atmosphere such as carbon dioxide, carbon monoxide, hydrogen sulphide, and nitrogen dioxide which have a heat trapping effect on the atmosphere. Basically, carbon dioxide and nitrogen dioxide as the major pollutants, are the products of combustion reactions in both renewable and non-renewable energy fuels. However, emission from renewable energy fuels are one of the key factors we need to analyze the overall carbon offsetting as the initial goal of using the renewable energy resources. Particularly, syngas production from biomass feedstock is one of the research projects conducted at Center for Clean Energy Research and Education (CENCERE) of Eastern Illinois University. Emission assessment is a significant part of the project towards a high quality syngas production for renewable energy.

A pilot downdraft gasifier is considered for the syngas production using different biomass feedstock such as woodchips and switchgrass. Basically, the produced syngas is continuously burned in a flare in order to check the status of gas production based on the flame conditions. Therefore, a portable combustion gas analyzer is installed at the top of the flare in order to simultaneously record the combustion products especially the emitted greenhouse gases. Technically, the gas analyzer is equipped with two types of sensors including electrochemical and non-dispersive infrared (NDIR) sensors to detect the combustion products. Basically, NO₂, SO₂ and H₂S are detected by the electrochemical and CO₂, CO and hydrocarbons are detected by the NDIR sensors. The recorded data are sent to a PC in order to analyze and compare the greenhouse gas emission under different conditions in terms of temperature, pressure and feedstock of the gas production.

Comparison of Asian countries and America in terms of elderly policies.

Swastika Sharma, Graduate Student, Gerontology

School of Family and Consumer Sciences

Faculty Mentor: Dr. Jacquelyn Frank

This independent study was done to study better an emerging issue of aging, “Global Aging” and focuses primarily on the elderly policies in terms of social security, health insurance and long term support system. The need for the study was identified due to author’s own experience of growing up in an Asian nation, Nepal and being familiar with the inadequate public policies and programs directed towards aging; this fact and perception was substantiated after being enrolled in Masters of Arts in Gerontology program at Eastern which made the author familiar with wide range of services available for American older adults in various levels and hence a need to compare these two nations seemed consequential. But the fact that one small nation cannot represent the aging policies of whole Asian continent, made it important to select three more Asian nations: Japan (where population aging rate is faster than any other nation), China and India (two most populated nations) to better comprehend the multidimensional aspects of aging process, public and private policies, living arrangement and caregiving pattern, and to fulfill the objective of the study, comparison of such aspects of Asian nations was made with the United States.

Alleviating Poverty

Kayla Spencer, Graduate Student, Family Services
School of Family and Consumer Sciences
Faculty Mentor: Dr. Crystal Duncan Lane

I currently work with the homeless population in this area and have found that a fear I have developed is doing more harm than good through my attempts to assist people. From what little experience I have gained thus far, I can also identify in others this need to better understand the population they are working with. The purpose of this study is to gain as much understanding on the mindset and barriers of poverty, as well as effective tools, programs, and strategies that can assist a professional in this field. Literature on these topics is being studied and applied. The focus with many organizations is relief, when restoration/rehabilitation and development are the effective solutions. The goal is to gain and teach this base of knowledge that allows professionals to develop programs focused on long-term solutions for individuals in poverty. Sharing this information with the general public will allow others to work more effectively with individuals and families in poverty.

Perceived Feelings of Contentment and Happiness After Consuming Snack Foods

Cara Stanek, Graduate Student, Dietetics
School of Family and Consumer Sciences
Faculty Mentor: Dr. Jim Painter

Research suggests that up to 25% of an individual's daily calories can come from snacking.

Participants were a convenience sample (n=100) of students and faculty at a Midwestern university. Participants signed an informed consent and completed a pre-survey; they ranked their agreement with each statement using a 4-point Likert-scale (1=strongly disagree, and 4= strongly agree). They then reviewed the labels from Wonderful Pistachios, Lays potato chips, Nacho Cheese Doritos, Oreos, Ritz crackers, or M&M candies. After, they consumed as much of the 100-calorie portion of the snack as desired. The post-survey consisted of the same statements and procedure. All data was recorded by subject number. The university's IRB approved the study.

Subjects' average ratings of agreement for pre-tests for happiness were: Doritos 1.78, Lays Potato Chips 1.76 M&Ms 2.18, Oreos 2.20, Wonderful Pistachios 3.06, and Ritz crackers 2.36. Subjects average rating of agreement for post tests were: Doritos 1.62, Lays Potato Chips 1.69, M&Ms 1.89, Oreos 1.83 , Wonderful Pistachios 3.29, and Ritz crackers 2.01. (1=strongly disagree and 4= strongly agree). Participants ranked pistachios significantly higher ($p<.05$) when comparing pre-tests and post-tests of snack foods. Reading package labels and sampling foods, can lead to changes in consumer perception of happiness.

Comparing Four Volunteer Experiences

Dana Tell, Graduate Student, Family and Consumer Sciences
School of Family and Consumer Sciences
Faculty Mentor: Dr. Crystal Duncan Lane

This presentation will be a description of the volunteering experience at four local venues that offer food to the community. All locations are open to the community during specific times. Two locations

offer a free plate of food with unlimited portions and welcome refills. The other two locations offer all you can eat for \$5 a person. All of the locations rely on word of mouth to get the community to attend. The food was served by volunteer staff at all the location. Volunteering did not have many requirements and training was brief. While there are similarities there are also differences. This presentation will compare and contrast the locations and describe the volunteer experience.

Quantifying a Predictive Model for Repelling Rope Using Linear Regression on a Dynamic Fatigue Apparatus

Kyle Wathen, Graduate Student, Technology Management

School of Technology

Faculty Mentor: Dr. Isaac Slaven

Rope systems are used in many industrial, mechanical, and recreational activities on an everyday use. However, it is important to understand when and how structural failure will occur to stop detrimental effects when it comes to people's safety. By testing rope structure under fatigue stress there can be a clear prediction to when ropes will experience a moment of failure, and to validate a clear prediction can stop or foresee accidents from happening. The way to predict moment of failure is by creating a linear regression model of tensile strength against a number of cycles used with a fatigue apparatus. From this linear regression there can be correlation between how fatigue stress can impair the ropes strength and determine when rope experiences failure to provide people a clear prediction to when ropes need to be changed. From this research people in many areas will have a prediction to when ropes used for repelling or in certain applications need to be handled to reduce accidents and increase safety measures.

Food Science Research | objective and sensory testing methods

Brooke Welcher-Miner, Graduate Student, Dietetics

School of Family and Consumer Sciences

Faculty Mentor: Dr. Melanie Burns

Protein is an essential part of the human diet that serves as a building block for muscle, bone, hormones, and more in the body. It provides countless health benefits, is part of numerous body processes, and should be consumed in variation. Daily recommendations for protein differ among individuals based upon age, sex, and level of physical activity. Most people meet the recommendations for protein, but not in the healthiest or most diverse manner. The necessity to increase lean protein in the American diet, as well as balance amongst the food groups sparked interest in modifying a no-bake granola bar recipe. The purpose is to determine the effects of added protein source (peanut butter) in varying amounts on the quality characteristics (breaking strength, product volume, color, flavor, chewiness, and overall likeability) of No Bake Granola Bars.

Creating an at home granola bar recipe that is simple to prepare and contributes to a healthy, balanced diet for persons of all ages is the aim of this recipe modification. This shall allow the consumer to make their own granola bars with convenience and at a reduced cost, potentially avoiding the more processed versions that are store-bought.