

## **POSTER PRESENTATIONS – Wednesday 4:00 - 5:30 MORRIS UC LOBBY**

### **SINGLE PRESENTERS**

Moderators: Leila Lomachill and Alberto Poxes

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#### **Rebecca Boyd**

Mentor: Erik Larson

#### **Timing of Expression of Progradational Collapse Blue Holes in the Bahamas: Examples from Eleuthera**

The purpose of this study was to determine when blue holes were expressed at the surface through progradational collapse. Petrographic thin sections were made from samples of cap rock belonging to four progradational collapse blue holes on Eleuthera. These thin sections were analyzed to determine whether the depositional environment of the cap rock was subtidal or eolian, so that a maximum age for expression at the surface could be determined. The cap rock of all four blue holes' were composed of subtidal facies, which suggests these blue holes were expressed at the surface post MIS-5e, <120,000 years ago. However, previous studies suggest the expression of blue holes occurred >300,000 years ago based on speleothem dating. In part due to this contradiction, more research is needed to better understand when the expression of progradational blue holes occurred.

#### **Alexis Conley**

Mentor: Kimberly Inman

#### **Molecular Cloning of Chicken FOXC1 for Gene Expression Analysis**

During early embryonic development, neural crest cells (NCCs) migrate into many regions of the vertebrate embryo, including the pharyngeal arches. Once in the pharyngeal arches, NCCs generate most of the cartilage, bone, and connective tissue of the head and face, including the jaw and middle ear bones. Analysis of jaw and middle ear development in a mouse model has indicated the requirement of FOXC1 gene expression for development of both structures in mammals. The jaw joint in mammals differs from other gnathostomes, with the middle ear bones in mammals being homologous to the jaw joint in other organisms (the chicken, for example). This research aims to discover if FOXC1 plays a role in proper formation of the jaw joint in non-mammalian gnathostomes. We have begun the process of amplifying the FOXC1 gene in order to create a timeline of gene expression in the developing chick embryo.

#### **Lauren Duncan**

Mentor: Scotty Thompson

#### **The Importance of Positive Reinforcement in School**

This action research project will portray the increase in student's academics and behavior when positive reinforcement is implemented within the early childhood classroom through various techniques. Techniques include positive notes home to parents, moving behavior clips up on the classroom behavior chart as well as student work being displayed on the classroom brag board. Academic grades will be examined prior to positive reinforcement being implemented within the classroom as well as after positive reinforcement is implemented within the classroom. A pre-assessment on student's overall attitude about school will be given to students before the positive reinforcement is implemented. A post-assessment will then be given on student's overall attitude about school after positive reinforcement is implemented. The results will display if student's overall attitude about school increases when there is positive reinforcement and an increase in student's academic grades.

## **Zachary Fryman**

Mentor: Scotty Thompson

### **Warm-Ups in the Classroom**

This presentation displays the topic of my Teacher Education Capstone project. It includes several steps of the action research process. My task was to initiate change in the classroom that would enhance both teaching and learning. I recognized a problem in the classroom that needed to be addressed. Valuable instruction time was being wasted at the beginning of each class period as the instructor waited for students to cease their conversations and visiting with peers. I took an action to solve this problem by initiating warm-up activities. This provided students with a task as soon as they entered the room. The goal of this action was to increase potential instructional time in the classroom by reducing wasted minutes at the beginning of the class period. This presentation describes the details and methods used to take this action.

## **Jessica Leesburg**

Mentor: Erik Larson

### **Petrographic Analysis of the Bush Bay Formation, Engadine Group, Hiawatha National Forest, Upper Peninsula, MI.**

The mid-Silurian Engadine Group is poorly understood and comprised of three dolostone formations. The upper-most unit, the Bush Bay Formation (BBF), has a negligible dip and a maximum thickness of 20m. A stratigraphic section of the BBF was measured by walking a distance of ~1.2km while gaining ~15m of elevation along a shallow slope representing the paleo-lakeshore of glacial Lake Nipissing within the Pontchartrain Shores area, east of St. Ignace, MI. Twenty-one hand samples were collected from outcrops comprised of slope breaks, reef mounds, grike fields, and alvar. Hand sample analysis and standard petrographic thin section analysis were conducted on the samples, and findings indicated that the BBF is primarily a dolowackestone. With the hand sample and thin section data a detailed stratigraphic column and description of the BBF has been completed and the Engadine Group is closer to being understood.

## **Audriana Lindamood**

Mentor: Scotty Thompson

### **Parent Involvement in Homework**

This presentation covers the first three chapters of an action research plan conducted to investigate the effects of providing parents literature on ways they can help their child do homework by examining student achievement and homework completion rates.

## **Summer Little**

Mentor: Aaron Bruewer

### **Using Literature to Promote Growth Mindset in the Classroom**

The presentation will cover the definitions of the terms growth and fixed mindset. These two terms are used consistently in the modern day classroom. The presentation will then examine how students holding one mindset, or the other impacts their learning and success in the classroom. After discussing both of these points the presentation will then examine which mindset should be promoted in the classroom. To do this a review of literature will be presented which covers methods which have been used in the past. Some of these methods proving effective, and others proving ineffective. In conclusion, the researcher will present the gap in the research and a proposal for addressing this gap.

## **Marwen Moslah**

Mentor: David Deacon

### **Computer Vision Application for Industrial Image Processing Test**

A computer vision calibration application developed with the National Instruments environment via C++ language. This application can allow engineers in the company of my home country in which I had my senior internship to detect anomalies for the screens of modems that they produce. These anomalies covers backlight intensity of these screens, dead pixels, RGB color values and other image processing tests. As consequence, instead of having a manual testing for the screens, thanks to this application, the test process for these screen became automated, minimising the intervention of those engineers, and ensuring more efficiency and reliability by minimising the test time.

## **Abbey Perry**

Mentor: Kimberly Inman

### **BMP4 Expression in the Embryonic Chick Eye Following Induced Gestational Diabetes**

Human adults with diabetes pose a 60% higher risk for cataract development. Similarly, metabolic conditions in a mother's womb may induce congenital cataracts- a diagnosis with possible complications such as permanent visual impairment, amblyopia, and nystagmus. It is known that expression of bone morphogenetic protein 4 (BMP4) is needed for proper formation of the eye in *Gallus gallus domesticus*. The aim of our current research is to create a timeline of when and where BMP4 expression occurs in the developing chick eye. To investigate the effects of BMP4 signaling in early stages of eye development, we will implant BMP4 soaked beads in the chick. Future research will observe the effects of gestational diabetes on expression of BMP4, using a model system formed by treating the developmental environment with glucose solution. We hypothesize that altering the metabolic conditions will result in disruption of the BMP4 mechanism and induction of cataract formation.

## **Cole Schrock**

Mentor: Aaron Bruewer

### **Can Student Art Make a Difference in their Environment at School?**

Art is an important part of any culture, as it provides information about what that culture considered to be important and how they live, or lived. A school is like a miniature culture and the art that its students create show what that school is interested in and what it finds to be important. The question remains, do students have actually have a say on the culture in their school?

## **Tyler Sherwood**

Mentor: Dan Chaffin

### **A Review of the Vegetative Anatomy of *Anredera Cordifolia* (Basellaceae)**

*Anredera cordifolia* (Tenore) Steenis is a vine of vigorous growth habit native to South America. Anatomical detail of vegetative organs was studied using light microscopy. Cellular characteristics, tissue types and regions of all vegetative organs were described. Utilizing resin as an embedding medium for sectioning seems to allow better cellular resolution in organs.

## **Logan Shinkle**

Mentor: Scotty Thompson

### **Monitoring Student's Learning Growth Over Time**

The study that will be presented is how well students learning growth improves over time. The areas that will be focused on is Language Arts and Mathematics. The goal is to get the student to improve every time their learning growth is measured and the strategies used to help their learning growth.

## **Kristine Thompson**

Mentor: Janet Snedegar

### **Do Thickeners Really Work?**

Research and analysis of the following PICO question: In newborn infants with gastro-esophageal reflux, does thickening the formula versus not thickening the formula reduce the symptoms of reflux?

## **Bo Wampler**

Mentor: Jennifer Napper

### **Developing General Biology Labs**

The goal of my research was to find ways that general biology labs could be executed more proficiently; in a way that students would better comprehend the curriculum. By using just the basic materials held at SSU, I was able to conduct many of the experiments that the university typically spends thousands of dollars, for a significantly lower cost - and most importantly all while collecting some amazing data. This research will be used to develop multiple labs for Shawnee State students to use in the near future.

## **Emilee Hedrick**

Mentor: Scotty Thompson

### **Decreasing Disruptions Using The Positive Reinforcement Strategy of Quiet Critters**

Quiet critters have become a new strategy for positive reinforcement in classrooms. Quiet critters are little pom-pom balls with googly eyes. The quiet critters only come out when the students are being quiet. Study shows that implementing positive reinforcement strategies in classrooms can help to decrease disruptions. There will be two different types of disruptions; major and minor disruptions. The quiet critters will come out during math instruction and will sit on their desk while instruction is being completed. If a student becomes disruptive, then the quiet critter goes back into the jar. With implementing quiet critters, there will be a decrease in the amount of disruptions that occur.

## **Abby Bailey**

Mentor: Scotty Thompson

### **The Positive and Negative Effects of Co-Teaching on Students' Learning**

The purpose of this study is to decide whether collaborative team teaching affects the way a child learns. By doing this study, the principle researcher wishes to study the outcomes of students' learning in a classroom setting with collaborative teaching. Specifically, the researcher requests to see if having two teachers in the classroom work in partnership benefits the learning experiences of the students.

## **Garett Scowden**

Mentor: Logan Minter

### **Integrating sustainable pest management in the Waller Conservatory at Shawnee State University**

This study pertains to investigating the implementation of a more sustainable, integrated pest management (IPM) plan in the Waller Conservatory at Shawnee State University. The conservatory has perennially faced infestations of mealy bugs, which survive by sucking nutrients from their host plant. Insect pests have been primarily combated using chemical control techniques throughout the conservatory's history. As an attempt to reduce pest pressure, cultures of beneficial, biocontrol insects have been released into the greenhouse, along with very targeted and biorational use of pesticides, only when necessary. Released biocontrol agents to date include 100+ mealy bug destroyers (*Cryptolaemus montrouzieri*), ~1000 green lacewing larvae (*Chrysoperla* sp.), and 9000 lady beetles (*Hippodamia convergens*). To test this method, eight plants were monitored weekly, prior to and following release of biocontrols. Measurements and pictures of mealy bug cultures were collected weekly to determine the impact and effectiveness of the new IPM program for Waller Conservatory.

## **GROUP PRESENTERS**

### **MUC Lobby**

Moderators: Leila Lomachill and Alberto Poxes

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## **Josh Barney & Mika Garrett**

Mentor: Wendi Fleeman

### **Nickel Diimine Complexes for Dye-Sensitized Solar Cells**

In recent years, transition-metal dye molecules have been studied for their use as sensitizers in dye-sensitized solar cells (DSSC). Previous studies have utilized multiple transition metals such as ruthenium, osmium, and platinum and have reported respective solar cell efficiencies up to 11%. However, these metals can be expensive and require a complicated, synthetic path. Therefore, this study focuses on the use of nickel diimine complexes as sensitizers in DSSC because of their inexpensive, simpler synthetic path. Currently, the synthesis and efficiency of the nickel sensitizer dye molecules, Ni(3,3'-dcbpy)qdt, Ni(4,4'-dcbpy)qdt, and Ni(5,5'-dcbpy)qdt are under investigation where dcbpy = dicarboxy-2,2'-bipyridine (with different steric conformations on the nickel diimine ligands) and qdt = quinoxaline-2,3-dithiolate.

## **Berea Burke & Jonathan Putnam**

Mentor: Eugene Burns

### **Effect of Foods on Bacterial Attachment in Crohn's Disease**

Thousands of people in the U.S. suffer daily from Crohn's disease. Treatments mainly target the symptoms using anti-inflammatory medications, with no known cure and the cause still being unknown. This disease involves chronic inflammation of some or all of the digestive track and includes symptoms such as diarrhea, fever, abdominal pain, and reduced appetite, among other symptoms. Intestinal microbial agents play a key role in causing Crohn's Disease as well as IBD, and this imbalance of microbiota is believed to exacerbate the inflammation. This research will investigate (1) The interaction and attachment mechanisms of 2 bacteria, *Serratia marcescens* and *Escherichia coli*, as well as 1 fungal species, *Candida tropicalis* to intestinal epithelial cells, (2) Compare bacterial and fungal species and interactions with typical food products to determine the effect on attachment including, Gluten, Lactose, and Capsaicin which may be a key determinate in Crohn's disease.

## **Jessica Conley & McKenzie McDowell**

Mentor: Aaron Bruewer

### **How to Increase Students' Attitudes Towards Mathematics**

This presentation focuses on ways in which teachers can increase students' attitudes towards mathematics and decrease math anxiety. The researchers researched two methods and their impact on student attitudes, the use of group based co-teaching models, and increased use of technology in the classroom.

## **Amy Craig, Sarah Biehl, & MaryLouise Thompson**

Mentor: Ryan Walker

### **Plantar Fasciitis**

What treatment approach is more effective for cases of chronic plantar fasciitis: orthotics or kinesio-taping?

## **Cassie Edwards, Kelsey Carmack & Jessica McCombs**

Mentor: Ryan Walker

### **Lateral Epicondylitis**

A review of treatment options and the effectiveness of each on lateral epicondylitis. Grip strength, pain, and ROM are measured to determine the effectiveness of each treatment performed on the patients.

## **Nathan Ewing, Jourdan Priddy, Catlin Shilling & Timothy Meyer**

Mentor: Ryan Walker

### **Subacromial Impingement**

The effectiveness of proprioceptive neuromuscular facilitation and scapular stabilization exercises in collegiate pitchers in regard to pitch velocity.

## **Charles Howell, Jessica Ruggles & Haley Ruggles**

Mentor: Ryan Walker

### **Patello Femoral Pain Syndrome**

Patellofemoral Pain Syndrome (PFPS) is a diagnosis for knee pain, and is a complex condition that our group researched. The poster will present an overview of PFPS. The poster will also include our hypothetical research project and suggest possible findings if the research were conducted. Three research papers were developed in the process of creating this presentation. The primary focus will be the effect Physical Therapy can have on PFPS.

## **Charles Howell, Jessica Ruggles & Haley Ruggles**

Mentor: Ryan Walker

### **Patellofemoral Pain Syndrome**

Patellofemoral pain, causes, and symptoms.

## **Levi Kiser, Amy Coriell, Andrew Cantwell & Corey Tenney**

Mentor: Ryan Walker

### **The Effects of Deep Tissue vs Soft Tissue Mobilization when Treating Carpal Tunnel Syndrome**

Our presentation compares the theory of how soft tissue mobilization when pair with active stretching would yield higher benefits in terms of range of motion that when compared with soft tissue range of motion paired with active stretching and active stretching on its' own; in a study group of factory working men with Carpal Tunnel Syndrome.

## **Levi Kiser, Amy Collins, Andrew Cantwell, & Corey Tenney**

Mentor: Ryan Walker

### **Benefits of Soft Tissue Mobilization vs. Deep Tissue Mobilization on Carpal Tunnel Syndrome**

This proposed study looks at how middle aged factory working men could benefit from tissue mobilization to the carpal tunnel. There will be three proposed groups, a control of just active stretching, a group with stretching paired with soft tissue mobilization and a group who pairs stretching and deep tissue mobilization. The benefits are then compared.

## **Allison Ratcliff, Kayla Satterfield, & Jordan Cauton**

Mentor: Ryan Walker

## **Greater Trochanteric Bursitis (GTB)**

This presentation describes GTB and shows, in our opinion, treatments that would help those with this condition. Our group put together an experiment that tested different treatment options for GTB and then predicted what we thought the outcomes of the experiment would be based off extensive research that we did.

**Corey Tenney, Andrew Cantwell, Amy Collins, & Levi Kiser**

Mentor: Ryan Walker

## **Does Soft Tissue Mobilization or Deep Tissue Mobilization Have a Greater Impact on Range of Motion when Paired with Active Stretching in Long Term Assembly Line Workers Diagnosed with Carpal Tunnel Syndrome?**

This proposed study looks at the benefits of both soft tissue and deep tissue mobilization when used in treating carpal tunnel syndrome, specifically in assembly line factory workers, when paired with active stretching. There would be three groups tested, one with DTM and active stretches, one with STM and active stretches, and the control of active stretching by itself.

**Aaron Wamsley, Gabriel Howard, & Madison Scarberry**

Mentor: Jennifer Napper

## **Detection of DNA Methylation in 5-Azacytidine treated Acute Myeloid Leukemia Cells**

Cells naturally regulate gene expression through DNA methylation, which is carried out by DNA methyltransferases (DNMT). DNA methylation ultimately results in a reduction of target protein expression in cells. Abnormal gene expression due to DNA methylation has been described in many types of cancer. We wish to determine whether inhibition of DNA methylation has an effect on AML cell survival. 5-azacytidine, a chemical analog of the nucleoside cytosine, has been well documented to inhibit DNMTs. Our hypothesis is that treating AML cells with 5-azacytidine will inhibit AML cell growth. Three AML cell lines, HL-60 and U937, and Kasumi 3 were treated with 5-azacytidine and kill curves were constructed. Appropriate concentrations of 5-azacytidine were determined from the kill curve data. After 48 hours of treatment, DNA from cells was isolated, and treated with sodium bisulfite. Bisulfite treatment will allow us to determine the extent of methylation in target genes using PCR and sequencing.