



4-17-2018

## SWOSU Research and Scholarly Activity Fair 2018

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### Description

On behalf of the members of the Southwestern Oklahoma State University (SWOSU) University Research and Scholarly Activity Committee (USRAC) - Welcome to the **Twenty-Fifth SWOSU Research and Scholarly Activity Fair!** There are 130 poster presentations and 10 oral presentations involving 293 student researchers, writers, presenters, artists, collaborators, and faculty sponsors encompassing activities from the SWOSU College of Pharmacy; SWOSU School of Nursing & Allied Health Sciences; and SWOSU Departments... [Read More](#)

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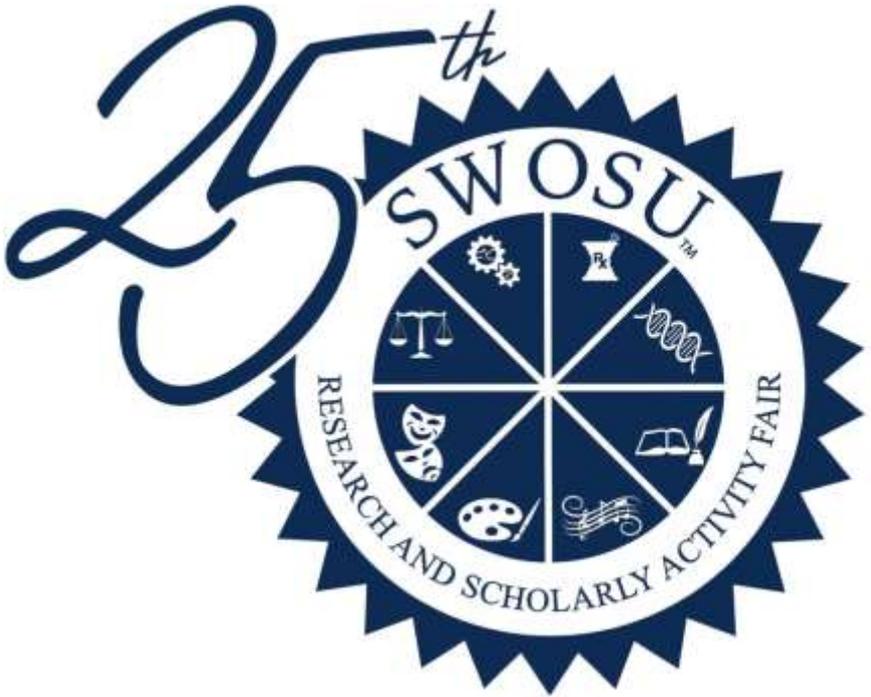
### Recommended Citation

Appeddu, Lisa and Smith, CJ, "SWOSU Research and Scholarly Activity Fair 2018" (2018). *SWOSU Research and Scholarly Activity Fair Programs*. 1.

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# The Twenty-Fifth Annual



**April 17, 2018**

**Pioneer Cellular Event Center**

**12:00 - 3:00 p.m.**

**Twenty-Fifth Annual  
SWOSU Research and Scholarly Activity Fair  
Tuesday, April 17, 2018**

On behalf of the members of the Southwestern Oklahoma State University (SWOSU) University Research and Scholarly Activity Committee (USRAC) - **Welcome to the Twenty-Fifth SWOSU Research and Scholarly Activity Fair!** There are **130** poster presentations and **10** oral presentations involving **293** student researchers, writers, presenters, artists, collaborators, and faculty sponsors encompassing activities from the SWOSU College of Pharmacy; SWOSU School of Nursing & Allied Health Sciences; and SWOSU Departments of Art, Communication, & Theatre; Biological Sciences; Business & Computer Science; Chemistry and Physics; Education; Engineering Technology; Language & Literature; Music; Psychology; and Social Sciences. This also includes guest presenters from the Biomedical Academy at the Western Technology Center, El Reno Public Schools, BlueSTEM AgriLearning Center, and Francis Tuttle Technology Center.

We wish to extend special thanks to all who played vital roles in making this event happen, particularly: President Randy Beutler and Provost James South, for their continued support of research and scholarly activity at all levels throughout the University; Veronica McGowan, interim Director of the OSP, for her enthusiastic help; and Mr. Nate Downs, Mr. Duncan Taylor, and their staff for helping to set up the facilities and providing refreshments. We appreciate the donations from area businesses and SWOSU organizations and departments which supplied the giveaways for the scavenger hunt and the visiting high school students. We also recognize the faculty, staff, and administrative sponsors and collaborators who dedicate significant time and effort toward integrating students into various forms of research and scholarly activity.

I personally would like to acknowledge Dr. Yolanda Carr, former Director of the Office of Sponsored Programs (OSP) and CJ Smith (OSP Grant Specialist) for their dedication and hard work to make this event a reality in coordination with the SWOSU USRAC.

Student research is an essential ingredient in undergraduate education. It fosters collaboration, critical thinking, and creativity in identifying and working to solve a question, plus it provides the opportunity to communicate results. And, from the student's perspective, there is the added excitement of potentially being the first to make a discovery, understand a problem, provide a solution, and/or make a creative contribution to the world. *We believe your involvement in the Fair is made even more special this year, which marks 25 years of highlighting research and scholarly activity accomplishments on the SWOSU campus.*

**Enjoy the Fair!**

Sincerely,



Dr. Lisa Appeddu, Chair  
University Research and Scholarly Activity Committee (USRAC)

2017 to 2018 SWOSU USRAC Committee Members

- Dr. Becky Bruce, Department of Social Sciences
- Dr. Rickey Cothran, Department of Biological Sciences
- Dr. Jared Edwards, Department of Psychology
- Dr. Jeremy Evert, Department of Business & Computer Science
- Dr. Denise Landrum-Geyer, Department of Language & Literature
- Mr. Ed Klein, Department of Education
- Ms. Erin Ridgeway, SWOSU Libraries
- Ms. Kim Zachary, College of Associate & Applied Programs
- Jay Garber, CAS SWOSU Student Representative
- Suzanne Parker, CPGS Student Representative

## Poster Presentations

*Posters are located on the Arena floor of the Pioneer Cellular Event Center (PCEC).*

*Entrances are located via stairs on both the West (main entrance) and East ends. An elevator is located on the West end of the PCEC, to the right of the Interactive Displays and doors leading to the food trucks.*

- 1 Benefits of Homemade Dog Food Compared to Store Bought Dog Food.** Tessa Ingram. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK; and Dr. Marilyn Wolgamott, Veterinarian, Heartland Animal Health Center, Weatherford, OK).

Veterinarians have claimed that homemade dog foods will not have a big impact on dogs, unless they have certain food allergies that need to be avoided. Dr. Marilyn Wolgamott, from the Heartland Animal Hospital in Weatherford, Oklahoma, stated that there will not be a significant change between homemade and high quality dog. Dr. Wolgamott said that the most significant changes will occur with dogs on poor food diets. She also stated that the testing will take at least two months to make sure it gets in the dog's system and starts to work. The project will focus on common dog foods that most people buy from the store. The researcher will be testing name brand foods. Dr. Wolgamott stated the research will yield insignificant in change, but do not have a firm statement on the outcome of the experiment. The project will test veterinarian approved dog foods against homemade dog foods to analyze what is healthier for dogs for long term health. The hypothesis is, if you give a dog homemade food then the dog's overall health will increase. Nutrition facts will be collected on the homemade dog food before testing begins. For the research a group of dogs will be gathered. The dogs will be grouped by homes, so if there is more than one dog in the home they can all eat the same food. The dogs will get their initial blood test done first before any further advancements. One group will be getting the dog food that is name brand and commonly bought for pets. The other set of dogs will be getting homemade dog food. All food will be approved by a vet before being used. All the research will be overseen by a vet. Every other week the dogs will be tested for eight weeks. They will have a regular check in addition to the blood tests. Blood will be drawn to be tested to see if they have improved in their health. The researcher will not be looking at one specific aspect of the blood tests. The project is looking at everything to take into consideration for the overall health of the dog. This is because one aspect does not define the overall health. The blood will go through a chemical test to check for levels of: cholesterol, protein, electrolytes, etc. After eight weeks of testing and collecting data the research will be concluded gathering results and sharing data.

- 2 Sugar Rush.** Demi Estrada. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

Studies have shown, "Dopamine levels in the brain have to be within a very narrow margin in order for a person to be able to focus on their work. But in attention deficit, dopamine levels are too low. Stimulant chemicals such as caffeine or amphetamines tend to increase dopamine levels." This study will explore and provide data as to whether or not test subjects with attention deficit react with improved performance due to increased levels of caffeine, as well as, collect data for any change in physical symptoms which may be connected to increased caffeine intake.

This experiment will start off with a self diagnosis for attention deficiency and see if the subject meets the criteria of the test given them. The researcher will begin with 19 subjects who will each receive a self-diagnosis test in order to split them into two groups: 9 subjects that meet the standards of self diagnosis for attention deficiency, and the other 9 will be the control group.

The experiment will last for one month, the subjects will continue their regular caffeine intake. For two day the subjects will take a 20 question math quiz which will be timed at their own speed. The subjects will be given Dr. Pepper 4oz after the first test, 20 minutes after their first test they will be given another test with the same amount of questions still self timed. The controls and attention deficits groups will be compared their scores from subtracting before and after to see the differences in control or experimental groups. This will suggest that the caffeine impacted the scores of both groups. The expected result is that increased caffeine intake will result in the score change between the two groups, because dopamine levels grew higher which enable the subject to focus on the task at hand.

- 3 Effects of caffeine on performance.** Kazik Earl. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

Studies have shown that caffeine does in fact increase the capability to perform better during workouts by about 6-12 percent. More benefits are also noticed in athletes who rarely drink coffee, hence are not tolerant to its stimulant effect. Everyone responds to caffeine differently so there is a possibility it can cause you to perform better or worse. In this experiment the researcher will try to find a way to increase workout performance.

Therefore, the researcher will conduct an experiment to better understand the effects of caffeine to athletes. The researcher will conduct the experiment during high school basketball practice to see whether or not it improves performance. A physical test will be conducted that will record the times of the players running down and back on a full size basketball court in seconds every Monday for four weeks. The researcher will randomly select two groups of five, one control group and one group consuming caffeine. The researcher will then began to give caffeine (4oz of Mtn dew) to the test subjects in the caffeine group every day for a month. Conduct the same performance test every Monday for four weeks. The researcher would expect to see a greater increase in running time after the subjects have been taking caffeine rather than their speed when they had no caffeine.

**4 Bacterial Growth On Cell Phones.** Paige Perkins Parker. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

Cell phones have been known to carry viruses of all shapes, sizes, and colors. There are bacteria and chemicals that people would not want touching their hands and face. These bacteria's are: Staph, E.coli, and MRSA, and much more. The listed bacteria can be encountered from everyday life, and are harmful if they are found inside the body, though outside they are almost completely harmless. Micrococcus, a flora of the skin especially on the face and Bacillus a common bacteria found outside. These are a few bacteria's that will most likely be found on all phones. Alcohol is something everyone uses to clean their phones or anything really, because people have always said it works the best to clean and disinfect. From researching multiple websites and articles concerning disinfectants on phones, or just in general. From all of those sources they say that alcohol is clearly the best choice. Through more research there have been numerous websites that also says UV lights is the best choice for disinfecting a phone, and since many hospitals and science labs use UV lights to clean and or disinfect goggles, patient rooms, and so much more the researcher found that information to be the most accurate and useful. One resource commented on a UV light phone cleaner, called phone soap, and she said " The Phone Soap may kill germs that the hydrogen peroxide and alcohol didn't kill." Therefore the researcher believes that the UV lights will be much more effective on cleaning and disinfecting cell phones.

**5 Placebo Effectiveness.** Teodora Rodriguez. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

The placebo effect is a beneficial effect, produced by a placebo drug or treatment, that cannot be attributed to the properties of the placebo itself, and must, therefore, be due to the patient's belief in that treatment. Coffee and other caffeinated drinks marketed and consumed by millions of people who have believed the caffeine in coffee is giving them the energy they need every morning but what researchers have found out that coffee may not be the reason behind their energy spur. This experiment will test if people who think they are drinking caffeine will perform as well as those who drink actual caffeine. The first group, which will also be the control group, do not drink anything and are required to take the online matching card game twice. The next group of ten individuals will receive four ounces of caffeinated coffee and will be required to take the online matching card game. The third group, which is, also the placebo group will drink four ounces of decaffeinated coffee and will play a find the pair game online. At the end of the experiment, the people who receive decaffeinated coffee will perform just as well as the ones who had actual caffeine.

**6 Vital Capacity: Athletes vs. Musicians vs. Athletic Musicians.** Zoraida Uribe. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

Vital capacity is the greatest amount of air that can be forced from the lungs after maximum inhalation. Athletes and musicians rely on their vital capacity to perform for long periods of time. In a similar previous study, it showed that athletes had a greater vital capacity than musicians do. This project is going to be testing the vital capacity of musicians, athletes, athletic musicians, and people who do not participate in any activity as the control group. The purpose of this experiment is to see which group has a greater vital capacity; just for general knowledge. This experiment will have about eight different test subjects for each group. There will be even amount of genders (four girls and four boys) for each group, because males have bigger lungs than females do, and the data need to be compare fairly. This experiment will test the test subjects two different ways: when they are calm and after they do a little exercise. The researcher will run the experiment preferably before the test subjects' practices or rehearsals. The researcher will run the test by testing for lung volumes, and use the data to do the calculations for vital capacity. The researcher will first test them when they are calm. Then, after collecting data from the test subject's first vital capacity results, the test subject will do a one-minute exercise and then do another lung volume procedure. The researcher will run the whole experiment once for each test subjects. From there the researcher can gather the data for each group and compare them for the conclusion results.

**7 Artificial Insemination vs Intrauterine Rods.** Halle Hartman. (Mr. Shane Brashears, Biomedical Academy,

Western Technology Center, Burns Flat, OK).

Artificial Insemination rods are rods you put through a sow's cervix to breed them. Artificial Insemination rods have been used to breed their sows for years, but in the last five years a new form of breeding has come out, called Intrauterine rods. Intrauterine rods are a rod that goes into the sow's uterus to breed the sows. Intrauterine rods have resulted in larger litter sizes according to many farms. In this project, it will test AI and Intrauterine rods and will determine which rod works more efficiently. The researcher predicts the Intrauterine rods will result in larger litter size. The researcher will obtain semen from boar studs to breed their sows. The semen will be looked at under a microscope and will be recorded by how many sperms are moving. Ten sows will be bred with Artificial Insemination rods and ten will be bred with Intrauterine rods. A record of backflow will be taken, backflow is when the semen starts coming back through the rod. A 114 days monitoring of the sows where their health and fetal health is insured is necessary this is the gestation period of a sow. The record of data of how many piglets each sow had will be taken and that will determine if the researcher's hypothesis is correct.

- 8 **Vegetarian Nightlights: pGLO modified Plants.** Sydney Goodwin. (Mr. Shane Brashears, Biomedical Academy, Western Technology Center, Burns Flat, OK).

A gene from a fluorescent jellyfish will be inserted into the sprout of a Wisconsin fast plant. Previous studies have been done using the same gene to make E.coli glow under a UV light. It has also been done on a bigger scale to tobacco. The gene should allow the plant to give off a glow when subject to UV light. This will be achieved by placing 25 seeds distributed evenly between 5 cups. While the plants are growing, the rest of the experiment will be conducted. A starter plate of Agrobacterium Tumefaciens will be grown to collect colonies off of. Other plates will be made that contain ampicillin and arabinose. The original pGLO experiment will be conducted with the change of E.coli to Agrobacterium Tumefaciens. Each plate will then have the different enzymes; HindIII, EcoRI, PstI, and NdeI. When those plates are checked under UV light for bio luminescence, only the bacterium the glowed will be transferred to plants. To transfer the bacterium, an incision will need to be made on the plants. Once transferred, the plants will be checked under an UV light for Fluorescence. A control plant will be sliced but no bacteria will be added. If there is fluorescence, then the transfer would be considered a success.

- 9 **Comparative Analysis of Severe Flooding on Vegetation Indices in Rural and Metropolitan Areas.** Ben Houston. (Dr. Kristy Ehlers, Teacher/Community Partnerships El Reno Public Schools; and Ann Marshall, BlueSTEM AgriLearning Center, El Reno, OK).

Rainfall has the unique ability to give sustenance to living organisms in most ecosystems around the world. However, in cases of severe flooding, rainfall has the ability to negatively impact ecosystems including the vegetation within those ecological communities. Variation between how severe flooding affects vegetation indices in different types of ecosystems is not fully understood. In an attempt to find an understanding, the Enhanced Vegetation Index (EVI) was utilized to discover the vegetation indices of two study areas representing two vastly different ecosystems, rural and metropolitan. Satellite observations were taken temporally at times approaching, directly after, and multiple weeks following the event to show the direct and prolonged effect of immense rainfall on vegetation. The results showed varying positive and negative trends between selected dates in their respective time periods corresponding to the flooding event.

- 10 **Tornado Scarrings Effect on Vegetation in Rural vs. Urban Landscape.** Katie Shea. (Dr. Kristy Ehlers, Teacher/Community Partnerships El Reno Public Schools; and Ann Marshall, BlueSTEM AgriLearning Center, El Reno, OK).

Research of scarring from two large tornados, both which took place in Oklahoma, was conducted to test how tornado scarring differs from a rural area to an urban area. Both of the tornados studied occurred in May. However, the tornados occurred over regions with different land use. MODIS data was pulled from Google Earth Engine, and the data was then entered into QGIS to evaluate statistics on the tornado scarring. The data received was used to compare the sum and mean of the vegetation data between the tornados. The statistics were also pulled from a few time periods following the tornado to be able to compare which land region recovered more quickly from its respective storm. While a tornado occurring in an urban area, may cause more damage, a rural tornado will leave a deeper scar on the actual landscape.

- 11 **In vitro rumen digestibility of sesame (*Sesamum orientale* L.) and soybean [*Glycine max* (L.) Merr.] forages for beef cattle.** Drake Holland and Kylee Carroll. (Dr. Kristy Ehlers, Teacher/Community Partnerships El Reno Public Schools; and Ann Marshall, BlueSTEM AgriLearning Center, El Reno, OK).

Stocker cattle in the U.S. Southern Great Plains (SGP) typically graze pastures of winter wheat (*Triticum aestivum* L.) during fall through spring, and perennial warm-season grasses such as bermudagrass [*Cynodon dactylon* (L.) Pers.] during summer. The nutritive value of warm-season grasses during summer declines rapidly in July when purchased, supplemental feeds are typically offered to cattle grazing these pastures. Alternative forages need to be evaluated that can help maintain nutritive value for grazing beef cattle during this mid- to late-summer period. We evaluated the rumen in vitro true digestibility (IVTD) potential of sesame (*Sesamum orientale* L.) and soybean [*Glycine max* (L.) Merr.] forages for beef cattle. After 60 days of plant growth, IVTD of forage leaf and pod samples averaged 78% for sesame and 80% for soybean; stem sample IVTD was 62% for sesame and 59% for soybean. The overall 60-day average of leaf, stem, and pod digestibilities for sesame (73% IVTD) and soybean (73% IVTD) was above requirements (67.5% digestibility) by cattle weighing 660 lb and gaining 2.2 lb d<sup>-1</sup>. The other nutritive value parameters (crude protein and fiber) need to be completed and a grazing study needs to be conducted with sesame and soybean to define their capacity to support beef stocker weight gains in the SGP region.

**12 Amount of Bacteria Present in Beef at Varying Internal Temperatures.** Grace Mathai. (Mrs. Julie Smiley Foster, Francis Tuttle Technology Center, Oklahoma City, OK).

Beef is meat which comes from the muscles of cow. Raw meat contains bacteria found on its surface that can be transmitted from the cow to humans and can cause deadly illness. Additionally ground beef has an increased amount of bacteria because it is ground by large blades that spread the bacteria to the inside of the beef. Steak is only touched by the blades on the outside therefore it has less bacteria than ground beef.

There are many different ways to cook beef and varying degrees of doneness. Many people enjoy eating rare steak, however, eating undercooked beef can lead to foodborne illnesses. Cooking food fully to an accepted internal temperature will kill bacteria, but rare steak is not fully cooked, yet is considered safe. Additionally, rarely cooked ground beef cooked to the same degree is not considered safe to consume. This study will be done to determine how much bacteria is present in rarely cooked beef steak and ground beef and how that compares to raw beef steak and ground beef. The prediction of this study is that beef steak cooked to a rare temperature of 125° F (52° C) will have bacteria present, but less bacteria than rarely cooked ground beef.

This study was conducted by swabbing the inside of raw beef steak, a raw ground beef patty, cooked beef steak, and a cooked ground beef patty. The cooked beef was rarely cooked to an internal temperature of 125° F. The bacteria grew at room temperature for 2 days then colonies were counted and observations were made.

The outcome of the study was that bacteria was present in both raw beef steak and raw ground beef. Bacteria was also found in rarely cooked ground beef but not rarely cooked beef steak. The raw beef steak had more and smaller colonies than the ground beef. Cooking the beef decreased the amount of bacteria present but completely eliminated bacteria in the beef steak.

**13 Male and female behavioral differences of fruit flies (*Drosophila melanogaster*) during foraging.** Randi Reyes and Courtney Curlless. (Dr. Jimena Aracena, SWOSU Department of Biological Sciences, Weatherford).

The foraging behavior of fruit flies (*Drosophila melanogaster*) on patches depends on food quality and their physiological state. The flies also may behave differently when feeding in groups. Other behaviors, such as mating and courtship, may interfere with decision making about feeding. The purpose of this experiment was to determine whether the presence of flies of the opposite sex would influence feeding behavior. Groups of fifty flies were allowed to feed for 60 minutes on two patches of sucrose solution (one dyed red and one dyed blue). The flies were assigned to one of three tests: males alone, females alone, and males with females. We froze the flies after feeding and recorded whether they fed and which sugar solutions they fed on according to the color of their abdomen. Preliminary results show that males in mixed groups fed significantly less than in same sex groups. This suggests that the presence of females disrupts the feeding behavior of males.

**14 Eaten to Endangerment: an analysis of applicability of the United Plant Saver's At-Risk Assessment Tool to wild-harvested edible plants.** Devin Widick, Maybree Rittenhouse, Jake Gregston, Elizabeth Finch, Mitchell Howe, William Ton-that, and Stephanie Buehler. (Dr. Lisa Castle, SWOSU Department of Biological Sciences, Weatherford, OK).

Wild-harvested edible plants were scored using the United Plant Savers' At-Risk Assessment Tool by students in the Southwestern Oklahoma State University Plant Taxonomy class. The goals of scoring these plants were three-fold. First, we sought to learn if the same questions that were originally designed to rank and categorize wild-harvest medicinal plants according to their vulnerability to over-harvest could be usefully applied to edible plants. Second, we hoped to compare wild-harvested edible plants to wild-harvested medicinal plants to determine if edible plants are appropriately prioritized with regards to conservation. Finally, we hoped to

expand students' knowledge of botanical terminology and increase their skills in sorting and synthesizing scientific information from disparate sources.

- 15 **Scoring a Genus vs. Scoring All the Species: Analysis of Threats to Wild-Harvested Echinacea Species.** David Castellanos, Joel Kliewer, Brenda Vang, Gustavo Martinez, Allison Statton, Alina Shrestha, and Brandon Matter. (Dr. Lisa Castle, SWOSU Department of Biological Sciences, Weatherford, OK).

Students in the Plant Taxonomy class at Southwestern Oklahoma State University scored species of Echinacea (purple cone flower) using the United Plant Savers' At-Risk Assessment Tool. Based on questions about plant life history traits, population size and distribution, the effects of harvest on populations and individual plants, and demand, the tool highlights species vulnerable to over-harvest and points out areas of vulnerability. The United Plant Savers, a conservation organization, had previously published scores for "Echinacea" as a genus. However, there are many species of Echinacea and we sought to determine if the scores for congeneric species are different enough to warrant separate rankings. While species scores can be dramatically different from each other, ranging from 24 for Echinacea paradoxa to 55 for Echinacea sanguinea, we encountered issues scoring the species separately because both users and harvesters do not always distinguish among species.

- 16 **The contribution of personality to species coexistence: a test in hyalella amphipods.** David Castellanos. (Dr. Rickey Cothran, SWOSU Department of Biological Sciences, Weatherford, OK).

Personality is an abstract, yet well-studied phenomenon that is most often associated with vertebrates, despite 98% of known animals being invertebrates. For many years, invertebrates have been overlooked because most scientists are reluctant to approach the topic of behavioral syndromes in "lower" organisms. However, understanding personalities within a population may provide insight into social and species interactions. We are exploring personality patterns in a species complex of Hyalella amphipods to better understand the interactions contributing to long-term species coexistence. Amphipods were tested for explorative behavior, proportion of time swimming, boldness/shyness, and activity levels. Tests were performed in a 6-x-6 gridded arena (each grid is 13 mm<sup>2</sup>) and the relative location of the amphipod was recorded at 10-second intervals for 3 minutes. We found tremendous variation in the behavioral patterns of amphipods. We are exploring the data for possible consistency in behaviors within individuals that are the hallmark of personality. We plan to use this work on amphipod personality to better understand coexistence of closely related species.

- 17 **The effects of behavioral interactions on the feeding habits of amphipod species.** Arissa Mercer. (Dr. Rickey Cothran, SWOSU Department of Biological Sciences, Weatherford, OK).

Feeding habits of amphipods are not well known, but could help explain the outcome of behavioral interactions between species and their ability to coexist in nature. This study examines the algal food preference of four species of amphipods in the genus Hyalella. The feeding habits of an amphipod may be altered by interactions with other amphipod species by exploitation (one species being better at finding food than the other) or interference (directly attacking other species or protecting the food source.) We hypothesized that each amphipod species will prefer algae that offers a greater nutrient quality. We also expected that when multiple amphipod species are competing, the larger species would displace the smaller species, through interference competition, from high nutrient quality food. To test these hypotheses, each amphipod species will be put in a container with algae that vary in quality to determine foraging preferences. The amphipods will then be tested together to discover if food preferences change based on interactions with other species. This study will give us greater insight into food preferences of amphipod species that are very similar in phenotype (i.e. they way the look), but also what role competition plays in resource use and perhaps the ability of amphipod species to coexist in nature.

- 18 **Pick Your Poison: Sublethal Effects of Pesticides on Life History Traits.** Lindsey Hendricks. (Dr. Rickey Cothran, SWOSU Department of Biological Sciences, Weatherford, OK).

Understanding sublethal effects of pesticides is critical because most pesticides are found in low concentrations in nature, which may harm organisms but not kill them. We explored the sublethal effects of malathion (an insecticide that targets the nervous system) on Hyalella amphipods (small, freshwater crustaceans). Two populations were collected in western Oklahoma that differ in proximity to agriculture. For both populations, I selected 60 male-female pairs of amphipods and equally distributed them across three treatments of malathion: no pesticide (0 ppb), low sublethal concentration (0.005 ppb), and high sublethal concentration (0.02 ppb). Each pair was exposed to the treatment concentration until they produced two broods of offspring. I chose to measure life history traits (which are traits directly related to survival and reproduction). Specifically, I measured

growth rate for both sexes. I also measured female fecundity (the number of offspring per female) and male gnathopod size (a claw-like appendage) which has been demonstrated to affect male mating success. For both populations, I found no evidence that sublethal concentrations of malathion affect Growth rate or fecundity, but does inhibit the growth of male gnathopod growth. This provides some hope that nature can cope with unintended exposures to chemical contaminants used in the agricultural and home and garden sectors. However, there are likely limits to the ability of populations to evolve toward pesticide tolerance.

**19 Promotion of T follicular helper cells through B7-H4: mechanisms of early phase differentiation.** William Ton-That. (Dr. Christopher Horton, SWOSU Department of Biological Sciences, Weatherford, OK).

T follicular helper (Tfh) cells are a recently described lineage of CD4+ T helper cells. Tfh cells, which are found in the follicles as opposed to ordinary T-cell zones of secondary lymphoid tissues, function to mediate B cell differentiation and antibody production. High expression of CXCR5 allows for the migration of Tfh into B cell follicles and produce stimulatory cytokines to encourage GC B cell formation. Many studies have shed light upon Tfh cell differentiation requirements; however, many details about this process are still unknown. Others have determined that cytokines, notably interleukin (IL)-21 and IL-6, are necessary for Tfh differentiation, while our data has suggests that the co-receptor protein B7-H4 plays a role in the promotion these cells as well. Our experiment seeks to determine a mechanism by which B7-H4 promotes Tfh cell accumulation. Spleens of mice were harvested from C57Bl/6 mice, followed by naive CD4+ cell purification using magnetic separation. Naive cells were cultured under Tfh polarizing conditions for 24 hours in the presence or absence of B7-H4 to examine early differentiation factors. RNA sequencing was used to determine candidate genes that have the potential to activate these mechanisms. Validation of these candidate genes will be carried out by quantitative RT-PCR. We will utilize this data to address transcriptional changes or signaling pathways involved in the differentiation of Tfh cells. A better understanding of Tfh and their differentiation factors will allow for a better understanding for its role within the immune system and potentially provide an area of treatment for autoimmune diseases and novel vaccination strategies.

**20 Timing of Avian Migration Onset Through the Oklahoma City Area 2002-2017 Using NOAA Weather Data.** Jennifer Prophet. (Dr. Zach Jones, SWOSU Department of Biological Sciences, Weatherford, OK).

Timing and duration of avian migration patterns may be linked to large-scale climate patterns and reflect long-term shifts in average regional temperatures. The National Centers for Environmental Information (NCEI) provides a publicly-available archive of National Oceanic and Atmospheric Administration (NOAA) weather radar data scans occurring every ten minutes dating back to 1995. Our primary data of interest are 1) the measure of reflectivity: the amount of power returning to a radar after hitting water, and 2) radial velocity: the movement of water relative to radar position. Aerial density and flight direction will be collected annually and compared to global and regional temperatures to determine effects on seasonal migrations. For the current study, we used KTLX (Oklahoma City) weather radar data to determine time, duration, intensity and direction of fall avian migration. Our analysis currently includes data from 2002-2017, with the fall migrations beginning in September. The global average temperature change over this time range was 2.358 °C. More data will be analyzed within this range in order to develop more accurate results regarding the effect of temperature change on fall migratory onset. In addition to migratory information, we have observed fine lines of insects caught in outflow air masses as well as regular sunrise takeoffs of waterfowl overwintering near Lake Hefner. We also have encountered radar signals caused by wind turbines, but this has not noticeably affected avian flight behavior or our data collection on the scale and altitudes being sampled.

**21 Looking beyond the leaf: understanding the impacts of motility on *Pseudomonas syringae* seed colonization.** Chelsea Miller. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford).

*Pseudomonas syringae* is an opportunistic phytopathogen that causes disease in agriculturally important plants. Strains of this bacteria are found ubiquitously in the soil and can have devastating effects on the global crop production. *P. syringae* is known to employ a surface motility called swarming to colonize leaf surfaces, which is mediated by the flagella, pili, and biosurfactants. Biosurfactants lower surface tension between a cell and the surface and act as lubricants to overcome friction. Deletion mutants lacking biosynthesis of the biosurfactants syringafactin ( $\Delta$ syfA) and rhamnolipid ( $\Delta$ rhlA) have been shown to have impaired swarming. *P. syringae* movement on leaves has been well studied as a preliminary step for development of necrotic lesions. Strains lacking biosurfactant biosynthesis have been shown to have reduced leaf colonizing abilities. *P. syringae* overwinters in association with infected plant tissue in the soil and is thought to reemerge in the spring to infect new seeds and seedlings. The mechanisms utilized to colonize seeds and seedlings following overwintering have not been studied. We hypothesize that *P. syringae* uses swarming motility in the soil to move toward and colonize seeds. The objective of this experiment is to evaluate the role of active motility in *P.*

*syringae* seed colonization and to determine the impact of rhamnolipid and syringafactin biosurfactants in movement towards seeds. To test this hypothesis, sterile sand was inoculated with *P. syringae* pv. *syringae* B728a parent,  $\Delta$ rhlA, and  $\Delta$ syfA strains, and common bean seeds were incubated in the soil for 15 minutes. To quantify the impact of growth independent of motility, half the seeds were moved into sterile sand. The remaining seeds were incubated in the inoculated sand for 12 hours. Population sizes for each treatment were tracked every three hours over a 12 hour period. Results show that *P. syringae* actively moves through the sand and that the biosurfactants play a role in *P. syringae* seed colonization. Understanding the impact of *P. syringae* swarming motility in soil could lead to control methods that prevent *P. syringae* colonization of seedlings at the beginning of a growing season.

- 22 Ice Nucleation: A look at evolutionary significance beyond frost injury.** Brooke Rankin. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford, OK).

Ice nucleation is the process of catalyzing the formation of sub-freezing water. Ice nucleation can be achieved by both biotic and abiotic nucleators including dirt, bacteria, and pollen. The phytopathogen *Pseudomonas syringae* is the most common biotic ice nucleator using the ice nucleation proteins (ICE) found in the membrane. Some ICE+ *P. syringae* strains are pathogenic to plants and causes frost injury when temperatures are near freezing. In addition to its presence on plants, ICE+ *P. syringae* has been found in clouds, the atmosphere, waterways, and snowpack. *P. syringae* ICE proteins are usually studied due to their role in pathogenicity when temperatures are close to freezing; however, ICE proteins are produced in bacteria at above freezing temperatures and are encoded by non-pathogenic *P. syringae* strains. This insinuates ICE proteins serve an additional evolutionary role. We hypothesize ICE proteins both enhance the ability of *P. syringae* to survive in hypertonic conditions and allow for the bacteria to undergo the process of aerosolization. To test this hypothesis, experiments were ran to compare ICE+, ICE-, and super ice nucleating strains of *P. syringae* along with ICE+ and ICE- *Pseudomonas putida*. An analysis of growth under stressful osmotic conditions was performed. Strains lacking ICE proteins were significantly effected in their ability to grow. The ability to aerosolize was compared by nebulizing strains in contact with a petri plate and determining concentration of viable cells. Because ice nucleating *P. syringae* are found in the atmosphere and different phases of the water cycle, it is likely the ice nucleating proteins serve a purpose beyond what is currently understood. A better understanding of ice nucleating proteins could lead to advances in snow manufacturing and food storage as well as increased inhibition of frost injury in crops.

- 23 Investigating *Pseudomonas syringae* pv. *syringae* B728a motility as means of colonization of above ground plant tissues.** Gloria Farinango. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford, OK).

*Pseudomonas syringae* is a phytopathogen that causes brown spot disease on common bean in addition to deleterious symptoms in a variety of economically important plants. This causes economic losses due to yield reductions. *P. syringae* pathogenicity is associated with its ability to move across the leaf surface using pili and flagella. Active movement allows the bacteria to colonize leaves while seeking out heterogeneous pools of nutrients and sites protected from UV radiation and desiccation. *P. syringae* survives in association with infected plant tissue in the soil. It is assumed that plant tissue in soil and contaminated seeds serve as a significant reservoir for *P. syringae*; however, little is known about the importance of motility in colonization of above ground tissue from these reservoirs. The objective of this study is to investigate the importance of *P. syringae* motility in colonization of plant tissues from a below ground reservoir, and determine the motility factors utilized in this colonization. We hypothesized that *P. syringae* uses pili mediated motility to colonize the radical, stem, and primary leaves during transmission from below ground to above ground tissues. To test our hypothesis, we compared the colonization ability of strains lacking the pili filament ( $\Delta$ pilA) and/or pili retraction protein ( $\Delta$ pilT) to the parent strain on four different common bean tissues. Comparisons were made by inoculating each strain on seeds and tracking *P. syringae* populations during plant development. Our hypothesis will be validated if the population sizes for the pili deletion mutant are significantly lower than the parent strain on each plant tissue. Understanding the mechanisms used to colonize above ground tissues following overwintering of *P. syringae* could lead to new methods for preventing brown spot.

- 24 Understanding *Pseudomonas syringae* repulsion of competitors in the phyllosphere.** Amelia McKennon. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford, OK).

The phyllosphere supports  $10^8$  bacterial cells per gram of leaf tissue. This community includes commensal, mutualistic, and pathogenic bacteria that are constantly competing for heterogeneously distributed nutrients via antagonistic behaviors. *Pseudomonas syringae* is a foliar pathogen that causes crop loss. The signs of infection include lesions on fruit, yellowing of leaves, growth retardation, and reduced yield. To seek sites for infiltrating plant tissue, *P. syringae* uses a group movement, called swarming, that requires a surface lubricating

biosurfactant called syringafactin. Strains lacking the genes for syringafactin biosynthesis ( $\Delta$ syfA) are nearly immobile in swarming conditions. Surprisingly, we observed movement by  $\Delta$ syfA away from a parent strain incubated in close proximity. This led to the hypothesis that *P. syringae* senses swarming and/or syringafactin production as a self-recognition signal to regulate antagonistic behaviors that repel competitors. To test this hypothesis, leaf colonizing bacteria were isolated from agricultural areas in Weatherford, OK. Because motility may serve as a *P. syringae* self-recognition signal, isolates were tested for ability to swarm, and isolates that lacked swarming capabilities were used for future experimentation. Non-swarming isolates were incubated in close proximity to the *P. syringae* parental strain and repulsion was monitored. *P. syringae* exhibited repulsion of 50% of the environmental isolates. To determine if *P. syringae* competitive repulsion is specific to certain leaf colonizing bacteria, 16s rRNA sequencing will be used to identify repelled isolates. This discovery could be used to inhibit repulsion by pathogenic bacteria, thereby decreasing their competitive advantage during colonization.

- 25 **Rhizobacteria promote plant-growth in winter wheat in Oklahoma soil.** Sarah Gore. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford, OK).

As the world's population increases, the demand for improved food quality and agricultural yields heightens. Pathogens, nutrient-poor soil, and environmental stress reduce crop yields. Pesticides and fertilizers classically used to circumvent these issues harm the environment; additionally, plant pathogens develop pesticide resistance with overuse. An imperative area of research focuses on plant-growth promoting rhizobacteria (PGPR) that colonize the rhizosphere and have unique associations with host plants. Recent studies have concentrated on characterizing these rhizobacteria as biocontrols and biofertilizers. They are environmentally-friendly, decrease risk to human health, have specific target activity, are effective in small quantities, self-replicate, and decrease pathogen resistance. These bacteria impact plant growth by competing with pathogens for ecological niches, inducing systemic resistance via immune response to pathogens, increasing nutrient sequestration, phytohormone stimulation, increasing stress tolerance, and producing allelochemicals and antimicrobials that inhibit pathogen growth. The objective of this project is to further investigate species of bacteria that promote plant growth. We hypothesize that Oklahoma soil contains bacteria capable of promoting the growth of winter wheat. Soil samples of bacterial species were isolated from various farmland locations in Weatherford, Oklahoma. To identify species that promote plant growth, winter wheat seeds were grown in the presence of unknown bacterial isolates, and root and shoot length and fresh weight of inoculated plants were compared to seeds grown in sterile soil. Isolates that support the growth of larger wheat plants will be identified by 16s rRNA sequencing. Future studies will work to identify the mechanisms used by newly identified PGPR. Novel PGPR have the potential to be used as commercial inoculants to increase the yield of winter wheat.

- 26 **Cloning and Over-Expression of a Novel Thermophilic Nuclease From *Sulfurihydrogenibium azorense*.** Abigail Trejo. (Dr. Vijayakumar Somalinga, SWOSU Department of Biological Sciences, Weatherford, OK).

Enzymes from thermophiles exhibit extreme temperature, chemical and pH stability making them excellent candidates for industrial processes. We have identified a novel thermonuclease, Sulaz\_0225 from *S. azorense*, a microaerophilic, thermophile isolated from a terrestrial hot spring. The sulaz\_0225 gene codes for a 20.2 kDa protein with a 19-amino acid N-terminal signal sequence. The N-terminal signal sequence is followed by a 156 amino acid Staphylococcal nuclease domain (SNase). The goal of this study is to characterize this putative thermonuclease for its potential use in biotechnological applications. PCR amplification was done using *S. azorense* genomic DNA as a template. The resulting 0.7 kb PCR product for sulaz\_0225 was digested with NdeI/XhoI and the digested product was ligated with pET28a vector that was previously digested with appropriate enzymes. Ligation products were transformed into *E. coli* XL1-Blue competent cells and the recombinant plasmids were subsequently purified from the transformants. The resulting constructs were transformed into *E. coli* LEMO21(DE3) strain for overexpression. Sulaz\_0225 thermonuclease was over-expressed in *E. coli* LEMO21(DE3) in LB broth at 20°C overnight. Induction was done at A600 = 1.0 with 0.5 mM Isopropyl- $\beta$ -thiogalactoside. Protein purification was done using metal affinity chromatography and the recombinant nuclease will be used for subsequent biochemical characterization.

- 27 **Method Development for the Determination of pKa's of various glycine metal complexes by <sup>1</sup>H-NMR.** Tien Tran and Blake Vinson. (Dr. Trevor Ellis, SWOSU Department of Chemistry and Physics, Weatherford, OK; and Dr. Jon Henrikson, SWOSU University Chemistry and Physics, Weatherford, OK).

The use of electron withdrawing groups is a well-known approach to change the chemical properties of a molecule, including the acidity. Our project's goal is to quantify the changes in pKa of previously synthesized ligands with the presence or absence of electron withdrawing groups attached to the molecule in organic solvents. A challenge in determining the acidity of a proton in organic solvent conditions is that common aqueous methods are not possible. Initially, we attempted to determine the ligand pKa by observing

chromophore wavelength shifts in the visible light spectrum, but due to absorbance interference, we were not able to successfully quantify the changes in the observed  $\lambda_{\text{max}}$  of the deprotonated species. We hypothesized that proton nuclear magnetic resonance ( $^1\text{H-NMR}$ ) would provide a means to determine the pKa of fluorinated and non-fluorinated ligands by measuring changes in the  $\alpha$ -proton integrated peak area compared to the integrated area of the  $^1\text{H-NMR}$  solvent resonance at equilibrium with varying additions of a known molar amount of base under organic solvent conditions. The results of our studies and potential applications of the findings with respect to the ligand will be discussed.

**28 The Preparation of a Chiral Ligand System for the Preparation of Optically Active Non-Proteinogenic Amino Acids.** Kody Shoff. (Dr. Trevor Ellis, SWOSU Department of Chemistry and Physics, Weatherford).

The aim of this project is focused on the development of innovative synthetic methodologies for the synthesis of unnatural amino acids. It would be difficult to overstate the biological importance of  $\alpha$ -amino acids, the building blocks of life, and perhaps the most studied class of organic compounds. Besides their primary function as structural units of peptides and proteins,  $\alpha$ -amino acids also serve countless biological functions in most living things. Nature's exceptional utility of this unique family of compounds has inspired research into the development of novel synthetic variations of these structures for use in pharmaceutical, agricultural, and food industries. Despite developments in the study and application of these vital biological molecules, very few advances have been made in the fundamental science of their synthesis. However, progress toward a new optically active nucleophilic glycine equivalent will be presented. This will include a description of the design as well as the introduction of a new optically active ligand that is envisioned to be the backbone of the metal complex including an amino acid Schiff's Base.

**29 Nitrile reactions of 1,1-bis(diphenylphosphino)ethene dirhenium compounds.** Garet Crispin. (Dr. David Esjornson, SWOSU Department of Chemistry and Physics, Weatherford, OK).

The dirhenium complexes  $[\text{Re}_2\text{Cl}_3(\mu\text{-dppE})_2(\text{RCN})_2]\text{PF}_6$ , where  $\text{R}=\text{CH}_3$ ,  $\text{CH}_2\text{CH}_3$ ,  $\text{CH}(\text{CH}_3)_2$  and  $\text{dppE} = 1,1\text{-bis}(\text{diphenylphosphino})\text{ethene}$ , have been prepared. Nitriles will react with  $\text{Re}_2\text{Cl}_4(\mu\text{-dppE})_2$  in refluxing acetone in the presence of  $\text{TlF}_6$  to produce asymmetric  $\text{Re}_2\text{Cl}_3(\mu\text{-dppE})_2(\text{RCN})_2]\text{PF}_6$ . The asymmetry is between the two Rhenium atoms. One of the Rhenium atoms in the  $\text{Re}_2^{4+}$  core has a coordination number of five; the other rhenium atom has a coordination number of six. Reactions of these bis-nitrile complex with additional nitrile seems to lead to coupling of two nitriles to form a coordinated di-imine ligands, based on preliminary X-ray data from the Service Crystallography at the Advanced Light Source (SCrALS).

**30 1,4,7,10,13-pentaazacyclopentadane: Streamlined synthesis and novel transition metal complexes.** Faith A. Okoroach and Alina Shrestha. (Dr. Tim Hubin, SWOSU Department of Chemistry and Physics, Weatherford).

Tetraazamacrocycles, those with four nitrogen atoms, have been ubiquitously exploited as transition metal ligands for a variety of purposes, including catalysis, medical imaging, pharmaceuticals, etc... However, the pentaazamacrocycles, those with 5 nitrogen atoms, are much less commonly used for similar purposes because of unavailability, difficulty in synthesizing them, and largely unknown metal coordination properties. We set out to explore this type of macrocycle and its transition metal complexes. A well respected synthetic route to parent pentaazamacrocycle  $15\text{aneN}_5$  was useful, but appeared unnecessarily long and complex. We simplified and shortened this synthetic route without a drop in yield. Eight different transition metal complexes were made using typical complexation methods. Electrospray mass spectra and elemental analyses were used to initially characterize the complexes. X-ray crystallography of multiple novel complexes yielded insight into the flexibility in coordination geometry of this interesting macrocycle.

**31 Ethylene cross-bridged pentaazamacrocycles and their transition metal complexes.** Elisabeth M. A. Allbritton and Terin L. Fletcher. (Dr. Tim Hubin, SWOSU Department of Chemistry and Physics, Weatherford).

Having worked in the field of ethylene cross-bridged tetraazamacrocycles for decades, our group has recently sought to explore ethylene cross-bridged pentaazamacrocycles. A patent method for producing ethylene cross-bridged 1,3,5,7,9,11-pentaazacyclopentadecane ( $15\text{aneN}_5$ ) was reproduced to give the "parent" ethylene crossbridged pentaazamacrocycle having three secondary amines in high yield. A novel route, based on glyoxal condensation, to the tris-alkylated ethylene cross-bridged analogue of this compound was successfully designed and carried out. Complexation of these ligands with a number of transition metal complexes has been successful, with X-ray crystal structures of several intermediates and transition metal complexes obtained. We will present the synthetic routes and the structural characterization of these compounds.

**32 Ethylene Cross-Bridged Tetraazamacrocycles with Thiol Pendant Arms.** A. James Nimsey and Angelica

J. Manning. (Dr. Tim Hubin, SWOSU Department of Chemistry and Physics, Weatherford, OK).

Cross-bridged tetraazamacrocycles have made important contributions as ligands that strongly bind transition metal ions. This property is very useful when the metal complex is intended for use under harsh conditions. Applications that have benefited from such complexes are: oxidation catalysis, medical imaging, and protein-binding drug molecules. Pendant arms can be added to the cross-bridged tetraazamacrocycle to modify the coordination geometry and the chemical properties of the resulting metal complex. Previous pendant arms utilized have included pyridine, amide, carboxylic acid, phenol, and amines. In this project, we have developed the synthesis, but two different paths, of pendant arm thiol derivatives of the well-known cross-bridged cyclam and cyclen ligands.

- 33 Heteroatom-containing bridged azamacrocycles and C-linked bis-azamacrocycles and their coordination complexes.** David S. Tresp. (Dr. Tim Hubin, SWOSU Department of Chemistry and Physics; Dr. Trevor Ellis, SWOSU Department of Chemistry and Physics, Weatherford, OK).

Chemokine receptors play a role in a number of disease states. Tetraazamacrocycles and bistetraazamacrocycles, and their complexes, are efficient CXCR4 antagonists. We proposed to systematically synthesize and evaluate non-N heteroatom containing azamacrocycles and C-linked bis-azamacrocycle as CXCR4 antagonists. Upon synthesis and chemical characterization, we evaluate the antagonism of CXCR4 in cell lines previously developed for such studies-with the results of these screens feeding back into the iterative re-design of additional antagonists. Synthetic routes towards non-N heteroatom containing azamacrocycles were developed by cyclizing triamines with non-N difunctional units using two C-linking strategies: 1. formation of bis-acrylates to cyclize two tetraamines; 2. Grignard nucleophilic attack on the electrophilic bridge C's of side- and cross- bridging intermediates. Electrospray mass spectra, and  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra were collected to characterize these novel ligands. The non-N (O, C) containing macrocycles were produced as shown by mass spectra; purification and complete characterization remains. Bis-acrylate linking units were elusive, although significant progress has been made. Grignard strategies for linking bridge-C's proved most difficult due to an incompatibility of the need for completely unreactive solvents to stabilize the in situ Grignard formation, while more polar (and reactive) solvents appear necessary to solubilize the electrophilic bridge side- and cross-bridging intermediates which are highly polar salts. The coordination chemistry of successfully synthesized new ligands will be presented.

- 34 Thiol and phenol pendant-arms for cross-bridged tetraazamacrocycle complexes.** Phillip T. Nguyen and Donald G. Jones. (Dr. Tim Hubin, SWOSU Department of Chemistry and Physics, Weatherford, OK).

We have begun to explore modifying cross-bridged tetraazamacrocycle oxidation catalysts by adding thiol and phenol pendant arms. Ethylene cross-bridged tetraazamacrocycle complexes of manganese and iron are mild oxidation catalysts that can react through a diverse range of oxidation mechanisms. In this work, we introduce a series of cross-bridged derivatives with thiol and phenol pendant arms. These pendant arms are intended to modify the electronic properties of the metal complexes, perhaps leading to new and/or different oxidation reactivity. Additionally, these pendant arms can also interact through hydrogen bonds with substrate and/or oxidant molecules, perhaps stabilizing reactive intermediates. Pendant-arm derivatives are possibly less kinetically stable than the original crossbridged catalysts, but appear to have modified coordination geometries that may lead to new reactivities and may bethermodynamically stabilized by the additional pendant arm donors. All new ligands have been complexed to Mn, Fe, Co, Ni, Cu, and Zn. The synthesis and characterization of the ligands and the synthesis, electrochemistry, and other characterization of their complexes will be presented.

- 35 Reevaluation of Hydrogen Atom Selectivity in Alkane Photochlorination Reactions. Part 1: Experimental Results.** Denise Anderson, Jennifer Park, Abner Nimsey, and Mariah Cook. (Dr. William Kelly, SWOSU Department of Chemistry and Physics, Weatherford, OK).

Free-radical photochlorination of alkanes is an effective method to convert alkanes into chloroalkanes. The reaction mechanism involves initial abstraction of a hydrogen atom from the alkane by a chlorine atom. The position of the hydrogen atom being removed determines the position of chlorination. The rate of abstraction is dependent on the structural position of the abstracted hydrogen, tertiary ( $3^\circ$ ) hydrogen reacting fastest and primary ( $1^\circ$ ) hydrogen reacting slowest. The selectivity of abstraction can be measured by examining the chlorinated product distribution and is a function of the differing rates of hydrogen abstraction.

2,3-Dimethylbutane, an alkane with only  $3^\circ$  and  $1^\circ$  hydrogen in its structure, is often used to assess the effect of different factors on hydrogen atom selectivity in free-radical reactions. In a 1957 landmark paper, Russell reported that photochlorination reactions of 2,3-dimethylbutane in benzene showed a significant increase in  $3^\circ$  selectivity. He attributed this increase to the formation of a weak complex between the chlorine atom and

benzene; this complexed chlorine is thus less reactive and more selective than the free chlorine atom.

This project reexamined the effect of aromatic solvents on hydrogen atom selectivity in photochlorination reactions of 2,3-dimethylbutane. Reactions were carried out "neat" (in the absence of solvent), and in the presence of a series of aromatic solvents (C<sub>6</sub>H<sub>5</sub>-Y, Y = H, F, Cl, Br, I, t-Bu, NO<sub>2</sub>, CF<sub>3</sub> and CN). The 3°/1° selectivity ratio was determined by first measuring the relative percent of 3° and 1° chlorinated product by gas chromatographic analysis of the product mixture and correcting for the number of hydrogen atoms of each structural type. The 3°/1° ratio was determined to be 3.8 in the absence of solvent and selectivity showed a remarkable increase in the aromatic solvents, ranging from 7 to over 40. Linear plots of log(3°/1°) vs. several experimental measures of aromatic ring electron density (relative ring basicity and Hammett  $\sigma$  constants) indicates a strong correlation of selectivity to ring electron density as would be expected with the formation of a chlorine atom-aromatic solvent complex. However two aromatic solvents, bromobenzene and iodobenzene exhibit a much greater increase in selectivity than would be predicted based on measurements of ring electron density. Alternative explanations of chlorine atom-aromatic complexes in these compounds will be discussed.

**36 Reevaluation of Hydrogen Atom Selectivity in Alkane Photochlorination Reactions. Part 2: Theoretical Analysis.** Denise Anderson, Jennifer Park, Abner Nimsey, and Mariah Cook. (Dr. William Kelly, SWOSU Department of Chemistry and Physics, Weatherford, OK).

Computational molecular modeling based on the mathematics of quantum mechanics has become an essential tool in Chemistry. Efficient quantum chemical algorithms and fast computers allow the approximate solution of the Schrodinger equation resulting in accurate predictions of molecular structures, reactivities and other molecular properties. Results from computational molecular models help to explain or interpret new experimental data, validate proposed concepts and predict the results of unknown chemistry. In a 2003 paper, Platz used advanced DFT computational methods to investigate the three proposed structures for the chlorine atom-benzene complex originally proposed by Russell in 1957. He found that one structure, currently known as the  $\eta$ 1  $\pi$ -complex, gave computed spectroscopic properties in very good agreement with experimental data. This is the currently accepted structure for the complex and has subsequently been validated by other experimental results.

This project employed computational modeling to examine the structures and complexation energies for a number of different substituted benzene-chlorine atom complexes (Cl-C<sub>6</sub>H<sub>5</sub>-Y, Y = H, F, Cl, Br, I, t-Bu, NO<sub>2</sub>, CF<sub>3</sub> and CN). The purpose was to examine the correlation between complex energy and 3°/1° selectivity ratios observed when photochlorination reactions of 2,3-dimethylbutane were carried out in these aromatic solvents. Multiple structures were examined for each complex: structures in which the chlorine atom forms a  $\eta$ 1  $\pi$ -complex similar to the structure predicted by Platts, but also alternative structures where the chlorine atom complexes with the ring substituent. Density Functional Theory (DFT) methods employing the B3LYP hybrid functional or the M062X global hybrid functional and 6-311+Gd,p basis sets were used to obtain the optimized molecular geometry and energy of the various complexes. The energies of the complexes were corrected for zero point energy differences. A plot of log(3°/1°) vs. complexation energy for the  $\eta$ 1  $\pi$ -complexes gave good correlation for all but two of the substituted benzene-chlorine atom complexes. Both bromobenzene and iodobenzene appear to have much larger 3°/1° selectivity ratios than would be predicted based on the computed stability of the  $\eta$ 1  $\pi$ -complex structure. However, when the complexation energy for the alternative complex molecular structure was used both solvents gave good correlation with the experimental measure of 3°/1° selectivity.

**37 Determination of benzocaine concentrations in aqueous solutions using screen-printed carbon electrodes and cyclic voltammetry.** Dr. David Martyn, SWOSU Department of Chemistry and Physics, Weatherford, OK; and Stephanie Kaitlyn Buehler.

This research revealed a potential electroanalytical method for determining benzocaine concentrations in aqueous solutions. Analyte concentrations were determined using commercially available, inexpensive, disposable, carbon screen-printed electrodes in conjunction with cyclic voltammetry. Anodic and cathodic peak currents of aqueous benzocaine solutions were determined using cyclic voltammetry. Benzocaine solutions were prepared from deionized water, saline, and phosphate buffer solutions at varying pH values. Using the anodic or cathodic peak height data, a calibration curve of peak current versus benzocaine concentration was prepared. The validity of the process was then tested using blind samples.

**38 A Dark Skies Exploration: Weatherford, Oklahoma.** Emily Trail, Jaxon Taylor, and Boubacar Wane. (Dr. Wayne Trail, SWOSU Department of Chemistry and Physics, Weatherford, OK).

Throughout most of the civilized world, security lights, streetlights, LED signs, and other light sources greatly brighten the night sky. This light pollution is expensive, disrupts ecosystems, and causes, through energy use,

other types of pollution. Further, it greatly reduces our ability to see the night sky. We examine this in the Weatherford area.

- 39 Measurement and Analysis of the 2017 Total Solar Eclipse.** Jaxon Taylor, Boubacar Wane, Emily Trail, Daniel Gassen, and Gareth Crispin. (Dr. Wayne Trail, SWOSU Department of Chemistry and Physics, Weatherford, OK; Dr. Tony Stein, SWOSU Department of Chemistry & Physics, Weatherford, OK; and Dr. Terry Goforth, SWOSU Department of Chemistry & Physics, Weatherford, OK).

We traveled to Glendo, Wyoming, to observe the 2017 Total Solar Eclipse from the center of the eclipse path. We designed and built remote sensing microcontroller circuits to measure local temperature, pressure, relative humidity, and light intensity throughout the partial and total phases. We then distributed these stand-alone circuits across the eclipse path. We have used our data to determine the speed of the Moon's shadow, which we compare to theoretical values. We have performed a similar comparison of measured solar brightness versus a theoretical estimate. We also used telescopes and cameras to photograph the eclipse from beginning to end, obtaining images of the Sun's photosphere, chromosphere, and corona.

- 40 The Dobsonian Telescope: An Outreach Exploration.** Cameron Cinnamon, Daniel Gassen, and Jaxon Taylor. (Dr. Wayne Trail, SWOSU Department of Chemistry and Physics, Weatherford, OK).

A Dobsonian is a very simple implementation of a reflecting telescope. It requires no motorized mounts or computers for pointing and its mechanical simplicity means that most of the expense is in the optical path and view quality. This type of telescope can be ideal for outreach. We have built 6-inch Dobsonians with the intent of exploring both their construction and their use as K12, youth group, or science camp activities.

- 41 Using Microcontrollers to Collect Environmental Data: A Study of the CPP Building.** Boubacar Wane and Jaxon Taylor. (Dr. Wayne Trail, SWOSU Department of Chemistry and Physics, Weatherford, OK).

We placed microcontroller circuits around the CPP building to record temperature, relative humidity, pressure, light intensity, and the state (opened or closed) of certain doors, as a way of studying microcontroller circuit design, programming, and data logging. While initially challenging, microcontroller circuit design and programming provides a fairly cheap way of measuring, organizing, and recording a wide range of physical quantities.

- 42 Prevalence of Food Insecurity among Undergraduate Students in Western Oklahoma.** Holly Davis, Marshall Wallace, Haley Zellner, Hannah Madison, Kathryn Rodgers, and Taylor Lewis. (Dr. Anne Pate, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

Food insecurity is defined in a 2015 report by the United States (U.S.) Department of Agriculture as a household having limited access to adequate food due to a lack of money or other resources. Oklahoma has seen a 1.6% rise in the percentage of food insecurity from 14.6% in 2003-2005 to the current 15.5% level in the most recent report. Recent research focusing on college students has found even higher levels of food insecurity in this sub-population. The goal of this study was to assess the prevalence of food insecurity among undergraduate students at a regional university in western Oklahoma. The researchers used a cross-sectional epidemiologic research design to assess food security status and other associated variables among Southwestern Oklahoma State University (SWOSU) students on the Weatherford, OK campus. The researchers developed a survey that included questions on demographics, general health and finance, academics, and ten standardized questions from the U.S. Household Food Security Survey Module (HFSSM) to assess food insecurity. Twenty-four fall classes were chosen randomly, 16 were administered the survey. A total of 334 completed surveys were obtained. Preliminary results suggest that approximately 50.6% of SWOSU students experience some level of food insecurity, with 23.4% experiencing low to very low food security. The results will be finalized and presented within the context of other academic and sociodemographic risk factors.

- 43 The Effects of Treadmill Therapy on the Gait of Parkinson's Disease Patients.** William Tanner, Taysi Peterson, Isela Sandoval, Lauren Quinby, Brogan Timmons, Heather Williams, and Marianne Wood. (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

Patients diagnosed with Parkinson's Disease have a decreased ability to perform activities of daily living, which in turn diminishes their quality of life due to the disease process. This process impairs the patient's gait which increase the risk of falls and inhibits their mobility (Cheng, Yang, Tang, Chen, 2013). Improving the patient's gait can help to strengthen mobility and promote their independence, further enhancing their overall quality of

life. As a nurse, when taking care of patients that have Parkinson's disease, the nurse could advocate this type of rehabilitation for the patient which would promote patient independence and safety. The literature review incorporated medical journal articles dated from 2013 to current that explored the effects of treadmill training on the gait of Parkinson disease patients only using inclusion data that is consistent with the gait of these patients. The results of the various studies show that treadmill therapy has a positive effect on multiple factors that influence gait, such as velocity, step length, stride, cadence, distance, motor function, postural instability, rhythm, balance, walking, peak arm speed, single stance duration, and dynamic gait index. Shulman et al. (2013) found that the gait score had increased by 12% and Mishra et al. (2014) found that gait scores had increased by nearly 50% with treadmill therapy. Treadmill training is a safe and accessible type of rehabilitation that shows promising results as an important factor in improving the treatment of balance and gait in patients with Parkinson disease (Mishra, Kulkarni, Rairkar, Shyam, & Sancheti, 2014). Future studies need include larger sample sizes, long term follow up of the participants measuring the effects of therapy during the different stages of the disease process.

**44 Effects of Exercise On Children with Diabetes and High Body Mass Index.** Hannah Simons, Gwendoline Neba, Brie Riggs, Hannah Edwards, Tyler Brown, and Michaela Orologio. (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

Participating in vigorous exercise is critical in improving a body mass index (BMI) in children with diabetes. Every additional 1% of body fat at ages 8 to 10 years decreased insulin sensitivity by approximately 3% and led to 0.5% increased requirement in first-phase insulin secretion 2 years later (Henderson et al., 2016). This statistic led to the following question: What is the best evidence-based practice to improve BMI and the effects of diabetes in children? This study is particularly beneficial to the field of nursing due to the potential use of nursing interventions, regarding vigorous exercise, tailored to children with a body mass index falling at or above the 95th percentile and a correlation to diabetes. Methods included conducting a literature review, a policy and procedure review, surveys, and observation of vigorous exercise such as walking, stationary biking, cardio, and physical education. Frequent blood glucose monitoring in children age 18 and under was also conducted. All studies that were obtained were written within the last 5 years, 2013-2018. To be able to participate in the study, the candidates must have fallen in an age range of 18 years or under and were able to participate in the designated physical exercise program for the study, and have a BMI range at or above the 95th percentile (meaning that they fell in the category of obesity) and/or have some type of correlation with diabetes. Participants were unable to be in the study if they were older than 18 years of age, were unable to participate in the designated physical exercise program for the study, had a BMI range below the 95th percentile (meaning that they did not fall in the category of obesity), or did not have some type of correlation with diabetes. All studies examined were either quantitative or qualitative. When conducting the research to find articles for the study the key words used for research were diabetes, vigorous exercise, adolescents, children, BMI, and obesity. The literature review showed that vigorous exercise programs can decrease BMI and hyperglycemia in children. Several studies compared multiple types of exercise, and vigorous or high intensity workouts showed the best outcomes. Implications for this study include gender, race, and social class. Other possible medical conditions the participant may have, and social class, which could all significantly alter the results of this study.

**45 Review of Literature: Substance Abuse Among Males Age 30 Years or Younger with Depression.** Kodi Holloway, Carlene Kinder, Courtney Miller, Abigail Morton, Braydon Nichols, Grace Pence, and Laura Shephard. (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

The purpose of this literature review is to examine the causes of substance abuse among men under 30 years old with depression. Impaired cognitive ability puts individuals at an increased risk for substance abuse (Latvala, Kuja-Halkola, D'Onofrio, Larsson, & Lichtenstein, 2016). The combination of mental disorders and substance abuse can lead to increased monetary costs for all parties involved in caring for the patient. The increased monetary costs are associated with substance abuse, higher suicide rates, increased substance dependence, increased depression and increased mortality. There have not been adequate studies that have examined the relationship between substance abuse and depression in young adult men. With this literature review we hope to bring awareness and education to medical professionals who will come into contact with these patients. This is significant to nursing as the prevalence of substance abuse is rising in all medical settings. Since the nurse is the patient advocate, the nurse is responsible for assessing for signs of depression and the need for interventions. The methods include conducting a literature review by searching key words, "young men", "substance abuse" and "depression" into medical journal databases, using only articles from 2013 or more recent. Exclusion criteria included "women" and "males over 30 years old". Although the literature review did not specify a particular age range, young males experience major changes in life that can affect mental health and increase the risk of substance abuse. The major changes include, puberty, new adult experiences, and making financial decisions. The literature review concluded that there is a positive correlation

between males under 30 and substance abuse with possible links to previous substance use, depression, and other cognitive disorders. These results conclude that males under 30 years of age with depression are more likely to abuse substances. This is relevant because of the ongoing opioid crisis in the United States. In the nursing field specifically, the findings from this literature review can be used to educate nurses on the need to assess for signs of depression and substance abuse.

- 46 **Dietary Flavonoid Intake as Complimentary Colorectal Cancer Treatment Literature Review.** Courtney Essary, Brooke Bowes, Carolyn Fletcher, Morgandy Benson, Rebecca Miller, and Tiffany Dyson. (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

Flavonoids, a diverse group of phytonutrients, are found in nearly all fruits and vegetables. More than six thousand types of these plant chemicals are responsible for the vibrant colors in vegetables and fruits. Flavonoids are being increasingly studied for their anticarcinogenic properties, especially as they pertain to colorectal cancer. Colorectal cancer is the third most diagnosed cancer in the United States (American Cancer Society, 2018). Nurses have a responsibility to educate patients on every facet of treatment including nonpharmacological methods, such as nutrition. The objective of this review of literature is to present a comprehensive overview of existing research of dietary flavonoids and their correlation with colorectal cancer treatment. The research method used was a review of literature gathered from eighteen scholarly resources. These included case studies, hospital-based interviews, and structured questionnaires. Results were quite varied throughout the literature collected. Fifty percent of the data collected showed that an increase in consumption of flavonoids yielded a decrease in colorectal cancer risk. Six studies yielded no correlation while three suggested that more research is needed to be conclusive. Research findings were inconclusive among various studies due to lack of resources available to study this subject such as monetary needs and researchers willing to perform a study. While evidence-based practice supports nurses encouraging increased intake of flavonoid-rich fruits and vegetables as part of a healthy diet, it is difficult to specify the degree of success in increased flavonoid intake as a complementary treatment to colorectal cancer. Further research is vital to understanding flavonoids as a complement to cancer treatment.

- 47 **Literature Review of Outpatient Disparities Among Intellectually Disabled Individuals Under 21.** Chylise Tracht, Chance Hernandez, Stephanie Agyemang, Taylor Eaves, Michael Simpson, Isabella Ramer, and Madison Herrera (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

The purpose of this literature review is to identify the quality and access to outpatient services such as health, mental health, and specialty services for people under the age of 21 with intellectual disabilities. This group may require enhanced professional medical support such as physical therapy, occupational therapy, and speech therapy, however, little information exists about the disparities of this population and the utilization of outpatient services to enhance quality of life. This literature review could have a great impact on nursing because of the long term effects of patient care for the intellectually disabled. If a patient is unable to reach adequate care when they are younger and at a drastic time of growth and development, it can lead to more health issues later in life. Also, the patient receiving proper care is huge in the nursing field because it is working holistically to better their quality of life. A literature review was conducted using various databases to access existing studies pertaining to quality and access to outpatient services for people under the age of 21 with intellectual disabilities. Studies included were peer reviewed after 2013 and included the specified population. Search terms included outpatient services, access, and intellectual disabilities. Terms excluded from the search were adults and inpatient services. Overall, the articles identified a trend of unmet needs of access to outpatient services for people under the age of 21 with intellectual disabilities. This unmet need was seen in areas such as disparities in rural communities including economic, distance and availability, lack of specialty clinics and providers, lack of knowledge and training regarding the needs for intellectually disabled individuals, insurance availability, and disparities among minority groups. Having identified these unmet needs, it provides additional information to make the necessary changes to better quality of care for this population and increase their quality of life. Nurses play a role in this, becoming educated about these healthcare disparities and advocating for improvement in their roles as part of the healthcare team and community. In order to find where the process is going wrong for a lot of patients, further research requires talking to patients, caregivers, and healthcare providers about the access deficit to outpatient service concerning proximity to the patient, insurance coverage, and other financial burdens.

- 48 **Literature Review: Effects of a Vigorous Exercise Program on Children Twenty-One Years of Age or Younger Undergoing a Hematopoietic Stem Cell Transplantation.** Kelsey Nadeau, Taylor Rinke, Roberto Barrios, Courtney Scouten, Kathryn Skelton, Olivia Alvarado, and Kenzie LoBaugh. (Mrs. Juli Bell, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

Since survival rates following hematopoietic stem cell transplantation in children have improved, research is

focusing towards interventions that lower the negative effects of the transplant and influence the patient's quality of life (Bogg, Broderick, Shaw, et al., 2015, p. 925). We conducted a literature review on the following: Implementing an exercise program for children undergoing an HSCT is an intervention that could have numerous short and long-term positive effects. This research is important to the nursing field as nurses could encounter this, be required to implement it, and/or have the knowledge to provide education on the topic. Our methods included selecting studies whose participants were 21 years of age or younger who underwent or were undergoing an HSCT. We included studies with varying types of exercise and excluded studies published before 2012. Results showed that exercise programs had been implemented in many settings including inpatient stem cell units, out-patient facilities, and oncology wards. The exercise regimens varied from muscle strength training, aerobic activities, mobility, endurance, and relaxation exercises that were measured by tools such as natural killer cell counts and peak oxygen uptake levels. These variables showed that diverse research has recently been conducted concerning the topic of how an exercise program may affect these children. In summary, research has shown that a supervised exercise regimen implemented both during and post hematopoietic stem cell transplantation in children is both safe, feasible, and most often beneficial. Many of the studies found that this intervention slowed the deterioration rate of QOL and the typical sedentary lifestyle of these patients. The importance of the exercise regimen being supervised by a trained PT/OT or nurse is a critical factor to consider, as well as having a separate gym/workout space to protect the immunocompromised patients and lower the spread of disease. What is missing from the research is looking at the effects of an exercise program before the SCT, bigger sample sizes, budgeting recommendations, and more data on the patient's personal opinions of the effects of the exercise regimen. The impact of this literature review can extend from educating health care professionals on the upcoming ideas regarding care of HSCT pediatric patients to lighting a spark for even more research to be conducted in the future.

- 49 **Medication Therapy Management: Empowering the Patient.** Jordyn Richey and Victoria Thompson. (Dr. Amiee Henderson, Rural Health Clinical Pharmacist, SWOSU College of Pharmacy, Weatherford, OK; Dr. Krista Brooks, Department of Pharmacy Practice, SWOSU College of Pharmacy, Weatherford, OK).

Objective: The purpose of this research is to educate and highlight the important beneficial outcomes patients, pharmacists, and other healthcare providers receive from Medication Therapy Management (MTM).

Thesis: Medication Therapy Management provides the community with many benefits. In order to demonstrate the importance, we will use pharmacist surveys to convey how MTM is implemented, ways to provide best patient care through this management, and the benefits of these types of programs that can ultimately improve patient health.

Methods: To illustrate the benefit of patient empowerment via Medication Therapy Management to the community, we will gather information by utilizing online resources such as cms.gov, amcp.org, pqaalliance.org, etc.; evaluating journal articles; and conducting interviews with pharmacists who have first-hand experience. After analyzing such data, we will compile the benefits associated with MTMs.

Summary: We expect to use this research to further aid in patient understanding of MTM benefits and importance in overall patient health.

- 50 **Demographics influencing the opinions on cannabis legalization in the United States.** Shelbey Trawick and Morgan Simpson. (Dr. Scott Long, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK; Dr. Lisa Appeddu, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK; Dr. Jared Edwards, SWOSU Department of Psychology, Weatherford, OK).

Oklahoma State Question 788, which proposes to legalize the licensed cultivation, use, and possession of cannabis (marijuana) for medical purposes, will appear on the June 2018 ballot. This state question is generating an abundance of public attention and controversy, resulting in many strong opinions concerning the legalization and/or decriminalization of cannabis for both recreational and medical use. The purpose of the current study is to determine the opinions of various subsets of the population regarding cannabis legalization in both the recreational and medical setting. This was accomplished by performing an extensive review of existing literature. The review yielded 17 scholarly articles, which were analyzed to determine trends in subject opinions of cannabis legalization. Five articles were based on medicinal use, five on recreational use, and seven on both topics without specifying use. The key components influencing attitudes of cannabis use and legalization which emerged from these articles included occupational, regional, generational, and religious factors. Results of the review suggest that those who are younger, less religious, and reside in the East and West regions of the United States are more likely to favor the overall legalization and use of cannabis. Conversely, older, more religious, and more centrally geographic inhabitants tend to oppose cannabis legalization. Overall, these categorical divisions in the population are likely to be predictive of the opinions of individuals. As Oklahomans come to the polls in June, it poses the question as to whether attitudes towards

cannabis legalization are changing as demographics change, even in conservative states.

- 51 **Drug-Disease State Interactions: Development of a Quick Reference Guide for Healthcare Professionals.** Victoria Thompson, Michelle Bannon, Claire Bullard, and Mercedes Coster. (Dr. Les Ramos, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK).

Objective: The purpose of this project is to develop a print and electronic reference for healthcare professionals to identify interactions between disease states and commonly prescribed medications.

Thesis: There is no known publication or database solely dedicated to identifying drug-disease state interactions. It is postulated that such a resource would be beneficial in reducing the negative impact of prescription drugs on existing disease states. For inclusion in the reference, a disease must be listed by the Centers for Medicare and Medicaid Services as a top chronic condition and/or listed as a common cause of mortality or morbidity by the Centers for Disease Control. Drugs qualified for inclusion must be listed in one or more of the following: 1) Sigler's Top 200 Community Drugs; 2) Sigler's Top 100 Injectable Drugs; and 3) a national or local formulary.

Methodology: Drugs were sorted by class and ranked according to prescription frequency. The most frequently prescribed drug per class is entered into one or more drug information databases to identify conditions in which either the drug is contraindicated or should be used with caution. Results are compiled in a tabular format with cross-referencing by disease state or drug to allow for rapid reference.

Summary: Using this process, we have developed a prototype that will be sent to a sample of healthcare professionals for testing and review.

- 52 **Pumping Patient Compliance Through Osmosis - Seriously, Employing Pump to Deliver Medications Orally?** Elizabeth Franklin and Taylor Nelms. (Dr. Hardeep Saluja, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK).

Patient medication compliance is an issue often seen when repetitive dosing is required. According to the World Health Organization, an average of 50% of patient population is non-adherent to their medications 1. Noncompliance can arise from various factors and can lead to many serious problems, including but not limited to, exacerbated disease condition, significant health care burden, and death. Sustained release drug products have been proven effective in improving patient compliance by providing a simplified dosage regimen 2. A novel sustained release drug delivery system called "Osmotic pump drug delivery system" was developed to alleviate problems associated with patient compliance. Osmotic pumps allow for less frequent dosing, but still retains consistent delivery of a therapeutic dose over the specified time interval. When the delivery system is introduced into the body, the specialized coating prevents immediate tablet disintegration. Once enough fluid has entered the tablet, osmotic pressure generated in the tablet forces the drug out of a laser-drilled hole at a controlled and predetermined rate. However very limited to none visual demonstration of the drug release kinetics reported in literature, which makes it difficult for students, health care professionals, and general population to understand and appreciate this novel technology. The aim of our study is to produce a visual representation of drug release from the osmotic drug delivery system to aid in the understanding of this innovative technology employed for drug delivery. Two different type of osmotic pumps, Push-Pull Osmotic Pump (PPOP) and Elementary Osmotic pump (EOP) will be investigated. Visual release mechanism of Sudafed 24 (EOP) and Glucotrol XL (PPOP) will be produced. The mediums used to demonstrate drug release from the osmotic pump drug include an aqueous medium, a medium representing gastric pH, and a medium representing intestinal pH. Photographs will be taken at specific time intervals to demonstrate the release of drugs from the osmotic pump delivery systems.

- 53 **Validation of 2D fingerprint similarity-based method for in silico virtual screening of LDH-A inhibitors.** Mustafa AL-Sunni. (Dr. Horrick Sharma, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK).

The aim of the present work is to conduct virtual high-throughput screening of 3D-molecular database to discover compounds with lactate dehydrogenase-A (LDH-A) binding affinities. ZINC, a commercial database of 15 million compounds was used for screening. We used a combination of atom-based 2D fingerprint similarity screening, pharmacophore screening, and molecular docking, which were first validated to ensure enrichment of actives. Here, the validation of 2D fingerprint similarity-based method is reported. Validation dataset of 1198 compounds, including 28 actives and 1170 decoys, was subjected to 2D atom-based dendritic, Molprint2D, radial, and MACCS fingerprint calculations. Molecular fingerprints are 2D atom-based descriptors that can be used to measure similarity between two molecules using a reference query structure. Thus, fingerprint values of each of the 28 active compounds was used as a query to obtain similarity scores for the remaining compounds

in the dataset. Tanimoto index was used for calculating the similarity scores. To enhance enrichment of actives, similarity scores were combined by data-fusion methods using both max and sum rank functions to give the corresponding fusion ranks of compounds in the dataset. For enrichment, we calculated enrichment factor (EF) for top 1%, 5% and 10% of the database. The 'molprint2D' fingerprint and max fusion rule resulted in highest enrichment and was used to screen the pruned database of ~12 million drug-like compounds.

- 54 Molecular Docking-Guided Design and Synthesis of Lactate Dehydrogenase-A Inhibitors as Potential Anticancer Agents.** Shanna Simmons. (Dr. Horrick Sharma, Department of Pharmaceutical Sciences, SWOSU College of Pharmacy, Weatherford, OK).

Cancer is a second-leading cause of deaths in US and it is estimated that more than half a million people die from cancer every year. Current chemotherapeutic agents in addition to targeting the rapidly dividing cancer cells, also kill normal cells leading to systemic toxicity and significant side effects. Thus, there is an urgent need to identify novel targets and develop agents that can selectively kill cancer cells. Lactate dehydrogenase-A (LDH-A) is a key glycolytic enzyme that is overexpressed in many human cancers and is shown to promote tumor proliferation, invasion, and survival. The goal of this project is to synthesize and identify compounds that can inhibit LDH-A using computer-assisted drug design. Molecular docking is a structure-based drug design approach that uses a 3D-structure of a target to design compounds that can bind and interact with the target protein. In this work, we first analyzed the crystal structure of LDH-A in complex with inhibitors to determine important molecular interactions. We generated a small library of isosteric compounds based on reported LDH-A inhibitors. The library of compounds was docked into the crystal structure of LDH-A using GLIDE, a molecular docking suite. From the molecular docking study we identified a scaffold that showed interactions with important residues of LDH-A. One analog of the promising scaffold was synthesized and purified. Future studies will involve testing the synthesized compound for LDH-A inhibition using *in vitro* enzymatic assay.

- 55 How do Music Therapy Interventions affect the Pain Management of Cancer Patients?** Heather Todd. (Dr. Sophia Lee, SWOSU Department of Music, Weatherford, OK).

In this study, we will discover the effects of music therapy interventions on cancer patients and their pain management. To discover this, we will survey cancer patients and ask them what their pain level is from one to ten before and after the music therapy intervention. The point of this study will be to see how long after the music therapy intervention the clients pain level is decreased. Through different music therapy interventions, it will show which is more effective and decreases the pain longer.

There have been many studies done on the effects of music on cancer patients and how it affects their pain management. Majority of them focus on the effects of the psychological and physiological pain. Throughout the many experiments done, they have tried quite a few different music therapy interventions. The majority of the researches that I have looked into did a listening based intervention. Because of this, I would like to expand on this research and see which interventions work best for all types of cancer. Along with seeing which intervention works best for all, I would like to see if there are any interventions that would work best for only a certain type of cancer.

I plan to decrease the amount of pain a cancer patient has from the beginning of the session to the end, and hopefully even after the session. Over 3 months, I would like to see that the patient is able to have a decrease in their pain levels by at least 50% and be able to find the best interventions that work for them and the pain type they are going through.

Through different music therapy interventions, I plan to see which intervention works best on controlling the cancer patient's pain management. While doing this, I would also like to see which intervention works best at controlling the different types of pain that the cancer patients go through.

- 56 Female Composers in a Patriarchal Society.** Misty Schumann-Hickman. (Dr. Sophia Lee, SWOSU Department of Music, Weatherford, OK).

The topic of my presentation will be that of how female composers have had to work within a patriarchal society, the challenges this has created for them, and how some found themselves successful.

- 57 Approaches to Vocal and Instrumental Improvisation in Music Therapy.** Laura Motzkus. (Dr. Sophia Lee, SWOSU Department of Music, Weatherford, OK).

Improvisation has long been popular in the world of music. Deriving from the earliest forms of music, from the Medieval period through the Romantic period - improvisation has become a technique known most commonly to performers. However, the role is much different in the music therapy clinical setting. Improvisation is used

as a clinical technique in music therapy and has been proven effective to many populations. However, when further looking into clinical improvisation, there lies three different categories - instrumental, vocal, and movement. For this study, instrumental and vocal improvisational techniques were examined. This study closely observed the similarities and different approaches to instrumental and vocal improvisation in the music therapy setting. Further knowledge of these two techniques are beneficial in knowing how to approach specific diagnosis in music therapy clinical settings and to help aid in achieving goals and objections set within.

- 58 Convenience vs. Community: Is Face to Face Fading Into Cyber Space?** Bron Briggs. (Dr. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

My research poster will present and determine if the standard brick and mortar physical store will be able to thrive and survive with the innovation and evolution of e-commerce and online shopping-especially in the United States. The poster will also examine the increasing trend of online shopping in correlation and effects towards their smaller and brick and mortar competitors.

The usage of online retailers and online shopping has drastically increased over the last decade. Consumers can shop for seemingly anything and everything all on a computer from the comfort of their own home. With the increasing simplicity and usage of online shopping as well as the number of store closings over the last few years, will the advancement of online shopping and alliances with major national retailers for pick-up capabilities be too much for the smaller "mom and pop" shops to handle and lead to a dismal future?

- 59 The History of Paper Money in the United States.** Liliana Perez. (Dr. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

My presentation will be over the history of paper money in the United States. From the beginning the colonists knew there would be a need to produce some type of equal trade before the revolutionary war. The Continental Congress decided to fund the war by issuing paper notes and promising silver or gold in exchange after winning the war. But as we all know, the war lasted for several years. Congress issued more and more notes to pay war costs and caused the notes to lose their value. After independence was won, the inflation rates were so high that the worth of congress was only a fraction of what it was before the war. Private banks started issuing their own currency with their own design, this complicated trade because the money wasn't worth the same at other banks in different states. During the civil war, the north began to overprint 'Greenbacks' to pay war costs causing the inflation rate to go up once more and depreciating the value of the bills. Since metal was very scarce during the war and people were keeping it to themselves, the government decided to issue 'paper coins' worth fractions of the notes. After the war, most of the notes were issued by federally chartered banks. In 1863, the first set of legal tender notes were issued, adorned with symbolic depictions of the west. Since the United States had seen so many waves of inflation with printing money, congress came up with a way to keep the value of the notes stable. They made the value equal to gold. That didn't work for long, so the Federal Reserve was born to make notes more flexible across the nation. The Federal Reserve was hit with the Great Depression and war again causing inflation to once more sky rocket. Finally, after a long journey, paper money in the U.S. became stable when the Federal Reserve aimed at keeping inflation rates on track and employment rates steady.

- 60 The Increase in Designer Prices.** Leticia Ortiz. (Dr. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

This paper empirically examines the impact of why prices have dramatically increased on fashion apparels using macroeconomics inflation keyword. From shoes to handbags to ready to wear prices have increased dramatically over the last decade, the question asked frequently is, why? A nearly 60% price increase may seem excessive, especially when compared to the US consumer Price Index, which has increased by 27% over the past decade- but its typical in the luxury fashion category. In the recent years, prices of luxury fashion products have grown at more than twice the rate of general inflation. Ready to wear dresses in the \$10,000 and up range barely existed 10 years ago, now they're commonplace. So now what is causing this, is that the rough cost of producing a luxury product that is about half of the price given when you take in consideration how much it takes to product and bring to market, all the way from materials to sale. These costs include raw materials, design, manufacturing, and fulfillment. Then at retail, there's the cost of prime real estate and sales staff. And finally the marketing, that cost a fortune to advertise. Over the past 10 years, and partially since the end of the recession many of these cost have increased dramatically. Not only did the material and all increase but also the labor price, increase on workers has had an impact as well. Finally, the final thing that causes inflation is the desirability and perception that that role. The more expensive something is, the more exclusive, and therefore, it becomes desirable. Although prices has increased dramatically, the shopping addiction has as well. From the statistics Southwestern Oklahoma State University the apparel in USA nation level consumer spending will

increase 50 billion from 2013-2020.

- 61 Uber and taxi drivers.** Jordan Bryant. (Ms. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

My research proposal will be about the different type of uber and taxi companies they are and how uber is possibly taking money away from the taxi companies because anyone can be an uber. It's no secret that uber is taking money away from the traditional taxi drives because ubers seen to be more fun, and because of the way uber is able to use software to get their names' out there. Since uber has started they income for taxi drivers has declined 3.7% due to the fact that ubers has been used more often because they are cheaper than taxi. One author in the newspaper wrote about how ubers have been taking jobs. Carl Benedikt Frey said that uber drivers get an average of a couple of more dollars more in hour than taxi drives and also that ubers are the flagship of the shared economy. Raising the income for those who need it is a solution frey is thinking we should do, because it could solve many issues and help taxi companies not run out of business. On the bright side of uber, they have created more jobs than taken so if the worst case comes, taxi drivers can just become uber drivers.

- 62 Analyzing the economic impact the acquisition of the Oklahoma City Thunder made on Oklahoma.** Seth Odam. (Dr. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

A research analysis that sets out to determine how the acquisition of the Oklahoma City Thunder, a major professional sports organization, affected the economic landscape of Oklahoma. As an avid Oklahoma City Thunder fan living around the Oklahoma City metro area my entire life I was a first hand witness to the apparent shift in the Oklahoma economy after the arrival of the Oklahoma City Thunder in 2008. The Thunder appeared to rejuvenate the area by bringing people into Oklahoma City from all across the state to watch a game. The development of Bricktown and surrounding areas seem to reflect the Thunder bringing a positive economic growth to the state. It's important to research the impact sport teams can have on an economic market to discover if the benefits of a team far outreach the traditional fan, and can positively or negatively affect the population of an entire city. I want to discover if the cost risks associated with having a team reciprocates to the overall wealth of the city. Despite professional sports being one of the largest entertainment markets in the United States there is not much academic research content regarding the impact professional organizations have on small market economies like Oklahoma City. There are many newspaper articles that would help support my research, but there have not been many specific studies that look into the economic impact an organization can have on an economy. My research would provide clarity on whether the investment of bringing in a professional sports team would be beneficial for an economy. Small market economists would potentially use this when trying to determine the value of investing in new venues and if the small market will be able to sustain the large investment it takes to host a team. Rather than looking primarily at previous research, I am going to research data myself and analyze trends among different professional teams.

- 63 Oil and Macroeconomics.** Deondric Hicks. (Dr. Jieun Chang, SWOSU Department of Social Sciences, Weatherford, OK).

Oil costs leave a great deal of suggestions on financial aspects. Oil costs have declined firmly since June of 2014. It isn't the essential sharp oil esteem swing: there have been five unique scenes of oil esteem drops in excess of 30 percent and a couple of more scenes of oil esteem spikes. Amid late decades, these drops and spikes have enabled a wide composition on the macroeconomic ramifications of oil esteem swings and the channels through which they work. For the overall economy when all is said in done, a supply-driven 45 percent oil cost abatement could be connected with an extension in world GDP of around 0.7-0.8 percent in the medium-term. Most of the written work revolves around surveying the impact of oil cost augments on certifiable development in genuine economies. These examinations move comprehensively, dependent upon the oil energy of the economy, oil exporter/shipper status, data tests, and approach. For example, for OECD countries, a 10 percent development in oil costs has been connected with a decline in honest to goodness activity of 0.3-0.6 percent in the United States and 0.1-0.3 percent for the Euro Area. Countries have declared a broad assortment of disclosures. By and large, oil esteem swings and swelling have been firmly related despite the fact that this relationship moved extensively transversely finished countries. Generous additions in oil costs in the midst of the past 40 years were routinely trailed by scenes of high swelling in various countries. As a result of yield, the impact of oil esteem swings on extension has, regardless, declined consistently. Equivalent results have been found for other moved economies and for some creating business segment economies. The abatement in experience is inferable from the reasons over that illuminate the diminishing in the impact on development, particularly improvements in cash strategy systems that achieved better securing of long-run extension wants.

- 64 **The Rights Of Crime Victim In The American Criminal Justice System.** Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK.

This poster will examine the rights of victims of violent crimes in the american legal system. The poster will examine the evolution of "victim's impact statements" in the american courts. The poster will analyze the emergence of victims compensation programs in the various states. The poster will conclude with a examination of the future of victims rights in the american legal system.

- 65 **Fake News: What the Media Doesn't Want Us to Know.** Brittany Cano. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

The purpose of this research is to identify and inform viewers of news media biases. Aspects of this research will explore current news articles and identify false statements within the articles, as well as peer reviewed studies, to help make readers aware of the current issue in American journalism. This research will also identify which new channel(s) lean a particular way in politics and also identify neutral media outlets, in an effort to give readers a better alternative for their news sources.

- 66 **Political Scandals.** Larry Baker. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

A presentation on the misuse and abuse of power and authority from those both in local, state, and federal positions. With a special insight on sexual harassment and assault.

- 67 **Criminal Law and Religion in America.** Michael Mills. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

This presentation will analyze the various laws in the american criminal justice system and their relationship to biblical principles and laws. The analysis will demonstrate the close relationship between american laws and ideals found in the bible. The presentation will show the judeo-christian roots of american laws and the impact old testament ideals have on american law and justice from historical to current perspectives.

- 68 **Militarization of Campus Police Forces: The 1033 Program and Colleges.** Aaron Cornell. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

The 1033 program is a procedure in which military equipment such as weapons, vehicles and aid kits are distributed to local law enforcement agencies upon request. Its intended purpose was for local law enforcement agencies to utilize equipment not normally available in order to counter national drug operations. Since 1995 the program has distributed over \$5.1 Billion worth of military equipment (Defense Logistics agency, 2014). Negative effects of the program have been seen through studies showing counties which receive larger 1033 transfers have higher rates of police killings (Delehanty, et. al., 2017). It has also been shown that increases in obtaining new military equipment is associated with increased willingness to engage in high-risk operations (Balco, 2014). This program has allowed the militarization of local law enforcements around the nation, but one type of law enforcement agency has yet to be explored in a meaningful way, school police forces. In 2014 it was reported that Arizona State University had purchased over 70 M-16s from the Law Enforcement Support Office (LESO) which operates the 1033 program (New York Times). This led to an exploration into the amount of money being spent by universities on this program.

My examination explored major schools around Oklahoma and surrounding states, as they have attempted to militarize through the 1033 Program over the past few decades. I incorporated data from the Department of Justice disposal service's database which itemizes all transactions to law enforcement agencies to all 50 states. Implications will be discussed in relation to military grade weapons purchases made by various universities across the nation. This was especially interesting in Oklahoma where the Putnam City Schools Police Department purchased riot type shotguns, multiple M-16 rifles and an armored military truck (Department Logistics Agency, 2018).

This research is especially important due to the Trump administration's rollback on the previous administrations attempt to regulation the Department of Justice's disposal service. Along with this program, further research into other programs such as homeland security grants could also expose the level at which schools around the country are militarizing in hopes of securing the safety of their students.

- 69 **The History and Formulation of Modern Gun Rights.** Aaron Cornell. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

In the past few years, the issue of individual gun rights has taken center stage in the political arena. Ideas and solutions have been proposed on both sides of this issue, along with many questioning the purpose and legal

justification for this fundamental piece of our constitution. I found it important to explore the origins of the second amendment, and how it has developed over the course of our nation's history. It is also important to understand the ramifications recent court cases have had on this issue.

In my search to understand the idea of gun ownership, I examined early writings about the second amendment through the original stated text, and through James Madison's arguments in the Federalist Papers. I soon began looking at the early Supreme Court cases discussing the expansion of Gun Ownership such as *United States V. Cruickshank* (1875). I also looked at the debate between the Collective Rights and Personal Rights Theories on gun ownership. In the Early 20th Century, the Gun ownership debate was assumed under the collective rights theory as established through the ruling in *United States V. Miller* (1939). This was the prevailing precedent for 70 years until *District of Columbia v. Heller* (2008) completely flipped the courts standing on gun rights. Since then many cases have affirmed the transition to the Personal Rights Theory, while also validating the individual state's ability to regulate this right. In my poster I will go into detail about the research I did, and use more cases to illustrate how entrenched this debate has been in our nation's history.

**70** **God v. Capital Punishment (BC - AD).** Velma Carriaga. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

Since the beginning of humanity, humans have struggled with good and evil, right and wrong, and the consequences of evil and wrongdoing.

According to the Death Penalty Information Center, the first death penalty laws were established in Eighteenth Century B.C. The first recorded execution was Captain George Kendall in the Jamestown Colony of Virginia in 1608.

The United States Supreme Court has ruled that capital punishment is legal and is not in violation of the United States Constitution. In addition, these rulings have established guidelines and placed limitations on the death penalty in the United States. But it wasn't until 1972 in the case of *Furman v. Georgia*, that capital punishment was found to be in violation of the United States Constitution.

There are approximately 280 million Christians in the United States. For Christians, the subject of capital punishment has been a long-standing topic of debate and an on-going conflict both within oneself and within the Christian community. Many Christians find it difficult to reconcile the need for justice with the importance of mercy and forgiveness as taught by Jesus Christ.

The purpose of this presentation is for the analysis of how Biblical teachings may or may not conflict with the modern teachings of the criminal justice system and the death penalty. The presentation "God v. Capital Punishment (BC-AD)" will examine the controversial role of the United States government in determining who shall live and who shall die.

**71** **Do Tweets Regarding Presidential Elections Correlate with Poll Results?** Madison Rae Mowdy. (Dr. Dan Brown, SWOSU Department of Social Sciences, Weatherford, OK).

When looking at twitter throughout the 2016, you will see an outstanding amount of tweets and retweets regarding specific political party candidates. The question is; do these tweets accurately indicate voter turnout? Celebrities, such as Kim Kardashian, Lady Gaga, and Jennifer Lopez endorsed Hillary Clinton. Donald Trump, likewise, had celebrity endorsement as well, from celebrities being Tim Allen, Hulk Hogan and Tom Brady. While Hillary Clintons celebrity endorsers had more retweets than Donald Trump, Hillary only won the Popular Vote by 3,000,000 votes. Accordingly, tweets and retweets do not correlate with actual voter turnout and results.

**72** **"Is that all?": Media Portrayal of Women in the 1950s and 1960s.** Katy Elmore. (Dr. Becky Bruce, SWOSU Department of Social Sciences, Weatherford, OK).

Media in the 1950s and 1960s most often depicted women as perfectly content housewives and mothers who never pursued careers, higher education, or intellectual activity. This was an unusual step back for the depiction of women since the 1940s, especially when considering figures and propaganda, such as Rosie the Riveter, encouraged women to break the norm and join the workforce to help the World War II effort. Once the war ended and women were no longer needed as much, advocating for women to pursue things beyond the home mostly ended and media, especially magazines, television, and advertisements set standards for women that women themselves had no say in. Examination of these three types of media from the 1950s and 1960s, as well as excerpts from Betty Friedan's *The Feminine Mystique*, show the gendered expectations that women were expected to meet.

- 73 **"Entering the Quagmire: Actions that led to U.S. Commitment in Vietnam".** Brooks Marshall. (Dr. Becky Bruce, SWOSU Department of Social Sciences, Weatherford, OK).

This project investigates the role that the release of the Pentagon Papers played in illuminating American activities in Vietnam prior to the rapid expansion of the conflict under the Johnson Administration. My research indicates that although President Johnson drastically expanded American commitment in the conflict, he was merely continuing a trend set by previous presidential administrations. Government documents indicate that the Eisenhower and Kennedy Administrations engaged in subversive activities in Vietnam that undermined the Geneva Accords of 1954. In addition, President Kennedy used rhetoric that placed the conflict in Vietnam within the struggle of the "free world" versus global Communism. By placing moral imperative in the struggle, he greatly increased the stakes that American leaders had in the outcome of the conflict. Kennedy's choice to appeal to the American public to defend the freedom of the Vietnamese people while only wishing to employ limited military means to complete that mission significantly hampered future American military decisions in the region. In addition, North Vietnam's leader made repeated efforts to engage the Americans in peaceful talks prior to the escalation of war. However, American leaders were unable to look past his communist background and believed North Vietnam posed a critical risk to the security of Southeast Asia. Politicians in the United States were unable to realize the unique international circumstances of specific events and chose to categorize any international event as a struggle between the "free world" and global communism. This study contends that American assumptions of monolithic communism combined with placing the Vietnam struggle within the broad context of freedom led to flawed policy decisions that culminated in over 58,000 Americans losing their life due to mistaken interpretations of Cold War tensions. At the early stages of the struggle, American leaders missed repeated opportunities to end their involvement in the conflict, yet political consequences of losing Vietnam to communism caused American politicians to refuse to withdraw from the country.

- 74 **Equality of Opportunity: the Racial Significance of the Elementary and Secondary Education Act.** Olivia Branscum. (Dr. Becky Bruce, SWOSU Department of Social Sciences, Weatherford, OK).

In 1965, President Lyndon Baines Johnson worked through Congress to pass the Elementary and Secondary Education Act as part of his plan for a "Great Society." This Act established a standard for educational opportunity and funding unmatched by any of Johnson's predecessors. LBJ's main concern in tackling inequality in education was the "War on Poverty" he established through his Great Society plan. While African American students made up the majority of those under the poverty line when the Elementary and Secondary Education Act was enacted by Congress, it did little to improve equality of opportunity for minority students. Because of complication in implementation that helped prolong the issue of segregation and allowed local governments to incorrectly allocate funds, especially in the South, the Act was unable to ensure equality of opportunity for young African American students. Through review of the Act itself, relevant Supreme Court cases covering the desegregation of education, and various speeches given by Johnson, this poster will assess how an act intended to provide aid to public schools that were subjected to lower funding due to area poverty failed to achieve its goal of equality in every area.

- 75 **A Study of Women in Public Life: Tarbell and her Writings on Madame Roland.** Emily Burgess. (Dr. Becky Bruce, SWOSU Department of Social Sciences, Weatherford, OK).

Ida Tarbell was a prolific writer and lecturer on many topics including the lives of President Abraham Lincoln, Napoleon, and Madame Roland. The biography of Madame Roland grew out of a study of the women of the French Revolution. Tarbell began this study in an effort to find evidence of women's abilities in public life. Her study of Roland focused extensively on the influence of Rousseau and her relationship with her husband. The conclusions that Tarbell drew from this study strengthened her support of the anti-suffrage movement.

- 76 **Ida Tarbell and the Limits of Being a Woman.** Emily Burgess. (Dr. Becky Bruce, SWOSU Department of Social Sciences, Weatherford, OK).

Ida Tarbell is best known as the journalist who worked to bring down Standard Oil. She also was a prolific writer and lecturer on topics ranging from tariff policy to the life of President Abraham Lincoln. In spite of the independent nature of her life, Tarbell was an anti-suffragette and opposed feminism. These views developed over the course of her lifetime. During Tarbell's time in college the suffrage movement faced scandal and declining public interest. In an effort to develop her own opinion on suffrage, Tarbell sought women in public life to study which brought her to the women of the French Revolution, in particular Madame Roland. Tarbell's study of Madame Roland resulted in the further development of her opposition to suffrage due to Roland's allegiance to her husband in the political arena. Tarbell saw this as evidence that women would never vote independent of their husband and thus could never be a moral force in politics, a key argument of the suffrage movement. Further works by Tarbell show the development of her views on the role of women in society.

Instead of arguing for the vote Tarbell advocated for domestic training to properly train women in the running and management of households. In addition to her writings Tarbell was a member of anti-suffrage groups. Tarbell's opposition to suffrage had an impact on her professional life as well in regards to the positions she took and the range of her work.

**77 I Know It If I Read It: Perception of Reliability and Credibility of News Stories.** Emily Burgess and Aaron Cornell. (Dr. Stephen Burgess, SWOSU Department of Psychology, Weatherford, OK).

Access to new information has likely never been at a higher level with the internet and other technological advances. However, this has been accompanied by an increase in the number of information sources (e.g., news outlets, social media). It may be more difficult to know which information is to be taken seriously and which is to be viewed skeptically. Individuals are influenced by their core beliefs and tend to reject findings that threaten their world view (Lewandowsky & Oberauer, 2016). Interestingly general level of education, scientific knowledge and science literacy are only moderate predictors of trust in science (Allum et al., 2008). This study is the first step in a programmatic examination of the factors that influence the perception of news media.

The current study examined how news from different sources was perceived when information that identified the source such as title, bylines, ads, and name of organization was removed. News stories covering similar topics were selected from Breitbart, CNN, FOX, and NBC in a 24-hour period. Each participant read three of these news stories and answered a survey that measured their perception of the reliability, credibility, liberalism and conservatism, bias, accuracy, and likelihood to discuss or share the information contained in the story. Participants were also asked to identify the source of the story and about news sources that they used and how informed they felt about national and international news. We hypothesized that participants would perceive news sources as more credible when the actual source of the news story was consistent with where they preferred to seek their news. We also hypothesized that participants would be able to identify the story as being from a conservative or liberal news outlet.

Overall the results suggest that the removal of bylines, ads, and authorship details for the selected stories decreased the ability of the participants to correctly identify the degree of liberalism and conservatism of the news source. There was a pattern of consistency across ratings of the stories which suggests the stories will be useful as stimuli for later studies. There was not a significant relationship between rating of conservatism/liberalism and the status of the news source as conservative or liberal.

**78 Male and Female Playable Character Choices and Customization in Video Games.** Alexandra Cassidy, Aaron Cornell, and Emily Burgess. (Dr. Stephen Burgess, SWOSU Department of Psychology, Weatherford).

There is the perception that video games are dominated by male players as well as developers (Prescott & Bogg, 2011; Pew Report 2015). However, approximately the same number of females and males play video games (Pew Report 2015). In the present study, we examined the playable character choices available in popular video games. We predicted that more games would have male playable character choices than female, and overall, there would be more male playable characters. We predict that this would be less true in E-rated video games than in teen and mature-rated video games. Approximately 50 video games were examined to determine the playable character options available. A playable character was defined to be one that could be selected at the beginning of a game. We coded the number of playable characters, the gender of each character, and the characteristics of the character (e.g., skin color, clothing options.) Results will be discussed in the context of the perceived androcentrism of video game culture.

**79 Representation of Characters by Gender across Video Game Covers of Different Ratings.** Alexandra Cassidy, Aaron Cornell, and Emily Burgess. (Dr. Stephen Burgess, SWOSU Department of Psychology, Weatherford, OK).

Background: A potential problem in the video game industry is the lack of equal representation of both males and females in the content creation process, which includes advertising, gameplay, and character design. This may lead to a skewed portrayal of reality throughout production (place cite here). Our research is in response to the perception that females are underrepresented in gaming culture. We hypothesized that more males would be present than females on video game covers, and males would more commonly be represented as primary characters than females. We also predicted that females would be more commonly represented as secondary characters than males.

Method: In order to research the most relevant data, we examined 53 games from best-seller lists of 2017 from Walmart, Amazon, Gamestop, and Steam. We coded each game cover for amount of characters, gender of characters present, primary and secondary characters, and gender of primary/secondary characters. Games were coded by two research assistants to enable the assessment of inter-rater reliability.

Results and Conclusions: Our results showed that 49% of covers had males present while 32% had females present. This difference was significant. 30% of games represented a male/males as the primary character while 26% of games represented a female/females as the primary character. This difference was not significant. Our results showed that 13% of video game covers represented males as secondary characters while 15% had females represented as secondary characters. This difference was not significant. This research project is an ongoing study was the first in a series of planned examinations of the representation of males and females in video games. We plan to increase the number of covers included and to add variables such as game rating to the analyses

**80 College Students' Perceptions of Credibility and Reliability of Real News Sources.** Aaron Cornell and Emily Burgess. (Dr. Stephen Burgess, SWOSU Department of Psychology, Weatherford, OK).

Conservatives and liberals use news sources and social media news sources differently (Pew, 2014). Access to new information has likely never been at a higher level with the internet and other technological advances. However, this has been accompanied by an increase in the number of information sources (e.g., news outlets, social media). It may be more difficult to know which information is to be taken seriously and which is to be viewed skeptically. In the present study we examined the perception of participants of different news sources. For example, how do participants perceive FOX News or CNN in terms of reliability, credibility or conservativeness/liberalness? Approximately 100 participants completed the materials. They rated CNN, FOX News, Associated Press, BBC, Breitbart, BuzzFeed, Huffington Post, NBC, New York Times, Wall Street Journal, Washington Post, and local news. Results will be discussed in the context of the importance of these findings for conducting research examining how new information is interpreted and considered.

**81 Replication and Extension of Burgess and Cornell, 2016: Does Choice of Game Affect Perceptions of Aggression and Threat.** Aaron Cornell. (Dr. Melinda Burgess, SWOSU Department of Psychology, Weatherford, OK).

The Association for Psychological Science recently focused attention on the need for replication of findings. This grew out of continued criticism over the lack of replication studies in psychology. The current study is a replication of Burgess & Cornell (2016). They investigated whether men's preferred choice of video games (M rated vs. E and/or T rated) was associated with their ratings of aggression and threat level in Black and White men. M-Rated video games are characterized by high levels of graphic violent images, consistent use of profane language, drug usage and highly stereotypical portrayals of racial minorities. (Burgess, et al., 2011; Dill, et al., 2005). They found that males who played M games, rated the Black men as higher in aggression and threat level than males who played E & T games. In the current study, participants viewed a series of images of black and white men for 5 seconds and 15 to rate them on a spectrum of qualities including aggression, threat level, compassion, intelligence, etc. They then completed a series of media surveys asking about types of media and video game content they most often used, and hours exposed. In addition to replicating the original study, we extended it to include female gamers. The results can be used to develop further studies exploring the effects mature rated video game play has in various settings and groups of people.

**82 Technology Use in Relation to Self Esteem Among Those with Mental Health Issues.** Kaylie Gill. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Studies have shown that "pathological internet users" reported lower self-esteem, increased loneliness, depressive state and suicidal ideation, as well as, increased shyness and external locus of control (Crabtree, Haslam, Postmes, & Haslam, 2010). There is evidence that members of stigmatized groups have better coping strategies due to the social support they receive from their group (Crabtree, Haslam, Postmes, & Haslam, 2010). The current research hypothesized that more exposure to technology would be related with lower self-perceptions among those with mental health issues. A secondary analysis was conducted from publicly available data from Wave IV of the National Longitudinal Study of Adolescent to Adult Health. The original sample of 5,114 was subset to only include participants that were diagnosed with mental health issues leaving 1,259 participants. The participants ranged in age from 25 - 34 with the majority (67.54%) at 27-31; of the participants 65.93% were female and 34.07% were male. A chi-square analysis showed a significant relationship between internet usage and self-perceived intelligence in participants with mental health issues  $\chi^2 = 24.88, 1 \text{ df}, p < 0.0001$ . Out of the participants who rated themselves as intelligent, 61.82% were internet users while only 44.66% were non-internet users. When examining the relationship between television and video viewing with self-perceived attractiveness in participants with mental health issues, a chi-square analysis determined there was no significant relationship. However, sex was found to be a moderator for this relationship. The original Chi-square p-value was  $p = 0.1790$ , males remained non-significant ( $\chi^2 = 3.0756, 5 \text{ df}, p = 0.6883$ ), and females is significant ( $\chi^2 = 11.8624, 5 \text{ df}, p = 0.0367$ ). The women who viewed no television or videos were more likely to rate themselves as attractive. The hypothesis for this research was not supported.

Some of the results supported the given hypothesis and previous research, but the majority did not. When paired to the different self-esteem variables, video and computer games yielded no significant relationships. It is possible that women that are less exposed to the internet and television are having less exposure to societies unrealistic expectations, therefore, viewing themselves in a more positive light. Further research examining if reduced exposure to technology could improve one's self-esteem is needed.

**83 The Association Between Parent Spent Time in Jail and Drug Use in Young Adults from Low Income Families.** Shelbi Scheffler. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Children with parents in prison are five to six times more likely to be imprisoned than their peers (Farrington & Murray, 2008). Children that come from low income families were more likely to start drinking alcohol at an early age than those who came from middle income families (Mason, Kosterman, McCarty, Herrenkohl, & Hawkins, 2010). It is hypothesized that young adults from low income families who have a parent or parent figure that has spent time in jail will be more likely to partake in risky drug and alcohol abuse. A secondary analysis was conducted from publicly available data from Wave IV of the National Longitudinal Study of Adolescent to Adult Health. The sample included 2,928 participants living in a household with an income of less than \$50,000 a year. A chi-square analysis revealed that those with a parent in jail (40%) were significantly more likely to partake in risky alcohol abuse,  $X^2 = 5.8$ , 1 df,  $p = .016$ , than those that did not have a parent in jail (34%). A chi-square analysis showed that those with a parent in jail (66%) were significantly more likely to partake in risky drug use,  $X^2 = 12.00$ , 1 df,  $p = .0005$ , than those that did not have a parent in jail (57%). These findings are consistent with previous research. Interventions targeted at young adults with a parent or parent figure currently or previously in jail could reduce the likelihood of that young adult becoming an addict.

**84 The Association between Young Adult Relationship's with Parents and Depression.** Hattie Click. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Very little research has been conducted on an adult's relationships with their parents and depression. A negative parental relationship has been shown to have a correlation with adolescent depression (Kouros & Garber, 2014). The current research hypothesized that higher levels of depression in young adults would correlate with negative relationships with their parents. A secondary analysis of archival data was conducted on Wave IV of the US National Longitudinal Study of Adolescent to Adult Health. The sample of 5,114 was subset to only participants that answered yes "they have felt depressed within the last 7 days," leaving, 319 participants. Participants ranged in age from 26 to 34 with 90.60% falling between 27-31 with 64.58% female and 35.42% male. A chi-square analysis showed participants who felt depressed in the last 7 days that did not feel close to their fathers (83%) were significantly more likely to report feeling isolated than those that felt close to their fathers (70%),  $X^2=4.69$ , df 1,  $p=.03$ . However, sex moderated this relationship resulting in a significant relationship only in females. These results may have occurred because of the lack of male participants in this study. Further research with a more equal distribution of sexes needs to be conducted before any conclusions can be made.

**85 The Relationship Between Authoritarian Religious Parenting Styles and Suicide In Young Adults.** Dana Norris. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Suicide alone is responsible for approximately 800,000 deaths per year ranking in the top three of leading causes of death in the U.S. (Wu, Wang, & Jia, 2015). With exceptionally high rates of religious involvement connecting church attendance and social respectability, authoritarian religious parenting styles are evident (Poole, 2015). Most studies support the notion that religion plays an overall protective role combating suicide. The current research hypothesized that there would be an increase in suicidal tendencies among individuals in religious authoritarian style homes. A secondary analysis was conducted of 5,114 participants from publicly available Wave IV data from the National Longitudinal Study of Adolescent to Adult Health. A Chi-square analysis showed a significantly higher percent (57.15%) of individuals who stated that faith is very or most important and have had no serious thought of committing suicide. This test also revealed that of those who stated they have seriously thought of suicide 52.81% of those individuals stated that faith is of no or little importance, ( $p = .0005$ ,  $X^2 = 12.11$ ). Most of the results of this examination support previous research findings that religion plays an overall protective role in combating suicide. Although there were some trends in the data that suggest future research would be beneficial to determine the significance of these relationships.

**86 The Relationship between Religious Beliefs and Sexuality.** Anna Wheeler. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Religion and sexuality/sexual behaviors are still an extremely controversial issue in today's society. Previous research has shown that the more religious a person is, the more conservative they are with their sexual

behavior and thoughts (Barry, Willoughby, & Clayton, 2015). Gender also seems to be related, since it has been shown that males varied their responses compared to females in sexual attitudes, religiosity, and spirituality, by having more open-minded viewpoints/actions (Luquis, Brelsford, & Rojas-Guyler, 2012). It is hypothesized that the more religious someone reports to be, the more conservative they will be with their sexual thoughts/behaviors. A secondary analysis of the fourth wave of the National Longitudinal Study of Adolescent to Adult Health archival data was conducted. This was a follow up to the previous three waves that originally used a school based clustered sampling design to identify a nationally representative sample. The current sample has 5,114 participants, aged 24 to 33. An ANOVA analysis revealed that the importance of faith and the number of partners a person had sex with just once was significantly associated  $F(1, 1136) = 24.48$   $p < .0001$ . The more important a person's faith was, the less one night stands they participated in. Sex moderated the relationship for what a person's present religion and how old they were the first time they had vaginal intercourse; Males  $F(1, 481) = 2.79$ ,  $p = 0.0242$ ; Females  $F(1, 463) = 2.64$ ,  $p = 0.3675$ . When reviewing the results, the hypothesis was supported. There are still many limitations and possible confounds of this study. Further research should be done to examine other religions, since the main one used here was Christianity.

**87 Association between Mistreatment by an Adult as a Child and Romantic Relationships in Young Adults.** Dacia Mooter. (Ms. Kristin Woods, SWOSU Department of Psychology, Weatherford, OK).

Abuse impacts people in different ways; research has shown that males have greater resilience after childhood abuse (Park, Nolen & Rosen, 2014). Childhood abuse can lead to poor coping skills in adulthood (Berzanski & Yates, 2008). Children base all future relationships off of those observed (Berzanski & Yates, 2008). Past research has shown the divorce rate in those that have been sexually abused is higher (Paradis & Boucher, 2010). A secondary analysis was conducted using data Wave IV of the US National Longitudinal Study of Adolescent to Adult Health. This sample consisted of 46% female and 54% male participants. About half of the participants reported being sexually, physically, or verbally abused at least once before turning 18. Chi-square analysis showed a significant association between verbal abuse and happiness in the relationship  $\chi^2 = 9.71$ , 2 df,  $p < .0078$ , however, sex moderated the relationship. Physical abuse and feelings of closeness in the relationship appeared to be significant  $\chi^2 = 15.16$ , 2 df,  $p < .0005$ , but was moderated by sex, males ( $p = 0.061$ ) and females ( $p = 0.007$ ). This research is not consistent with past research; however, it looked at more everyday relationship issues whereas previous research examined larger aspects such as divorce and further abuse.

**88 Automating Avionics Tests for the Space Launch System.** Thomas Crews. (Mrs. Madeline Baugher, SWOSU Department of Business & Computer Science, Weatherford, OK).

Testing aerospace systems has historically been a lengthy and expensive process of trial and error, in which only the first phases of a mission could be simulated. In the event of a failed test, months of work could be destroyed in the blink of an eye. Some tests have even proven dangerous and can be fatal. With today's monumental advancements in computing power, however, tests can be conducted within the safety and control of a virtual space. Entire mission simulations can be carried out in laboratory environments without ever igniting a rocket. While these simulations are enormously helpful, they generate an equally enormous amount of data. With tight deadlines and project budgets, methods must be developed to make sense of this data quickly and effectively. Using advanced data analysis techniques written in the modern Python programming language, virtually infinite amounts of information can be sorted in real time, aggregating all relevant data and highlighting anomalies. These automated data analysis tools have been incorporated into an extensible framework codenamed MAESTRO (Managed Operation Environment for Simulation, Test, and Real-time Operation). The United States Army has recently adapted MAESTRO for use in the field of satellite missile defense, and the private aerospace industry is applying MAESTRO to its own launch simulations. In the far future, these infinitely scalable tools will even help put a man on Mars.

**89 Game Design Through Unity.** Kamuela Kekoa Ahuna. (Dr. Jeremy Evert, SWOSU Department of Business & Computer Science, Weatherford, OK).

Game design is a powerful tool that offers unique programming situations and teaches the premises of creative problem solving and concept visualization. There are multiple platforms that are available to the aspiring game designer, many of which are free. The specific engine discussed in this research is Unity. Unity is an open-source software that has many assets available to the user to supplement their game where their skills may fall short. Though Unity is exceptionally user-friendly, it can be difficult to learn how to use and master. Our team saw that SWOSU did not offer any classes on this incredibly useful software, so we decided to change this by developing our own curriculum. This class teaches the basics of Unity, from UI to scripting. In this class, we have discussed the fundamentals of game design, participated in creative programming environments, and created games for leisure and competition. Each week, our team hosts anywhere between five and ten students that are interested in learning more about this software and possible career field. The students have

learned C# Programming, team cooperation, source code management, the Unity interface, and how to research problems with scripting, game-object component management, and cross-software asset organization. Our team feels the capability of adapting to a new software and learning how to successfully utilize the resources Unity provides is an important skill to have as an undergraduate researcher. This class allows students to understand more about this particular career field and provides a unique hands-on experience to better understand what it takes to make a game.

**90 Scalability of Computer Algorithms Based on Sizes of Data Sets and Algorithm Complexity.** Jordyn Hartzell and Gunner Powers. (Dr. Jeremy Evert, SWOSU Department of Business & Computer Science,.)

If one is to consider the computational world of today, what are the important aspects of modern computing? The modern technological demands of society rely upon better performance and finding ways to optimize new and existing solutions to our problems. As the world of computing technology progresses, accuracy and efficiency continue to be the pillars upon which our technological world is based. Furthermore, logic is at the core of computer science. While logic is one of the underlying concepts of the discipline, such as with computation, algorithms serve as the backbone for much of the practical applications within computer science.

Computing algorithms take the foundations of logic and apply them to real-world applications. Whether it be scientific research, designing software, security applications, or data manipulation, algorithms provide the logic to run our technological world. Our modern computations require the same efficient and accurate results on problems with larger data sets than ever before. The scale of the questions that computer science can answer will not stagnate; in fact, the scale will continue to evolve. Thusly, one must ensure that the algorithms will provide satisfactory results on any spectrum.

What does the inevitability of data growth imply for algorithm design? One must consider the possibility of behavioral differences of algorithms on different ends of the sample scale. However, this begins to impose fundamental questions about designing algorithms for large data set usage. Does the complexity of the algorithm hinder the scalability? Will a simplified algorithm retain accuracy as the quantity of data increases? How can one optimize an algorithm intended for "big data" to ensure efficiency?

A review of the literature has revealed many interesting problems to examine, as well as possible algorithms that may efficiently produce results for these problems. One problem of particular interest is classification. Our research team plans to examine the problem of classifying individual gamers with the intent of pairing them with others through a gaming social network. Our plan is to examine some of the conventional classifiers such as Linear Models, Neural Networks, Kernel Methods, and Expectation Maximization. These algorithms will be assessed for theoretical and practical fitness to this problem. Following this, the classifiers that would be most suitable with the aforementioned problem will be implemented in future studies.

**91 Creating a Survey for the School of Business with Students in Quantitative Methods in Business Course.** Dr. Holly McKee, SWOSU Department of Business & Computer Science, Weatherford, OK; and Alexandra Young.

SWOSU's Everett Dobson School of Business and Technology has developed a Strategic Plan to guide its faculty and leadership as they move toward a number of goals for the future. The Strategic Plan includes the following goal: "Strategic Goal 1: Advance student learning and impact to society." This goal includes a number of initiatives including: "survey potential employers about possible collaborations and expectations of SWOSU graduates." The researcher will achieve this initiative with the help of her Quantitative Methods in Business students by developing and administering a survey as a service learning project. Students in the course have completed the following research tasks: developing the survey, validating the survey using a Delphi approach, putting the survey into the software program, drafting a list of participants, soliciting feedback from stakeholders, drafting an application to SWOSU's Protection of Human Subjects Committee, and applying for university funding from the Office of Sponsored Programs. The service learning approach includes asking students to complete a reflective journal assignment on their experience as well as a survey administered through SWOSU's Service Learning office. This poster will detail the progress made so far on this project as well as service learning approach used in the classroom.

**92 Get the lead out: Picher, Oklahoma lead contamination.** Jeevan Maharjan and Shristi Maharjan. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

Picher, Oklahoma was one of the most productive mining field in the southern part of states. This site produced more than \$20 billion in ore from 1917 to 1947. More than half of the lead and zinc used in the first world war came from this site. The result of extracting lead from the mine left the chalky piles of chat around the residential areas which were used by the locals to fill the driveways and some even used it to fill the children's

sandbox. However, the residents of the Picher were unknown with the hazardous effect of the lead contamination. By mid 90s, a school counselor learned the link between the contamination of lead with the learning disabilities. Out of all the students who attended school, 46% of students were tested to have unsafe levels of lead in their blood; that is 11 times greater than the state average. The accumulation of lead through slow process leaves permanent effects on human health like mental retardation, behavior disorder, anemia, hypertension, renal impairment, coma and even death.

In 1980, a survey indicated approximately 2,900 acres of land in Ottawa county was covered by chat piles. The problem was first discovered by EPA when the acid waste was discharged from the sites to ground water and through the chat piles and boreholes in 1939. In June 6, 1984, record of decision(ROD) was filed by EPA as Operable Unit Number 1 (OU1). OU1 addressed the on-site surface water impacted by mine discharges and the ground water on the site. In 1996, EPA settled its claims concerning the site with a bankrupt mining company which had the largest operation at the site and issued a Special Notice to the Companies and to DOI which gave the Companies and DOI a chance to come up with a solution to remove the chat piles but instead the company decided to offer help by performing a Community Health Action and Monitoring program (CHAMP). In March 21, 1996 EPA started their own removal action to resolve the lead contaminated site.

The chat piles are now surrounded with barbed wire and government signs warning against trespassing. What's left of the school still sits in the shadow of the giant mounds of chat. The hallways are empty, the windows are broken, and the doors are boarded shut. The power lines are still there, but the homes they connected to no longer exist. Earlier in 2015, more than 1,000 migratory birds were found dead across Picher of suspected zinc poisoning.

- 93 **Fire Water.** Julian Torres and Caleb Yoder. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

Starting in 1868, the Cuyahoga River, located in Cleveland Ohio, began to catch fire. In 1912 the most fatal Cuyahoga fire started and killed five people; however, in 1952 another fire began and proved to be the costliest blaze, causing 1.3 million dollars' worth of damage. The river caught fire nine more times until 1969 when congress finally decided to implement the National Environmental Policy Act (NEPA) in 1970. NEPA then helped establish the Environmental Protection Agency (EPA) who went on to create the Clean Water Act in 1972. The clean water act was created to help make the river livable for aquatic life and make the river safe for public use.

The cause of the pollution and many fires is credited to the industrial factories, including Akron, running alongside the river dumping their waste directly into the water. Toxins such as cadmium, chromium, and lead were found in the river creating a dead zone where no life existed. In 1991 the EPA published a report stating the water quality was improving and aquatic life returning. In 1994 fish eating birds such as Great Blue Heron and Bald Eagles returned Cuyahoga showing enough improvement to sustain enough aquatic life to feed predators which meant the river had come a long way from 1988 when the river was labeled one of the most polluted rivers on the great lakes. In 1998 the White House called the Cuyahoga River an American heritage which in return gave the river priority in federal funding.

In 2002, a 377-million-dollar sewage plan was brought up by Akron to try to prevent sewage and runoff rainwater from entering the river and creating more pollution. In 2008, the Cuyahoga River was deemed fishable by the EPA which shows just how far the city came from 1868 when river dumping was creating many hazards to the public and wildlife.

- 94 **The Black Sea: Deep Water Horizon 2010.** Baylor Watkins and Tucker Sawatzky. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

Unfortunately, oil spills have become more regular in the last 15 years or so. Some have been very small with little to no damage and some have been large and devastating to our environment. One in particular is the Deep Water Horizon Spill of 2010. This is an informational poster on this particular accident. This poster will reflect on things that could have been done differently to avoid a situation like this, as well as consequences British Petroleum faces still today. This poster will cover the environmental effects and the efforts to clean up the aftermath. 3.19 million barrels of oil were released in to the ocean because of this accident, this is the day the Gulf of Mexico could have been called the Black Sea.

- 95 **The Metal Cocktail of Radiation.** Camellio Gonzales and Rachel Pozzi. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

During the settling of the western United States, many people were settling in the Colorado basin to mine for

gold and silver to provide for their families. They would expel mine shafts of water into the Animas River, which the mountains surrounding it contained precious ore. This happened in the early parts of 1873, then by the mid-1920s there were about 1,500 mine claims as it became a popular trade for income. The mines started to dwindle around 1991. In addition to the Animas Rivers supply of metals, a uranium mine was built in the 1960s which expelled 500 tons of toxic metals including: Thorium, Polonium, Radium, Bismuth, Strontium -90, Sulfates, Chlorides, Sodium, Arsenic, and Vanadium. Studies conducted on various chemicals involved representatives of Colorado, New Mexico, the public health service, the uranium company, and all other interested agencies, local and federal. Radium and Strontium-90 were found hazardous due to sediments of metals depositing in bones. In 1959, the Secretary of Health, Education, and Welfare only ordered containment of the Radium and Strontium-90 sediments. Studies in the early 2000s found brook trout in the upper Animas River contaminated with cadmium, copper, lead, zinc, aluminum, and iron. The brook trout findings were a result of acid drainage from abandoned mines. These levels of metals were hazardous to the point that it effected fish internally. Acid drainage was flowing in to the Upper Animas Watershed at hundreds of gallons per minute, until the Gold King mine spill of 2015. Heavy equipment operators were digging around a soil plug alongside Animas River mountains, when suddenly it gave way into the river spewing about 3 million gallons of acid mine drainage into the river. The metals contained in the drainage where iron, aluminum, calcium, magnesium, potassium, lead, manganese, zinc, copper, sodium, barium, arsenic, vanadium, molybdenum, silver, chromium, cobalt, antimony, nickel, mercury, cadmium, beryllium, selenium, and thallium, to name a few; it was a cocktail of metals which flowed out red-orange then turned yellow once it reached the water. The water remained yellow for days, involving the EPA, federal, state and tribal agencies. The EPA set up settling ponds diverting the spill. Agencies alarmed communities affected by the contaminated water levels. The EPA estimates the mines in the U.S.A are \$24 billion in clean up and maintenance, as a result there is less effort to clean up the remaining mines.

- 96 **Pennsylvania Nuclear Island Accident.** Jennifer Martinez and Rachael Lean. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

The accident happened at the Three Mile Island Unit 2 (TMI-2) reactor on March 28, 1979, near Middletown, Pennsylvania. There was a small malfunction in the secondary cooling circuit, causing temperatures to rise in the main coolant tank. This issue caused the reactor to shut down in one second. This was the worst commercial nuclear power plant accident in U.S. history. There were radioactive gases released into the atmosphere. After several days, there was an anti-nuclear movement as a result. Many people remain hopeful and envision a day when there will be a more ecologically-balanced world.

We will talk specifically about why, what happened, and how an accident like this can be avoided in the future. Furthermore, it will also show what impact it had on nuclear energy, movements, and several other things that happened ecologically.

- 97 **What's Love Got to Do With It?** Kooper Marsh and Spencer Eldred. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

William T. Love tried to build canal about six to seven miles long connecting the upper and lower Niagara River for providing cheap power. The economy fell into depression and the financial help started backing out so Love had to abandon the project. At this point it was only sixty feet wide and three thousand feet long. The City of Niagara and the U.S. Army used this site for chemical dumping. Then the land was sold to Hooker Chemical Corporation in 1942 and became their chemical disposal site until 1953. After filling the canal, they lined it with clay and covered it up with dirt and then sold the land to the Niagara Board of Education for one dollar. Through the 50's, 60's, and 70's they started to smell strange odors and notice substances seeping up in their yards. In 1978, after a record rainfall, and explosion occurred. After years of chemicals percolating to the surface and causing birth defects, miscarriages, and multiple other forms of health problems, President Carter had to intervene. Ninety-eight families were evacuated and another forty-six families were found temporary housing. The cleanup of the Love Canal involved removing contaminated soil, installing drainage pipes to capture contaminated groundwater for treatment, and covering it with clay and plastics. It was all funded by Superfund and the cleanup efforts were completely finished in 2004.

- 98 **Behind the Slides: The View Master Factory.** Nelson Navarete and Rafael Villela. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

The stereoscopic slide viewer was produced from 1950 to 2001 and was a very popular toy for children. This toy was produced in The View Master factory of the Mattel Corporation in Beaverton, Oregon. Since the 1950's through the 1970's the factory dumped drums of TCE onsite and began recycling and reducing the use of TCE in the 1980's. TCE or trichloroethylene is a decreasing agent that can cause developmental and neurological

problems and is classified as a carcinogen by the EPA. It was not until 1998 that a chemical analysis found a high concentration of TCE in the on-site water well. This water well supplied all the water needed for both industrial purposes and human consumption. After the discovery of TCE in the water well, all use of the well stopped. This prevented further exposure because no other drinking water wells tapped into the contaminated well, so the TCE contamination was contained. Prior to this discovery, an estimated 13,700 employees that worked in The View Master Factory were exposed to the high concentrations of TCE in the water. This exposure caused various cancers in the former workers and the following generations. The NDI identified over 1,000 deaths related to The View Master Factory contamination from the 1950's to the turn of the century.

Former workers and their next of kin are still being invited to participate in a public health evaluation regarding their exposure. In conclusion, this disaster taught an important lesson about the proper disposal of chemical waste, and the importance of annual health evaluations and chemical analysis of water sources in locations that handle dangerous chemicals.

- 99 Crises on the Prince William Sound.** Rilan Sewell and Todd Walsh. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

On March 24, 1989 an Exxon Valdez tanker was carrying fifty million gallons of crude oil through Prince William Sound. Sometime around midnight the tanker struck a reef spilling what has been estimated to be around eleven million gallons of oil. It was the worst oil spill in America until Deep Water Horizon in 2010.

The state of Alaska sued Exxon because of the spill, and the government fined the corporation for violating the Clean Water Act. Exxon paid an estimated one billion dollars in settlements to the state of Alaska and the federal government. They also paid around three hundred million dollars to private parties. A lawsuit against the company was also filed by the native people of Alaska resulting in a five billion dollar reward. In 2008 the Supreme Court changed this amount to five hundred and seven million dollars. In 2014 the National Oceanic and Atmospheric Administration reported that most of the affected species had recovered over the twenty five years, but the site had not fully recovered.

- 100 What's in your water: Hinkley groundwater remediation.** Ryan Boecker and Jacob Brooks. (Ms. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

This is something that many people from Hinkley California had to think about. Hinkley is a town in the Mojave Desert in southern California. Hinkley is a small town that had a big disaster to their water. The company PG&E is a natural gas compression company. At each recompression station the compressor were being cooled with large tanks that held a known carcinogen chromium-6. The used carcinogen was then dumped into an unlined pond that let leached into the groundwater and contaminated the towns drinking water supply. More than fifty years later there is still ongoing clean up.

- 101 Lead in the Water, Corruption in the Air.** Salman Al Salman and Ali Alkuabi. (Mrs. Cindi Albrightson, SWOSU Department of Engineering Technology, Weatherford, OK).

The citizens of Flint, Michigan, especially the youngest of them, who inadvertently ingested lead from the water supply. Children absorb more lead into bodies through their underdeveloped intestines. Lead settles in the bones of children and causes both short-and long-term physical and mental problems. Those in charge of the water supply knew of the problem and did nothing for several months. The lead in the Flint water that leached in from the water lines caused the lead levels in excess of what is considered healthy in the blood of the children of Flint. Children had been exposed for several months before anyone tested for lead. The lead problems for Flint began in April of 2014 when the city switched water supply source from Lake Huron to the Flint River as a cost-saving measure. The EPA regulations that require corrosion control for lead and copper were also discontinued. On several different occasions, residents were warned to boil their water because of bacterial contamination because the corrosion made the water more susceptible to bacteria also. In 2014, children from Flint began to test positive for lead exposure in the areas that can cause damage. Flint, Michigan is no stranger to problems. Poverty is high in Flint. Inner cities often contain a great deal of what Mark Laidlaw, Gabriel Filippelli, Richard Sadler, et al. of the International Journal of Environmental Research and Public Health call legacy lead because the infrastructure is old and in need of repair (2). Children who are diagnosed with lead exposure usually live in inner cities. Legacy sources of lead contamination which include leaded gasoline, lead-based paint, lead leached from water pipes and industrial sources of lead were regulated in the late twentieth century. Most of these sources do not affect consumers, at least those who do not live in inner cities where little renovation has taken place in recent decades.

- 102 Glow From Beginnings.** Dr. Sherri Brogdon, SWOSU Department of Education, Weatherford, OK; Dr. Tracy Henry, SWOSU Department of Education, Weatherford, OK; Paige Ward, Dayana Mack, Cassie Smith, and

Abbie Chadd.

The Glow Prom is a prom dedicated to teenagers and adults with special needs. Student Council for Exceptional Children and Kappa Delta Pi, both organizations in the Education Department sponsored the first annual prom in March 2017. We then presented the information about getting the prom started at the Kappa Delta Pi Convocation in Pittsburgh, PA in October 2017. We recently finished the second Glow Prom with three times the schools attending. The attendees received a Glow Prom t-shirt and were treated to an evening of fun, food, and dancing. We also have special guests representing SWOSU and the community to help with the event. The volleyball team, Zeta Phi, the Bulldog mascot, the Fire Clowns, and the Highway Patrol were all there to make it a very special occasion.

- 103 Communication about Plagiarism Reports: Do Instructor-Led Discussions Increase Student Efficacy and Perceived Higher Instructor Immediacy?** Dr. Elaine Davies, SWOSU Department of Art, Communication, & Theatre, Weatherford, OK).

A recent report by Inside Higher Education outlines several issues with plagiarism detection software that may contribute to adversarial relationships between teachers and students (Straumshein, 2015). This current study uses a quasi-experimental design to examine if instructor-led discussions about how to interpret the plagiarism reports leads to higher levels of student efficacy in the detection of three types of plagiarism and increased perceived instructor immediacy. The results supported the predictions. Students given direct instruction prior to submission of papers to a detection website were better able to recognize the three types of plagiarism. Instruction also increased positive affect towards the instructor.

- 104 Verona: The city of love.** Rem lang, Malaka Aleid, Sahirah Alhashim, Rahaf AL-Johani, Sarah Alsalat, and Shamas Alnaser. (Dr. Tugba Sevin, SWOSU Department of Language & Literature, Weatherford, OK).

Verona is a beautiful city located in northeast Italy. This city is very famous for being a setting of Shakespeare's "Romeo and Juliet". In our poster presentation we will highlight interesting facts about this Italian city, show how this city became the scene of many famous works of Shakespeare and we will also point out important cultural events happening in Verona every year.

- 105 Beautiful Italy: Milano & Rome.** Hussain Al eid, Ahmed Alamer, Hassan Almajid, Hussain Alshahaf, Jafar Abuhussein, Abdullah Alamro, and Ziyad Alsaqabi. (Dr. Tugba Sevin, SWOSU Department of Language & Literature, Weatherford, OK).

We will be presenting the interesting places in the beautiful cities of Roma and Milano of Italy. If you're thinking to have a trip to Italy this is the best source to get all the general information that you need to know about those two beautiful cities.

Firstly, Milan city, capital of Milano located in northern Italy. It is the leading financial center and the most prosperous manufacturing and commercial city of Italy. Armani, Prada, Dolce & Gabbana are all worldwide known brands originated in Milan thus considered one of the fashion capital of the world. In addition, Bruno Munari, Giò Ponti, Ettore Sottsass and Gae Aulenti were milanese designers and architects who contributed to making Milan a world-famous hotspot for Design and Architecture. Milan now famous for the engineering and architecture university, has a strong international fame and recognition. Lastly, what every visitor like to indulge in is the food. Milan like every city in Italy has its own traditional dishes: Risotto alla Milanese, Cotoletta alla Milanese, Panettone and Cassoeula are some of them.

Rome world's most photogenic city it is famous for its architectural monuments, history, art, culture, and nature. Recreation opportunities are plentiful with the Mohawk River Trail connecting Rome's waterfront, historical sites, commercial districts, local schools, parks. the Colosseum is still the world's largest amphitheater, The Vatican, the Trevi Fountain, St Peter's Square, Spanish Steps are some of the most visited places around Rome. Finally, the best for last which is the food. Roman cuisine is flavored by lard and olive oil, perfumed by sage, rosemary, cinnamon, marjoram, and mint. Its flora is the artichoke, the pea, the puntarelle, the fava bean, and the chickpea. Its fauna are the pig, the lamb, and the cod. Traditional dishes are Bucatini all'amatriciana, Spaghetti alla carbonara, and Spaghetti cacio e pepe. These dishes are the most common but not all traditional food in Rome.

- 106 Sicily: The toe of Italy.** Tray Shortie, Kenneth Mendez, Kathryn McDowell, Eric Castillo-nava, Yesenia Casas, and Johnny Wong. (Dr. Tugba Sevin, SWOSU Department of Language & Literature, Weatherford, OK).

Our group has chosen to research Sicily and learn about its culture, religion, and cuisine aspects for our presentation. In their culture music plays a dominant role in everyday life. Sicilians often listen to operas late

into the night. A vibrant selection of pastas, fish, deserts, meats, and vegetables, keep Sicilians healthy. A friendly culture, warm climate, and beaches attract tourists across the world to Sicily every year. The Catholic churches instill religious beliefs and an importance sense of family and love. Even though Sicily is only an island in Italy, it offers its very own rich culture background welcoming to all.

- 107 The Water City- Venice.** Katee Reed, Hadley Ogden, Justin Westfahl, Alyssa Henry, Carolena Oniwa, and Micheal O'Hara. (Dr. Tugba Sevin, SWOSU Department of Language & Literature, Weatherford, OK).

Our group would to to present the topic of Venice for our presentation. In our presentation we discuss aspects of Venice in five categories consisting of the history, the architecture, the food, the festivals, the music, and the canals.

- 108 Marvelous Monster Maker.** Olivia Butler, Brianna Sutton, and Sierra Swanda. (Dr. Kelley Logan, SWOSU Department of Language & Literature, Weatherford, OK; and Dr. Siripom Peters, SWOSU Department of Art, Communication, & Theatre, Weatherford, OK).

This is a three-part project which engaged a first-grade classroom in our community and challenged their creativity, individuality, and originality by having them create their own character for a story. When we asked the kids to draw these monsters we wanted them to give their drawings a personality in order to bring their characters to life. We then took their creations and molded stories around their characters. In addition, we paired with the art students who brought the characters into existence with different art material. At the conclusion of our project we returned to the classroom and gave the students their monsters and stories. Being English majors, we know the importance of using creative prompts to inspire writing. We accomplished this by collaborating with the kids on their monsters. The monsters were tools for us to creatively use our writing experiences.

- 109 Artificial Intelligence (AI): Boon or Bane?** Fnu CheGilbert. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

How worried are you about Artificial Intelligence (AI)? In his poster presentation, CheGilbert, Fnu of Cameroon will unpack what AI is already doing today and how rapidly it is evolving in areas such as perception and cognition. Though many believe that technology has its advantages and disadvantages, the presenter will share research evidence with regard to how far and in what ways AI will affect us humans in the near future.

- 110 Computer Aided-Surgery.** Oscar D. Cuellar. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Surgery is risky and often leaves patients with "sequelae". Based on his research findings, Oscar D. Cuellar from Colombia will address how computer aided-surgery is making a difference in patients' lives, how it is improving the chances of successful surgeries as well as speedy recoveries, and most of all, how it is reducing the effects of possible "sequelae".

- 111 Cyber Security.** Precious Adeshina. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

In this research, the presenter will address the importance of cyber security in our lives today as well as the problems associated with maintaining it.

- 112 Homelessness: Why Is It Happening and How Can We Help?** Mohammed Alnajrani. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK)..

The presenter, Mohammed Alnajrani of Saudi Arabia, has lived in beautiful San Francisco. As an international student, he always wondered why there were so many homeless people in an area where there is so much wealth. Hence, the presenter will address the lifestyle of the homeless people based on his personal observation as well as his research findings. The presenter also hopes to have a dialogue with his audience members as to how homelessness in San Francisco (an around the world) can be eradicated.

- 113 How Cultural Differences Can Be a Barrier in International Business Transactions?** Ahmed Albaqshi. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK)..
- Because we live in a globalized world today, business opportunities between countries are on the rise. However, business people tend to miss out or even lose out on major business deals with their counterparts from other countries simply due to unfamiliar cultural norms. The presenter, Ahmed Albaqshi from Saudi Arabia, believes that when cultural differences are learned, they can open up a win-win, lucrative opportunities in the business world for all parties. The presenter will also address and share with his audience members evidence-based information on language barriers, customs, target audiences, just to name a few.
- 114 Kids Addiction to Technology: Is It a Problem?** Ruth Akunna Egbom. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).
- The use of technology among adolescents and young teens today has increased at an alarming rate, and this has impacted them both negatively as well as positively. Do you think the negative outweighs the positive? Ruth Akunna Egbom from Nigeria will address several burning questions for her audience members including why technology addiction has become a real life problem, and what are some of the problems it has created.
- 115 The Blue Zones: Why People "Forget" to Die?** Abdullah Alzunaidi. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).
- Based on his curiosity about healthy living, Alzunaidi Abdullah Alzunaidi stumbled upon "The Blue Zones" during his one of his reading projects in his COMP 1 class and has been fascinated with them ever since. In his poster presentation, the presenter will point out to his audience members what "The Blue Zones" are all about, where they are located, and how the people there live a long healthy life.
- 116 Colony Collapse Disorder (CCD): Why It's Happening, What Are the Consequences, and What Can Be Done To Put a Stop to the Declining Bee Population.** Gege Yang. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).
- Gege Yang from China is passionate about bees. She strongly believes that bees matter. Hence, based on her research findings, the presenter, who is increasingly concerned about the "devastating effects of their dwindling numbers," will address what are the causes and effects of the global CCD crisis, how will it affect us humans, and what can be done to stop the rapid bee decline.
- 117 Traditional Middle Eastern & Chinese Medicine That Works.** Maryam Alkhaibari. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).
- Maryam Alkhaibari from Saudi Arabia has always been fascinated with the modern yet traditional treatment plans that have been used for centuries in the Middle East and China. In her poster presentation, Maryam will share her personal experiences and knowledge of "cupping/vacuum" methods that are used to treat certain ailments and diseases to her audience members.
- 118 Are Electronic-Cigarettes Safe?** Hamzah Jamil. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).
- In his poster presentation, Hamzah Jamil from Pakistan will discuss about the controversial electronic-cigarettes that come with many nicknames. Hoping to pique the interest of his audience members, the presenter will share his research findings on the health risks and side effects of e-cigarettes.
- 119 Ondol.** Jieun Park and Hyekyeong Se. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Jieun Park and Hyekyeong Seo from South Korea will proudly share their interesting research findings about "ondol." The presenters will explain to their audience members why the Pyecheong Olympics athletes from other countries were intrigued by the ondol heating system. The presenters plan to reveal startling facts to audience members about the innovative, distinctive way to not only heat the air but also the floor.

- 120 Earthquake.** Wu Juo-chun. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Juo-chun, Wu from Taiwan believes that one way of reaching out to the victims of earthquakes in her home country is by taking into consideration counseling strategies. In her poster presentation, the presenter will address how certain effective grief counseling strategies can be used to help disaster survivors return to their 'pre-disaster' level of functioning.

- 121 We're Talking Food Scarcity.** Arpana James and Shannon Marcar. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Arpana James and Shannon Marcar from India strongly feel that "in the present world, resources are depleting and man is solely responsible for it." In their poster presentation, the presenters will share their interesting research findings on how much food is being wasted every day simply due to cosmetic quality and standards. The presenters hope to reframe the idea of one man's trash could, after all, be another man's breakfast, lunch, and dinner.

- 122 Living With Solitary Kidney: Can People Still Lead Normal, Healthy Lives?** Smeyder Silvera. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Most people have two kidneys. But what would it be like to be missing a kidney? This was the thought-provoking question Smeyder Silvera of Paraguay asked herself after a mishap a couple of years ago. Apart from sharing her personal experience, the presenter will share her fascinating research findings on the causes why a person may be forced to live with a solitary kidney.

- 123 Fast Fashion: How the Choices We Are Making are Creating a Chain of Problems All Over the World?** Yun-hsuan Liao. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

"Are you a fast fashion addict?" asks Liao, Yun-hsuan. This presenter from Taiwan opines that fast fashion is not "a" problem, but it is actually "a chain of problems." The presenter will share her incredible research findings with her audience members about what is "fast fashion", what this "dirty" industry of fast fashion is causing globally, and how to begin the "recovery process" and be a smart and ethical consumer.

- 124 Nothing to Sneeze At: Why Holding a Sneeze Can Be Dangerous?** Abdulaala Al Muhsan. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

There are times when "stiffing a sneeze may seem appropriate," like when you're in a crowded elevator or when meeting the queen. But a recent case study suggests that you should probably just let it rip wherever you are (just please, still cover your mouth). The presenter, Abdulaala Al Muhsan from Saudi Arabia hopes to share his interesting research findings with his audience members.

- 125 Night Markets.** Yi-ling Chiao. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

Mention Taiwan, and the first thing that comes to people's minds are the popular bustling night markets. These night markets offer local treasures: Affordable, mouthwatering snacks, trendy clothes, and a fun place to hang out with friends and family. But according to Chiao, Yi-ling from Taiwan, these night markets also draw crowds

that pack the market and leave trash everywhere. Because Taiwanese Night Markets are a big part of her Taiwanese culture and a tourists' haven, the presenter will address several effective ways that will help fix the trash issues in these night markets.

- 126 Fish Skin Grafts: How Tilapia Skin Treats Burns and Speeds Healing?** Sahar Alharbi and Shamaa Hazazi. (Ms. Thanges Maia Kesnan, SWOSU Department of Language & Literature, Weatherford, OK; Mr. Fred Alsberg, SWOSU Department of Language & Literature, Weatherford, OK; and Ms. Taylor Verkler, SWOSU Language & Literature, Weatherford, OK).

In their poster presentation, Sahar Alharbi and Shamaa Hazazi from Saudi Arabia will share with the audience this groundbreaking discovery of how sterilized tilapia skin is being used in certain hospitals to successfully treat second and third degree burns on humans and animals. The presenters will also address startling information on how tilapia skin speeds the healing process compared to the conventional treatment methods.

**127 - 128**

**World-building: The Foundation of Fantastic Literature.** Tyler Burch, Kristi Celestine, Melissa Hightower, Abigail Carter, Laura Howe, Cable Jacobsen, Graham Kerley, Connor Kirk, Katee Reed, Bradley Rowson, Trenton Thomas, Bailey Thomas, and Jerah Wellborn. (Dr. Victoria Gaydosik, SWOSU Department of Language and Literature, Weatherford, OK).

The literature of fantasy originates in ancient mythologies until it morphs into the little-respected sub-genre of children's literature in the nineteenth century in the many volumes of fairy tales published then. Fantasy remained below the radar of serious critics until the works of J. R. R. Tolkien appeared in the mid-twentieth century, especially his epic novel *The Lord of the Rings*. That novel revolutionized fantasy, especially in the detailed universe of Middle Earth that Tolkien created as a backdrop to the many sentient creatures that populate the story. Slowly, the wider popular genre of speculative fiction, including science fiction, fantasy, and horror, has begun to win attention from artists and critics.

Subsequent fantasy writers such as C. S. Lewis, creator of the Narnia universe and the seven books set there, *The Chronicles of Narnia*, and Ursula K. Le Guin, who created the Earthsea universe and set five books in it, followed Tolkien's model in using world-building to develop extended, detailed, and highly realistic settings in which fantastic stories could unfold. Many other artists have also used this model to drive the burgeoning publishing phenomenon of contemporary fantasy fiction.

Under the instruction of Dr. Victoria Gaydosik, students enrolled in LIT 4013 *The Novel: Tolkien and Fantasy* were assigned to engage in world-building to create a short sketch out of their own imaginings in which they will demonstrate the features of a possible fantasy world that could possibly grow into a fictional tale. The assignment requires both a short descriptive essay and a map showing the features of the imagined fantasy world.

## Interactive Displays

*The following interactive displays are found on the main Lobby Level on the West end of the PCEC, toward the 7<sup>th</sup> Street entrance.*

- 129 The Story of the Great Plains: Washita Attack.** Dr. Siriporn Peters, SWOSU Department of Art, Communication, & Theatre, Weatherford, OK; and Connor Albrightson).

The Story of the Great Plains is part of the collaborative design project to support the Washita Battlefield National Historic Site under the National Park Service to commemorate the 150th anniversary of the Attack at the Washita River. The research was funded by the National Endowment for the Arts and Southwestern Oklahoma State University, Oklahoma. The objective of this project is to disseminate knowledge about the Washita Attack in 1868. The research methods and methodology were Mixed Methods Research. The participatory design was employed as the design approach. The representatives of Washita Battlefield National Historic Site, the National Park Service and Southern Cheyenne people who are the descendants of the Washita's survivors also took part in this research. The renown Southern Cheyenne artist, George Levi use ledger art, a traditional Native American art form, to create drawings interpreting the battle. The ledger drawings will be transformed into tactile graphics with braille, motion graphics, and audio so they can be enjoyed by visually impaired people. A catalogue for the exhibit also will be created. The exhibition will take place at the Washita Visitor Center in November 2018. The research procedures consist of four phases. The first phase focuses on data collection and analysis. The second phase emphasizes on creating ledger art and other visual communication for interpretation and exhibition. The third phase is implementation and evaluation. The fourth phase is refinement and dissemination the design research outcomes.

- 130 Interactive Design for Accessibility.** Dr. Siriporn Peters, SWOSU Department of Art, Communication, & Theatre, Weatherford, OK; Mr. Frederic Murray, Instructional Services Librarian, SWOSU Libraries, Weatherford, OK; Mr. Kevin Mohr, Washita Battlefield National Historic Site, National Park Service; and Dr. Henrietta Mann, The Cheyenne and Arapaho Tribal College.

The interactive design for accessibility is a collaborative design project between Southwestern Oklahoma State University and Washita Battlefield National Historic Site (WBNHS) in Cheyenne, Oklahoma. The objectives were to generate knowledge from the design community and appropriate solutions to the stakeholders. The main goals were to create appropriate design solutions of making knowledge visual and accessible for the young visitors and visitors of the WBNHS who have visual impairments.

This project was guided by key research questions as follows.

- 1) What are the most effective design approaches and strategies for designing the interactive design for accessibility?
- 2) What are the roles and contribution of graphic design and designers as design researchers in the collaborative design project?
- 3) How can graphic designers evaluate the effectiveness of the collaborative design project?

The research methodology was a qualitative research. The research methods for data collections were interviews, observations, group discussions, and documents.

The Universal Design (UD) and User Experience (UX) were employed as design approaches and strategies. The Chief of Interpretation (Kevin Mohr) at WBNHS was part of the research team and a stakeholder. The research procedures consisted of four phases. The first phase was data collection for interpretation and audio script. Dr. Henrietta Mann, Assistant Professor Frederic Murray, and Dr. Peters were the key researchers. The second phase focused creating design elements for the interactive design such as digital illustration and audio that meets the needs of the stakeholders and production requirements. The third phase was evaluations and refinements. The fourth phase was implementation and evaluation. The research outcomes reveal that UD and UX are the most effective design approaches and strategies. The key roles and contributions of graphic designers are as facilitators, digital media producers and visual communicators that make knowledge visible and easy to access. The effectiveness of this project was evaluated by the stakeholder and visitors of the WBNHS. In 2017, the WBNHS was selected as the recipient of the National Park Service National Interpretive Design Accessibility Achievement Award.

## Podium Presentations

*The following oral presentations will begin at 1:00 in the SkyView room.*

*The SkyView Room is on the top floor – the entrance is located on the West end of the PCEC via stairs and an elevator found to the right of the Interactive Displays and doors leading to the food trucks.*

*Please do not enter the presentation room if the door is closed and a presentation has already started.*

- 131 My Fantasy World: Mundo.** Katee Reed. (Dr. Victoria Gaydosik, SWOSU Department of Language & Literature, Weatherford, OK).

*Start time: 1:00 pm*

My presentation will be over the fantasy world I am to create for my fantasy class. I will talk about the geography of the world, the culture, the religion, and the government of the world.

- 132 Black Widowers: Love, Death, and Gender in Robert Browning's Poetry.** Conner Kirk. (Dr. Amanda Smith, SWOSU Department of Language and Literature, Weatherford, OK).

*Start time: 1:20 pm*

The paper that I am submitting for podium presentation is a comparative, in-depth analysis of the poems, "Porphyria's Lover" and "My Last Duchess," by Robert Browning. It includes a breakdown of the roles and treatment of women by the men in the Victorian era. In these poems, the female figures have their lives taken from them and their spirits crushed as they are forced into the sphere of domesticity by their lover and husband, respectively. I not only delve into the specificity of Browning's word choice throughout both poems but also the motivation to kill, the act of killing, and the treatment of the women after they are murdered. Additionally, I address whether these texts signal proto-feminism within the Victorian era.

- 133 Flux as a Constant in "The Lazy Crow".** Nathaniel Murray. (Dr. Kevin Collins, SWOSU Department of Language and Literature, Weatherford, OK).

*Start time: 1:40 pm*

Often times an author can provide readers with ideas that are a reflection of the times the author has lived in. In William Gilmore Simms's story, "The Lazy Crow," the author provides certain contrasts in the relationship of two of its characters, Mr. Carrington and his slave Scipio, such as showing leniency and appeasement in one moment and then impatience and taunting in the next. This may have caused certain readers of Simms's time to view Carrington as an accommodating and indulgent figure while others may have viewed him as a symbol for the vile institution of slavery. In addition, this flux in their relationship might have caused a different interpretation for contemporary 21st century readers based on their context.

Aside from the relationship between Mr. Carrington and Scipio, my paper examines "The Lazy Crow" in a way that sheds some light on how a contemporary reader might view certain subjects in the story such as the symbolism in the crow itself, the importance of symbolism in the interactions among Mr. Carrington, Gullah Sam, and Scipio in relation to slavery, how traditional African religions had an effect on both the oppressed and the oppressors during the course of the narrative, and the polemical pro-slavery argument that underlies the story.

- 134 Accurate Representation in "The Lazy Crow".** Sam Frans. (Dr. Kevin Collins, SWOSU Department of Language and Literature, Weatherford, OK).

*Start time: 2:00 pm*

William Gilmore Simms is regarded by some as an individual that worked to perpetuate a system that subjected a race of individuals to persecution based on a perspective steeped in bias and dehumanization. However, this interpretation of the Southern author lacks a contextual basis that would demonstrate the complexity of his work as well as the thoughtfulness in which he approached it. In his story "The Lazy Crow," Simms accurately depicts the multifaceted nature of African American culture that had previously been simply caricatured. His commendable effort to encapsulate the culture also allowed him to play an integral role in the preservation of the Gullah dialect and a component of history that potentially could have been lost.

The purpose of my paper is to highlight the contradiction that Simms himself was. He was a slaveowner, but also, as a crucial player in the authentic characterization of slave culture, he humanized the people. Simms's work established a precedent in respect to the unbiased representation of a subject regardless of what that subject may be, or what the authors preconceived notions of it are.

- 135 Romanticizing Slavery in Simms's "The Lazy Crow".** M. Alexia Pinon. (Dr. Kevin Collins, SWOSU

Throughout his career, William Gilmore Simms was an advocate and spokesperson for the South and in his stories, he integrated into them the idea that slavery was a beneficial institution for both slaves and their masters. One of the stories that advocates most strongly for slavery is "The Lazy Crow."

The purpose of this paper is to discuss Simms's role in romanticizing slavery in American literature when faced with abolitionist movement that threaten the economic life of the South. It also discusses conservatism in the South and how it became a factor when anti-slavery movements began to arise as well as the concept of paternalism and how Simms used it to have an emotional impact in his readers.

## Powerpoint Presentations

The following oral presentations will begin at 1:00 in the **Film room (121)**.

The Film Room is on the same level as the Arena floor – the entrance is located on the East end of the PCEC by taking the ramp out of the Arena and turning left down the hallway.

Please do not enter the room if the door is closed and a presentation has already started.

- 136 Investigating the effects of varying surface conditions on phytopathogens.** Jay Garber. (Dr. Regina McGrane, SWOSU Department of Biological Sciences, Weatherford, OK).  
Start time: 1:00 pm

The ability of pathogens to respond to environmental variation is instrumental for survival. Failure to respond to a stress may result in the death of the pathogen. Adaptation to the local environment often takes place via a change in the pathogen's transcriptome. These changes in gene expression result in phenotypic variation. Increased understanding of how transcriptional changes occur provide potential means for pathogen control. Motility is an important pathogenicity factor for the phytopathogen *Pseudomonas syringae*. In the laboratory setting *P. syringae* exhibits three distinct motility behaviors, but the mechanisms regulating these behaviors in the phyllosphere is unknown. We hypothesized that *P. syringae* responds to changes in surface tension to modulate motility behaviors. In this study we evaluated two flagella stators and two flagella glycosyltransferases. These genes were chosen because we expected their expression to vary in response to surface conditions. The flagella stators MotAB and MotCD generate the power necessary for flagella rotation. Previous studies suggest MotAB functions as a low torque stator while MotCD functions as a high torque stator. Flagella glycosyltransferase stabilizes the flagella in high friction environments and prevents breakage. To identify the surface signals which modulate surface behaviors, expression of motility factors was evaluated in conditions that simulate mechanical stress, disruptions in flagella rotation, and acute osmotic stress. These conditions were simulated using varying agar, ficoll, and salt concentrations, respectively. To investigate the potential of the flagella itself as a sensor for varying surface conditions, both the wild type and a mutant strain of *P. syringae* lacking the gene encoding flagellin were evaluated. Our results indicate that expression of the flagella stators and glycosyltransferase are altered in response to mechanical stress and disruptions in flagella rotation and that the flagella serves as a surface sensor. Studies are underway to determine the impact of osmotic stress. Increased understanding of the mechanisms of transcriptional changes that increase adaptation to host tissue provide potential means for pathogen control.

- 137 Complementary foraging preferences in the aquatic hemipterans *Belostoma flumineum* and *Ranatra fusca*: a tale of coexistence.** Allison Statton. (Dr. Rickey Cothran, SWOSU Department of Biological Sciences, Weatherford, OK).  
Start time: 1:20 pm

*Belostoma flumineum* and *Ranatra fusca* are two predatory hemipterans commonly found in the littoral zones of aquatic environments. Both utilize the same foraging mode (catching prey with their forelegs and piercing them with a beak), which could lead to competition. A shift in resource utilization through species-specific prey preferences may lessen competition and allow for species coexistence. We hypothesized that differences in beak length and foreleg shape would influence foraging preferences because of variability in the shape and size of prey. We tested for differences in foraging preferences by setting up arenas containing two predators of the same species and seven each of three prey species (amphipods, snails, and damselfly naiads) with Elodea to provide structural complexity. Each trial ran until approximately 60% of the prey was consumed. *B. flumineum* preferred snails and avoided damselflies. *R. fusca* preferred amphipods and strongly avoided snails. Results suggest that *B. flumineum* and *R. fusca* primarily feed on different prey items, which may contribute to their long-term coexistence.

- 138** **Prevalence of Food Insecurity among Undergraduate Students in Western Oklahoma.** Holly Davis, Marshall Wallace, Haley Zellner, Kathryn Rodgers, Hannah Madison, and Taylor Lewis. (Dr. Anne Pate, SWOSU School of Nursing and Allied Health Sciences, Weatherford, OK).

*Start time: 1:40 pm*

Food insecurity is defined in a 2015 report by the United States (U.S.) Department of Agriculture as a household having limited access to adequate food due to a lack of money or other resources. Oklahoma has seen a 1.6% rise in the percentage of food insecurity from 14.6% in 2003-2005 to the current 15.5% level in the most recent report. Recent research focusing on college students has found even higher levels of food insecurity in this sub-population. The goal of this study was to assess the prevalence of food insecurity among undergraduate students at a regional university in western Oklahoma. The researchers used a cross-sectional epidemiologic research design to assess food security status and other associated variables among Southwestern Oklahoma State University (SWOSU) students on the Weatherford, OK campus. The researchers developed a survey that included questions on demographics, general health and finance, academics, and ten standardized questions from the U.S. Household Food Security Survey Module (HFSSM) to assess food insecurity. Twenty-four fall classes were chosen randomly, 16 were administered the survey. A total of 334 completed surveys were obtained. Preliminary results suggest that approximately 50.6% of SWOSU students experience some level of food insecurity, with 23.4% experiencing low to very low food security. The results will be finalized and presented within the context of other academic and sociodemographic risk factors.

- 139** **Identification Through Navel Bacteria.** Jasmine Meyer. (Mr. Shane Brashears, SWOSU Department of Education, Weatherford).

*Start time: 2:00 pm*

Studies have shown navels could contain personal identification by the amount and different bacteria found in the navel. This means that the creation of an identification database by swabbing navels could be possible. The purpose of this experiment is to identify people by identifying the different bacteria growing in the navels. If we can match the bacteria growing in the navel of each individual person, then we can determine individual identifications due to a person's bacterial growth in the navel. The researcher will swab hands for the control group. By growing the bacteria we will use morphology to identify the bacteria.

- 140** **World-building: The Foundation of Fantastic Literature.** Tyler Burch, Kristi Celestine, Melissa Hightower, Abigail Carter, Laura Howe, Cable Jacobsen, Graham Kerley, Connor Kirk, Katee Reed, Bradley Rowson, Trenton Thomas, Bailey Thomas, and Jerah Wellborn. (Dr. Victoria Gaydosik, SWOSU Department of Language and Literature, Weatherford, OK).

*Start time: 2:20 pm*

The literature of fantasy originates in ancient mythologies until it morphs into the little-respected sub-genre of children's literature in the nineteenth century in the many volumes of fairy tales published then. Fantasy remained below the radar of serious critics until the works of J. R. R. Tolkien appeared in the mid-twentieth century, especially his epic novel *“The Lord of the Rings”*. That novel revolutionized fantasy, especially in the detailed universe of Middle Earth that Tolkien created as a backdrop to the many sentient creatures that populate the story. Slowly, the wider popular genre of speculative fiction, including science fiction, fantasy, and horror, has begun to win attention from artists and critics.

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## Index of Students and Faculty

<b>Student / Faculty*</b>	<b>Presentation #</b>
Abuhussein, Jafar .....	105
Adeshina, Precious.....	111
Agyemang, Stephanie .....	47
Ahuna, Kamuela Kekoa.....	89
Alamro, Abdullah .....	105
Albaqshi, Ahmed .....	113
Albrightson, Mrs. Cindi* .....	92, 93, 94, 95, 96, 97, 98, 99, 100, 101
Albrightson, Connor.....	129
Almajid, Hassan .....	105
Alamer, Ahmed .....	105
Al eid, Hussain.....	105
Aleid, Malaka .....	104
Alharbi, Sahar .....	126
Alhashim, Sahirah .....	104
AL-Johani, Rahaf.....	104
Alkuabiy, Ali .....	101
Allbritton, Elisabeth M. A. ....	31
Alkhaibari, Maryam.....	117
Al Muhsan, Abdulaala.....	124
Alnajrani, Mohammed.....	112
Alnaser, Shamas .....	104
Alsahaf, Hussain.....	105
Alsalat, Sarah .....	104
Al Salman, Salman.....	101
Alsaqabi, Ziyad .....	105
Alsberg, Mr. Fred* .....	109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126
Al-Sunni, Mustafa .....	53
Alvarado, Olivia .....	48
Alzunaidi, Abdullah .....	115
Anderson, Denise .....	35, 36
Appeddu, Dr. Lisa* .....	50
Aracena, Dr. Jimena* .....	13
Baker, Larry .....	66
Bannon, Michelle .....	51
Barrios, Roberto .....	48
Baughner, Mrs. Madeline* .....	88
Bell, Mrs. Juli* .....	43, 44, 45, 46, 47, 48
Benson, Morgandy .....	46
Boecker, Ryan .....	100
Bowes, Brooke .....	46

Branscum, Olivia .....	74
Brashears, Mr. Shane* .....	1, 2, 3, 4, 5, 6, 7, 8, 139
Briggs, Bron .....	58
Brogdon, Dr. Sherni* .....	102
Brooks, Jacob .....	100
Brooks, Dr. Krista* .....	49
Brown, Dr. Dan* .....	64, 65, 66, 67, 68, 69, 70, 71
Brown, Tyler.....	44
Bruce, Dr. Becky* .....	72, 73, 74, 75, 76
Bryant, Jordan .....	61
Buehler, Stephanie.....	14, 37
Bullard, Claire .....	51
Burch, Tyler .....	127, 128, 140
Burgess, Emily.....	75, 76, 77, 78, 79, 80
Burgess, Dr. Melinda*.....	81
Burgess, Dr. Stephen*.....	77, 78, 79, 80
Butler, Olivia .....	108
Cano, Brittany.....	65
Carriaga, Velma.....	70
Carroll, Kylee .....	11
Carter, Abigail.....	127, 128, 140
Casas, Yesenia .....	106
Cassidy, Alexandra.....	78, 79
Castellanos, David.....	15, 16
Castillo-nava, Eric.....	106
Castle, Dr. Lisa* .....	14, 15
Celestine, Kristi.....	127, 128, 140
Chadd, Abbie .....	102
Chang, Dr. Jieun* .....	58, 59, 60, 61, 62, 63
CheGilbert, Fnu .....	109
Chiao, Yi-ling .....	125
Cinnamon, Cameron .....	40
Click, Hattie.....	84
Collins, Dr. Kevin* .....	133, 134, 135
Cook, Mariah .....	35, 36
Cothran, Dr. Rickey* .....	16, 17, 18, 137
Cornell, Aaron.....	68, 69, 77, 78, 79, 80, 81
Coster, Mercedes .....	51
Crews, Thomas .....	88
Crispin, Garet.....	29, 39
Cuellar, Oscar D. ....	110
Curless, Courtney.....	13
Davies, Dr. Elaine* .....	103
Davis, Holly.....	42, 138
Dyson, Tiffany.....	46
Earl, Kazik .....	3

Eaves, Taylor.....	47
Edwards, Hannah.....	44
Edwards, Dr. Jared*.....	50
Egbom, Ruth Akunna.....	114
Ehlers, Dr. Kristy*.....	9, 10, 11
Eldred, Spencer.....	97
Ellis, Dr. Trevor*.....	27, 28
Elmore, Katy.....	72
Esjornson, Dr. David*.....	29
Essary, Courtney.....	46
Estrada, Demi.....	2
Evert, Dr. Jeremy*.....	89, 90
Farinango, Gloria.....	23
Finch, Elizabeth.....	14
Fletcher, Carolyn.....	46
Fletcher, Terin L.....	31
Foster, Mrs. Julie Smiley*.....	12
Franklin, Elizabeth.....	52
Frans, Sam.....	134
Garber, Jay.....	136
Gassen, Daniel.....	39, 40
Gaydosik, Dr. Victoria.....	127, 128, 131, 140
Gill, Kaylie.....	82
Gregston, Jake.....	14
Gonzales, Camellio.....	95
Goodwin, Sydney.....	8
Gore, Sarah.....	25
Hartman, Halle.....	7
Hartzell, Jordyn.....	90
Hazazi, Shamaa.....	126
Henderson, Dr. Aimee*.....	49
Hendricks, Lindsey.....	18
Henrikson, Dr. Jon*.....	27
Henry, Alyssa.....	107
Henry, Dr. Tracy*.....	102
Hernandez, Chance.....	47
Herrera, Madison.....	47
Hicks, Deondric.....	63
Hightower, Melissa.....	127, 128, 140
Holland, Drake.....	11
Holloway, Kodi.....	45
Horton, Dr. Christopher*.....	19
Houston, Ben.....	9
Howe, Laura.....	127, 128, 140
Howe, Mitchell.....	14
Hubin, Dr. Tim*.....	30, 31, 32, 33, 34

lang, Rem.....	104
Ingram, Tessa .....	1
Jacobsen, Cable.....	127, 128, 140
James, Arpana .....	121
Jamil, Hamzah.....	118
Jones, Donald G.....	34
Jones, Dr. Zach*.....	20
Juo-chun, Wu .....	120
Kelly, Dr. William*.....	35, 36
Kerley, Graham .....	127, 128, 140
Kesnan, Ms. Thanges Maia* .....	109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126
Kinder, Carlene.....	45
Kirk, Connor.....	127, 128, 132, 140
Kliewer, Joel .....	15
Lean, Rachael .....	96
Lee, Dr. Sophia* .....	55, 56, 57
Lewis, Taylor.....	42, 138
Liao, Yun-hsuan .....	123
LoBaugh, Kenzie .....	48
Logan, Dr. Kelley*.....	108
Long, Dr. Scott* .....	50
Mack, Dayana.....	102
Madison, Hannah .....	42, 138
Maharjan, Jeevan.....	92
Maharjan, Shristi.....	92
Mann, Dr. Henrietta* .....	130
Manning, Angelica J .....	32
Marcar, Shannon .....	121
Marshall, Ms. Ann* .....	9, 10, 11
Marshall, Brooks.....	73
Martinez, Gustavo .....	15
Martinez, Jennifer.....	96
XMartyn, Dr. David.....	37
Marsh, Kooper.....	97
Mathai, Grace .....	12
Matter, Brandon .....	15
Mcdowell, Kathryn .....	106
McGrane, Dr. Regina*.....	21, 22, 23, 24, 25, 136
McKee, Dr. Holly* .....	91
McKennon, Amelia .....	24
Mendez, Kenneth .....	106
Mercer, Arissa .....	17
Meyer, Jasmine .....	139
Miller, Chelsea.....	21

Miller, Courtney .....45

Miller, Rebecca.....46

Mills, Michael.....67

Mohr, Mr. Kevin .....130

Mooter, Dacia .....87

Morton, Abigail .....45

Motzkus, Laura .....57

Mowdy, Madison Rae.....71

Murray, Mr. Frederic\* .....130

Murray, Nathaniel.....133

Nadeau, Kelsey .....48

Navarete, Nelson.....98

Neba, Gwendoline .....44

Nelms, Taylor .....52

Nguyen, Phillip T. ....34

Nichols, Braydon .....45

Nimsey, Abner.....35, 36

Nimsey, James A. ....32

Norris, Dana .....85

Odam, Seth .....62

Ogden, Hadley .....107

O'Hara, Michael.....107

Okorocho, Faith A. ....30

Oniwa, Carolena.....107

Orologio, Michaela .....44

Ortiz, Leticia.....60

Park, Jennifer .....35, 36

Park, Jieun.....119

Parker, Paige Perkins.....4

Pate, Dr. Anne.....42, 138

Pence, Grace.....45

Perez, Lilibiana.....59

Peters, Dr. Siriporn\* .....129, 130

Peterson, Taysi .....43

Pinon, M. Alexia .....135

Powers, Gunner .....90

Pozzi, Rachel.....95

Prophet, Jennifer .....20

Quinby, Lauren.....43

Ramer, Isabella .....47

Ramos, Dr. Les\* .....51

Rankin, Brooke.....22

Reed, Katee.....107, 127, 128, 131, 140

Reyes, Randy .....13

Richey, Jordyn.....49

Riggs, Brie .....44

Rinke, Taylor.....	48
Rittenhoue, Maybree .....	14
Rodgers, Kathryn.....	42, 138
Rodriguez, Teodora.....	5
Rowson, Bradley .....	127, 128, 140
Saluja, Dr. Hardeep*.....	52
Sandoval, Isela .....	43
Sawatzky, Tucker .....	94
Scheffler, Shelbi .....	83
Schumann-Hickman, Misty.....	56
Scouten, Courtney.....	48
Se, Hyekeyeong .....	119
Sevin, Dr. Tugba*.....	104, 105, 106, 107
Sewell, Rilan.....	99
Sharma, Dr. Horrick* .....	53, 54
Shea, Katie .....	10
Shephard, Laura .....	45
Shoff, Kody .....	28
Shortie, Tray .....	106
Shrestha, Alina .....	15, 30
Silvera, Smeyder .....	122
Simmons, Shanna .....	54
Simons, Hannah .....	44
Simpson, Michael .....	47
Simpson, Morgan .....	50
Skelton, Kathryn .....	48
Smith, Dr. Amanda*.....	132
Smith, Cassie.....	102
Somalinga, Dr. Vijayakumar* .....	26
Statton, Allison.....	15, 137
Sutton, Brianna.....	108
Swanda, Sierra .....	108
Tanner, William.....	43
Taylor, Jaxon .....	38, 39, 40, 41
Thomas, Bailey.....	127, 128, 140
Thomas, Trenton .....	127, 128, 140
Thompson, Victoria.....	51
Timmons, Brogan .....	43
Todd, Heather.....	55
Ton-that, William.....	14, 19
Torres, Julian.....	93
Tracht, Chylise.....	47
Trail, Emily.....	38, 39
XTrail, Dr. Wayne .....	38, 39, 40, 41
Tran, Tien .....	27
Trawick, Shelbey .....	50

Trejo, Abigail.....	26
Tresp, David S.....	33
Uribe, Zoraida.....	6
Vang, Brenda.....	15
Verkler, Ms. Taylor*.....	109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126
Villela, Rafael.....	98
Vinson, Blake.....	27
Wallace, Marshall.....	42, 138
Walsh, Todd.....	99
Wane, Boubacar.....	38, 39, 41
Ward, Paige.....	102
Watkins, Baylor.....	94
Wellborn, Jerah.....	127, 128, 140
Westfahl, Justin.....	107
Wheeler, Anna.....	86
Widdick, Devin.....	14
William, Heather.....	43
Wolgammott, Dr. Marilyn.....	1
Wong, Johnny.....	106
Wood, Marianne.....	43
Woods, Ms. Kristin*.....	82, 83, 84, 85, 86, 87
Yang, Gege.....	116
Yoder, Caleb.....	93
Young, Alexandra.....	91
Zellner, Haley.....	42, 138

## Things to do during and after the SWOSU Research & Scholarly Activity Fair:

1. **Share Pictures and Videos:** Please post your photos and videos via social media, and tag them with:

[#SWOSUResearch](#)

[#GoDawgs](#)

[@SWOSU](#)

NOTE: Use the **SWOSU Research Snapchat filter** on April 17 between 9 am and 3 pm.

And, feel free to send in your photos by emailing them to [osp@swosu.edu](mailto:osp@swosu.edu)

2. **Exit Survey:** Please complete a short online survey to provide feedback regarding your experience with the Fair – this will help us to make future events better. Your responses are anonymous – Note: the survey directs you to a separate link to **enter a drawing for a free drink at the Bulldog Beanery (optional)**.

-The survey may be found here: <https://bit.ly/2He8dOW>

-Or by scanning the QR code to the right:

-We also will email this link to you after the Fair.



3. **Look for your photo:** The SWOSU Office of Sponsored Programs will post photos from the 2018 SWOSU Research & Scholarly Activity Fair on its website.

After the Fair, see photos at:

<http://www.swosu.edu/administration/osp/> → Research Fair → Photo Gallery

4. **Report and publish your work:** Check with your mentor about reporting and publishing your poster or oral presentation. Some options include:

-Completing a **Scholarly Activity & Academic Activity Report** for the office of sponsored programs: <http://www.swosu.edu/administration/osp/scholarly-activity-report.aspx>

-Publishing your work on **Digital Commons** via the SWOSU Libraries (<http://dc.swosu.edu/>)

-Writing and submitting a paper to the SWOSU Journal of Undergraduate Research: <http://www.swosu.edu/academics/jur/index.aspx>

5. **Get ready for next year:** It is never too early to prepare for the 2019 Fair!

-If you were evaluated at this Fair, review the feedback on your evaluation with your mentor.

-Work with your mentor or find a new mentor to do more research and scholarly activity.

-Find other events at which to present your work – such as the Oklahoma Academy of Science and Oklahoma Research Day, both which will be hosted here in Weatherford, OK, over the 2018 to 2019 school year.

**We congratulate you for participating in the 2018 SWOSU Research & Scholarly Activity Fair, and we look forward to seeing you next year!**

