NATIONAL CONFERENCE ON UNDERGRADUATE RESEARCH (NCUR)

2018 Reflections on Edmond

TULSA COMMUNITY COLLEGE

2018 TCC NCUR ATTENDANCE STATISTICS:

13 FACULTY AND ADMINISTRATORS FUNDED THROUGH THE **TCC FOUNDATION GRANT**

2 FACULTY AND 3 STUDENTS FUNDED THROUGH **OK INBRE TRAVEL GRANTS**

(Professors Sloan and Spencer with Students Laughlin, Forrester, and Kennedy

10 STUDENTS FUNDED THROUGH **OK INBRE SUBCONTRACT**

ORGANIZATION FOR THE TRAVEL PROVIDED BY TCC AND MOST NOTABLY—MELISSA THURSTON, MELISSA TEACHNOR, DIANA SPENCER, AND CINDY SHANKS.

COMPILED BY:

DIANA SPENCER
GKFF ENDOWED CHAIR OF RESEARCH

POSTERS PRESENTED:

Modulation of Nerve Growth Factor (NGF) Expression in Trinitrobenzene Sulfonic Acid (TNBS) Induced Colitis in Rat Colon

Christy Eslinger, Kenneth Miller, and Subhas Das

The Bacterial Diversity Found in the Rhizosphere Between Soil Samples Taken from Ecological Niches Using 16S rRNA Genes

Ashley Kennedy, Brian Forrester, and Diana Spencer

An Arboreal Study of Tulsa Community College's Southeast Campus

Connor McLellan, Macie Baldwin-Griffin, Mary Phillips, Mark Swanson, Rob Katz

Utilizing Cytochrome C Oxidase I (COI) for Microgenomic Identification of Osteichthyes Obtained from Rural and Urban Ponds in the Oklahoma Central Plains

A. Brown, A. Eberhard, C. Eslinger, M. Gates, M. Hilton, D. Johnson, A. Kennedy, A. Platt, S. Sandoval, D. Spencer

Food, Culture, and Society: An Interdisciplinary Investigation Including Science and Liberal Arts

D. Cunningham, D. Axsom, C. Fryman, J. Airhart, A.Cross, M. Easterling, D. Gray, M. Phillips, C. Thompson, D. Spencer

Human Development on Wildlife Diversity in Urban Wooded Ecosystem

Chirstie Nesbit and Brian Cosby

Intensity Matters: Perineuronal Nets Remodeling in Naloxone-precipitated Morphine Withdrawal on Female Adolescent Rats

Ashley Zongker, R. Gaglia, P. Gonzales, R. Velasquez, D. Vazquez-Sanroman

Viability Assay & Potential Effects of E-Juice on CHO-K1 Cells

A. Brown, K. Casey, A. Eberhard, C. Eslinger, S. Grace, A. Hughes, D. Johnson, A. Kennedy, S. Laughlin, C. Longden, K. Smith, D. Sloan

NCUR REFLECTIONS

As I walked the UCO Campus in 2018, I could not help but hear my internal voice of the 17 year old woman who attended UCO on a drama scholarship many years previous. With each trek across the campus, I saw my corner dorm window at Murdaugh Hall and the metal roof of the drama scene shop. Memories continuously flooded my mind. I sat in presentations in the same classrooms that I had attended as a communications major and was aware that the younger me had no idea of where a life in academia would take me. How could I know that I would change majors to Social Work and then Education to find a career that includes smatterings of each of those majors of drama and social work with the added focus of molecular biology and research? How exciting it is to provide the National Council on Undergraduate Research (NCUR) Conference to students in their first two years of college and to know that they will very possibly also experience key pieces to the foundations of their careers on this same campus.

As the George Kaiser Endowed Chair of Research at Tulsa Community College, I have had the opportunity to work with multiple faculty members and students to increase our attendance at NCUR at the University of Central Oklahoma. With the ease of travel to Edmond, Oklahoma, we had 14 students and 15 faculty members attend the presentations. We had eight poster presentations that included biology, biotechnology, and our first interdisciplinary posters. We had faculty attend from multiple disciplines including sociology, psychology, biology, humanities, biotechnology, performing arts and communications. Two stellar adjunct faculty members attended with their poster presentation that included work derived in a secondary student concurrent enrollment class.

NCUR 2018 included three nationally recognized plenary speakers and over 3,500 student presentations. The presentations included eleven poster sessions with a minimum of 130 posters with each time slot. The energy, passion, interest, questions with thoughtful answers, topics, and variety amazes me every time I attend NCUR. The level of communication and learning that is occurring in every corner of the room is exactly what I want to offer to students and faculty. Multiple oral, visual arts, and performing arts sessions are also presented. I find the work outside my field extremely interesting and enjoyable. I attended two memorable music performances from students attending UCO: *A Flaw in our DNA* and *Horns "Dancing on a Hill."* I also enjoyed an outstanding visual arts presentation, *The Universe Under a Microscope* by Claire Chabot, at the University of South Carolina-Columbia. The student had taken pictures of cells using fluorophores. She had then named each image based upon women scientists. One of her slides depicted her work hanging in her lab. It was transformative to later attend the Melton Gallery after the talk and see the actual work. These images are possible for our students to prepare. I was inspired to attempt to produce an image of my own. The worlds of art and science melded into one. My phone contains multiple images of methods and digital online database titles to investigate.

Watching my students present their posters represents a capstone learning experience for them. They understand and present with growing confidence. Students from other institutions

interested in our topic find the poster to ask questions. The growth from student to student with networking and possible future investigations discussed is extraordinary. While the students find their comfortable niche in the academic arena, I am grateful to help facilitate the opportunities provided by the multiple funders.

Diana Spencer
Professor of Biotechnology and GKFF Endowed Chair of Research

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Participating in NCUR this year, my reflections fall along 3 notions:

1. I enjoy watching our students (TCC) experience and respond to this conference on several levels. This is a large conference with hundreds of student presenters. When our students realize they are one of hundreds, once they get past the initial panic and complete their presentation, I see an enormous pride wash over them. Their confidence builds, they take the opportunity to learn from their fellow students, and many of them suddenly begin to see themselves as part of a larger research community that they can carry forward into their futures. This experience also allows them to come in contact with a large diverse group from different parts of the country and world. I tend to hope their growth in diversity appreciation grows an inch or two.

2. I always learn from the Student Presenters, whether through their verbal or poster presentations. I heard one presentation on American Mormonism. This is a topic we don't see often in this part of our world. One young man presented a poster presentation on classical sociological perspectives and new ways to study, apply, and teach them in today's postmodern world. Quite advanced abstract thinking for an undergraduate student. I will be contacting him to discuss his research further.

3. My lesson after attending this conference which keeps getting reinforced, is that if I take the time and effort to work with undergraduate students on research knowledge and skills, they will gain valuable experiences in academia, social networking, and how their research might contribute to their communities and/or own self-worth.

Thanks to the folks at Engaged Learning and to Diana Spencer for making this opportunity available!

Gay Phillips
Professor of Sociology

As a faculty member without a student presenter, I felt very honored to be asked to attend NCUR. I went with the expectation that I would return home with fresh ideas and inspiration. The experience exceeded my expectations. It was great getting to know our student presenters and hearing about their passion for research. Research is so empowering for

students. They are not only learning, but they are also adding to the body of knowledge within their field. They are truly constructing knowledge!!! The conference made me realize what a wonderful gift we are giving students when we give them research opportunities! It has inspired me to seek out and create more research opportunities for my students. I want to give my students the gift of research!

Jerilyn Schultz
Professor of Psychology

I am sincerely grateful for the wonderful opportunity of attending this national conference. It was quite the experience to see so many individuals with so much passion and knowledge in so many various fields. I found inspiring research with each new set of poster presentations. While there were many presentations which were very detailed and complex, although I could not always completely comprehend the details, the general picture and idea behind that research process was definitely of interest to me. It also left me more determined than ever and looking forward to progressing my education so that even the details of these complex processes are within my wealth of knowledge.

The opportunities at this conference were endless and my only regret is that we had to pick and choose between all these great presentations. I loved the poster presentations due to the large variety of subjects; however, I also loved the oral presentations and the more focused atmosphere. The inclusion of music and art were unexpected to me and greatly appreciated. I especially loved an art presentation which integrated science with art.

In presenting my own poster, I am often surprised at the level of ease in which I go through the presentation. Being an introvert, it is not necessarily within my daily activities to converse with multiple people. I enjoy the opportunity to come out of my shell and share information that I am passionate about with others.

I left this conference with a much greater understanding of not only the importance of research, but how much progress is being made, even at the undergraduate level. And my desire to and my belief that I will become a medical researcher has grown to an appreciable greater extent as a direct result of attending this conference.

Stephanie Laughlin
Student Presenter

During the weekend of April 5-7-2018 I attended the NCUR conference at the University of Central Oklahoma in Edmond Oklahoma. The conference was a great success. I especially enjoyed talking to the student presenters about their projects and learning about the procedures they used in conducting research. Also looking at all of the different projects and getting ideas for future possibilities for students to pursue here. There were very interesting oral and cultural presentations that introduced different perspectives that I enjoyed

listening to. The conference provided great opportunities to meet with colleagues from different schools and countries and get new perspectives on conducting research and pursuing ideas. I want to thank Dr. Spencer for all of the hard work she did in order for all of the students and faculty to attend this conference. It was an experience that will benefit all of us.

Mark Swanson
Professor of Biology

It has been a few weeks now since I had the opportunity to present at the National Convention of Undergraduate Research and the more I think about my experience there the more thankful I am for having been given the opportunity to partake in it. I had the opportunity to talk to and listen to many interesting presenters and learn about subjects that I knew nothing about. There is no experience more fulfilling then listening to someone talk about a subject or project that they care deeply about and in my experience that was everyone I talked to at NCUR. I enjoyed getting to present on our project and being asked insightful questions by peers and learning what they thought of it. We even had a few people who said that they were interested in recreating our project at their universities and colleges to better their schools learning environment. When I first arrived, I was nervous about presenting, but once I realized that NCUR is about inspiring and teaching your peers presenting became easier and more enjoyable.

Connor McLellan
Student Presenter

My favorite part of NCUR is watching the students react to the "grandness" of NCUR. Most TCC students have never been to a research conference, and they are usually "wowed" by the amount of undergraduate research that is going on, saying things like, "I had no idea . . . ." I believe these presentation opportunities really drive students toward a STEM career or STEM profession.

NCUR always provides engaging faculty sessions that provide insight into increasing undergraduate research opportunities. In addition, I think it is great that NCUR provides sessions for students to plan for their future, and provides opportunities to visit with potential four year and graduate institutions.
NCUR validates my desire to continue undergraduate research in my classroom, and my desire to encourage students to seek undergraduate research opportunities.

All in all, NCUR is one of my favorite conferences to attend because of the impact on student success.

Dusti Sloan
Professor of Biotechnology and Biology / Interim Biotechnology Coordinator

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Although I was only able to attend one day of this year's conference, NCUR 2018 fulfilled my expectations for what I've come to anticipate as a truly incredible experience on multiple levels. I was again very impressed by not only the quantity, but also the *quality* of work that I saw being presented by undergraduate students from across the nation. NCUR conclusively demonstrates that undergraduate students can not only perform, but excel in conducting substantive research!

I was especially pleased to have an opportunity to view the excellent posters that were presented by some of our own bright and exceptionally talented TCC students. Our students did a great job presenting their research alongside (and with equal effectiveness as) students from some of the nation's preeminent research institutions.

I also appreciate the somewhat rare opportunity that NCUR provides to explore and learn about research conducted outside of my own discipline. This helps to broaden my vision of research and provides inspiration for future collaborations in multidisciplinary research. I sincerely wish that all TCC faculty had the opportunity to attend this incredible conference.

Neil Enis
Professor of Biology and Life Sciences Faculty Department Chair

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This was my first experience with a national research conference, and I was impressed. While I was only able to attend one day of the conference and participated in a limited number of poster, oral, and plenary sessions, it was clear that even three days wasn't enough time to do the offerings justice. There were so many interesting and diverse presentations that I would have liked to visit a great many more.

I enjoyed speaking to the TCC students who presented posters and was very impressed with the way they conducted themselves and the seriousness with which they responded to questions. They all explained their research well and answered questions appropriately. I was very proud of those I was able to interact with. TCC was well-represented!
In addition to visiting with TCC students, I also visited a number of other posters and was impressed with the quality of students from all areas of the country (none of the projects were more in-depth than those from TCC, however). In general, students were eager to explain what their posters represented. I was particularly interested in research into perceptions of the value of social media by age group, because it parallels my class's research from this semester: "Effects of Social Media Use on Relationships in a College Student Sample." In addition, I was intrigued by posters examining common characteristics of Trump voters and addressing misconceptions about psychology principles. A couple of oral presentations on music ("A Quiet Mind") and a music score devoted to analyzing the wives of Henry VIII also proved enlightening ("Try Me Good King").

I think my overall impression is that research need not be extremely complex to be interesting; conversely, less complex projects may lead to more interesting and/or accessible results. While there are certainly challenges in getting my concurrently enrolled students to such gatherings, I

think it would be valuable to explore the possibilities of doing so in the future. I will contact Melissa Steadley in the Concurrent Enrollment office to see what might be possible going forward. Students gain such confidence from conducting and then presenting their own research.

I appreciate the efforts of those who applied for funding and coordinated other arrangements (most especially Diana Spencer) for such a large group from TCC to attend. Melissa Teachnor was instrumental in helping our group coordinate schedules for a car pool on April 6 (among other things), and I appreciate Kelly Allen's willingness to drive.

Janice Airhart
OK INBRE Bioscience Outreach Representative

This year I had the opportunity go to NCUR. There were several hundred students from all over the world presenting at the University of Central Oklahoma. Several research projects peaked my interest, but one stands out. One student from Monmouth University of Science studied *The Use of Essentials Oils to combat Streptococcus Pneumonia*. His project shows cinnamon and oregano have higher zones of inhibition than prescribed Cipro. And thus far, no resistance to the oils have occurred. This is promising in a world of antibiotic resistance. Many years ago, an old farmer told me to add oregano to my chickens' water and I would have the healthiest chickens. He was correct. My chickens have always been healthy. I went home and did some research and found oregano was given to chickens, via water, on organic farms instead of antibiotics.

Most importantly on this trip, I had the pleasure of having stimulating conversations with many great people. Conversations that assured me that I'm not the only student who struggles with many aspects of college. For instance, being center stage and talking about research is difficult. The weekend has shown me the tough competition ahead of me on my road to Vet School. It also confirmed my thoughts on college being more of an endurance race than intelligence.

I love all aspects of science and I sincerely hope to continue research, become a better public speaker, and return to NCUR with more confidence. I would like to thank Dr. Diana Spencer for obtaining funding for the students to participate. Her love for her subject and students is the reason TCC students are well educated and successful. Also, I would like to thank Mark Swanson for giving his students the opportunity to submit their abstracts to present at NCUR.

Chirstie Nesbit
Student Presenter

My name is Brian Forrester and I attended the NCUR 2018 conference in Edmond, OK. It is with my deepest thanks that you provided funding for me to attend. This event really can change people's lives for the better. I was there for the science but what happens there is pretty magical. The amount of science and new research that is presented is quite overwhelming. It takes a lot of preparation to narrow it down to the research that really interests you.

It was just great to meet Brandon Thompson who did similar work to my research. His work was on the meta-barcoding of microbial cave communities in southwest Virginia. We became friends and exchanged emails. He told me about the workshop he took called GCATSEEK. It taught the QIIME data process that stands for Quantitative Insights Into Microbial Ecology. He showed me the ANOSIM program that stands for Analysis Of Similarity. It was similar to the Shannon Diversity Index that I had used. I really learned a lot from him.

I also got to learn new techniques in plant DNA extraction from Rachel Bautzman whose work was "Assessing the genetic diversity of native and nonnative Phragmites in Wisconsin." Instead of extracting DNA through mortar and pestle, she used a power drill with an attachment that you buy and a small amount of silica. Her DNA concentrations from the Nanodrop were quite impressive. It was so interesting that I am going to follow up with her on this technique.
The conference covered all academic programs so it was a well-rounded experience. I got to experience a French horn symphony and attend an art exhibit that had surprisingly emotional and thought provoking art. There was a drawing there of a boat full of refugees heading into Ellis Island and the people on the island refusing to allow the refugees to land. It made me think back to the time that I was on the Staten Island ferry with a large group of immigrants and when the Statue of Liberty came into view, they all started crying and hugging each other. The art made me emotionally confront how things have changed.

I will never forget all the good things that happened at 2018 and I hope many students in the future will get to experience all the things that happen at NCUR.

Brian Forrester
Student Presenter

I had a wonderful time at NCUR 2018. I was able to talk to a variety of other student presenters and see how relevant the information and techniques we learn in class really are. Specifically, I enjoyed seeing a student present his poster titled "Metagenomic Analysis of Cave Prokaryotic Microbiomes in Southwest VA". It was interesting mainly because his project mirrored the summer project I worked on with Dr. Spencer. We used similar laboratory techniques, but different analyzing tools. Altogether, it was nice to see that the techniques I have learned are so versatile. However, my favorite presentations were those pertaining the use of essential oils to combat bacterial pathogens as a replacement for antibiotics. Some of the presentations I saw on this topic include "Antimicrobial Activity of Cinnamon Oil Nano-emulsion On *Acinetobacter Baumannii*" and "The Use of Essential Oils to Combat *Streptococcus pneumoniae*". It was very rewarding to see that a problem I am interested in researching is being

taken on by an assortment of undergraduates and research laboratories around the United States. In addition to listening to presentations by other students, I was able to, along with my summer lab partner, present our findings from the summer, which was equally rewarding as listening to the other student presenters. Being able to present to people genuinely interested in the techniques used and the reasons behind doing certain kinds of research was wonderful and satisfying. It was a glimpse into the wider field of science research, where anything and everything is researched. While something may not seem interesting to me, it can appear groundbreaking to another researcher. Seeing so many undergrads come together to celebrate science was honestly awe inspiring and made me realize what a wonderful field I am entering. I am not the only crazy science person out there; there are thousands of us! It was fun and exciting and overwhelming all at once. Honestly, I expected it to be smaller, like Oklahoma Research Day, but it was huge! I was too excited to be nervous about presenting, and I learned so much about the possible uses for the techniques I have learned that I will have no worries about finding something to interest me when I go looking for a full-time job in a lab setting. All in all, it was a fun experience and it made me realize that I have so many options going forward that the hardest part will picking where to go and what to do. It was a true learning experience.

Ashley Kennedy
Student Presenter

While I attended both oral and poster sessions, I realized that many study topics can be readily implemented to TCC with our students. In fact, many studies used the paper-pencil type of tests with descriptive statistics. I think that it is not difficult to adopt such study format for doing undergraduate research with the students who have not had much exposure to research or the experience of independent study. I am motivated to make a study with motivated students so that they have experience of doing research at the college setting.

Heekyeong Park
Professor of Psychology

Wow! What an incredible three days. From the moment we arrived, I knew the whole group was in for a remarkable trip. First, I have to admit I had no idea that the University of Central Oklahoma existed, and then to arrive and see this huge beautiful campus that was just loaded with students. Next, I learned that the campus itself was closed for the convention and all those students were there for NCUR. It was a moment to remember. Everywhere I turned there was an opportunity to meet new people. From the shuttle buses, to standing in line for lunch, and even on the elevator at the hotel. It was incredible the diversity that was present. I met Serena an artist from Wisconsin, Natalie a professor of biology from North Carolina and her 4 students there presenting, and Rob a psychology major from Arizona. So many different venues available to see, made it impossible to make it to them all. Along with a few fellow classmates, I was able to catch exhibitions covering art, music, dance, theater, and the scientific oral presentations. Although this left me completely exhausted it was three days I will never forget. I was fortunate enough to present my research over the pain

pathways of the enteric nervous system the first day there and could focus my attention on seeing as much as possible the remaining two. I had more visitors to my poster than I had ever had before and felt this overwhelming sense of accomplishment. There were posters, posters, and more posters to see. I tried to step outside my comfort zone and look at things other than the biotechnology field. I decided to look at posters that dealt with problems created by man or ourselves. I learned about antibiotic resistance, that the white rhino is now going to go extinct with only two females left, and how global warming is going to wipe out an entire trout species because of the warming spring waters. It was sad in one way to think that this was all created by our own hands but on the other side it was enormously hopeful for the future that these students not only saw the errors of our ways but did research on how to make it better. If all this was not enough, there was also the college representatives from all across the United States there to answer any question one may have over higher education. I definitely took the chance to spend a few minutes with the rep from the NIH. The entire trip back I was able to have a meaningful conversation with the two professors in my van over all that we had just witnessed. The experience was one that will fuel my own research for at least the rest of my undergrad academia. Thank you!!

Christy Eslinger
Student Presenter

My attendance to NCUR was limited to Friday, April 6th. However, during the limited amount of time that I had to attend the conference I was able to review numerous posters and attend two student presentations. My initial impression of NCUR was a sense of surprise in regards to size of the conference and the number of students that were present. I have not been exposed to NCUR prior to this conference and didn't realize just how large the Undergraduate Research Community is across the US. I was even more surprised to learn that there were students presenting from outside the US.

My focus for the day was on the poster presentations as that would allow me to review the most undergraduate research topics, as well as, interact with the greatest number of students. I was most interested in reviewing posters that were discipline specific to geography, environmental science, and Geographic Information Systems (GIS). What I observed was that there were a variety of poster presentations within the discipline of Environmental Science but very few within the discipline of geography and none identified as specific to GIS. However, two posters that I reviewed were inherently geographic in nature; both categorized under the heading of Mathematics. The first, "Quantifying the Distribution of Urban Vegetation Based on Google Street View Images," was interesting in that students were using sophisticated algorithms to identify and quantify pixels representing vegetation within the street view images. The students used GIS software to produce 3-Dimensionally extracted images and to map the resulting vegetation. I was impressed with the complexity of this project and spent several minutes discussing the student's next analysis with the data they had produced. They were particularly interested in comparing their mapped results with demographic data such as household income, or asthma occurrence. We spoke at length of the limitations of their data including the need for privacy for much of the demographic data and the lack of "street-level" demographic data.

The second poster I was particularly impressed with was “Wind Speed and Intensity of Tornadoes Compared From East to West in Oklahoma.” These students examined tornadic data of wind speeds and intensities and looked for regional patterns in the data. Their data led them to conclude there was some regional variation in tornadic activity. This particular research intrigued me since it was inherently a geography research question but these students approached it from a mathematical perspective with Chi-Square and ANOVA tests. We spoke at length for the need to map the tornadoes combined with their respective intensities and wind speeds and to look at the question they were interested in using geostatistics with the full understanding that those type of statistics were more advanced than what they were prepared to do at the moment. It was this particular poster that got me thinking about what our GIS students could do and possibly present. This type of project would definitely be within the scope of our Advanced GIS course and would give students a chance to practice some of the tools we cover in class.

Overall, I think it is impressive to see the level of excitement and pride the students had for their work. It is clear that the challenges to student research at a two-year institution can be overcome to produce undergraduate research of quality. The value of this research is the exposure of these students to the scientific process, engaged learning techniques, confidence, the development of employable skills and a sense of satisfaction in the knowledge that they are contributing to the scientific community.

Kelly Allen
Professor of Geography

I arrived at UCO on Thursday in a TCC van, serving as a back-up driver. A former student of mine, Dylan Axsom, provided his own transportation and arrived within minutes to connect. He had participated in a group research project during fall 2017 in General Biology for Non-majors, and this was his first exposure to a scientific conference. The work he did was part of a NCUR poster presentation and inter-disciplinary collaboration between several classrooms. The opening ceremony inclusion of Native language and dress was delightful to him, as we are both Native Americans. More than 30 flags were displayed of federally-recognized tribes, and we stayed after the speaker to hear the Native American drummers. We spent the vast majority of the day together, attended poster sessions, oral sessions, and a group session concerning graduate school applications. These experiences allowed us to experience a higher quality and quantity of interaction, particularly since this was the first scientific research conference he had ever attended. After having lunch with all attendees, we attended an oral session he had chosen. “The Role of Individual Background on Academic Performance,” presented by Julia Pemberton of William Peace University. This gave him additional insight into options for undergraduate research topics within the scope of his interest. We walked over four miles to various venues, and his enthusiasm did not wane. Due to his attendance at a journalism conference, he needed to leave before the group around 3pm. The best return on investment for Thursday was seeing Dylan develop broader horizons and perspectives on his own academic career.

Following his departure, I returned to the poster session. Attending faculty from TCC were also present there. I did visit several posters and speak with other biology faculty about their

experience. I teach introductory biology courses with integrated group research projects required for majors and non-majors. The poster session became a platform for finding ways to connect my own students with public databases for possible group research projects involving data-mining.

On Friday, I was in the poster session early and met a student whose project used data analysis from a public source. The poster was entitled, "Investigation of Ambient PM 2.5 Concentrations in Lima, Peru" by Joseph Self, University of Michigan. Pollution statistics gathered from sites across the world are accessible at AirNow and analyzed using MATLAB R2017b. The data site is sponsored by the Department of State and collects Air Quality Monitoring data from U.S. embassies and consulates around the world to inform U.S. personnel and citizens overseas. I was able to introduce Dr. Spencer to the presenter, Mr. Self. He informed our view of challenges and opportunities for using this type of platform with students. We later discussed at length with Professor Mary Phillips. Our long-term goal is to work collaboratively to create a lab that could be used to introduce data mining to introductory students.

In addition, I met a young lady presenting a poster with an education focus. Kaylee Parker of Young Harris College was presenting a poster entitled, "Collaboration: Teacher Perspectives of Collaboration Practices Within an Elementary School Setting." Her work applied to my current role as AEP Credits Count Program Manager. We discussed barriers to collaborative efforts within the traditional school classroom. She has had multiple student teaching experiences and describes the primary barrier to collaboration as fear of the unknown. Instructors often express concern about chaos erupting during group learning experiences. This aligns perfectly with what we see at our implementation sites. She also aptly described the result of no collaborative efforts resulting in isolation.

One shining star of my NCUR experience was connecting with Ricardo DeSantiago of San Diego State University. His poster, "Anthropogenic Debris Consumption by Wetland Fishes" involved the study of plastics in the ecosystem. He appeared to be a non-traditional student, who had heard of SACNAS but had not attended a conference. I encouraged him to find out more about the organization, as I am a lifetime member. His vocabulary and presentation were incredibly impressive, and his elevator pitch was the best I encountered throughout the conference. After interacting with several undergraduates who expressed their research participation was due to pressure from family or teachers, it was a breath of fresh air to meet this student who had pursued it for the love of research.

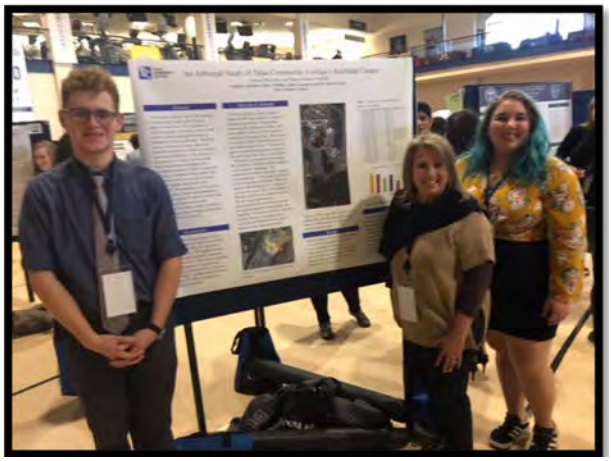
The best return on investment for the entire experience was looking to find ways to create a lab accessible to biology faculty that involves data mining to answer novel questions. It would be easy to integrate this model into the group research projects conducted by my students each term. I definitely experienced a deep sense of collegiality within the institution across disciplines this week!

Mona Easterling
AEP Credit Counts Director and an Adjunct Instructor in Biology

I was thrilled to be able to bring two of my BIOL 1224 for majors students to present at NCUR this year, Connor McLellan and Macie Baldwin. They did a fabulous job! Their service learning/research project involved creating a database of TCC's Southeast campus trees. Connor and Macie demonstrated their project during the Partners in Community Forestry Conference site visit at the SEC. Their work helped TCC SEC receive the USA Tree Campus recognition. It takes a village to mentor and support students. Rob Katz shared the USA Tree Campus opportunity and involved students in the Sustainability committee. Mark Swanson and I helped with data collection and presentation.

> *"Education is not about filling buckets but lighting fires"*
>
> WILLIAM YEATS

I am grateful and appreciate the TCC Foundation and OK INBRE for the financial support that made participation at NCUR possible, and Diana Spencer, for her tireless encouragement and enthusiasm. I overheard Connor and Macie thinking of new research projects they wanted to do and present at NCUR next year. Take away… Research opportunities impact and change students' lives. The great student presentations at NCUR will energize me to continue to mentor and offer research and service learning opportunities in my courses. NCUR helps me to light fires.



One take away about the student research projects was the variety of student research posters that used established databases to pose a research question. The projects used data mining to determine correlations to solve the question posed. I plan to explore free databases such as:

Amazon Web Services (https://aws.amazon.com/public-datasets/)
Cal State Long Beach Free Databases (https://csulb.libguides.com/c.php?g=39192&p=250836),
Dataquest (https://www.dataquest.io/blog/free-datasets-for-projects/)
Data Repositories (http://oad.simmons.edu/oadwiki/Data_repositories)
Berkeley Data Lab (http://www.lib.berkeley.edu/libraries/data-lab)
Data.gov (https://www.data.gov/)

Fun take away….Last year, I was captivated by the Recycled Tree at NCUR. This year, with students from the Club of Medical and Natural Sciences, we made our very own Recycled Tree display for Earth Day. Art meets science. Stop by the Science and Math building.

Mary Phillips
Professor of Biology

I really enjoyed attending NCUR with you last week! It was a great experience for me as a student and also as someone who isn't very knowledgeable about the STEM field. I always thought that I, as a communications person, was on the opposite side of the spectrum and that our two groups didn't intertwine much. Getting to see how the research and teamwork isn't just for STEM majors was very encouraging and I feel like I took a lot away despite my short time there.

I'm pretty bummed that I couldn't be there the whole weekend, but everything I had planned for this month decided to fall on the same 4 days. I seriously appreciate the effort to you made to let me go considering how short I was there. Thanks again for making it happen for me and I hope we can work together more closely in the future!

Dylan Axsom
Student Presenter

Having never been to a conference like his before, I really didn't know what to expect. I only signed up at first to get a better graduate school application, and truthfully, I thought I wouldn't enjoy the trip at all. I had pictured dark auditoriums in which one person at a time was presenting a poster for about an hour or so, with maybe a crying baby here and there, but otherwise silent and boring. What I was presented with was unbelievably better. The science fair-esque environment for the poster presentations gave me the opportunity to really dig in and learn about subjects that I thought were interesting (one example being a presentation on using micro-RNA, which I had never even heard of, to, in short, prevent lung, cervical, and breast cancer), and here and there stopping to broaden my horizons on something I normally would never have studied (if you need to know how to tell if your 16th century porcelain plate is authentically Oriental or if it's a Dutch knockoff from the same era, I'm officially your guy). In addition, the grad school booths on the second floor presented me with an amazing opportunity to talk to recruiters from every corner of the state in the period of one hour, rather than e-mailing the school individually and waiting to hear back. Some of the schools I had never even thought to consider, such as two of my (now) top choices, Alabama University and West Florida University. The freedom to roam on my own and visit whatever I was interested in was nice as well. It allowed me to go a couple to oral seminars, have some deep discussions with

other students that were interested in the same subject matter, and make new friends. I also feel like this was a great opportunity to network. I just realized about a year ago how important networking is, and I'm realizing that more and more as time goes by. I got to truly know many great people while I was there, and these connections may prove to be invaluable in the future. When it got time for me to actually present, it was nerve-wracking, but I got through it, while hearing ideas from other students on how to possibly improve the current research or ideas of how to further research on the next project. Yet another great moment, and admittedly a surprising one was listening to Kareem Abdul-Jabbar give his speech. I was slightly wary of going and almost did something else, but I'm glad I didn't! I expected the whole thing to be about sports, and while some of it was, most of it was about how to help others learn, black lives matter, professional athletes and their place in political activism, religion, and finding yourself. It was very eye opening in many ways. So, out of all of this, if I had to choose a favorite take-away from the whole trip... it would have to be the confidence in myself that I now have. My end game is to become a college professor and to do that I plan on getting my PhD. It's an incredibly daunting task, and if you had asked me in high school if I thought I had the ability to get a PhD I probably would have laughed at you. I would have told you that I never would be able to get into graduate school, let alone pass it. While I have other things factoring into my new found confidence (support systems, better grades than high school), this conference really pushed it over the edge. There is no longer a doubt in my mind that I can do this, that it will be enjoyable and rewarding, and that I have the ability to use my research to help others, which is arguably the very meaning of life.

Dillon Cunningham
Student Presenter