

NATIONAL CONFERENCE ON UNDERGRADUATE RESEARCH (NCUR) 2019: ENGAGE & EXPLORE

2019 REFLECTIONS ON KENNESAW



The experience was held at Kennesaw State University just north of Atlanta, Georgia on April 11-13, 2019.

The conference provides expression of all forms and topics of undergraduate research.

Tulsa Community College sent eight students and eight faculty members this year.



FUNDING:

We are grateful to the following funding agencies that assisted with travel to NCUR:

- The **Tulsa Community College Foundation** funds with a grant request written by Diana Spencer.
- **Phi Theta Kappa** funded Justin West.
- **Engaged Learning** funds for faculty development.
- Also, **Oklahoma INBRE** played a large part in travel through the TCC Subcontracted funds and through individual travel awards granted to faculty members Dusti Sloan, Mary Phillips, Mark Swanson, Mona Easterling, and Diana Spencer.

POSTERS PRESENTED:

Tulsa Community College sent eight students and eight faculty members to Kennesaw State University April 11-13, 2019.



ZERO WASTE INITIATIVE WASTE AUDITS FOR A SUSTAINABLE CAMPUS

Friday, April 12, between 8:50 and 9:10 AM: Science Building 212.

Student Justin West with faculty sponsors Michael Limas and Rob Katz

SODIUM INGESTION BY WILDLIFE IN A BOTTOMLAND HARDWOOD ECOSYSTEM

Friday, April 12, between 11:00 and 12:00 PM: Student Recreation and Activity Center

Student Isabella Hadley with faculty sponsor Mark Swanson

OPTIMIZATION OF THE DNA BARCODING PROTOCOL AND THE EVOLUTIONARY HISTORY OF BOTANIC GARDEN PLANTS

Friday, April 12, between 4:00 and 5:00 PM: Student Recreation and Activity Center

Student Nikki Morgan with faculty sponsor Diana Spencer

VIABILITY ASSAY & POTENTIAL EFFECTS OF E-JUICE ON RAT LUNG CELLS

Thursday, April 11, between 1:00 and 2:00 PM: Student Recreation and Activity Center

Student Kadin Falkensten with faculty sponsor Dusti Sloan

MICROBIOMES OF NATIVE AND INVASIVE BEETLES, COMPARING O. CINGULATA AND A. GLABRIPENNIS

Friday, April 12, between 4:00 and 5:00 PM: Student Recreation and Activity Center

Student Lydia Ostmo with faculty sponsors Diana Spencer and Bryan Coppedge

EFFECTS OF VARIOUS SUBSTANCES ON HEART RATES OF DAPHNIA SUBJECTED TO G-FORCES

Friday, April 12, between 9:45 and 10:45 AM: Student Recreation and Activity Center

Student Rowan Stevens with faculty sponsor Mary Phillips

A STUDY OF PUBLICLY ACCESSIBLE DATA REGARDING CHRONIC OBSTRUCTIVE PULMONARY DISEASE AMONG ADULTS IN TULSA, OKLAHOMA

Friday, April 12, between 4:00 and 5:00 PM: Student Recreation and Activity Center

Students Thy Ha and Daria Reynolds with faculty sponsor Mona Easterling

FACULTY AND STUDENT REFLECTIONS ON THE TRIP

“Research experiences and NCUR always delivers and pushes us all to continue exploring the high impact practice of scholarly investigations.”

Diana Spencer

GKFF Chair of Undergraduate Research

FACULTY

“Attending the conference has given me many new ideas for projects and how to improve existing research.”

The National Conference for Undergraduate Research (NCUR) was held at Kennesaw State University in Georgia from April 11-13, 2019. OK-INBRE made it possible for me to attend with one of my students who gave a poster presentation. The NCUR conference brings together students and professors from the United States and several other countries to share their research experiences.

I had many good encounters with student presenters and visiting professors. When I talked with student presenters and shared my similar experiences with their research project they would become very interested in what I had to say. One example when I was talking to a couple of young women that conducted a project with Strawberry Frogs in Costa Rica, they were really excited when I shared my experiences I had with the frogs in the same location. Also talking with other professors about new ideas and modifying current projects to collect new data will help in creating new research.

The NCUR conference is a great institution that brings together many young people to learn new ideas for conducting research, make new contacts and discover new opportunities for the future. Attending the conference has given me many new ideas for projects and how to improve existing research. Research projects do not have to be a complicated question, as I learned from many of the research questions presented. Many were very simple and did not require expensive equipment to conduct them. Keeping research projects simple and inexpensive is an important concept for students to understand when designing a project.



I greatly appreciate the grant money that was awarded by OK-INBRE so I could attend with my student. For future projects I will have new ideas and insights that I can present to my students. Not only did I greatly benefit, but so will my future students.

Mark Swanson

STUDENT

"I cannot express the gratitude I feel for the opportunity to attend this magnificent gathering of minds."

I cannot express the gratitude I feel for the opportunity to attend this magnificent gathering of minds. I have been out of school for 25+ years, but it was always my dream to return and earn a degree. I never thought I would be able to join the amazing people that participated at NCUR this year. My co-authors Thy Ha and professor Mona Easterling have had such a huge impact on my life. The faculty that attended NCUR with us are supportive, helpful, and inspiring. Additionally, the students that presented were amazing! So many talented, passionate, and caring individuals. Since I arrived later than the rest, because of a test, I was only able to hear one speaker, but she had a huge impact on my thinking. Dr Valerie Montgomery Rice spoke with such passion and conviction. I too want to make a difference in patients' lives. The Kennesaw State University campus is beautiful and all the volunteers were very friendly and helpful. I think what I take away from NCUR was exponentially more than what I expected and it is something that I will treasure always. Thank you.

Daria Reynolds



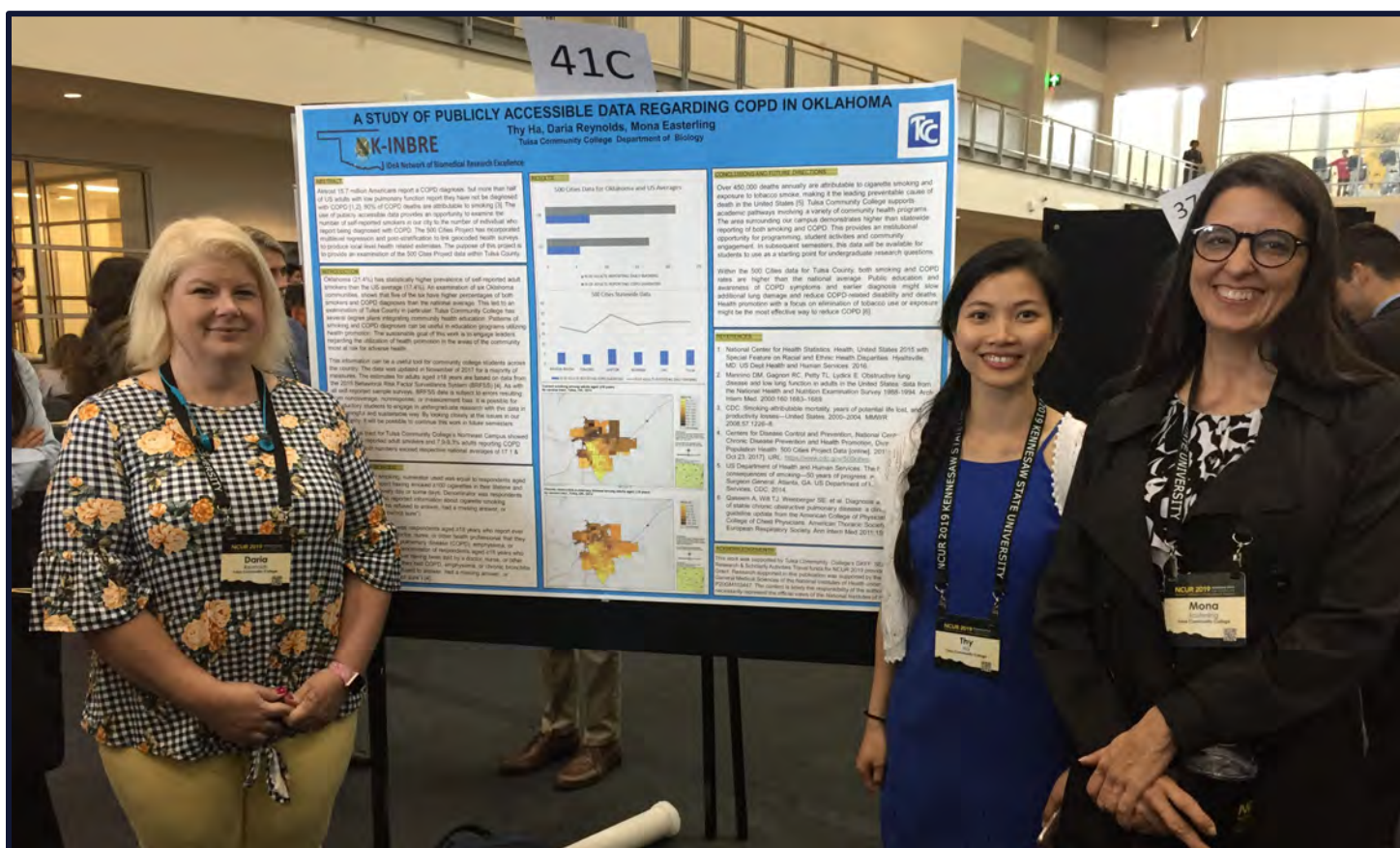
STUDENT

“When I walked into the Convocation Center at Kennesaw State University, I was so overwhelmed and emotional by the vast room filled up with all the students and faculty members from over 40 states and some foreign countries.”

I felt grateful for the wonderful opportunity to attend NCUR 2019, and it was also a great learning experience. When I walked into the Convocation Center at Kennesaw State University, I was so overwhelmed and emotional by the vast room filled up with all the students and faculty members from over 40 states and some foreign countries. It was the biggest event that I have ever attended in my life. I learned a lot from this national conference. It opened my views about my academic and career goals. I am usually an introverted person, and English is my second language, so talking to people is not something that I am used to. However, while attending NCUR, it improved my confidence and social skills. I admired the work and passion of the students on their research and oral presentations. I loved and was also amazed by the poster presentations with the various topics. I found two posters that caught my interest. One was “Rescue Dosing as a Standardized Treatment Protocol for Neonatal Abstinence Syndrome to Decrease Length of Hospital Stay” by Mallory Lanier. I learned the importance of helping babies whose

mothers were addicts while pregnant. This topic evoked my passion and made me more determine about my career goals towards a neonatal nurse practitioner. Another topic was "Environmental and Anthropogenic Factors Affecting Coral Health" by Kristin Jones. This topic opened my eyes on the effect of sunscreen chemicals (oxybenzone or octinoxate) on the coral reefs and how damaging they are to marine ecosystem. I also gained new knowledge from my Professor (Mona Easterling), other faculty members, fellow peers, and other students at the conference. This trip was an unforgettable experience and it taught me a lot about communication of research which can reveal many new topics to better improve the world through dedication and teamwork.

Thy Ha



FACULTY

"This trip will be impacting my teaching for years to come!"

Due to an OK-INBRE travel grant, I was able to travel to NCUR 2019 with student presenters. This was an exceptional experience for me, and it provided me with the opportunity to travel with former instructors of my own – Professor Mary Phillips, Dr. Sloan and Dr. Spencer. The conference was graciously hosted by Kennesaw State University in Georgia. There was much to see and do on their lovely campus.



Thursday began with plenary speaker, Dr. Alistair Dove whose conservation work in marine biology was inspirational! It was energizing to hear about the long-term impacts of his whale shark research. Several members of our travel cohort attended oral presentations following the plenary session. "The Integration of Science and Theater: Creating the Science Play Digital Catalogue" exposed us to an undergraduate research project accessible to the classroom via the web (<http://scienceplays.org/>). "Ableism in Theatre: Sensory Disabilities in Performances for Young Audiences" gave me some great tips for increasing awareness of ableism in my own presentations.

Following this session, there was time to lunch with the entire group and a visit the NCUR student Art Exhibit. An interactive Art Competition allows for participants to vote online for a piece representing the Civil Rights Movement. There were artist biographies and short video presentations about each piece. I was delighted to visit this exhibit with students and cast my vote for the competition.

Kennesaw State had hundreds of volunteers keeping the campus green exciting with song, dance and flash mobs. This was very entertaining on the way to poster sessions. I was amazed at the work of TCC graduate Christy Eslinger, as she presented on Global Demethylation Attenuates Glutaminase and Nerve Growth Factor in Tribs-Induced Colitis. This work involves impacts IBS through a pharmaceutical currently used to treat cancer. Another TCC student, Kadin Falkensten, presented on Viability Assay & Potential Effect of E-juice on Rat Lung Cells.

After Thursday sessions wrapped up, I was able to travel to dinner with two of my former students, Thy Ha and Daria Reynolds. This time for discussing the experiences of the day was incredibly valuable. It is humbling and invigorating to see the work of other students from across the country. Early the next morning, the group attended Zero Waste Initiative: Waste Audits for a Sustainable Campus an oral presentation by TCC student, Justin. There was time for me to visit the art museum on campus before the next session. I was very inspired by the work of Hicham Berrada that included videos of chemical reactions and mercury manipulated by air. It made me consider possibilities for my students to explore the intersection of science and art. This is one of my primary takeaways from the conference. It seems this addition of an art component would be a wonderful option for many students. This knowledge from the science plays presentation and the art of Mr. Berrada is what I plan to bring back to the classroom.

The final poster presentations of the day wrapped up our Friday. This was followed by a dinner full of laughter and collegial sharing. All faculty members who attended embraced and expanded the learning of others each time we met as a group. I am so grateful for the opportunity to attend a national conference with both students and colleagues. This trip will be impacting my teaching for years to come!

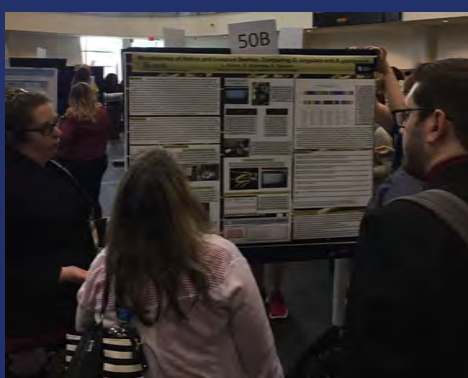
Mona Easterling

FACULTY

"The collegiate atmosphere and diversity of presentations, faculty, and students make NCUR one of my favorite and memorable conferences."

The collegiate atmosphere and diversity of presentations, faculty, and students make NCUR one of my favorite and memorable conferences. NCUR 2019 was an inspiring and motivating experience. I always leave the conference renewed with new ideas for my courses (Data mining, surveys, science plays - <http://scienceplays.org/>). I plan to offer science plays (performance, review, research) as a project option and perhaps collaborate with TCC's theater department. That would be fun!

This is my third NCUR conference attendance and second bringing students. I am grateful to Dr. Diana Spencer for leading by example and broadening our research experience. Thank you! I could not have done it without you! I appreciate and thank the TCC Foundation, Engaged Learning, and OK INBRE grants for the funding to share this life-changing opportunity with my student, Rowan Stevens. Rowan's study focused on assessing *Daphnia*'s heart rate using substances such as CBD oil and exposure to G-forces. "The idea was to show which of these substances would be either beneficial or detrimental to the physiological systems of humans and other animals during the rocket launch stage of space flight." Rowan's project and presentation were impressive. I am honored to have been Rowan's mentor. Rowan later shared that an instructor who listened to the presentation wanted to use the experiment in her courses. WOW!!! What's next? Rowan will need to publish this one!



The plenary sessions were entertaining and informational. I was unaware of how much more there is to learn about the lifecycle of whale sharks (Dr. Alistair Dove). We met Dr. Dove while listening to student posters and asked him to come to Tulsa. He would love to visit and give a presentation. Diana, Cindy, let's bring him to Tulsa! Dr. Valerie Montgomery-Rice shared about health equity awareness. My takeaway - Equity is not the new buzz word but a call to action.

A big thank you to all the students and faculty who made this trip a fun and memorable journey. All students did an exceptional job and represented TCC well. I was so proud to be part of this amazing group.

Here we are hiking to dinner! This group is not deterred by obstacles and challenges. Let's plan for NCUR 2020!

Mary Phillips

FACULTY

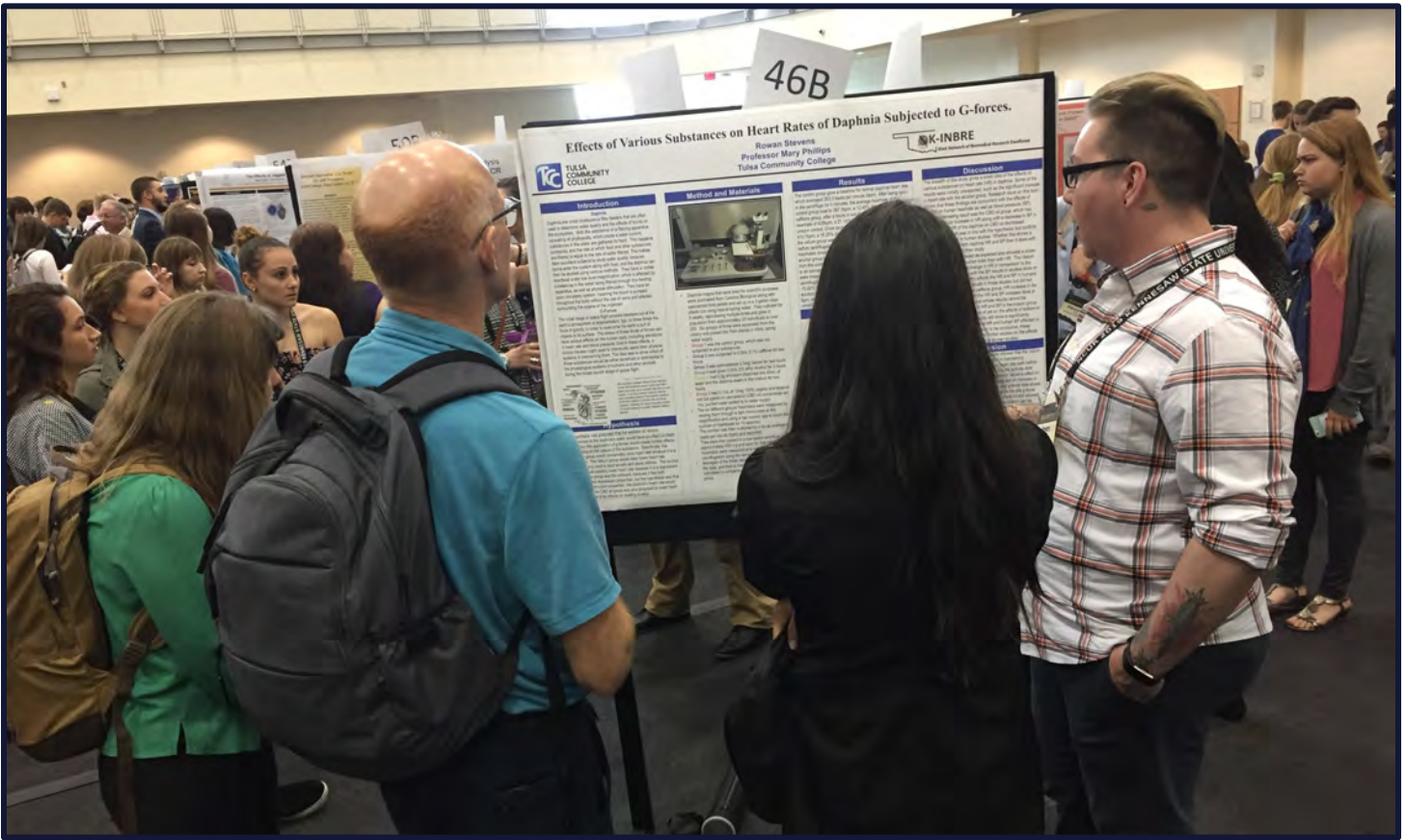
"It is about the process--not the product."

I came to NCUR overwhelmingly grateful for the opportunity and eager to learn ways I can incorporate the high impact practice of undergraduate research in TCC's Interpreter Education Program. I found TCC's SEARcHH and ASPIRE faculty group at the 2018 Stayonference where Dr. Spencer presented. Through my participation with this group during the 2018-2019 academic year I have been consistently inspired by the outcomes my colleagues are accomplishing as they embed undergraduate research into their courses and mentor TCC students to the point of poster presentations and oral presentations at state and national conferences. My goal in attending NCUR is aptly summed up by the conference theme: "Engage, Explore, and Experience."

A significant part of my engagement at NCUR were the presentations geared toward faculty. I attended every Faculty session I could through taking notes, asking questions, and making a personal list of action items to follow up on the workshop. The first session was, Filling the gap: Improving access and assessing the impact of undergraduate research by Catherine Chan and Lavar Charleston of the University of Wisconsin - Whitewater, where I was reminded of the importance of using assessment to inform and justify teaching practices. The speakers' applied this principle throughout their presentation which began with questioning the list of high impact practices, that are often taken for granted as being effective, and demonstrated how in their program the high impact practice of research is having significant impact on retention.

Secondly, I attended Transformative Meaningful Learning Experiences in Undergraduate Research by Leann Laubach and Barbara Arnold from the University of Central Oklahoma, where Laubach and Arnold demonstrated some effective experiential learning techniques to teach research methodology, design, and foundational concepts such as plagiarism. A big bonus is these activities involved origami and legos! I found connections between their discipline, nursing, and mine in that both fields espouse evidence-based practice. I left with some practical activities to use in class and an encouragement that undergraduate research is necessary for interpreting students!

Next, I attended Converting courses in Undergraduate Research Experiences by Gregory Young, DMA, of Montana State University: Undergraduate Scholars Program, where I learned about a series of books on undergraduate research that Routledge is publishing.



This project was a response to a void of resources for faculty teaching undergraduate research in the fine arts. This was particularly inspiration to me as there was no representation from my discipline at NCUR; there is a clear need for interpreting resources and research to be done and shared! Dr. Young's specialty is in fine arts, more specifically music with a clear connection between music and interpreting in principles of practice. When I posed the question to Dr. Young of experiencing any resistance to his student's work in undergraduate research as a deterrent to necessary practice his response of, "Can we as faculty develop a value of the process of inquiry over the covering of content?" resonated deeply with me. Interpreting students must be lifelong learners and I left this workshop with a deeper appreciation of the potential impact research can have on students!

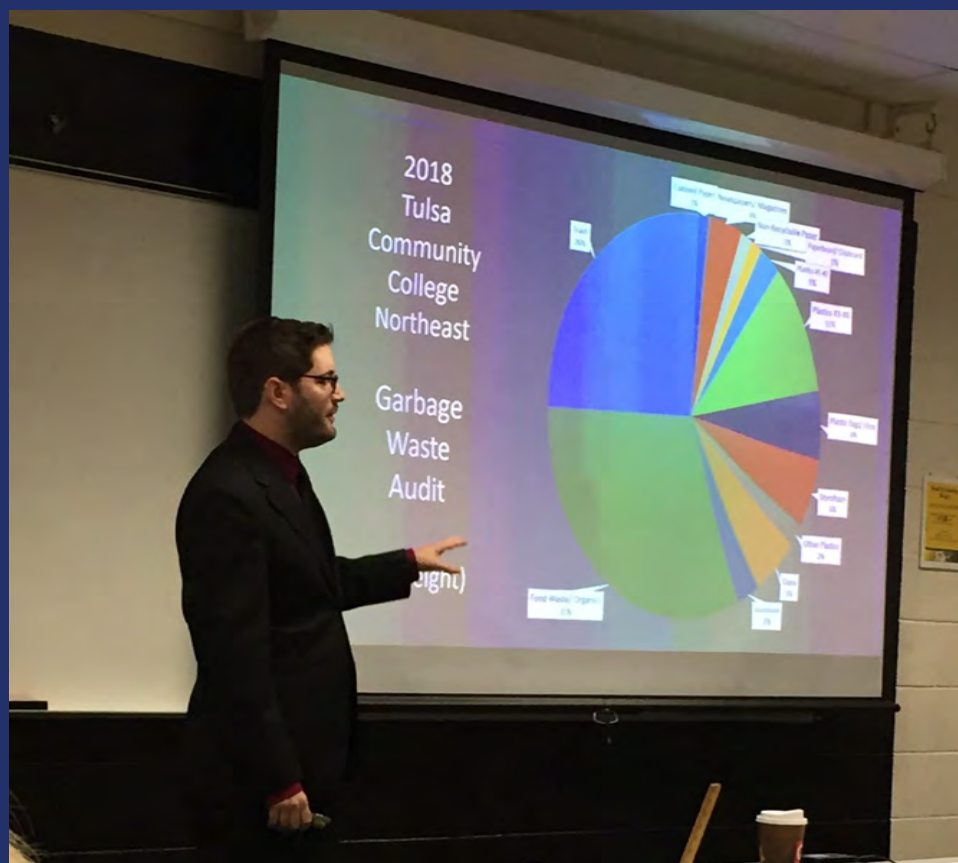
Finally, because I teach an internship course, I chose to attend "Applied Research as a Bridge Between Theory and Practice" By Elizabeth Martin-Malikian, Ameen Farooq, and M. Saleh Uddin from Kennesaw State University. Their work is in architecture and I saw great connections between their discipline and interpreting in the profound impact of context on decision making for architects and interpreters. I was impressed with their sequencing of courses and supporting students on a grand thesis project through three semesters!

Exploring the student oral and poster presentations was significant motivation for me to design a project to add to my program. It was a joy to see first-hand TCC students and their counterparts from universities across the country sharing both the culmination of their work and their first stepping stones toward future research and further studies. While

traveling and sharing meals with TCC students I took the opportunity to learn from them first-hand what their experience throughout their research projects were like, what barriers they had encountered, how they overcame them, and their future plans for education and employment. These students' worldview has grown through their engagement, exploring and experience with research.

My experience at NCUR and my future students' undergraduate research is about the process not the product. While flying home to Tulsa from the conference I drafted a topic, research question, methodology, and timeline for an undergraduate research project for one of my courses. This is something I have been working toward over the last twelve months but until my opportunity to engage me, explore, and experience at NCUR I had made very little progress. I am more optimistic than ever that this project will be transformative for future TCC interpreting students.

Rhoda Smietanski



FACULTY

"This was an excellent conference and I learned so much from it. I am very grateful to have had the opportunity and I hope that I can attend NCUR 2020 with a student of my own to present research!"

My goal at NCUR was to get an idea of what type of research is being done at other colleges and universities. I wanted to get a better understanding of what level of research is appropriate for undergraduates, since I am a new faculty member and have no experience in this area. It was wonderful to see that, while some projects were very complex, others were quite simple (but no less exciting). This was very encouraging as my biggest worries with undergraduate research were: would a simple project completed in a semester be acceptable, and if the project is simple, will students get much out of it. After visiting several poster presentations, I was able to tell that even the simplest projects are very beneficial to students, as they are allowed a bit of control in the questions they ask. This autonomy gets them out of their shell and inspires them to dig deep into their work, and as a result they are proud of the work they accomplish.

During the conference I went to a chemistry specific faculty session that discussed what type of research projects were appropriate for the classroom and how one could implement research in the classroom. This session addressed everything I needed to know. During this session I realized that at this stage in a student's academic career, they will get far more value from a project that engages them in the research process, and the project itself does not need to be novel. An appropriate research project should get students thinking about posing a question, forming a hypothesis, researching literature, designing an experiment and analyzing data. Our goal is to get the students to develop their critical thinking abilities to prepare them for the future.

This also gave me the opportunity to speak with other chemistry faculty and see how they have incorporated research into their classes. I got a lot of great ideas from these interactions. Initially, I thought that the limited instrumental resources at TCC would make doing research impossible, but after discussing how others have made do with similar limitations I was inspired. One of the people in my group (we were split into groups in the session) said "you can titrate anything." This got me thinking about simpler experiments where students might try to determine the pH of soil samples or collect samples of water and test for contaminants. I realized there are plenty of projects that students can do without the need to use expensive instrumentation. These projects would be easily relatable to the material covered in class and achieve the goal of getting the students to think critically about a problem. This was an excellent conference and I learned so much from it. I am very grateful to have had the opportunity and I hope that I can attend NCUR 2020 with a student of my own to present research!

Eric Butson

STUDENT

"The quantity of research was overwhelming, but the quality was exquisite."

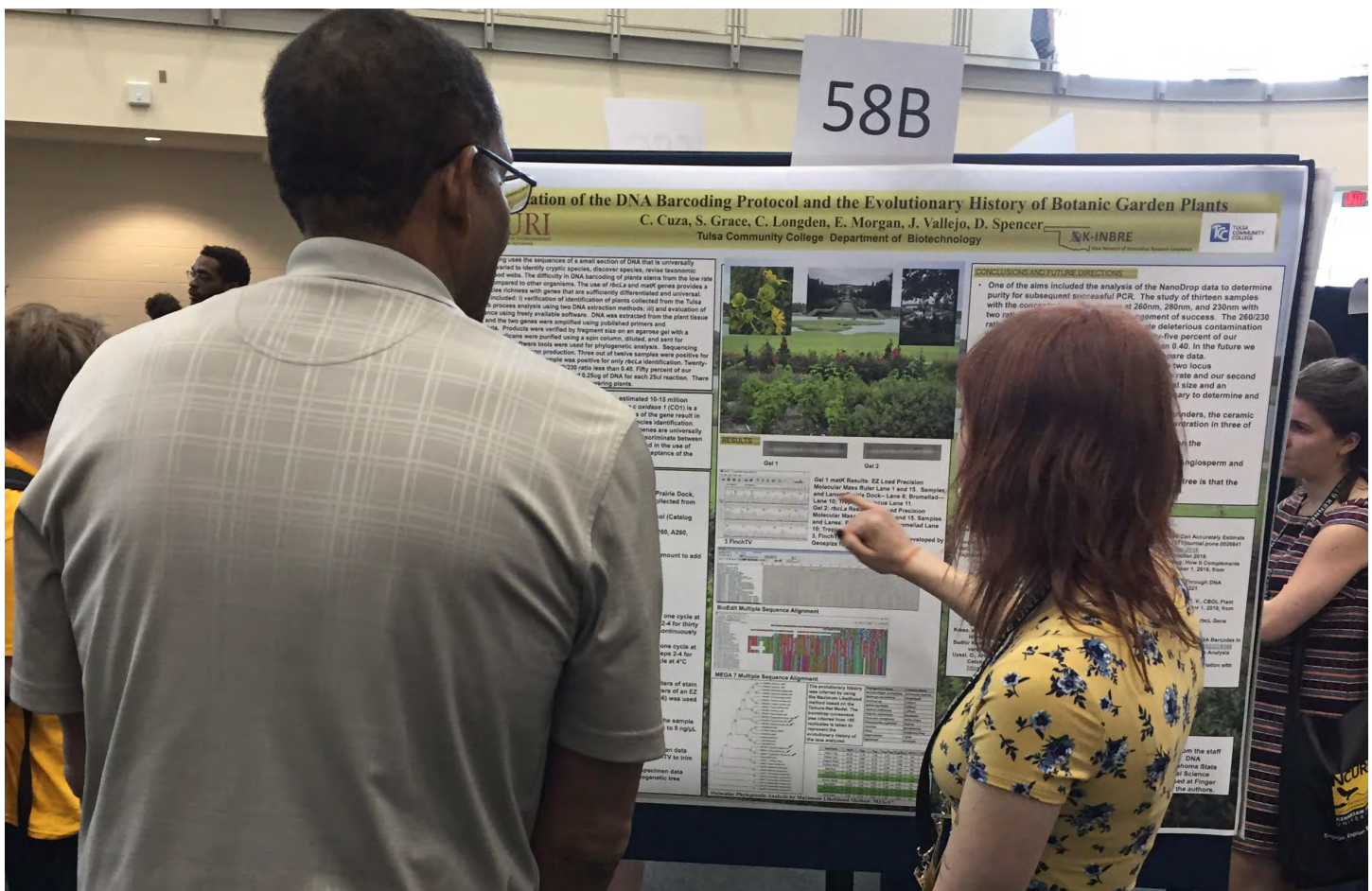
This was my first ever flight trip and it was so exciting. Kennesaw State University was a beautiful, large campus full of art and wonderful, nice people that were very helpful and inviting. The presentations that I saw and heard were all very well done and helped me learn a lot about new things in my own field of biotechnology and in other fields like

literature, history, film, and healthcare. The quantity of research was overwhelming, but the quality was exquisite. I never realized how much an undergraduate could contribute to research, especially in a school setting. Presenting my own work was a wonderful experience as well, especially when I had people who were very excited about the research I had done and asked to take pictures of my poster. It made me feel like I had made a valuable contribution to current and future research. Outside of NCUR events, Atlanta was beautiful and lively; greenery and flowers everywhere, wonderful restaurants and shopping centers. I'm so glad that I got to travel to a new state and explore, learn, and grow as a person. I'm very thankful to OK-INBRE for funding the trip, and I hope to be able to contribute to research and attend NCUR again in the future.

Isabella Hadley

STUDENT

“Attending NCUR has strengthened my desire to attain a job that involves research and has made me feel a new energy for doing research.”



After going to NCUR, my thoughts on research have been changed for the better. I now feel more confident in presenting research, as well as having a better grasp on what presenting research in a poster session involves. Attending NCUR has strengthened my desire to attain a job that involves research and has made me feel a new energy for doing research.

The most impactful moment of the whole trip for me was seeing the size of the event and gaining an understanding of just how many people are doing research on a broad range of topics. While only a few of the presentations really “stood out” to me, just seeing the wide range of research being done in every field of study was inspirational.

Kadin Falkenstein

STUDENT

“Observing the diversity in research and learning how fortunate I am to be a part of a school that includes research within the class setting was quite an eye-opening experience.”

I'm so grateful for the gift to attend this year's National Conference of Undergraduate Research. During the trip I learned quite a few things such as why Egyptians don't smile and how unknown the reproduction and life of a whale shark is. I was able to attend a free art museum that showcased art from people with hearing disabilities. Observing the diversity in research and learning how fortunate I am to be a part of a school that includes research within the class setting was quite an eye-opening experience. Thank you for funding me and thank you for giving me this opportunity to learn and enjoy an adventure within the science community. I will be forever grateful to all that made this trip happen and supported my research. Thank you so much.

Erin Nikki Morgan

STUDENT

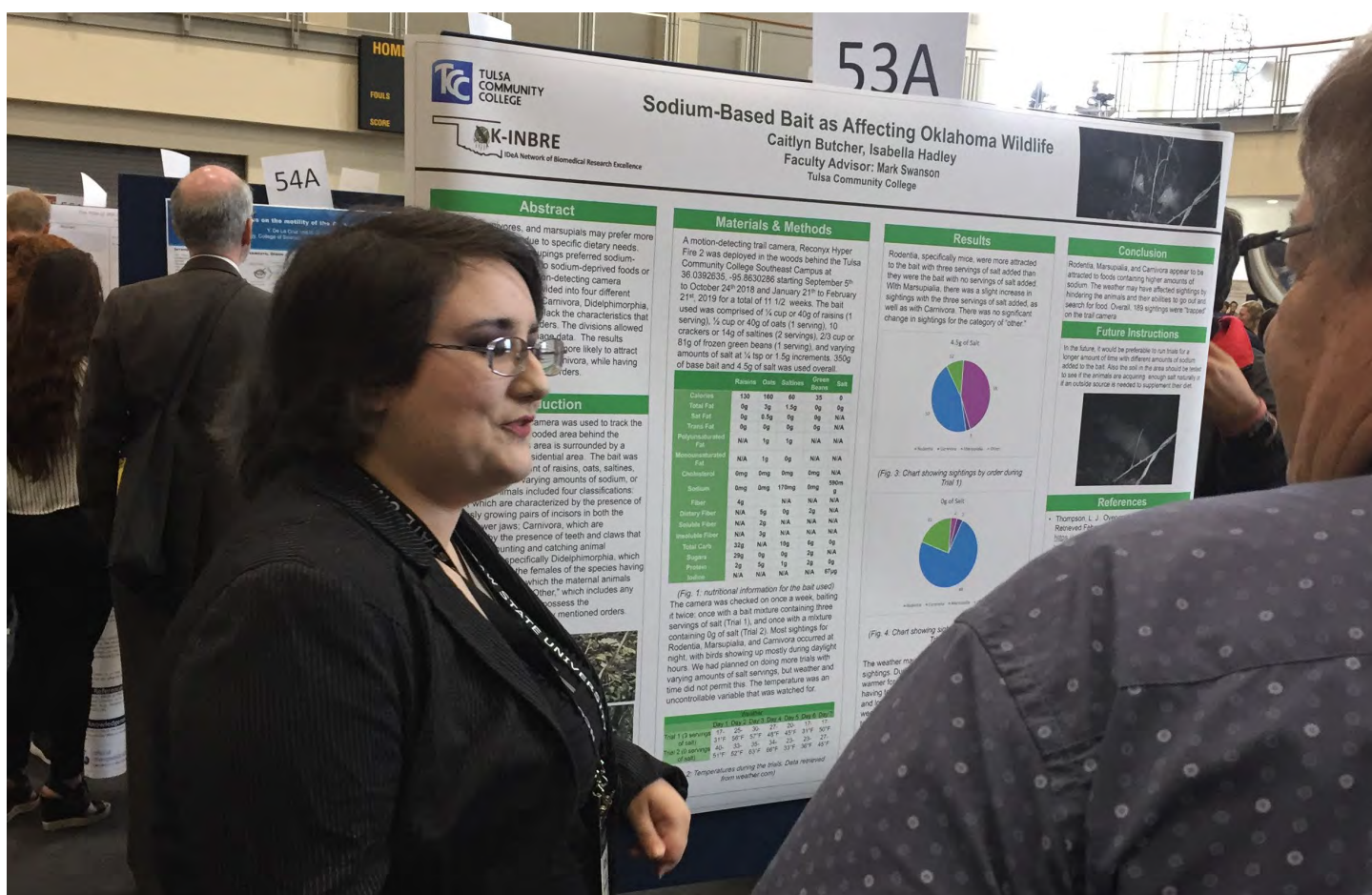
“There was clearly some great work being done in many areas on the undergraduate level.”

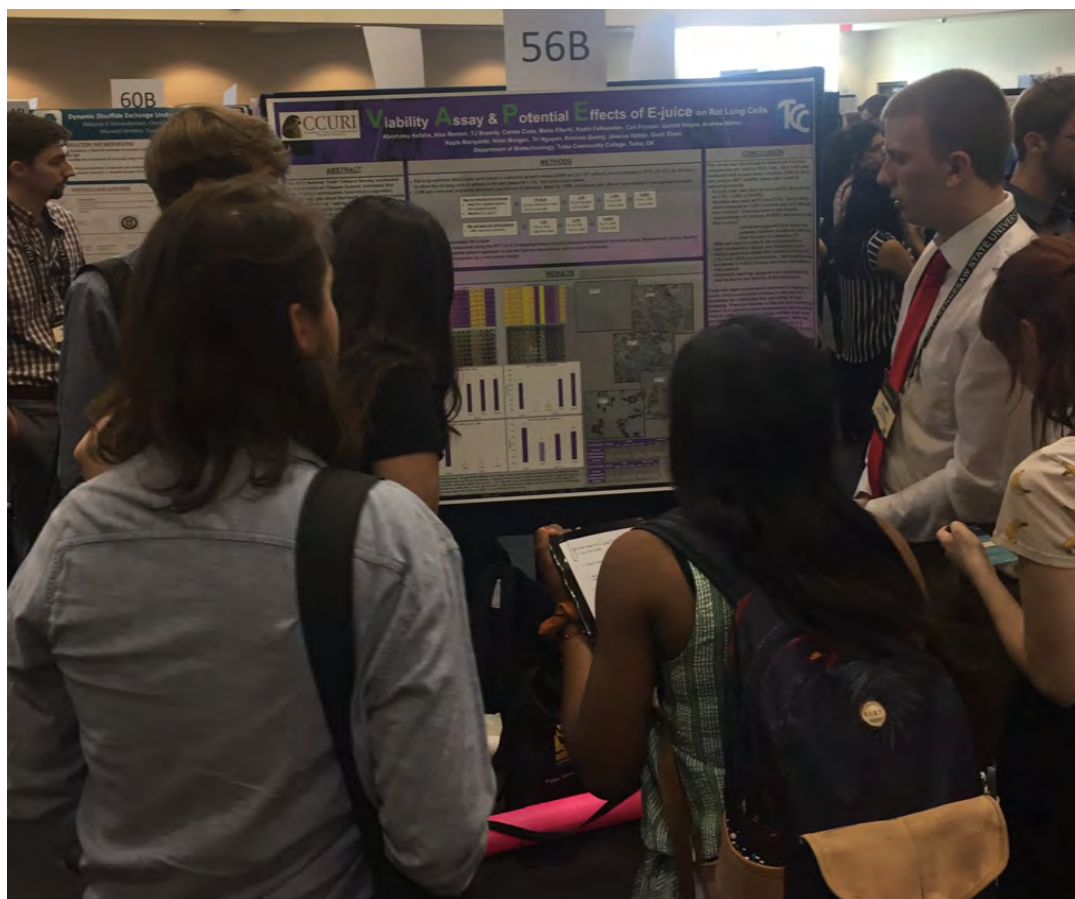
My immediate reaction to seeing student poster presentations was surprise at the huge array of topics being studied. From advertising, to social justice, economics, biology, chemistry and more. Some poster designs were non-traditional, but most followed an established format. All the students looked eager to talk about their work; some managed a small crowd with ease. The environment was very informal, so it was easy to walk right up and hear about their project. Some projects were very complicated, involving dozens

of brain scans (although it was not conducted by the poster author), while others were simpler, like seeing which pollinators came to certain flowers in one geographic area. There was clearly some great work being done in many areas on the undergraduate level.

I enjoyed sharing my research with people who stopped by my poster. In particular, one observer actually worked in the lab of one of the scientists whose work I cited; that was a highlight for me. She said she would share my work with the aforementioned principal investigator, which was very kind. I enjoyed the informal nature of the gathering, and engaging in Q & A. I did my best to put my research in layman's terms for those without a background in biology, as students in other areas had done for me. All the comments and questions I received were insightful and kind; everyone seems to be out to help each other, not pick everyone's work apart. I feel that my experience listening to presentations has reinforced interests I have in ecology, ornithology, microbiology, and field work. I definitely think my path forward in research and education will include those touchstones. I am very thankful for the opportunity to attend NCUR, and I would love to be able to continue to expand my knowledge and experience through more research and more conferences!

Lydia Ostmo





STUDENT

***“Now after being exposed to the wealth of research at NCUR
I have merged (my passion and my major).”***

I wanted to thank those responsible for the student trip to the National Council of Undergraduate Research. I have worked towards my passion for sustainability here at TCC, but I have not witnessed research in my major Computer Information Systems/Computer Science. While examining the amazing variety and quality of research performed at NCUR I was able to find a path to combine the two. I had previously spent my time on divergent goals, one my passion the other my major. Now after being exposed to the wealth of research at NCUR I have merged them. My goal is to satisfy my need to save our planet for the next generation using the advanced techniques of computer science to achieve these goals. My next project will dwarf my current contributions to student research. I have NCUR and the funding agencies to thank for this. Thank you.

Justin West

FACULTY

“Before attending the conference, it is difficult to imagine what more than 4000 projects of research looks like with presentations occurring within 2.5 days.”

It is always thrilling to share with a new group of faculty members and students the depth and breadth of undergraduate research found at NCUR. Before attending the conference, it is difficult to imagine what more than 4000 projects of research looks like with presentations occurring within 2.5 days. The dynamism throughout the campus with the rooms full of energized students and faculty reverberate constantly. Art projects were being created in real time, and flash mob dances were surprises to enjoy. We were able to share a first-time air flight with a student, and we were able to host our first TCC student giving an oral presentation at NCUR. The poster presentations always provide a learning experience for the student presenters, and the growth in confidence of reviewing work and sharing with peers and visiting professors is always invigorating. I enjoy standing back and watching my students present their novel research. One student was ecstatic as one of the publishers of the most cited paper on the poster had a lab-mate of that study send a picture of the poster to the author! A compliment such as this is exhilarating for a student in that one's work is valued by experts in the field. I also enjoyed watching two of our newest faculty maneuver the offerings and arrive home with plans for research opportunities that they could provide in their own courses. A previous graduate of the research opportunities at TCC returned to a second NCUR experience with research from her four-year institution; she was invited with an expense-paid trip to an academic lab in Michigan to discover if perhaps she might join the lab for her funded doctoral studies! Sharing the convention, planes, trains, automobiles, hotels, meals, exhaustion, and jokes creates a bond and experience that are not matched by many educational experiences. Lines between faculty and students dissolve as all become insatiable learners in a community. Research experiences and NCUR always delivers and pushes us all to continue exploring the high impact practice of scholarly investigations.

Diana Spencer

