



THE RANDOLPH COLLEGE  
SYMPOSIUM OF  
**ARTISTS**  
AND  
**SCHOLARS**

April 18 & 19, 2019

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# Welcome

Dear Symposium Attendee,

Welcome to Randolph College's 11th annual Symposium of Artists and Scholars. We look forward to this event highlighting the wide spectrum of liberal arts outcomes and experiences nurtured here at Randolph College.

The presentations and posters featured during this symposium represent the diverse disciplines we offer and exemplify the learning that takes place every day. Thanks to the dedication of our nationally ranked faculty members, students have opportunities to develop skills through mentorships with faculty as well as partnering with their professors for important research projects.

Randolph College prepares students to engage the world critically and creatively, live and work honorably, and experience life abundantly. Since the College's founding in 1891 as Randolph-Macon Woman's College, this institution has remained dedicated to providing an excellent liberal arts education focused on one student at a time. Nearly 130 years later, our students continue to inspire their classmates and faculty to stretch boundaries, spread compassion, and become significant contributors to their communities.

I thank the committee who collaborated on organizing this symposium and the nominated students who agreed to share their projects. We appreciate the dedicated faculty members who consistently venture outside of the classroom to foster and nurture individual scholars and artists. This collegiality is key in making the symposium the outstanding program that it is today.

I am sure you will enjoy this year's Symposium of Artists and Scholars.

Vita abundantior,  
Sincerely,

A handwritten signature in black ink that reads "Bradley W. Bateman".

Bradley W. Bateman  
President

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# SCHEDULE

THURSDAY, April 18, 2019

## ORAL PRESENTATIONS

**Session 0:** 4:30 p.m.-5:45 p.m.

Nichols Theatre, Student Center

- Presley Pippin, "Does the Sum of First-Grade Students and Math Vocabulary Equal Acquisition?"
- Skylar Pippin, "Teamwork Makes the Dream Work- Cooperative Learning in Second Graders"
- Courtney Hughes, "First-Generation College Students: The Effects of Involvement on the College Experience"
- Katherine Phillips, "Alternative High School Classroom: Hands-On Learning in Science"
- Meghan Moran, "Don't Choke!: Reducing Student Assessment Anxiety through Expressive Writing"

7:00 p.m.-8:00 p.m.

Nichols Theatre, Student Center

**KEYNOTE:** *"We had a splendid suffrage movement in Virginia: The women's suffrage movement at local, state, and national levels"*

Karen E. Campbell '77

Vanderbilt University Professor of Sociology, Emerita

Randolph College Board of Trustees, Emerita

FRIDAY, APRIL 19, 2019

SAS Luncheon (for confirmed guests) 11:45 a.m.-1:00 p.m.

Smith Banquet Hall

## ORAL PRESENTATIONS

**Session 2a:** 3:00 p.m.-4:00 p.m.

Nichols Theatre, Student Center

- Alyssa Horton, "Redefining Masculinity through K-pop"
- Thinh (Bill) Pham, "Comparing the Quality of Rainwater Collected from Roof-level and Ground-Level Surfaces"
- Erika Edwards, "Benefits of Using Humor in the Classroom"
- Rebekah Griffith, "Let's Get Real: Authentic Assessment and its Influence"

**Session 2b:** 3:00 p.m.-4:00 p.m.

Quillian Conference Room, Student Center

- Samantha Dickerson, "The Effects of Probing Questions and Concept Maps on Vocabulary Acquisition"
- McKenzie Givens, "Enter the Galaxy of Reading: Become a Shooting Star"
- Williams Owsley, "Sit Down! Hold Still! Be Silent! You are taking a test"
- Georgie Roark, "Cultivating Collaborative Learners: Incorporating Agriculture in the Classroom through Cooperative Learning"

## ORAL PRESENTATIONS continued

[Ice Cream treats served 8:00 p.m.-8:15 p.m.]

**Session 1a:** 8:15 p.m.-9:15 p.m.

Nichols Theatre, Student Center

- Katherine Horne, "I Like to Move It, Move It! Learning Through Movement"
- Joshua Yeast, "Inquiry-Based Learning: It is Time to Get Curious"
- Stephanie Quirk, "Active Learning and Memory in the Classroom"
- McKenzie Schmitt, "Five, six, seven, eight!" Integrating Dance into Mathematics"

**Session 1b:** 8:15 p.m.-9:15 p.m.

Quillian Conference Room, Student Center

- Brian Anderson, "What Teachers Believe and How It Affects Students"
- Nicole Monroe, "Is Inquiry Just for Science?"
- Allison Hart, "MATLAB Modelling of Water Quality from Rainwater Harvesting Systems"
- Tori Green and Sarah Wardlow, "The Effects of a Kudzu Root and St. John's Wort Combination on Ethanol Intake"

## **POSTER/EXHIBIT SESSION AND RECEPTION**

**4:15 p.m.- 5:15 p.m.**

Hampson Commons | Enjoy some savory *hors d'oeuvres*

- Marie Abowd, Tyrah Cobb-Davis, A. J. Elliot, "Campus-Community Social Equity Resilience Assessment"
- Mackenzie Ambrose, "Food Rescue and Distribution in Portugal"
- Amadou Beye, "Interning in Vietnam"
- Anh (Jessica) Bui, San Hoang, Dung Nguyen, and Leo Cohen, "Lynchburg Neighborhood Database Initiative (LNDI): A Pilot Study"
- Alexander Clem, "System-Safety Engineering: Mitigating to Save Lives"
- Austin Collier and Bryan Hue, "Development of an iOS Application"
- Damien Douglas and Joshua Yeast, "Teaching Math and Science in a Changing World"
- A.J. Elliott, "Professional Certificate in Geographic Information System and Internship with Kelley Deetz"
- Katherine Gibson, Rachel Lee, Shannon McQuaid, and Sarah Reed, "Campus-Community Ecosystem Services Resilience Assessment"
- Rebekah Griffith, "Project Food Rescue: Portugal"
- Samantha Hablas, "Experience in Portugal: Serving Food Insecure Populationsand Beyond"
- Andrew Hayden, Emad Davis, and Mengjin Sun, "Creating a Digital Environment that Increases Research's Accountability and Communication"
- Andrew Hayden, "Creating a Real-Time Thermal Video Display in the Front Lobby of the Martin Science Building"
- Bryan Hue, "Literature review on Rainwater Harvesting Systems"
- Courtney Hughes, "Alternative Spring Break: Portugal"
- Keyu Jin, Niles Brown, and Priscilla Ranjitkar, "Campus-Community Health and Wellness Resilience Project Assessment"
- Joddy Misidor, Ranita Sarfo, and Renee Sarpong, "Bee Friendly Virginia Native Plants"
- Thanh Tung (Adam) Nguyen and Thinh (Bill) Pham, "Multidirectional Binaural Audio"
- Thanh Tung (Adam) Nguyen, "TAS Lab Assistant RISE Internship"
- Michaela Saunders, "Transitioning with Song: How It Affects Transition Length and Student Readiness"
- Jordan Sheets, San Hoang, Keyu Jin, and Canaan Taylor, "University of Reading: Study Abroad"
- Marvin Shockley, "Nazi Architecture Used as Propaganda and the Effects of National Socialism"
- Yuriy Snyder, "Multiscale Modeling of a Functionalized Surface Catalyst for Hydrogen Peroxide Production"
- Meagan Swithers, "Questioning Questioning: An Exploration of Intentional Questioning"
- Arnav Upadhyay, Elizabeth Exline, Margaret Van Beek, Maya Wheeler "Campus-Community Infrastructure Resilience Assessment"
- William Vernon, "The Utilization of Computer Vision for the Measurement of Kinematic Motion in the Classroom"
- Andrew Young, "Campus-Community Economic Resilience Assessment"

# 2019 PRESENTATIONS

## **Marie Abowd '19, Tyrah Cobb-Davis '19, A. J. Elliot, '19**

"Campus-Community Social Equity Resilience Assessment"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

Institutions, businesses, and communities are incorporating resilience strategies as an essential element of climate action planning to help prepare for the adverse impacts of climate change. In January 2017, President Bateman made Randolph College a signatory to the Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our Central Virginia community to develop goals and strategies to address resilience as part of climate action planning. In an effort to achieve these objectives, the Spring 2018 EVST 315 Energy & Society class conducted an assessment of campus-community resilience. Our team evaluated key resilience indicators in the dimension of social equity, determining areas of strength and vulnerability. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

## **Mackenzie Ambrose '21**

"Food Rescue and Distribution in Portugal"

Staff Mentor: Amanda Gelber, Assistant Director of Campus Life

On my Alternative Spring Break trip, I traveled outside of the country with several other Randolph College students to participate in a service project in Portugal. During this trip, we packaged and distributed food to those in need within the local communities. This opportunity gave me the chance to immerse myself in an unfamiliar country and culture while also working with others to make a positive impact. I will present my interpersonal experiences as well as those I had with the other students and the mentors on the trip. This trip helped me expand my understanding of cultures outside of the one I have always known while also exploring my personal values.

## **Brian Anderson M.A.T. '19**

"What Teachers Believe and How It Affects Students"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

Have you ever taken a test on something you knew almost nothing about and still managed to get a good grade? The reason for this might be your use of test taking strategies. Test taking strategies are non-content strategies used during tests to help improve performance. For years, students have experienced classic test-prep instructions similar to "underline key words, use a highlighter, cross out wrong answers;" however, what happens when such strategies are no longer effective for students in the digital age? Through teacher and administrator interviews and analysis of students' test scores, my action research explored teachers' attitudes and instructional methods for test-prep strategies amidst an ever-changing area of testing. As schools enter a more technological era of testing, it is important for

teachers and students to investigate and re-imagine test taking strategies to improve overall academic performance.

## **Amadou Beye '19**

"Interning in Vietnam"

Staff Mentor: Maegan Crews Fallen, Internship Director

Grant Thornton (Vietnam) Limited is an independent member firm of Grant Thornton International. Grant Thornton Vietnam provides professional services such as Audit, Tax, Advisory, and Outsourcing. In summer 2018, I was their Advisory Intern so that I could supplement my career potential and possibly join Grant Thornton's firm after I graduate. I learned about the objectives of the process of due diligence which will be the focus of my presentation.

## **Anh (Jessica) Bui '20, San Hoang '20, Dung Nguyen '18, and Leo Cohen**

"Lynchburg Neighborhood Database Initiative (LNDI): A Pilot Study"

Faculty Mentor: Dr. Elizabeth Perry-Sizemore, Economics

The Baltimore Neighborhood Indicators Alliance (BNTA) is an almost 20-year old project managed by the University of Baltimore. BNIA collects, organizes, and publishes available neighborhood-level data that is helpful in determining the well-being of communities within Baltimore. The BNIA has identified eight "Vital Signs," or categories of neighborhood well-being, and for each, a multitude of indicators, or variables that allow for exploration of that vital sign. Desired data can then be pulled for cross-sectional, time-series, and panel analysis. The purpose of this project is to pilot the development of a similar database for Lynchburg, Virginia and to collect, analyze, and share early findings about variations in Census Block Group indicators across the city.

## **Alexander Clem '19**

"System-Safety Engineering: Mitigating to Save Lives"

Faculty Mentor: Dr. Peter Sheldon, Physics

System Engineering is the design and management of complex systems. System Safety-Engineering is a branch of System Engineering that involves the analyzing and mitigating of risk during the design and production process to ensure proper risk management. This can be done by the identification of hazardous situations that might crop up during complex system processes that can lead to a mishap. A mishap has a level of possibility versus severity known as risk. Everything has an associated risk and it is the System Safety Engineer's task to ensure the risk management and identification processes are being conducted thoroughly and properly in coherence with established safety guidelines. The importance of this kind of engineering is critical as identifying and mitigating risk during the design and production process saves not only resources, but also lives. I will discuss my work on safety engineering at the Naval Surface Warfare Center: Dahlgren Division.

**Austin Collier '19 and Bryan Hue '19**

"Development of an iOS Application"

Faculty Mentor: Dr. Jia Wan, Mathematics

We developed a farming game on iOS systems for our Software Development class. In the game, users can plant different types of crops, sell what grew in their fields, and pay for higher tier crops with their profit. The project required design of the game, completion of the system specification documentation, implementing features by programming skills, product testing, and maintaining. During the process, our team has been exposed to exploring languages and programming tools such as Swift, Xcode, and GitHub. The development process significantly expanded our knowledge of developing on mobile devices and enhanced our experience of team programming.

**Samantha Dickerson '19**

"The Effects of Probing Questions and Concept Maps on Vocabulary Acquisition"

Faculty Mentor: Dr. Crystal Howell, Education

Have you ever thought about how you learned vocabulary as a child? In my previous observations in elementary classrooms, students learned vocabulary through activity sheets, which they did not seem to enjoy. In my action research study, I investigated whether interactive read-alouds and concept maps could support emergent readers' vocabulary acquisition. The study took place in an urban elementary school and included an intervention period of two weeks with a pre- and post- test assessment. In this scholarly discussion, I will focus on how students responded to the interactive read-aloud and concept map intervention when compared to their normal vocabulary instruction.

**Damien Douglas '21 and Joshua Yeast '19**

"Teaching Math and Science in a Changing World"

Faculty Mentor: Dr. Peter Sheldon, Physics; Dr. Amanda Rumore, Biology; and Dr. Peggy Schimmoeller, Education

We report the results of a study in which we gave teachers experience and access to resources to teach hands-on and inquiry-based science lessons in the classroom. This study was conducted to increase teacher content knowledge and comfort with STEM subjects, as well as to eliminate students' and teachers' stereotypical perception of scientists. Participants included forty 3rd-8th grade teachers and 9th grade environmental science teachers, and 63 students from our weeklong summer science camp. The teachers participated in a weeklong institute using inquiry-based lessons across the sciences that they could replicate in their classrooms. The following week, select teachers from the institute were able to try teaching these lessons to students at our science camp. Both teachers and students were given various pre- and post-test surveys to gain an understanding of their comfort level with science and perception of scientists.

**Erika Edwards M.A.T. '19**

"Benefits of Using Humor in the Classroom"

Faculty Mentor: Dr. Crystal Howell, Education

Have you ever wondered how the use of humor in the classroom can affect the level of participation and success among students? In my action research

project, I explored this question with a class of tenth grade English students. Through this study, I aimed to determine the usefulness of humor as a means to increase participation and achievement. In this discussion, I will describe how students used humor, present findings based on their final grades, and discuss the implications of this research for teachers. Come see this symposium about the benefits of using humor in the classroom...it's no joking matter!

**A.J. Elliott '19**

"Professional Certificate in Geographic Information System and Internship with Kelley Deetz"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

By using the information that I gained from Michigan State Geography Department's Professional Certificate in Geographic Information System (GIS) course, I will work alongside Dr. Kelley Deetz to locate possible slave burial sites in multiple areas in Lynchburg. I will be applying skills such as remote sensing (RS), global positioning systems (GPS), and cartography. I will also be using Ground Penetrating Radar (GPR) to look for burial sites and artifacts which could be relevant to Lynchburg's history.

**Katherine Gibson '20, Rachel Lee '19, Shannon McQuaid '20, and Sarah Reed '19**

"Campus-Community Ecosystem Services Resilience Assessment"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

Institutions, businesses, and communities are incorporating resilience strategies as an essential element of climate action planning to help prepare for the adverse impacts of climate change. In January 2017, President Bateman made Randolph College a signatory to the Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our Central Virginia community to develop goals and strategies to address resilience as part of climate action planning. In an effort to achieve these objectives, the Spring 2018 EVST 315 Energy & Society class conducted an assessment of campus-community resilience. Our team evaluated key resilience indicators in the dimension of ecosystem services, determining areas of strength and vulnerability. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

**McKenzie Givens '19**

"Enter the Galaxy of Reading: Become a Shooting Star"

Faculty Mentor: Dr. Cheryl Lindeman, Education

Do you remember studying sight words in elementary school? Do you remember boring activities like writing the words 100 times each? Did you wish you had a fun way to practice them? In our society, most students are tech savvy and use technology in their day-to-day learning. Imagine using a computer based program with fun activities to learn sight words. The goal of this research study was to investigate if a computer based program (i-Ready) increased reading comprehension of first graders by using pre-, weekly, and post-assessments. During the lessons, the students used the flash card drill method to test their knowledge about grade level sight words such as to, the, by, him. Students' performances using two approaches were compared.

**Tori Green '19 and Sarah Wardlow '20**

"The Effects of a Kudzu Root and St. John's Wort Combination on Ethanol Intake"

Faculty Mentor: Dr. Dennis Goff, Psychology

Kudzu Root (KR), the vine originating from China, and St. John's Wort (SJW), a flowering plant, are being researched as treatments for alcohol addiction. Few animal studies and fewer human studies exist that examine the effects of SJW and KR in those addicted to alcohol. However, the few published studies that do exist produced positive results showing decreased alcohol intake in both humans and rats after consuming SJW and KR. This experiment is a conceptual replication of the effects of KR and SJW. We are the first that we know of to also examine the effects of a KR and SJW combination. Fifteen Long-Evans rats were given free access to water and ethanol to establish an alcohol preference. During the treatment period, they consumed a 0.5g/kg dose of KR, a 0.5g/kg dose of SJW, or a combination of the two. We expect to replicate the decrease in ethanol intake with KR and SJW, while exploring the effects of the combination of ethanol intake.

**Rebekah Griffith '19**

"Let's Get Real: Authentic Assessment and its Influence"

Faculty Mentor: Dr. Crystal Howell, Education

Assessments are an integral component in education, allowing teachers to test students' knowledge of new content, to understand students' lines of reasoning, and to determine students' strengths and weaknesses. However, often once the test is over, new knowledge learned is forgotten. In my research, I investigated whether there is a kind of assessment that can help students better retain information and skills and apply them to their daily lives. In this action research study, conducted in an urban fourth-grade classroom in central Virginia, I asked whether authentic assessment could enhance students' knowledge and retention compared to traditional forms of summative assessment. In my scholarly talk, I will discuss my findings and their implications for teachers and students.

**Rebekah Griffith '19**

"Project Food Rescue: Portugal"

Staff Mentor: Amanda Gelber, Assistant Director of Campus Life

There are nearly 2.6 million people living below the poverty line in Portugal. Many people go with little to no food because of the high numbers of impoverished people. The Food Rescue project is an evening project working with volunteers to collect food in the afternoon from local restaurants and supermarkets to then distribute to underprivileged families, elderly, and homeless in the evenings. During this service project, we logged daily reflections to consider the challenges we faced individually and as a group. We were also encouraged to participate in daily challenges to broaden our cultural experience. On my poster, I will present photos from the trip and discuss the challenges and experiences I was presented with while participating in The Food Rescue project in Portugal.

**Samantha Hablas '19**

"Experience in Portugal: Serving Food Insecure Populations and Beyond"

Staff Mentor: Amanda Gelber, Assistant Director of Campus Life

Over spring break, I traveled to Lisbon, Portugal to serve food to insecure

populations and people below the poverty line. The purpose of this trip was to gain a deeper understanding of social and ethical issues globally, and to serve others internationally. During my time in Portugal, I went on several day trips close to Lisbon, which included discussions on leadership and other useful topics. My poster presentation will include pictures from my trip and highlights of what was most special to me. I want to show others how no matter where we are in the world, there is always someone who could use our help. I will engage with people who come to look at my poster so they can learn more about the experience I had in Portugal, so they too can see poverty and other social/ethical issues from a global perspective.

**Allison Hart '19**

"MATLAB Modelling of Water Quality from Rainwater Harvesting Systems"

Faculty Mentor: Dr. Sarah Sojka, Environmental Studies and Science, and Physics

Rainwater harvesting systems provide an opportunity to reduce water scarcity by capturing runoff, and while there is plenty of research about the supply efficiency of these systems, there is very little research about controls on water quality. In this project, we will use a numerical model to examine the effectiveness of three water treatment methods commonly used in rainwater harvesting systems. The three methods will be a point-of-use system, a recirculating treatment system (which returns treated water to the main storage tank) and a day tank system (which stores treated water temporarily in an auxiliary tank before use). We will first set up the model with UV radiation and monitor the population of E. coli, but hope to expand to a more general model in which the user can modify details of the organism and disinfection method. The results of this study can guide design and regulatory decisions to lead to safer rainwater harvesting systems.

**Andrew Hayden '19, Emad Davis '19, and Mengjin Sun '19**

"Creating a Digital Environment that Increases Research's Accountability and Communication"

Faculty Mentor: Dr. Jia Wan, Mathematics

We developed a user interface (UI) for research project management, LogSmart. Our UI is aimed at serving the needs of academia, therefore we considered two types of users: students and professors/research advisers. Students can keep track of their own research, see due dates of their milestones, and communicate with their professors directly through the UI. Professors can easily access their students' progress by viewing the students' logs. While Google classroom and Moodle try to create a paperless alternative to classrooms and a framework for assignment distribution, LogSmart is directed specifically at student researchers and their faculty advisors. Moreover, our UI has a simpler and more intuitive design that creates a user friendly environment.

**Andrew Hayden '19**

"Creating a Real-time Thermal Video Display in the Front Lobby of Martin Science Building"

Faculty Mentor: Dr. Peter Sheldon, Physics

We are working to install a thermal imaging camera inside the front entrance of Martin Science that will video display the thermal image of people and objects going in and out of Martin in real-time. To prevent unnecessary use and energy consumption, the thermal camera will be triggered to display its image from a

motion sensor installed in the same location. Motion in the front entrance of Martin will be recognized by the motion sensor, trigger the thermal camera, and be displayed on the flat screen in Martin 302 - visible as you enter the building. The screen will also show what is being printed on the 3D printer, and a microcontroller will be programmed to switch regularly between the two images. We will create a unique display of technology to educate and impress our community and visitors.

### **Katherine Horne '19**

"I Like to Move It, Move It!" Learning Through Movement"

Faculty Mentor: Dr. Crystal Howell, Education

Remember sitting in class staring at the clock, counting down the seconds until you were finally able to stand up, even if it was just for a minute? I conducted an action research project that explored how creative movement affects students during traditional desk work. My research question was: Does movement during a lesson improve students' attention and time on task? I studied this question in an urban first grade classroom. During intervention lessons, students were given the option to move around the room rather than simply sit at their desks to complete independent work. At the end of the last lesson, their time-on-task behaviors were compared before and after the intervention. I invite you to join my scholarly discussion as I explore how we can add movement to improve students' classroom experience.

### **Alyssa Horton '19**

"Redefining Masculinity through K-pop"

Faculty Mentor: Dr. Danielle Currier, Sociology

Music has become South Korea's most profitable export since the country's financial crisis in the 1990's. Today, Korean pop music is consumed on a massive global scale. This mass consumption is in part because of increasing social media usage, and our ability to click share, retweet, and reblog. While the lyrics of this music are in the artists' native language, Korean global consumers find that they are not bound by the language barrier. From daring listeners to follow their own dreams to encouraging self-confidence and self-love, the messages that are reaching stadium size audiences are not only positive, but challenging notions of masculinity. Conducting a narrative and visual analysis, this study observes the presentation of masculinity that is being portrayed in K-pop.

### **Bryan Hue '19**

"Literature review on Rainwater Harvesting Systems"

Faculty Mentor: Dr. Sarah Sojka, Environmental Studies and Science, and Physics

This project is an in-depth analysis of rainwater harvesting systems portrayed in research journals in comparison to real life applications. Due to increasing water shortages in arid and semi-arid regions in the world, rainwater harvesting systems can be expected to see increased usage. Therefore, despite a sizable coverage on the topic, a noticeable trend shows that majority of research journals do not comply with standards provided by the American Rainwater Catchment Systems Association (ARCSA) and the American Society of Plumbing Engineers. Although the research was not limited to the United States, these guidelines are still suitable reference standards. Trends seen in the research so far suggests that there is an over emphasis on particular modules of the systems

rather than focusing on the entire system as a whole. The objective is to provide a guideline for future researchers to improve compliance with local regulations.

### **Courtney Hughes '19**

"Alternative Spring Break: Portugal"

Staff Mentor: Amanda Gelber, Assistant Director of Campus Life

I participated in a service-learning trip to Lisbon, Portugal. We served food to the elderly, children, and families that are below the poverty line. We spent spring break helping others that are not fortunate enough to have the most basic of necessities, like food.

### **Courtney Hughes '19**

"First-Generation College Students: The Effects of Involvement on the College Experience"

Faculty Mentor: Dr. Danielle Currier, Sociology

First-generation college students tend to be overlooked when focusing on college student involvement and the effect of such involvement on the experience of first-generation college students. A traditional college student, a student for whom one or both parents have attended college or obtained a college degree, have an advantage when it comes to the college experience. These traditional students have an established social and cultural capital because of the parents' college attendance and the parents' social networks. First-generation students lack the social and cultural capital and therefore might have a more difficult time getting involved or being engaged in college activities. This research focuses on how first-generation students get involved and if involvement helps their academic and social collegiate experience.

### **Keyu Jin '20, Niles Brown '20, and Priscilla Ranjitkar '20**

"Campus-Community Health and Wellness Resilience Project"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

Institutions, businesses, and communities are incorporating resilience strategies as an essential element of climate action planning to help prepare for the adverse impacts of climate change. In January 2017, President Bateman made Randolph College a signatory to the Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our Central Virginia community to develop goals and strategies to address resilience as part of climate action planning. In an effort to achieve these objectives, the Spring 2018 EVST 315 Energy & Society class conducted an assessment of campus-community resilience. Our team evaluated key resilience indicators in the dimension of Health and Wellness, determining areas of strength and vulnerability. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

### **Jdody Misidor, '21, Ranita Sarfo '21, and Renee Sarpong '21**

"Bee Friendly Virginia Native Plants"

Faculty Mentor: Dr. Kristin Bliss, Biology

An independent study research project was conducted to determine habitat and seed germination requirements and bee desirability for twenty-five

Virginia native plant species. After library research, a summary database was constructed to organize habitat and germination information. Subsequently, fifteen species of bee friendly native plants were selected for experimentation. Germination trials using common stratification and scarification techniques were carried out and field trials will be implemented this spring. The location and layout of proposed bee friendly garden spaces on campus will be presented.

### Nicole Monroe '19

"Is Inquiry Just for Science?"

Faculty Mentor: Dr. Cheryl Lindeman, Education

Traditional teaching and learning methods do not work for all students. Hands-on and inquiry-based approaches to learning may give students an added tool to help them be more successful in mathematics. The goal of this action research study was to see if inquiry-based learning or hands on learning increased fifth graders' math achievement scores. Pre- and post- test math unit scores were compared to determine if students were able to use their inquiry clues on the tests. An additional assessment strategy was to analyze what students suggested to a fictitious student for solving math problems based on their "clue" training lessons.

### Meghan Moran M.A.T. '19

"Don't Choke! Reducing Student Assessment Anxiety through Expressive Writing"

Faculty Mentor: Dr. Crystal Howell, Education

As our education system increasingly moves towards high stakes assessments that dictate students' futures, teachers need a solution to help students that experience testing anxiety (von der Embse and Witmer, 2014). It is important that assessments measure student comprehension and often anxiety prevents students from performing at their highest level. In this research project it was investigated if teachers can use expressive writing exercises to help decrease student anxiety and increase academic achievement. Expressive writing is centered on emotion, without regard to spelling, grammar, or other conventions. I hypothesized that if students were allowed to write through their anxiety prior to a summative assignment, they would perform better overall. In this scholarly talk, I will discuss how I implemented expressive writing prompts prior to summative assessments to try to reduce student anxiety and increase student achievement.

### Thanh Tung (Adam) Nguyen '19 and Thinh (Bill) Pham '20

"Multidirectional Binaural Audio"

Faculty Mentor: Dr. Peter Sheldon, Physics

Binaural audio is a recording technique that helps recreate the most realistic hearing experience, simulating the human hearing experience using two microphones to record the audio differences between the two ears. However, the listener plays a very inactive role in the listening experience since as soon as they turn their head, the source of sounds in traditional binaural audio will not change according to the listener's orientation. Our project is to create a system using additional microphones and angular motion detectors, which detect the listener's orientation, and the system will respond to maintain a more realistic listening experience that changes with orientation.

### Thanh Tung (Adam) Nguyen '19

"TAS Lab Assistant RISE Internship"

Faculty Mentor: Dr. Sarah Sojka, Environmental Studies and Science, and Physics

I completed an internship with The American School (TAS) (<http://tas.edu.vn/>) as a Lab Assistant during winter break. TAS is a K12 school in Ho Chi Minh city with the mission to bring the US Education environment to Vietnam and prepare students for higher education abroad. The school was excited to have a student from a college in the US who has had experiences with lab work and STEM. They also appreciated having someone who could help manage and maintain the lab equipment and assist faculty members with class activities.

### William Owsley M.A.T. '19

"Sit Down! Hold Still! Be Silent! You are taking a test"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

Accommodations to help alleviate the effects of Attention Deficit Hyperactivity Disorder (ADHD) on learning are vital to students' success. The purpose of this action research was to examine the effect of introducing stress balls as a testing accommodation. This qualitative research study focused on two fourth grade students in a rural school division in Virginia. During the pre-intervention, the number of hyperactive behaviors, improper call outs, and students' academic achievement were recorded. Stress balls were introduced as an instructional tool to aid students in self-regulatory behavior during testing situations. Over a six-week period, students were given the choice to use the stress balls when testing and the number of hyperactive behaviors, improper call outs, and academic achievement were recorded using the same methods as the pre-intervention. An analysis of variance (ANOVA) was used to compare pre-intervention data to the data collected during the intervention phase and post intervention.

### Thinh (Bill) Pham '20 and Margaret Van Beek '19

"Comparing the Quality of Rainwater Collected from Roof-level Surfaces and Ground-level Surfaces"

Faculty Mentor: Dr. Sarah Sojka, Environmental Studies and Science, and Physics

Rainwater harvesting systems have increased in popularity throughout the United States and globally. Most guidelines recommend collecting runoff from roof surfaces only because the roofs are thought to be cleaner. We compared the runoff quality of both roof surfaces and ground level surfaces such as parking lots and lawns by sampling runoff from three events and measuring parameters relevant to microbial health. Biological oxygen demand and turbidity were significantly lower in runoff from roof surface than in runoff from pedestrian, lawn, and vehicular surfaces. However, total coliform and E. coli concentrations were not significantly lower in runoff from roof surfaces than in runoff from vehicular surfaces, though they were lower than concentrations in runoff from pedestrian and lawn surfaces. The similar water quality of runoff from vehicular and roof surfaces can provide a wider range of possibilities for rainwater harvesting systems.

### Katherine Phillips M.A.T. '19

"Alternative High School Classroom: Hands-On Learning in Science"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

Not all students like science...But why? How do we move science education from lectures into something exciting and hands on? Though traditional schools use many active-learning approaches, memorization and lecturing encompass much of science instruction in high school. This study explored the effect of using hands-on learning, rather than a lecture-based teaching approach, on student achievement and attitudes toward science in a small, alternative high school setting. Test scores and student comments were analyzed to determine which approach was the most effective. Students were also asked to draw a scientist at the end of the intervention, which was used to interpret their attitude toward science.

### **Presley Pippin '19**

"Does the Sum of First-Grade Students and Math Vocabulary Equal Acquisition?"

Faculty Mentor: Dr. Cheryl Lindeman, Education

In today's world, students are expected to regurgitate words instead of understanding vocabulary. Half of the general population hear words associated with mathematics and do not understand how to apply this knowledge. Direct teaching strategies allow first grade students to be more intentional about their mathematics learning. These strategies encourage teachers to be more intentional in their teaching. During this four-week study, I compared data from observations and an intervention with math vocabulary words. Students were assessed by a pre- and post-test during each week. The purpose of this study was to increase students' vocabulary acquisition. During this scholarly talk, I will explain the intervention in greater detail and share my findings.

### **Skylar Pippin '19**

"Teamwork Makes the Dream Work- Cooperative Learning in Second Graders"

Faculty Mentor: Dr. Crystal Howell, Education

In a world where we focus on being the first and best, students often forget how to be a person. While the drive to be the best is important, this will not lead to success if students do not learn to work with others. Cooperative learning is a category of teaching techniques in which students work together to learn. Alongside content, students learn how to effectively communicate with others. In this quantitative study in an urban, central Virginia elementary school, I observed prosocial behaviors in second grade students, first during lessons using direct instruction and then during lessons using cooperative learning strategies. In my talk, I will describe the relationship between prosocial behaviors and the instructional strategies used.

### **Stephanie Quirk M.A.T. '19**

"Active Learning and Memory in the Classroom"

Faculty Mentor: Dr. Crystal Howell, Education

Have you ever had a great lesson you thought your students grasped, only to find when they came back the next day, they had forgotten the information? Why do students sometimes forget information we teach? A better question might be, what can we as educators do to make our teaching stick in students' memories? This research project focuses on active learning, an approach that strives to involve students in the learning process more than traditional teaching methods. The specific active learning strategies

explored in this project are cooperative learning and the use of student-generated images. The goal of this research is for students to retain more knowledge using these strategies, measured through higher test scores. In this scholarly talk, I will discuss how I developed my research, the strategies, and the results.

### **Georgie Roark '20**

"Cultivating Collaborative Learners: Incorporating Agriculture in the Classroom through Cooperative Learning"

Faculty Mentor: Dr. Crystal Howell, Education

Imagine having multiple brains. Each brain has a different way of thinking and a different approach to solving problems, but all of the brains are searching for one solution. This may seem like science fiction, but with collaborative learning, this way of thinking is possible. Using the minds of many instead of one can help clear confusion, introduce new lines of reasoning, and improve social ability. Through cooperative learning, students are able to build skills that will be carried with them throughout their lives. In this study, I explore how collaborative learning can be used to support students' agricultural knowledge. A part of the Virginia science curriculum, agriculture encompasses what we eat and how it is grown—that is, how we survive.

### **Michaela Saunders '19**

"Transitioning with Song: How It Affects Transition Length and Student Readiness"

Faculty Mentor: Dr. Crystal Howell, Education

You may remember activities your teacher planned for you, but do you remember what happened between those activities? Sometimes you may have had to wait for your peers to be ready to move on or maybe it was you on whom the rest of the class was waiting. These transitions can be frustrating because they reduce on-task instructional time, and impact if the student is ready to learn when the transition is over. This action research project, conducted in a Virginia kindergarten classroom, examines two song-based transition strategies: a timed pre-recorded song and a song that the class sings together. The aim of this study is to understand the effects of songs as a transition strategy on transition length and student readiness.

### **Mekenzie Schmitt '19**

"Five, six, seven, eight! Integrating Dance into Mathematics"

Faculty Mentor: Dr. Cheryl Lindeman, Education

Not all students have equal access to the arts in school. When it comes to making the arts available in elementary schools, dance is often overlooked. But why is this? Elementary school students are natural movers and sitting still is a chore. Most elementary school students are asked to sit still and focus during math class. Many students struggle both with sitting still and with comprehending mathematics. So, what would happen if we took students' natural love of movement and dance and integrated it with math instruction? I implemented a three-week action research study in which 18 first grade students participated in one dance-integrated math lesson per week. My goal was to find out if students would score higher on in-class assessments of math content recall and comprehension. The results show what happens when a group of first-grade students learn dance and math in concert.

**Jordan Sheets '20, San Hoang '20, Keyu Jin '20, and Canaan Taylor '20**

"Study Abroad: University of Reading"

We will present photos of our semester studying in the United Kingdom. Highlights of our excursions and field trips will be featured.

**Marvin Shockley '19**

"Nazi Architecture Used as Propaganda and the Effects of National Socialism"

Faculty Mentor: Dr. Gerard Sherayko, History

The use of propaganda in the Nazi Regime was to control and take advantage of Germany's citizens. Hitler controlled the media, art, and even architecture; he wanted cities filled with buildings more magnificent than those of Rome and Paris. Architecture was meant to display the true power of the Nazi party and its ideals and was intended to stand permanently for the 1000-year Reich. I traveled to Berlin in early March 2019 to visit the buildings that remain standing long after the fall of the Nazi regime. I will illustrate how examining this architecture helps us to understand how the Third Reich established a totalitarian government and gained the support of many German citizens through specific architectural styles and designs.

**Yuriy Snyder '19**

"Multiscale Modeling of a Functionalized Surface Catalyst for Hydrogen Peroxide Production"

Faculty Mentor: Dr. Jesse Kern, Chemistry

Hydrogen peroxide (HP) is a commodity chemical with a broad range of uses. The major environmental detriment of the life cycle of HP is the current industrial process used in HP synthesis; it is otherwise a "green" chemical in its applications. Reducing the environmental impact of HP synthesis through a new process would serve as a major improvement that would save energy and money. Computational modeling allows proposed materials such as surface catalysts to be studied for viability before any (sometimes costly) synthesis or thermodynamic characterization is carried out. The goal of this project is to model a simple surface catalyst for the production of hydrogen peroxide directly from hydrogen and oxygen gases, without the need for catalytic nanoparticles or multiphase reactors.

**Meagan Swithers, M.A.T. '19**

"Questioning Questioning: An Exploration of Intentional Questioning"

Faculty Mentor: Dr. Crystal Howell, Education

Humans naturally seek information. Adults ask questions about the world around them. But where do we learn to ask questions? Through this quantitative study, I created opportunities for third-grade students to generate their own questions in an elementary school classroom. Through an assessment-scoring tool, I then studied the effect of prompting students to ask more questions on their knowledge of classroom content. To evaluate the success of this approach, I collected and analyzed weekly reading assessments pre- and post- intervention to determine if students performed better after engaging in this intentional questioning strategy.

**Arnav Upadhyay '19, Elizabeth Exline '19, Margaret Van Beek '19, Maya Wheeler '19**

"Campus-Community Infrastructure Resilience Assessment"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

Institutions, businesses, and communities are incorporating resilience

strategies as an essential element of climate action planning to help prepare for the adverse impacts of climate change. In January 2017, President Bateman made Randolph College a signatory to the Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our Central Virginia community to develop goals and strategies to address resilience as part of climate action planning. In an effort to achieve these objectives, the Spring 2018 EVST 315 Energy & Society class conducted an assessment of campus-community resilience. Our team evaluated key resilience indicators in the dimension of infrastructure, determining areas of strength and vulnerability. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

**William Vernon '19**

"The Utilization of Computer Vision for the Measurement of Kinematic Motion in the Classroom"

Faculty Mentor: Dr. Peter Sheldon, Physics

In the past decade, technology has improved rapidly and has become more accessible to the general public. One such technology is computer vision which works with cameras to track objects; examples include cars, which use sensors and cameras for crash prevention and self-parking, and phone apps such as Snap Chat, which use computer vision to track faces and place fun graphics on them. Although it is ubiquitous, computer vision has not percolated into the classroom where it could be a tool for studying motion in physics and engineering applications. Currently, video analysis of motion is performed in the classroom through a process fondly referred to as "blue-dotting," because a student has to manually put a dot in each frame of a video. With computer vision, this process is automated so that students can apply efforts to understand the problem at hand and not be frustrated by the tedium of video analysis.

**Joshua Yeast '19**

"Inquiry-Based Learning: It is Time to Get Curious"

Faculty Mentor: Dr. Crystal Howell, Education

When I reflect on my time in elementary school, I remember all the tedious work I had to do in class. I distinctly remember the instructions given to my classmates and me about how to complete our worksheets correctly. I wish I were able to remember more times when I was actively engaged in my assignments. Students should be curious about the material they are learning. For my action research project, I studied the effects of inquiry-motivated reading assignments on students' achievement in reading comprehension. In my scholarly talk, I will describe the existing reading instructional practices. I will then present my intervention, a week-long sequence of inquiry-motivated reading assignments. Students in a third-grade class worked to solve an overarching problem or "mystery." Based on the results of my study, I hope to introduce inquiry-based teaching strategies in more classrooms.

**Andrew Young '21, Golden Dennison '19, Nicole Marie Dorton '19, and Thanh Tung (Adam) Nguyen '19**

"Campus-Community Economic Resilience Assessment"

Faculty Mentor: Dr. Karin Warren, Environmental Studies

Institutions, businesses, and communities are incorporating resilience strategies as an essential element of climate action planning to help

prepare for the adverse impacts of climate change. In January 2017, President Bateman made Randolph College a signatory to the Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our Central Virginia community to develop goals and strategies to address resilience as part of climate action planning. In an effort to achieve

these objectives, the Spring 2018 EVST 315 Energy & Society class conducted an assessment of campus-community resilience. Our team evaluated key resilience indicators in the dimension of economics, determining areas of strength and vulnerability. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

**It is respectful to:**

- stay for all the presentations in a block
- enter seminar rooms between presentations, not during
  - silence cell phones

**Thank you for attending!**

The Symposium of Artists and Scholars is coordinated by the Center for Student Research.

## ***Special thanks***

*Karen E. Campbell, Vanderbilt University Professor of Sociology, Emerita  
Randolph College Board of Trustees, Emerita*

### **Student Scholarship Committee:**

*Brad Bullock, Professor of Sociology*

*Kristin Dabney, Alumnae and Alumni Career Network Manager*

*Brenda Edson, Director of College Relations*

*Wes Fugate, Vice President for Student Affairs and Dean of Students*

*Amanda Rumore, Assistant Professor of Biology and Interim Director of the Center for Student Research*

*Peter Sheldon, Professor of Physics and Director of the Center for Student Research*

*Holly Tatum, Professor of Psychology*

*Luisa Carrera, Center for Student Research Administrative Coordinator*

*Dean of the College*

*Buildings and Grounds staff, especially Jannette Wade, facilities scheduler*

*Mitchell Rohde and the Aramark catering staff*

*Brenda Edson and Leigh Ann Bush of the Office of College Relations*

*Printworks, Inc.*

KEYNOTE SPEAKER

# Karen E. Campbell '77

*Vanderbilt University Professor of Sociology, Emerita; Randolph College Board of Trustees, Emerita*

Karen Campbell '77 earned a Bachelor of Arts in sociology and anthropology, with a minor in biology, from Randolph-Macon Woman's College (now Randolph College) and a master's (1982) and Ph.D. (1985) in sociology from the University of North Carolina—Chapel Hill. At R-MWC, she was a member of the swim team, co-chair of the exam committee, and senior representative to the Judiciary Committee. In 1979, she married Bob Galloway (son of Marianne Skinner Galloway '49) in Houston Memorial Chapel.

From 1985 until her retirement in 2016, Professor Campbell was a professor of sociology at Vanderbilt University. She taught Introductory Sociology, as well as courses about women and work, women and public policy, research methods, and stratification; she also taught the teaching workshop, helping graduate students prepare to teach. Her research focused on gender inequalities in various settings and forms: gender differences in the use of social networks for job searches, and in neighborhood networks; the successes and failures of state women's suffrage movements in the United States; the entry of women into the professions of medicine and law in the late 1800s and early 1900s; and changes over time in regional variation in gender-role attitudes.

During her time at Vanderbilt, she received the Mentoring Award from the Margaret Cuninggim Women's Center (1998), an Affirmative Action Award (1998), and the Jeffrey Nordhaus Award for Excellence in Undergraduate Teaching in the College of Arts and Science (1999). In spring 2016, she received the Mary Jane Werthan Award for contributions to the advancement of women at Vanderbilt. In 2013, the Southern Sociological Society awarded her the Jocher-Beard Award for distinguished scholarly contributions to the understanding of gender and society.

She has served on 60 dissertation committees in sociology and related disciplines and held a variety of administrative roles at Vanderbilt. In 2011, she began a stint as senior associate dean for undergraduate studies in the College of Arts and Science. From 2006 to 2017, she served on the Board of Trustees of Randolph College. She and husband, a Vanderbilt professor of biomedical engineering, emeritus, retired to Smith Mountain Lake in 2016.





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