THE RANDOLPH COLLEGE

SYMPOSIUM OF ARTISTS AND SCHOLARS

Welcome

Dear Symposium Attendee,

Welcome to Randolph College's 12th 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. One hundred and twenty-nine 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 faculty-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,

Bradley W. Bateman
President

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2020
PRESENTATIONS

Lauren Appel '20

"Asylum Seekers in France and England: A Healthcare Policy Crisis"

Faculty Mentor: Dr. Mari Ishibashi, Political Science

Over the past 10 years, Europe has been home to 79% of applying asylum seekers, specifically from Africa and the Middle East, compared to other major destinations around the world. As large groups of these people await a determined legal status by the courts, they are often forced to wait months, even years, before a final decision is made. While awaiting the verdict of their cases, they can experience health problems that require medical attention, creating an increased cost for the economies of these nations. My study investigates how France and England in particular, provide healthcare to asylum seekers in these situations. This presentation seeks to demonstrate and explain the different implications of each nation's healthcare policy on the refugee population and argue that the difficulties they face when trying to access basic medical care while in these situations can cause them to be physically worse-off.

Hope Banton '21 - WITHDRAWN

"Homecoming," a personal essay

Faculty Mentor: Dr. Gary Dop, English

My creative nonfiction story, "Homecoming," explores my experience returning home to care for my mother after the death of my father, which coincided with the integral summer between graduating high school and beginning college. This essay serves as a testimony to life's unpredictability and humanity's astonishing adaptability. It also explains the significant shift in family dynamics that are a direct effect of anyone's passing. Writing about this part of my life has been particularly important for me in my creative writing classes, which have allowed me to work through my own experiences in a healthy way while also creating something meaningful that is worth sharing.

Monica Bell M.A.T. '20

"Tunes for Transitions"

Faculty Mentor: Dr. Roberta Parker, Education

"Fifteen minutes can save you money on your car insurance." Do you think 15 minutes of music during school transition activities can save teachers 15 minutes of stress? Motivating students to transition quickly and quietly, whether it be moving from one classroom to another or from one assignment to another, can be a "tragedy" for teachers. This study focused on the use of music during the first 15 minutes of class after students transitioned from another classroom. During the study, students were able to listen to their own music for 15 minutes one week and then to teacher selected music for 15 minutes the second week. Come learn whether tunes during transitions saved teachers 15 minutes of stress.

Gabriel Blodgett '20 (withdrawn)

"Reflexive Rewilding through the Tiny House Movement"

Faculty Mentor: Dr. David Schwartz, Philosophy

Dr. Schwartz's class on rewilding coincided with my obsession with the tiny house movement, a growing trend by which people decide to live in homes measuring no more than 400 square feet. Rewilding is a concept through which we aim to revert our environments and ourselves back to a "wilder" state. Some of my studies have also focused on humans' attitudes toward their environments. I have found that before we may have widespread adoption of wilder and sustainable ways of living, we must become closer to our environments and understand our impacts on it. I believe that the tiny house movement promotes the principles of sustainability and minimalism within ourselves that may result in a widespread adoption of rewilding practices.

Gabriel Blodgett '20 and Hannah Overstreet '20 (withdrawn)

"Improving a Corporate Food Donation Program through Recipient Identification and Donation Impact"

Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. Megan Bloomer '06 and Nick Sterling from the Cheesecake Factory

The Cheesecake Factory Inc. makes all of their food from fresh ingredients, in-house daily. Because of this commitment, their restaurants accumulate an above-average amount of unused food that would typically go to waste. In order to remain committed to sustainability and social justice, the Cheesecake Factory Inc. has partnered with Copia and Doordash to create a food waste program that ensures their restaurants are donating as much of their unused food, as efficiently as possible, with the greatest community impact. Part of a larger internship team of seven Randolph students, we focused on pairing restaurants with recipient agencies, such as soup kitchens or homeless shelters, that can then utilize the donated food from The Cheesecake Factory to feed people in the surrounding community. We also monitored feedback from recipient agencies in the program in order to determine possible areas of improvement. Finally, we identified criteria under which recipient agencies can be assessed in the future to ensure the greatest community impact.

Corey Boswell '20

"Photographic Biodiversity Assessment of Randolph College"

Faculty Mentors: Dr. Doug Shedd, Biology; Emily Smith, Coordinator of Natural History and Archaeology Collections

Biodiversity is the variety and variability of all life on Earth and is often considered an important indicator of the health of an ecosystem. In 2014, the World Wildlife Fund's "Living Planet Report 2014" estimated that the overall biodiversity of the planet had decreased by 52% between 1970 and 2010. The objective of this project was to conduct an exploratory study into the biodiversity of Randolph College by establishing a photographic database of the variety and abundance of life on campus, including plants, animals, and fungi. The data obtained in this study can be further expanded on by future students of Randolph College, and can be used as a base to track biodiversity on campus for years to come.

Colleen Bowen, M.A.T. '20

"Primary Source Selfies of Napoleon: Thinking like a Historian in High School"

Faculty Mentor: Dr. Crystal Howell, Education

How often do you incorporate emojis, Gifs, or other images into your text messages or social media posts? Images not only enhance communication but also play a critical role in how people interact. In this increasingly visual society, students need to learn how to analyze and interpret the visual messages they encounter. In this action-research project, I aimed to determine if two visual analysis strategies enable high school students to read historical images of Napoleon critically. Through explicit instruction of two visual analysis strategies, high school history students were able to engage in historical thinking, enhancing their ability to interpret visual communication, an essential component of 21st-century literacy. The findings of this study can be used to develop more primary source visual analysis resources for social studies teachers and students.

Anh Phuong Bui '20 and Ly Phuong Linh Nguyen '20 (withdrawn)

"The Cheesecake Factory's Sustainability Internship"

Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. Megan Bloomer '06 and Nick Sterling from the Cheesecake Factory

This internship was divided into three tasks, each of which was managed by a team. Our team's focus was specifically on improving the operational and financial performance of the delivery agency, DoorDash, an on-demand prepared food delivery service. The Cheesecake Factory's Sustainability and Corporate Social Responsibility Department is experimenting with a new food diversion project called the Nourish Program. This program's focus is to donate excess food from the restaurants to local non-profits that feed nutritious meals to people in the community who have limited access to food. The company partners with DoorDash to ensure the food from Cheesecake Factory's restaurants is delivered to local agencies. We monitored and examined key performance metrics to identify low performers and developed correctional strategies for these performers. Our final products are templates and guidelines for streamlining instructions that prioritize brevity and clarity. The goal is to unify operations among all sites, minimize delivery distance to less than 10 miles and reach a 97% overall donation drop-off success.

Ke'Asia Carter '20

"You Can Walk the Walk, But Can You Social the Emotional?"

Faculty Mentor: Dr. Crystal Howell, Eduction

Think about the times as a kid that your teacher helped you learn about managing emotions, setting and achieving positive goals, and showing or feeling empathy for others. What do you remember about it? Was it beneficial? Today, Social-Emotional Learning (SEL) is a hot topic in the education world. In this presentation, I examine if PK-12 schools in the Region 5-Valley district of Virginia value SEL by analyzing their school mission statements on their school websites. As a future teacher, I believe it is important to implement SEL into my classwork as a benefit to my students overall health. Research shows that teaching students SEL skills leads to positive behavior, less emotional distress, academic success and fewer behavior problems. all of which are very important to be happy and successful in life.

Sidney Clark '22 (withdrawn)

"Measuring the Therapeutic Potential of Thera-Tree Technology Using Thermography, Heart Rate, and Behavioral Indicators"

Faculty Mentor: Dr. Amanda Rumore, Biology

The use of non-traditional therapy aids in equestrian sports is growing in popularity. The Tad Coffin Thera-tree® claims to have significant therapeutic benefits related to equine behavior, performance, and pain relief. The Thera-tree® emits far infrared radiation (FIR), which is said to be strong enough to have an effect at the cellular level. In this study, we used four horses of similar age, breed, and workload to establish if the Thera-tree® had any effect on pain response, resting heart rate, behavioral indicators, and body thermography. We found the Thera-tree® reduced resting heart rate and increased the number of relaxed behaviors exhibited by the horses compared to their baseline control values. There was no difference in pain response or reduction in negative behaviors. The results of our study propose further investigation using a larger sample size and refined measurement techniques to fully understand the therapeutic benefits of the Thera-tree® device.

John Coffron '20

"Up Foundation Internship"

Mentor: James Stewart

Last summer, I completed an internship with the Unlimited Potential (UP) Foundation, where I worked with young teenagers as a mentor and peer leader in a summer camp program for at-risk youth in the Lynchburg community. I led group activities, created informational presentations, and provided moral and forward-thinking guidance for the participants in the program. The program was focused on skills training, drug prevention, and guidance for life success. While in the internship, I developed skills providing moral and practical guidance for individuals who have experienced significant trauma in their lives. Additionally, I gained experience in understanding the budgetary constraints that non-profit and social work organizations have, which may help in my future endeavors after I graduate. The presentation focuses on my takeaways from the internship, both in terms of strategies to employ when working with troubled youth and methods required for success in running a non-profit organization.

Alexander Conway '20 and Lauren Sines '20

"Alternative Spring Break (Nepal): Construction at Deeya Shree English Boarding School"

Staff Mentor: Tanya Weigold, Interim Director of Campus Life

Last year, construction began on a new seven-room school building in Lokanthali, Nepal, a small town seated on the borders of Kathmandu and Bhaktapur. This year, Randolph College partnered with Nepal Volunteers Council (NVC), a nonprofit organization that offers volunteer, educational, and travel programs in Nepal, enabling Randolph students to aid in continued school construction projects. As such, we were given the opportunity to travel to Nepal to help build a new fence that covers the now extended school grounds, and to assist in painting the fence and the new building's interior and exterior. We were given chances to explore Nepal, to reevaluate our worldviews, and to recommit ourselves to lifestyles centered in gratitude. Thank you to Randolph College and its RISE grant for this opportunity!

George Darko-Boateng '20

"The Bank: the 8-5 life in the heart of Accra, Ghana"

Faculty Mentor: Dr. John Abell, Economics

Beyond what meets the eye about retail banking: the friendly tellers, branch managers, loan officers, ATM machines and debit cards, is a vast world of banking not often seen by retail customers. Behind the scenes, is a globally interconnected, highly competitive and technological world. However, my internship sponsored by the RISE grant, at the Societe Generale Bank, Ghana, gave me a detailed look at the behind-the-scenes- world of banking. Working as an Assistant Relations Manager at the Public Sector Unit of the Corporate Coverage Department, I was able to help manage the portfolios of corporate customers like Ghana Oil Company (GOIL) and Intercity State Transport Corporation (STC). In this presentation, I will present to you some of what I did and learnt at the bank, including my work on interest rates using Python.

Samantha Dickerson M.A.T. '20

"Let's Talk About Tech, Baby!"

Faculty Mentor: Dr. Crystal Howell, Education

Which came first, the technology or the lesson plan? Research suggests teachers should choose technology carefully based on the purpose of the lesson. In practice, many teachers choose technology based on what is available in their classroom. In this research project, I examine the effects of technology on teachers' use of space in their classrooms. Data were collected by mapping three rural Virginia middle school teachers in their classrooms and then interviewing participants about their use of space, especially as it relates to technology. In this scholarly talk, I will describe my findings, and how I applied them to improve my own teaching practice--and you can, too.

Tenzin Dolker '20

"Modeling of Legionella Growth in Rainwater Harvesting Systems"

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

Rainwater harvesting systems are good alternatives for indoor water use and to reduce water scarcity, but proper maintenance of the rainwater storage tank is critical. Harmful bacteria and dangerous contaminants thrive under various conditions. Legionella is one of the most common pathogenic bacteria found in water systems, including rainwater tanks. These bacteria grow in warm conditions around 25-45 degree Celsius. This research focuses on modelling a rainwater system using a computer program called GIFMod. The components of the model are catchment, storage tank, over flow, and usage. Legionella is introduced to the catchment and storage tank. The goal of designing this model is to control the temperature of the storage tank and monitor the growth phase of legionella at different temperatures. The result from this research can contribute to properly reduce and eliminate legionella growth in rainwater harvesting systems.

Leah Dorman M.A.T. '20

"In Math, We Don't Play Round, But Could We?"

Faculty Mentor: Dr. Roberta Parker, Education

What if I told you that you could learn math while playing a video game? In middle school, I remember feeling frustration at being expected to always work quietly while not having much choice over my learning. It could be argued that, years ago, middle school classes often had fewer technological resources available and that is why these experiences were such. Unfortunately, middle school classrooms today do not look very different, but they could. This study examined the effects of bringing active learning and serious game design into one classroom on student motivation, attitude towards school, and academic achievement.

Damien Douglas '21

"J-Term at Washington University in St. Louis"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

This past winter, the R.I.SE. Grant funded me to go to Washington University in St. Louis during their J-Term. During my time at Washington University, I worked in a classroom and lab to better understand how to analyze circuits and gained valuable connections with notable people in the engineering field. I also visited multiple engineering companies to observe how they operate to gain insights into the lives of engineers after graduation. In my presentation, I will talk about the background gained from these experiences while at Washington University.

Paige Edwards '21

"Temporal and Spatial Variability in Benthic Microalgae in a Shallow Coastal Lagoon"

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

Seagrass is important for coastal ecosystems, providing habitat and food, storing carbon, and protecting shorelines. Climate change is causing a decline in seagrass. Even short term temperature increases can cause seagrass die-backs. Benthic microalgae (photosynthetic organisms that live in sediment) are an important part of seagrass ecosystems and produce extracellular polysaccharides which are slime like substances that bind sediment together. This keeps the sediment from making the water too cloudy for seagrass to photosynthesize. It is important to know how benthic microalgae responds to heat stress. Lab experiments found that benthic microalgae is less abundant above 24° C. This study explores the effects of heat stress on benthic microalgae in a natural environment through repeated sampling of 15 sites on the Eastern Shore of Virginia during summer 2019. The results show the temporal and spatial variability of benthic microalgae and provide insight into how they respond to high temperature events.

Ghazal Fakhraeipour '20 - WITHDRAWN

"Chinese Internet Censorship; False Justification of the Great Firewall Policy"

Faculty Mentor: Dr. Jennifer Gauthier, Communication Studies

My senior research paper focuses on the Chinese government's regulations of internet (aka the Great Firewall). During winter break, I traveled to China and conducted field interviews to understand individuals' knowledge Chinese government censorship and general social media usage. The goal was to collect thoughts and opinions of Chinese citizens residing in the USA and compare them to the interviews from and data measuring social media usage of Chinese citizens. After analysis of the data, I will have identified false justification statements made by the government of China regarding the Great Firewall.

Matthew Williams '20 and Léopoldine Galopin '20 (withdrawn)

"Development of Techniques for the Measuring of the Efficacy of a Range of Antimicrobial Materials"

Faculty Mentors: Dr. Jesse Kern, Chemistry; Dr. Amanda Rumore, Biology

Self-cleaning materials, such as antimicrobial surface treatments, function via the slow oxidation of organic matter when in contact with nanoparticles, typically embedded on or within the material. With the use of self-cleaning materials in hospitals, schools, and similar public locations increasing recently, understanding the timeline of replacement for the self-cleaning surfaces (SCS) is crucial to ensure that they are replaced when they no longer function. The current replacement protocol for these SCSs is done based on the visual wear of the ink printed on the SCSs. We created a testing protocol that utilizes the oxidation of organic dye solutions by the surface. We tested many different materials and found their efficacies. The tested SCSs experienced decreased oxidation rates in the short-term but maintained modest efficacy over moderate timescales. More research is needed on the long-term degradation of the surfaces.

Katherine Gibson '20

"Growing Up: A Decision-Making Tool for Vertical Farming"

Faculty Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. Sarah Sojka Environmental Studies and Science, and Physics & Engineering; and Dr. Danielle Currier, Sociology

Vertical farming encompasses the idea of growing up rather than out. Recently, vertical farms have cropped up around the globe to grow more food per acre and to make agriculture more environmentally sustainable. The objective of this study is to construct a decision-making tool for communities to decide whether or not a vertical farm would be beneficial. After analyzing current and past vertical farms, the results tailored this tool to encompass aspects of social, economic, and environmental sustainability within a community. The study included a trip to the Netherlands and Denmark to assess the tool on some of the most successful current vertical farms. These visits helped to determine how the tool would work in a real-life setting.

Rebekah Griffith M.A.T. '20

"Assessing Assessments: Let's Collaborate"

Faculty Mentor: Dr. Roberta Parker, Education

Have you ever been handed a test in school and after looking at the first few questions realized you studied the wrong information? The information you thought was important to know was not actually on the test. In schools today, there is an emphasis on preparation for high-stakes tests. As a result, many teachers format their classroom tests to mirror these high stakes assessments, which leaves little room for student voice. If students were given the opportunity to help develop their tests, would students perform better on the assessments? This study examined whether student collaboration to create quiz questions would have a positive effect on their academic achievement.

Rebecca Heidenfelder '21

"Breeding Bird Population Trends in Lynchburg, VA"

Faculty Mentors: Dr. Doug Shedd, Biology; Emily Smith, Coordinator of Natural History and Archaeology Collections

The Lynchburg Bird Club has been conducting breeding bird counts in early June from 1974-2019. Each year, during the first weekend of June, similar paths were followed and consistent numbers of bird watchers identified and recorded species within a 15-mile radius of Lynchburg College. In 2018, Kati Biggs digitized and totaled breeding bird count information by year to produce a database for studying population trends in more than 100 species. During my independent study, I have updated this database and analyzed the population trends in several species that are of interest from the perspective of science and conservation. My talk will discuss the trends I found during my research and what the trends mean for certain populations

Katie Horne M.A.T. '20

"Through the Looking Glass: Reflecting on Reflection"

Faculty Mentor: Dr. Roberta Parker, Education

"You've done something wrong...what's the first thing you are asked to do? Do you think about what you did wrong? This research explored what would happen if a group of fourth grade students were to reflect specifically on both positive and negative events. In particular, does teaching students how to reflect help them be successful academically, and improve confidence and self-esteem? To answer this question, I observed the students to find out if they were unintentionally already reflecting. I then analyzed the best way to introduce an intervention that would be clear to my group of students. Students were given explicit instruction on how to reflect and were able to practice different reflection models. The results of this study have called for their own further reflection and have even encouraged me to rethink that way I reflect.

Alyssa Horton M.A.T. '20

"Decisions, Decisions: Do Students Choose What to Read Based on Their Race and Gender?"

Faculty Mentor: Dr. Roberta Parker, Education

How do you choose a book to read for pleasure? Do you "judge a book by its cover," read the first few pages, or get a friend's advice? How do you think students in elementary school choose books to read for pleasure? They might look at the cover, notice what color it is, if the characters are illustrated, and what the title is. Is there a possibility that a student's book choice is related to their race and gender? This mixed methods study aims to discover why a student chooses one book over another. By asking a group of third grade students about their interests, and why they decided on one book over another, I began to understand that factors that influence the decision-making process when students face the challenge of choosing a book.

Keyu Jin '20, Riley Lorson '21, and Priscilla Ranjtkar '20 (withdrawn)

"Improving Performance of The Cheesecake Factory's Food Donation Program through Analysis of Compliance Data"

Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. Megan Bloomer '06 and Nick Sterling from the Cheesecake Factory

The Cheesecake Factory recently established a food waste diversion program that donates excess food to local communities in the United States. An internship team at Randolph College assisted the Cheesecake Factory this semester in analyzing and improving the program, focusing on three areas of inquiry: Recipient Agencies, Food Delivery Service, and Compliance. Our group worked on compliance, determining if restaurants were meeting their donation targets and analyzing the factors influencing restaurants' performance in order to develop a more efficient business strategy. To identify areas for improvement, we compared data on total donation times, amount of meals served, average donation amounts, weight of each donation bag, and donation frequency for U.S. Cheesecake Factory locations. We identified restaurants that were not meeting set targets for the Nourish Program and examined factors that may have caused this under-performance. All of the intern groups collaborated to further develop a sustainable business strategy that would improve the impact on local communities and justify the program's continued investment.

Amanda Johnson '20 - WITHDRAWN

"Setting: A Backdrop of Influence in Creative Writing"

Faculty Mentor: Dr. Laura-Gray Street, English

The Big Apple has inspired writers for many generations. Both Hemingway and Fitzgerald resided at the Algonquin Hotel, and William Faulkner wrote his Nobel Prize acceptance speech there. Just up the street, The Plaza Hotel was the setting for a tense scene between Jay Gatsby and Tom Buchanan in The Great Gatsby. In Catcher in the Rye, Holden Caulfield passed through the Museum of Natural History. And who could forget Holly Golightly's breakfast in front of Tiffany & Co.? Then there's Coney Island, a place of inclusivity to Walt Whitman, and a "cruel reminder of the temporality of our dreams" to Stephen Crane. In this presentation, I will briefly examine the influence of setting on classic literature, report my experience visiting these literary venues in New York City, and reflect on their influence on my own writing.

Gabrielle Kostuck '21

"Preparing Specimens for Biological Collections"

Faculty Mentors: Dr. Doug Shedd, Biology; Emily Smith, Coordinator of Natural History and Archaeology Collections

Biological collections are important for ecologists, evolutionary biologists, climatologists, paleontologists, geologists, anthropologists, artists and public outreach. Over the last two years, I have prepared fifteen avian specimens and several mammalian specimens for the Randolph College Natural History Collection. All of the specimens in the Randolph College Natural History Collection are ethically sourced. I cataloged each of the specimens and, eventually, the catalogue will be digitized so it is available to researchers online. In addition to preparing study skins for Collections, I have prepared life-like mounted specimens and internal armatures. I hope to do more of this in the future, because life-like specimens are useful for teaching and outreach programs. This poster includes representations of the specimen prep process and examples of the completed projects.

Gabriel Krueger '20 (withdrawn)

"The Effects of Street Art on Educational Performance"

Faculty Mentor: Dr. Danielle Currier, Sociology

Art changes lives and research has shown that participation in the arts helps young people find new ways to express their identities and find their voices. This research examines street art (graffiti) in various urban centers to see if and how this form of expression can help young people find ways out of poverty and break the "cycle of poverty." Through photography, and online media research, I compare the places where street art (graffiti) is legal to those where it is highly regulated, and cite the differences in success rates among students (measured by statistics of graduation rates and standardized test scores).

Leif Kvarnes '20 , Léopoldine Galopin '20 and Matthew Williams '20

"Tribology of an Antimicrobial Surface"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Antimicrobial surfaces are being deployed in doctors' offices, airports, bathrooms, and other busy public places to help prevent the spread of bacteria. Efficacy of the antimicrobial surfaces over time is poorly understood. We are implementing a systematic method to create lab-stressed samples to analyze the longevity of the antimicrobial treatments to surfaces.

Matthew LaPorte '20

Sustainability in the USVI: Greenhouse Gas Emissions from Utilizing Liquefied Propane Gas

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

Five months after two Category-5 Hurricanes, Irma and Maria, blew through the U.S. Virgin Islands (USVI), power was completely restored to all consumers, however the impacts from the devastation can still be observed today. The islands do not produce their own fuel, therefore oil and liquefied petroleum gas (LPG) must be imported. The USVI Water and Power Authority's (WAPA) has struggled to implement solar and wind energy sources but is transitioning to LPG generators. While LPG is considered a cleaner and more efficient source than the previous fuel oil, it still has an impact on the environment. Sponsored by the Randolph College RISE Program, I was able to tour St. Thomas and investigate the ongoing effects of these hurricanes, the transition to LPG generators, and the current solar energy utilization on the island. I developed and will present an environmental analysis on three different energy source scenarios based on this research.

Matthew LaPorte '20

"The System Safety Engineering Internship Experience: An Overview of Dahlgren and the AEGIS Combat System"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

As modern systems become more digitized and complex, system safety engineers work to identify hazards, assess risk, and recommend mitigations that make systems safer for humans and the environment. The objective of this poster presentation is to share my personal and professional experience as a System Safety Engineering intern for the Naval Surface Warfare Center Dahlgren Division. The AEGIS Combat System Group within the R42 branch performs safety analyses for new AEGIS Combat System Baselines. The System Safety Division does work to keep the men and women aboard U.S. Navy Ships as safe as possible around lethal weapon systems.

Riley Lorson '21 and Madeline Owens '20

"The Randolph Thrive Program: a Campus Nature Program To Promote Students Wellness and Mental Health"

Faculty Mentor: Dr. Karin Warren, Environmental Studies and Science

Randolph Thrive is a campus-wide, self-navigated program designed to provide spaces where students can connect with nature and gain psychological benefits from the time spent in the spaces. Inspiration for Randolph Thrive stems from the increasing statistics of college students with mental health concerns along with research showing the positive impacts of a campus nature program. We have worked under the supervision of Dr. Warren and closely with the Library, Health Center, Counseling Center, and Sustainability Council who have all approved and supported the implementation of this resource. The program identifies many outdoor spaces for students to be mindful as well as one indoor space in the Library to be accessible during unfavorable weather conditions. Our poster displays these nature spaces and highlights our ideas for involving the program in student life.

Jessica McIntosh M.A.T. '20

"Teaching Today's Kids To Solve Tomorrow's Problems: How Project-Based Learning Supports Multi-Step Thinking Skills"

Faculty Mentor: Dr. Crystal Howell, Education

When you are faced with a problem, how do you solve it? You likely use multi-step thinking (MST), which is the ability to apply logical reasoning to a problem or scenario. Today's students have grown up with unlimited access to resources and information to help solve problems of any shape or size, but when they are required to use their own MST skills to solve a problem, it can be a challenge. Project-based learning (PBL) is an educational trend and its very design lends itself to teaching students how to use MST skills in a hands-on, inquiry driven, and creative way. This study tracked the presence of MST skills in over 50 high school students while they participated in a Meaningful Watershed Educational Experience (MWEE) PBL unit.

Robert Miller '20

"The Design and Construction of a Combat Robot"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Vector Space, a local makers' space based in Lynchburg, recently offered a combat robot design and building class in which the final robots competed in a national tournament alongside those of the other class participants. This project involves most of the work done during that class and uses information and techniques learned from the building and use of that original robot, which includes programming in C++, soldering, and machining. After battling two different combat robots, and suffering two defeats in the tournament, design flaws and battle strategies were analyzed resulting in the creation of a more advanced combat robot. The specific techniques learned from the construction of this combat robot are explained and further ideas on how to improve the combat robot are explored.

Sarah Mueller '20 (withdrawn)

"Restoration to Rewilding: Understanding the Evolution of Environmental Philosophy"

Faculty Mentor: Dr. David Schwartz, Philosophy

Restoration and preservation have been the focus of environmental policy throughout the last half-century. These methods of handling environmental degradation have led humanity to assume an assertive role in the natural order, controlling and "restoring" natural processes through artificial means. Philosophers argue for a new and ethical way to heal the planet through rewilding. Rewilding refers to resetting the trophic cascade through the reintroduction of species, both flora and fauna, that have gone extinct. This backseat approach to environmental policy respects the autonomy of nature as it resets the function of an ecosystem and allows its effects to unfold without recurrent human intervention. This presentation includes a proposal for a basic rewilding plan for Randolph College's back-campus area. This evolving approach to conservation would expose students, and the greater Lynchburg community, to the positive effects of rewilding here in their own backyard.

Alex Murgas '20 (withdrawn)

"Women in Fascist Italy and Nazi Germany"

Faculty Mentor: Dr. Gerard Sherayko, History

Women's rights did not truly flourish until around the 1970's and 1980's and, even then, were often overlooked with some people even arguing that they were not important at all. Still today, women's involvement throughout history can be disregarded. My project explored the ways in which women were involved in, and supported, the fascist regimes in both Italy and Germany, which were both inherently oppressive to women. Much of the support for these regimes were upper and middle class women. It gave them a way to be active in political life leading to the formation of female factions of the party and influenced the progressive changes that occurred after the fall of the authoritarian systems. My project highlights the ways in which all socio-economic classes of women involved themselves with the regimes in their country.

Madeline Owens '20

"Couplehood in Public Spaces"

Faculty Mentor: Dr. Danielle Currier, Sociology

Couplehood in public spaces is a visual sociology photography project to study the expressions of affection and intimacy in public spaces in various cultures through the lens of a camera. The photographic images will capture specific moments in time of subjects at random displaying a form of intimacy through their affection towards each other. The images will be analyzed for patterns (similarities and differences) of public displays of affection through cultural norms for 'couplehood' expressions. These are ways in which expressions differ in cultures; differences between same-sex, opposite sex, and undeterminate sex couples; and how expressions differ in various public spaces and times of day.

Melissa Pasierb '20

"Khan Academy or TED-Ed? Which Videos Are The Most Beneficial To Students?"

Faculty Mentor: Dr. Crystal Howell, Education

Short instructional videos are frequently used in the classroom and freely available online. You may have even used videos to study or watched one in a class. However, which videos will actually keep middle-schoolers awake while effectively aiding in knowledge transfer? As online tools and resources become more prevalent, it becomes increasingly important to understand the research behind digital tools. Digital drawing and slowmation video, a specific type of stop motion, formats have both been shown to deepen student understanding of science content knowledge. In this scholarly talk, I analyze the effects of these two kinds of videos among middle school science students in an urban Virginia school.

Nate Peverill '20 (withdrawn)

"Hamelin," historical fiction, a short story

Faculty Mentor: Dr. Gary Dop, English

My project involved a RISE grant and allowed me to bring my original writing to Las Vegas for the Sigma Tau Delta (English Honor Society) International Convention. My short story, "Hamelin," is historical fiction that is set in Europe during the last months of WWII. It follows the experience of a young, American draftee named Charlie Muller. Muller is burdened by guilt when his reluctance to shoot at an enemy soldier results in the death of his friend. The story explores the morality of killing and the nature of good and evil.

Thinh Pham '20

"Medical Physics: Summer Internship at Riverside Cancer Center"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Medical Physics is an innovative field of physics that helps diagnosing and treating many diseases, especially cancer. The practice of Medical Physics is to apply principles of physics that manipulate particles, chemicals, and radiations that identify tumors, and inform practitioners in how to plan and treat patients in the safest, yet most efficient methods possible. The responsibility of a Medical Physicist is to ensure physics principles are applied correctly, machines are working as expected, and that treatment practices are utilized and performed well. Ultimately, this results in precisely delivered treatments from doctors to patients with minimum harm. My internship at Riverside Cancer Center allowed me to learn basic practices of a Medical Physicist, who specializes in Radiation Treatment. I have learned general quality assurances, operation principles of machines, and basics treatment planning techniques.

Thinh Pham '20

"Senior Honors Research: Performance of Multileaf Collimators on Elekta Synergy Linear Accelerator"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Multileaf collimators (MLCs) are sets of metal leaves with dynamic independent movements that play an important role in radiation treatment. MLCs work as beam shaping devices, in a linear accelerator, and modify the radiation beam to the tumor shape during treatment. It maximizes the dose delivery to the target tumor and minimizes dose distribution to the neighboring healthy organs. Under certain settings of the treatment plan, and given certain mechanical conditions, the MLCs leaves may exhibit strange behaviors that increase the possibility to introduce lines of under dosage or over dosage to the target areas. This research studies the behavior of MLCs under specific circumstances. By recreating the behavior in separate settings, I try to predict which leaf is having a problem or how to prevent problem circumstances in future treatment planning.

Sara Primm '20

"The Lost Colony of Roanoke: History and Memory"

Faculty Mentor: Dr. John d'Entremont, History

The Roanoke Island colony was the result of three English voyages to North Carolina's Outer Banks during the 1580s. The last voyage produced what is traditionally termed the "Lost Colony" because of the mysterious disappearance of all English settlers from Roanoke Island sometime after the summer of 1587. My project assesses the various interpretation of this disappearance offered by academic and public historians and the popular media. I also will discuss my own recent journey to the site of the Roanoke colony, funded by the RISE grant.

Joshua Propst M.A.T. '20

"Duo You Lingo? A Study of Duolingo and Participation"

Faculty Mentor: Dr. Crystal Howell, Education

Have you ever been called on to speak in front of your peers in a foreign language class and felt your stomach hit the floor? You are not alone! This fear is due to something called the affective filter. Do not fret; I present a possible solution to foreign language anxieties. The widely popular language-learning app, Duolingo, could help you, and/or your students, feel at ease in foreign language classes. In my presentation, I will describe the impact of Duolingo on the affective filter of secondary students and their participation in a classroom.

Jude Quintero '20

"Adaptive System Control Using Model Estimation and Model Predictive Control"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Isn't cruise control amazing? Your car knows just how far it needs to push the pedal down to go the speed you want, even when you are on a hill. This is an example of control theory at work. In this talk, a modified type of controller is introduced, which is able to control anything! (Well, almost anything.) It is able to adapt to a specific situation and requires less setup than a regular controller. The theory behind the modified controller, which relies on system modeling similar to linear regression, allows the it to change its response over time, and to learn from the past, and provide the best control possible.

Jude Quintero '20

"Relay Autotuning of an HVAC Controller"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

Heating, ventilation, and air conditioning (HVAC) systems rely heavily on the Proportional-Integral-Derivative (PID) controller to maintain temperature and user comfort, but these controllers are more likely to be performing below peak performance due to poor tuning. Tuning of PID controllers is often done by hand, and can take hours for a single controller. The Relay Autotuning Program designed at Southern Air, Inc. is engineered to overcome the issues associated with tuning PID controllers. The program written in JAVA allows an operator to simply start the autotuning program and then walk away. This Relay Autotuning Program was presented at the 2019 PhysCon using RISE grant funds.

Priscilla Ranjtkar '20

"Interning at the Cheesecake Factory"

Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. Megan Bloomer '06 and Nick Sterling

My aspiration to pursue a career in sustainability was energized over winter break through my internship with The Cheesecake Factory's Sustainability Office. I received a Randolph Innovative Student Experience (RISE) grant to shadow the Vice President and Director of Sustainability at The Cheesecake Factory's Corporate Headquarters in Calabasas, CA. The Cheesecake Factory makes all of their food from fresh ingredients, in-house, daily. Because of this commitment, their restaurants accumulate an above-average amount of unused food that would typically go to waste. I contributed to The Cheesecake Factory's "Nourish Program," by providing research that ensures their restaurants are donating as much of their unused food, as efficiently as possible, with the greatest community impact. I am delighted that my contributions to The Cheesecake Factory's "Nourish Program" also support my commitment to sustainability and social justice.

Sabina Sabat '22

"We Are But Bones: Mementos Mori in Roman Cooking"

Faculty Mentor: Dr. Susan Stevens, Classics

Mementos mori, or reminders to "be mindful of death," play a prominent role in Roman convivial images and literature. The connection between death and convivial spaces is that we must "eat, drink, and be merry" while we still can. I will argue that these themes: the inevitability of death and necessity to embrace life, are also present in Roman convivial and luxury cooking. They present themselves in two ways: celebrations of life (eggs, testicles, wombs, figs, apples, and other fruits as symbols of fertility, birth, and rebirth) and reminders of death (mushrooms, which can only exist through death and decomposition, and beans, which Romans believed might contain the souls of the dead). Regardless of category, these foods ultimately serve as a reminder of both, exhorting diners to embrace the joy of the current moment in life in the face of inevitable death.

Da'Quan Saunders-McNear '20

"Undergraduate Collegiate Engagement"

Faculty Mentor: Dr. Danielle Currier, Sociology

As sexual minorities in the US have experienced increased social acceptance in the past two decades, LGBTQ+ college students have become more comfortable disclosing their sexual identities at their educational institutions. However, there is little research on sex differences in level of comfort and disclosure. Using data gathered through a survey and interviews with college students at eight universities and colleges in Virginia, I examine the levels of extracurricular involvement of students who identify as a sexual minority and their comfort levels with disclosing their sexual minority status. The focus of the project is to understand the levels of comfort sexual minorities feel engaging in sports, Greek life, clubs and leadership organizations and see if there are sex, gender, and race differences in comfort levels.

Mekenzie Schmitt M.A.T. '20

"More Than One Write Way to Dance"

Faculty Mentor: Dr.Roberta Parker, Education

Writing is hard. Translating ideas from thoughts in your head into written words is complicated. It is even more complicated when you are in the first grade and do not yet know how to write all the words you need to get your ideas across. How can we teach beginning writers about the process of sharing ideas with an audience when their ideas are still bigger than their words? One possible way is to teach students to share ideas in a language where their vocabulary matches their ideas. For my action research study, I chose to use the language of movement since children learn to read body language before they learn to speak. I taught a group of 18 first graders to tell and retell stories through creative dance to see if the idea-sharing skills they learned through dance would help them find ways to put their ideas into writing.

Peyton Shipley '20 and Victoria Marsh '20

"Sustainable Energy in Iceland"

Faculty Mentors: Dr. Karin Warren, Environmental Studies and Science; Sarah Sojka Environmental Studies and Science, and Physics & Engineering

As a region with many natural resources, Iceland has the opportunity that most countries do not. It is a country known for different and creative ways of creating sustainable energy. The entire country runs on renewable energy. Around 73% of the electricity provided is powered by hydro plants, created through converting the flow of water into energy. Geothermal plants provide the other 26%. Since it is an extremely volcanic region, Iceland uses the steam to create a little over a fourth of the electricity consumed in the country.

Allen Vaytser '20 and Frankie DiOrio '20

"Do Ticks Cause Cat Scratch Fever?"

Faculty Mentor: Dr. Adam Houlihan, Biology

Bartonella henselae is a bacterial pathogen that causes "cat scratch fever," a disease commonly transmitted by the bite or scratch of an infected cat. This infection causes lymphadenopathy near the site of inoculation, red bumps on the skin, fever, fatigue, and discomfort. While cats are the most common source of infection, transmission by ticks is also reported, but the relative role of tick-borne transmission is poorly understood. The goal of this project is to quantify the role that ticks play in the spread of B. henselae in central Virginia. Captured ticks are tested for the presence of B. henselae DNA using molecular methods.

Joseph Vazquez '20 and Hailey Gilman '21

"Wave-Based Acoustical Simulation of Alvin Lucier's "I am Sitting in a Room""

Mentors: Dr. Katrin Schenk, Physics & Engineering; Dr. Randall Speer, Music

Alvin Lucier's "I Am Sitting in a Room" (IASIAR) is an experimental sound art piece in which a recording is played in a room and the recording is played back and recorded until, according to Lucier, the resonant frequencies of the room are amplified above other frequencies. In order to explore this premise, we have developed a computational model for IASIAR. We define a Lucier Iteration as the playing of a source function in an enclosed space, the collection of the resulting waveform, and the use of said waveform as its own source function. We propose using the Finite Difference Time Domain (FDTD) method of acoustical simulation to further understand the modal nature of IASIAR for an arbitrary number of Lucier's Iterations.

Samantha Verhaagen '20

"Language Enhancement and Cultural Immersion"

Faculty Mentor: Dr. Mari Ishibashi, Political Science

In my spring semester, I did an independent study to learn more about the politics and culture of Mexico from the time of the Revolution until present day. To compliment this study, I used the RISE grant to live abroad in Mexico for five weeks to complete an intensive Spanish language course. My time abroad was also used to visit museums and historical sites that enhanced my previous knowledge from the Independent Study.

Kyle Wade '20 and Sidney Keyes '20

"The Effects of Academic Rigor and Athletic Training Load on Division III Student-Athletes Performance"

Faculty Mentor: Dr. Meghan Halbrook, Sport and Exercise Studies

The proposed study attempts to highlight the importance of student-athlete academic and athletic training load while reducing overtraining effects caused by psychological and physiological stressors on the body. This study will statistically analyze overtraining loads using a self-reported perceived exertion technological application and a wearable global positioning system tracker. These results will improve player-coach connections, reduce overexertion symptoms of the body and mind, and help student-athletes meet the expectations of academic and athletic loads. Previous studies have solely tested overall training loads and athletes' perceptions in games and practice sessions. This study will compile the effects of academic intensity with regard to athletic performance in order to create an acceptable training load for players to excel on both sides of the athletic and academic spectrum.

Lewis Ward '20

"Senior Art Show: Process and Rejections"

Faculty Mentor: Dr. Kathy Muehlemann

This installation will be a look into how I used my RISE grant to create art for my Senior Show. This exhibition will look into how everyday experiences inspire my art. It will look into the process of how I get an idea for a piece, the execution and materials, and the final production. This presentation will include works not exhibited in the senior show, which opens the week of Symposium. This will include images from the planning of various works displayed with an explanation of how to narrow down your art to a thematic show.

John Warren '20

"Modeling of Arrow Flight on How Front of Center, Weight Bias, and Spin Affect Arrow Drag"

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

Archery is one of the oldest arts practiced today. The evolution of archery began at the start of mankind's history, and evidence of ancient archers has been found around the world as early as 10,000 years ago. The laws of physics play a critical role in arrow flight. These laws allow an archer to make educated predictions and improvements, but most progress has been the result of trial and error. In this project, I will model how vane quantity, size, degree, surface area, and contact points with the air affect the arrow's drag and acceleration. I will also explore the concept of FOC, or "front of center," which helps adjust for the added weight bias up front leading the arrow to fall drastically at distance.

Matthew Williams '20

"Monitoring Chemical Composition and Evaporation Rate of Fluid in Wet-Mount Specimen"

Mentors: Emily Smith, Coordinator of Natural History and Archaeology Collections and Sara Harper, Biology Lab Technician

Specimens from the Natural History Collection are incredibly important to both education and outreach. Some of these specimens need to be stored in a solution comprised of formalin, ethanol, and isopropyl alcohol. Because ethanol and isopropyl are volatile, it is vital to keep these solutions at consistent concentrations when preserving the specimens, which requires accurately monitoring the concentrations. Tests using density to find concentrations are used, but because specimens vary in preparation method, size, and material, they are too inconsistent for accurate or efficient use of the density test. We devised a new test involving Gas Chromatography that has provided excellent results and is very accurate. This test should be of great interest to other collections and is important to the field.

Sara Woodward M.A.T. '20

"Fighting Fake News: Teaching Students to Evaluate Arguments from Evidence"

Faculty Mentor: Dr. Roberta Parker, Education

How can you tell if someone is telling you the truth? What makes a good argument? In today's age of viral social media posts and "fake news," the skill of evaluating the strength of a claim is vital. People need to be able to determine whether an argument is strong and valid in order to make informed decisions about who to vote for, what to buy, and how to stay healthy. If one goal of education is to prepare students to be productive citizens, educators must teach students to evaluate arguments. English teachers have begun using media literacy strategies to teach students to evaluate claims in the news. In this study, I investigate whether or not using these media literacy strategies in the science classroom can improve students' ability to identify claims, evaluate evidence, and judge the validity of an argument.

Cody Wright '20

"Presidential Leadership in the Making of the 20th Century"

Faculty Mentor: Dr. Gerard Sherayko, History

Although each American president has a different worldview, each cares about their vision, image, and the legacy they leave behind. Each leader has a diverse array of talents and gifts including intelligence, resiliency, empathy, and the gift of oratory. Focusing on the presidencies of Franklin Roosevelt, John Kennedy, Lyndon Johnson, Jimmy Carter, and George Herbert Walker Bush, my presentation explores questions such as how leaders install a sense of purpose into the American public and how a President channels that purpose into meaningful action. How does a President lead in particularly turbulent times? Is there any difference between leadership, power, ethics, and can one exist without the other? What is the ethical component of leadership, and how should a leader behave in changing times? In the end, is leadership about being a 'good' person, or pushing an agenda?

Joshua Yeast M.A.T. '20 - WITHDRAWN

"ClassDojo may be a NoGo"

Faculty Mentor: Dr. Roberta Parker, Education

Being a first-year teacher is very difficult and one of the biggest challenges is classroom management. Being at a school that implements a school-wide behavior management strategy makes it easier, right? Come to presentation to find out if this is the case. I set out to determine if the implementation of ClassDojo, an electronic point monitoring system, implemented with a token economy, decreased students' disruptive behaviors in the classroom. I will discuss the positive and negative effects of this behavior management intervention.

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

Special thanks

Doug Shedd, *The Catherine Ehrman Thoresen'23 and William E. Thoresen Professor of Biology*

Student Scholarship Committee:
Danielle Currier, *Associate Professor of Sociology and Director of Summer Research program*
Kristin Dabney, *Alumnae and Alumni Career Network Manager*
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Meghan Halbrook, *Assistant Professor of Sport and Exercise Studies*
Adam Houlihan, *Associate Professor of Biology*
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Peter Sheldon, *Professor of Physics & Engineering and Director of the Center for Student Research*

Luisa Carrera, *Administrative Coordinator, Center for Student Research*

Provost's Office
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Kimberly Word and the Aramark catering staff
Brenda Edson, Leigh Ann Bush and Dave Blount of the Office of College Relations

KEYNOTE SPEAKER

Doug Shedd

The Catherine Ehrman Thoresen'23 and William E. Thoresen Professor of Biology

I became a biologist because I'm interested in why the world is the way it is, and the areas in which I specialize - behavior, ecology, and evolution - provide lots of answers. I've studied animals ranging from ravens to lemurs, in places as close to home as the Randolph campus and as far away as the Serengeti plains of East Africa. Currently, I'm working on a research project in Ireland that focuses on the chough. This rare species of bird is ecologically linked to the traditional agricultural practices still in evidence along parts of Ireland's west coast.

When I'm not teaching, I like spending time with my family, reading, walking, watching birds and baseball, and discussing biology's philosophical implications with my students and friends. I also greatly enjoy exchanging emails with Biology alums, many of whom are engaged in fascinating careers and research.

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