

THE RANDOLPH COLLEGE
SYMPOSIUM OF
ARTISTS AND
SCHOLARS

The Symposium of Artists and Scholars features student presentations from disciplines across campus

APRIL 29 & 30, 2021



Welcome

Dear Symposium Attendee,

Welcome to Randolph College's 13th 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 thirty 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,

A handwritten signature in black ink that reads "Bradley W. Bateman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Bradley W. Bateman
President

KEYNOTE SPEAKER

PAMELA RISENHOOVER

The Charles A. Dana Professor of Dance and Director of the Helen McGehee Visiting Artist Program

PAMELA RISENHOOVER is currently the Charles A. Dana Professor of Dance and Director of the Helen McGehee Visiting Artist Program in Dance at Randolph College. On the faculty since 1984, she is a past recipient of two of the College's teaching awards—the Gillie A. Larew Distinguished Teaching Award (1998-99) and the Catherine Graves Davidson Award (2003-04).

A New Yorker by birth, she is a graduate of LaGuardia High School's School of Performing Arts in New York—the "Fame" school—where she received honors in ballet. She then went on to receive her BFA from the Juilliard School where she studied with many important teachers from the professional dance world, including Helen McGehee. Following her graduation from Juilliard, she received a scholarship from the Martha Graham Center of Contemporary Dance and subsequently performed with the Martha Graham Dance Company and the Graham Ensemble. It was during this time when she first came to Randolph-Macon Woman's College as a visiting instructor brought here by Ms. McGehee, the founder of the Visiting Artist Program in Dance. She would go on to receive her MFA from UNC at Greensboro.

Ms. Risenhoover performed with other dance companies, such as the Bernhard Ballet Company, DANCES/Janet Soares, and the Anthony Morgan Dance Company. She has worked with notable choreographers including Kazuko Hirabayashi, Helen McGehee, Genia Melikova, Susan Marshall, Judith Garay, Anna Sokolow, and Ethel Winter.

In 2001 she and her husband, John Justice, then the Mary Frances Williams Professor of Philosophy, did a faculty exchange with Nanjing University in China. She has also performed and conducted master classes in England, Colorado, Massachusetts, and Michigan. In addition, she taught at the Virginia School of the Arts in the early 1990s.

As the Director of the Helen McGehee Visiting Artist Program in Dance since 1986, she has brought many distinguished dance artists to campus. These extraordinary dance artists taught ballet and modern dance to college students while in-residence. They include the first ballerina to perform with Rudolf Nureyev following his legendary defection from the Soviet Union; a MacArthur Foundation "Genius Grant" recipient; one of the stars of "The Children of Theatre Street" an Oscar-nominated documentary narrated by Princess Grace of Monaco; various cast members of another Oscar-nominated documentary, "Dancemaker" about choreographer Paul Taylor. A member of AGMA (American Guild of Musical Artists) since 1982, her other credits also include commercials that aired nationally and internationally.



Due to the pandemic, all presentations will be available virtually and asynchronously.

Please join us for a celebration of student scholarship by viewing and interacting with our keynote speaker and with all of our student speakers during the Symposium weekend (Thursday–Sunday).

All presentations will be available virtually at <http://sas2021.go.randolphcollege.edu/>

Professor Pamela Risenhoover’s keynote presentation on creativity, the liberal arts, and the pandemic will be available for viewing on Thursday, April 29 at 11 a.m.

Student oral presentations, exhibits, and poster presentations will be available for viewing on Friday, April 30 at 11 a.m.

The website will be available for you to submit questions, and the speakers will respond throughout the weekend. Please join us!

ABSTRACTS

Benjamin Ailsworth
Rodrigo Amestegui
Rabiea Ashraf
Devin Bagby
Emilie Bryant
Joshua Bulavko
Tyler Campbell
Emma Carrico
Cassidy Carter
KeAsia Carter
Jordan Clark
Dagim Desta
John Dolan
Christine Dorman
Mitchell Doss
Donald Doyle
Stacey Dudley
Paige Edwards
Elizabeth Ellen
Landon Fielder
Brooklyn Ford
Alyssa Galbreath
Alissa Garcia-Cruz
Carter Garrett
Hailey Gilman
Zeb Gray
Sarah Greene
Elijah Harrison
Nicole Heddings
Rebecca Heidenfelder
Jackson Jacobs
Sabrina Johnson
Rebecca Jones
Jacob Katz
Samantha Landers
Riley Lorson
Erika Mabry
Tomi McGinnis
Samuel Mott
Kennedy Moulton
Dilawar Mubashir
Madison Murphy
Taylor Murphy
Dominique Nelson
Jeffery Oliveri
Jackson Powell
Agnes Reyes

Bryce Russell
Michaela Salerno
Andrew Scales
Shamir Scott
Michelle Starks
Lindsey Taylor
Nadia Tibbs
Nicholas Vazquez
Zachary Waugh
Abby Whitlock

2021 PRESENTATIONS

Benjamin Ailsworth '22, Logan Davis '21, Jdody Misidor '21

"Community Climate Resilience: Energy Efficiency and Vulnerability of Lynchburg Housing and Development"

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

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. Randolph College a signatory to a Climate Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our south-central Virginia community to develop goals and strategies to address resilience as part of climate action planning. Towards this goal, the 2019 Energy & Society class conducted an assessment of campus-community resilience. This year's class is using the results of the prior work to address strategies for addressing climate vulnerabilities in our region. Our team evaluated climate vulnerability in energy efficiency in buildings and housing. We researched case studies from other cities of community-based energy strategies to address these vulnerabilities, and assessed the feasibility of applying these strategies in the region of south-central Virginia. We will share the results of our investigation, and recommendations for addressing key community vulnerabilities on our campus and in the community.

Rodrigo Amestegui '21

"Algorithmic Agency"

Faculty Mentor: Dr. Jennifer Gauthier, Media and Culture

According to Pew Research, 70% of Americans use social media. Algorithms collect our information to later profit off our usage, and this results in algorithms individualizing our experiences on social media platforms. Societally, we are becoming more egocentric due to individual echo chambers playing upon our cognitive biases: political actions and movements that were once built through human relationships and societal experiences are now stalled by our disseminated information systems. This project aims to explain how algorithms are built, what makes them effective, and display how algorithms have affected our individual actions during the COVID pandemic. Through survey responses, we grouped people by their main purposes for using media, took an average count of their COVID actions, and then matched political news consumption within each group. This project aims to find the effects of our media consumption to determine if those that are uninformed act the same as those who are misinformed.

Rabiea Ashraf '21

"Dwelling- A continuous path towards belonging"

Faculty Mentors: Dr. Suzanne Bessenger, Religious Studies; Dr. Gordon Steffey, Religious Studies

Built in the 19th century, Agudath Sholom Synagogue has long been a mechanism of homemaking for the Jewish minority in Lynchburg. As a member of the more recent Muslim minority, I can attest that seeing Lynchburg as 'home' and belonging here requires an ongoing effort. In this study, I seek to understand how members of Agudath Sholom Synagogue understand belonging as a minority in Lynchburg. For this study, I became a participant and observer at Agudath Sholom for twelve weeks and conducted interviews with synagogue leaders and members. I borrowed Thomas Tweed's notion of dwelling to interpret the data generated by my fieldwork and interviews. Based on both historical influences and the reported experiences by the members of the synagogue, I concluded that the process of dwelling is a never-ending one and the path to belonging is challenging for a religious minority community.

Devin Bagby '21

"Sexism in Sport: A Review of Social Media Comments"

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

The current study examined sexism present in social media comment sections of sport-related posts focusing on females, female athletes, and other female sportspersons using Instagram as the medium. Previous research (Darvin & Sagas, 2017; Fink, 2016) indicates that women in sport endure sexism through overt and covert ways that can be damaging to said women. For this reason, the researchers analyzed the percentage of sexist comments related to particular posts, while also analyzing the intersectionality content of these messages. A textual analysis was used to examine the top 10 comments of 114 posts that fit the identified criterion from January 1 - February 28, 2021. The posts were taken from the well-known, athletically-focused Instagram accounts of ESPN, SportsCenter, and BleacherReport. Preliminary results indicate that certain themes such as assumption of inferiority, objectification, and restrictive gender roles were common throughout the posts regarding female athletes and women in sport (Kaskan, 2010).

Emilie Bryant '22

"Yarning for Unity: Unifying Communities through Public Art Initiatives"

Faculty Mentor: Dr. Lesley Shipley, Art History

In the fall of 2020, I created a socially engaged and participatory art exhibit for the exterior of the Maier Museum of Art with multimedia and craft-related works, titled Yarning for Unity. The works were designed by a collective of artists and activists. The exhibition contributed to community engagement through a safe outdoor art exhibition at a time when many people were forced to stay at home due to the pandemic. I was inspired by the practice of yarnbombing, Guerilla Kindness (Sayraphim Lothian Ph.D.), Craftivism (Betsy Greer and Sarah Corbett), and New Genre Public Art (Suzanne Lacy). I encouraged contributing artists to use innovations in artistic practice and non-traditional mediums. Yarning for Unity was a means for the community to work together in a civil and uplifting way, and the benefits reached both artists and the public.

Joshua Bulavko '22

"History and Historic Preservation of Rivermont Avenue and Beyond"

Faculty Mentor: Dr. Gerard Sherayko, History

Rivermont Avenue of Lynchburg, Virginia is a city filled with stories, and I set out to discover them under the guidance of Dr. Gerard Sherayko of Randolph College's History Department. In the 2020 Summer Research Program, I compiled a series of narratives utilizing interviews conducted during previous SRPs. This process was essential to know how life in Lynchburg has evolved and how the past can help address social inequalities in the present. Our narratives were uploaded to the Friends of Rivermont Historical Society webpage (www.friendsofrivermont.org) to be accessed by any citizen or business owner interested in the history of the neighborhood. These captivating chronicles feature alumnae and staff from Randolph-Macon Woman's College, as well as longtime residents from the Rivermont Historic District. We set out to show that old places matter and I hope to inspire others to become active in historic preservation.

Tyler Campbell '21

"Robotization of the Randolph College Winfree Observatory"

Faculty Mentors: Dr. Peter Sheldon, Physics & Engineering; Dr. Katrin Schenk, Physics & Engineering

The Winfree Observatory at Randolph College has undergone a slow process of technological advancements since the 1920's. In its current state, the observatory has a 14-inch telescope that can be controlled autonomously to point in a specified direction, but two independent manual switches are

required in order to operate the dome and shutters, which is inefficient when capturing long-exposure images or frequently shifting the telescope to observe various astronomical phenomena. The objective of this project is to create an autonomous system capable of controlling the observatory from a cellular app such that the shutters and dome are always in the proper position relative to the telescope, as well as designing the shutters to close automatically in the event of inclement weather.

Cassidy Carter '21, Elijah Harrison '21

"Let It Go: Children's Interpretation of Song Lyrics in a Multimedia Context"

Faculty Mentor: Dr. Sara Beck, Psychology

There have been many studies on children's learning in a musical context, but little is known about age-related change in how children construct meaning from multimedia songs. In this study, we examine age-related change in children's understanding of song meaning, using the song "Let it Go" from Frozen. We are currently recruiting sixty children familiar with the movie Frozen, in the age range of 3 to 10 years old. Individually testing children virtually (Zoom), we first give them a global comprehension measure of the song that consists of two-alternative forced-choice visual responses. Children then watch the "Let it Go" music video, with the researcher stopping at three points throughout the video to ask the child how Elsa is feeling and how the child knows. These answers are then coded for reference to song lyrics, Elsa's appearance, Elsa's actions, plot line/narrative, and non-lyrical musical elements. Data analysis is currently underway.

KeAsia Carter '21

"'Hey Social! Let's Get Emotional, Social-Emotional': Is Social-Emotional Learning Effective?"

Faculty Mentor: Dr. Crystal Howell, Education

Think back to the time when you were a student. Did your teacher help you learn about managing emotions, setting and achieving positive goals, and showing empathy for others? Was it beneficial to you or any of your peers? Social-emotional learning (SEL) is a hot topic in 21st-century schools. Beginning fall 2021, school divisions in Virginia will be required to develop a social-emotional curriculum at all grade levels. Research shows teaching students SEL skills leads to positive behavior, less emotional distress, academic success, and fewer behavior problems. This research evaluated lesson plans to determine their effectiveness of SEL skills on academic, social, and emotional learning in a kindergarten classroom. My talk will focus on examining whether there are academic, social, and emotional benefits of teaching SEL in a kindergarten classroom.

Jordan Clark, M.A.T. '21

"Special Education in a COVID World: A Students' Perspective on Their Learning Environment"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

Students have been thrust into online learning as a result of the global COVID-19 pandemic. Online learning has created new challenges for all students, with arguably an even greater impact on students with disabilities. Due to limited research on students' perceptions of virtual learning, the extent of the challenges posed to students with disabilities is ambiguous. This study invites middle school students with disabilities to share their perceptions of individual needs in the virtual learning environment and whether or not their needs are being met.

Dagim Desta '23, Jacob Katz '23, Jackson Powell '21, Nicholas Vazquez '23

"An Investigation of the Efficacy of Current Machine Learning Techniques for the Analysis of Mouse Ultrasonic Vocalizations"

Faculty Mentor: Dr. Katrin Schenk, Physics & Engineering

We analyzed the efficacy of several machine learning-based codes to detect and analyze mouse ultrasonic vocalizations (USVs) using upwards of four terabytes of sound data collected by Dr. Schenk and her collaborators over the last ten years. USV's in these data, also called calls, have been identified using detection and analysis code that Dr. Schenk's cohort has written. The detection and analysis of these USVs have been verified using the gold-standard by-eye method in which an expert looks through a frequency versus time plot (called a spectrogram) looking for mistakes in detection. These verified USVs were then used as the testbed for several machine learning-based call detection codebases.

John Dolan '21

"The Psychology of Sport Injuries"

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

This project was completed, in part, through the Sport and Exercise Studies Senior Seminar course. The two-fold purpose of the research was to review peer-reviewed studies examining how psychological factors can contribute to sport injuries and how sport injuries can lead to psychological issues. Research indicates that there is a multi-directional relationship between psychological factors (such as stress, depression, and anxiety) and injury occurrence. Furthermore, psychological barriers also influence the recovery process. For coaches and athletic trainers, understanding the myriad of factors related to sport injuries may prevent athletes from experiencing burn out or negative psychological states in the rehabilitation process.

Christine Dorman, M.A.T. '21

"Does It Add Up? Pandemic Effects on Middle School Math Achievement"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

Teaching was transformed overnight due to a governor-mandated shift in instruction in response to a world health pandemic. Educational settings were suddenly transformed to virtual and hybrid models. What effect did this have on math achievement for middle school students in an urban city in the heart of Virginia? How will education be permanently altered moving forward after the pandemic? Educators and students were forced to alter their modes of instruction and learning with scarcely a warning. Adult support abruptly shifted from teachers to parents. These unanticipated changes did have an effect on math achievement for virtual and hybrid students, especially students with disabilities. The results have been calculated, but do they measure up to success?

Mitchell Doss '21, Brooklyn Ford '22, Abby Whitlock '23,

"Community Climate Resilience: Biodiversity and Tree Coverage"

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

Institutions, businesses, and communities are incorporating resilience strategies as an essential element of climate action planning. Randolph College is a signatory to a Climate Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our community to develop strategies to address resilience as part of climate action planning. Towards this goal, the 2019 Energy & Society class conducted an assessment of campus-community resilience. This year's class is using the results of the prior work to address strategies for addressing climate vulnerabilities in our region. Our team evaluated climate vulnerability in Biodiversity and Tree Coverage. We researched case studies from other cities of community-based energy strategies to address these vulnerabilities, and assessed the feasibility of applying these strategies in the region of south-central Virginia. We will share the results of our investigation and recommendations for addressing key community vulnerabilities.

Donald Doyle '21

"Journalism in eSports"

Faculty Mentor: Dr. Jennifer Gauthier, Media and Culture

Competitive video games have been popular since arcades were introduced to society, and have grown into a multi-million dollar industry. However, the industry is plagued by one major issue - its existence within journalism. During the summer and fall semester of 2020, I created a YouTube channel that focused on the competitive Call of Duty scene. Throughout my project, I interviewed different journalists and analysts and was able to complete reports on the various tournaments. I gained insight to what was effective and ineffective within eSports journalism. This project was made possible through the RISE Grant and was pivotal in developing my video editing, production, writing, and collaboration skills.

Stacey Dudley '24

"Painting the Partings"

Faculty Mentor: Dr. Jennifer Gauthier, Media and Culture

My installation consists of four paintings each sized 11 x 14 inches. I intended to depict influential people who shaped America's social justice systems in a way that is bright and exciting with an array of colors in the backgrounds. My purpose was to exhibit the harmony that the activists intended to create through the flowy background. I portrayed the citizens' portraits using only black and white to symbolize the state that they were living in, where the country was divided and inequality was a major issue. My paintings connect to social justice issues of today as we strive to unify people and end the parting between individuals.

Paige Edwards '21, Riley Lorson '21, Michelle Starks '22

"Community Climate Resilience: Health Impacts and Heat Islands"

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

Institutions, businesses, and communities are incorporating climate resilience strategies to prepare for the adverse impacts of climate change. Randolph College is a signatory to a Climate Resilience Commitment as part of the President's Climate Commitments by institutions of Higher Education. This Commitment obligates Randolph College to work with our south-central Virginia community to develop goals and strategies to address resilience as part of climate action planning. The 2021 Energy & Society class conducted an assessment of campus-community resilience and used the results of prior work to address strategies for addressing climate vulnerabilities in our region. Our team evaluated climate vulnerability of health impacts in heat islands. We researched case studies from other cities of community-based energy strategies to address these vulnerabilities and assessed the feasibility of applying these strategies in south-central Virginia. We will share the results of our investigation and recommendations on our campus and in the community.

Paige Edwards '21

"Proposal of Long Term Monitoring Plan for the Impact of Sediment Downstream of College Lake Dam Removal"

Faculty Mentors: Dr. Karin Warren, Environmental Studies and Science; Dr. William Bare, Chemistry; Dr. Sarah Sojka, Environmental Studies and Science and Physics & Engineering; Dr. Laura Henry-Stone, Environmental Sciences and Sustainability, University of Lynchburg

In 2018, a rainfall event caused water to flow over the top of College Lake Dam at the University of Lynchburg. This extreme event highlighted the urgency of addressing the risks posed by the dam and led the City of Lynchburg to the decision to remove the dam and allow College Lake to transition to a wetland ecosystem over time. When the dam is removed, accumulated sediment will be released downstream. I will present a proposed monitoring protocol to track and assess the habitat impacts of sediment loading downstream. The monitoring plan focuses on the physical characteristics of the stream including habitat classification, stream width, and size of sediment or rocks. The University of Lynchburg will be incorporating my monitoring plan into their overall program for monitoring and assessment of the evolving College Lake ecosystem.

Elizabeth Ellen '21, Lindsey Taylor '21

"The Relationship between Helicopter Parenting and Cognitive Development in College Students"

Faculty Mentor: Dr. Holly Tatum, Psychology

Helicopter parenting is characterized by well-intentioned parenting behaviors that has been linked with psychological control (Winner & Nicholson, 2018). For example, helicopter parents attempt to prevent their child from experiencing failure or conflict by making decisions for their child (Cline & Fay, 1990). The researchers examined how helicopter parenting is related to cognitive functioning and decision making in college students. Participants included 50-60 Randolph College students between the ages of 18 and 22. Participants were tasked with completing the Decision Making Self Efficacy scale (Reed et al., 2012), the Multidimensional Helicopter Parenting Scale (Love, 2016), and the Wason Card Task (Wason, 1966) which measures logical reasoning. The researchers predicted a negative correlation between children of helicopter parents and both confidence in completing the Wason Card tasks and decision making self-efficacy.

Landon Fielder M.A.T. '21

"'I don't study to know more, but to ignore less:' Setting Students up for a Bilingual Success Story"

Faculty Mentor: Dr. Crystal Howell, Education

Let us set students up for a bilingual success story. If university-level programs and advanced high school Spanish programs use literature as a proven method of teaching Spanish to their students in place of more traditional methods, then why not teach novice middle school students in the same manner? This study argues that middle school language programs should throw out the traditional textbooks and grab an authentic short story, or poem such as *Hombres necios*, to develop students' Spanish proficiency in reading, writing, listening, and speaking without entering a convent.

Alyssa Galbreath '21

"A Sociological Content Analysis of Self-Harm Support Groups on Facebook"

Faculty Mentor: Dr. Danielle Currier, Sociology

In this presentation I will offer results from a content analysis I conducted on five Facebook groups offering support for people who previously or currently engage in non-suicidal self-harm. Self-harm, especially as shown in the media, has become negatively stigmatized and widely misunderstood. The purpose of this project was to clearly define various types of non-suicidal self-harm, examine the causes and demographics of those who engage in these activities, and analyze how people engage and present themselves on Facebook support groups. The groups chosen for this analysis were created by people who personally engaged(d) in these activities, not groups run by therapeutic professionals or organizations. This research provides insight into the relationship one has with self-harm (and healing from self-harm) through the analysis of posts being shared on a specific social media platform.

Alissa Garcia-Cruz '22

"The Discussion of Violence in LatinX Families"

Faculty Mentor: Dr. Danielle Currier, Sociology

Domestic violence, sexual assault, rape, abuse, and/or incest within most American families are often considered "taboo" topics of discussion. Factors such as cultural norms and patriarchal family structures transferring inter-generational knowledge are particularly true among non-white populations. This research examines if people of LatinX/Hispanic descent in the US do or don't discuss these issues. So far I have conducted a comprehensive meta-analysis of existing literature in sociology, psychology, and family studies. In the Summer, I will conduct 5-10 interviews with LatinX/Hispanic adults living in Virginia and Iowa. I will access participants through a snowball sample, using connections of my own mixed-heritage family. Following this, a qualitative analysis of pertinent themes will be done on the interview data. The LatinX/Hispanic population will constitute 30% of the US population by 2050, there is a great need for more research on this topic. Projects like this will provide empirical evidence for policymakers and academics alike.

Carter Garrett M.A.T. '21

"Into the Unknown: Supporting First-Year Teachers from Various Preparation Backgrounds"

Faculty Mentor: Dr. Crystal Howell, Education

How do we know what we don't know? First-year and novice teachers often do not know where to start or what to ask for when they enter their educational occupation. As they progress and grow in their careers it is easy to look back and think of things they wish they had known, been given, or been taught that would have made them more successful. Instead, teachers often have to participate in the trial by fire method of learning. This study examines the different supports offered to novice teachers, what they found to be valuable, and what they wish they had received. When presented with various opportunities for support and development, teachers can be more successful and comfortable in their craft.

Hailey Gilman '22, Bryce Russell, Nadia Tibbs

"Evaluating the Impacts of Seagrass Restoration on Carbon Storage"

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

Coastal ecosystems capture carbon from the environment, mitigating the climate effects of human carbon emissions. Restoration of seagrass beds, a key part coastal ecosystems, are seen as a way to enhance carbon storage. However, much of the carbon stored in seagrass beds comes from outside of the beds and there is little information regarding the impact of seagrass restoration on carbon

storage in adjacent sediments. This study quantifies the relationship between carbon stored within and local to the restored seagrass beds by evaluating data collected before and after restoration. Many of the sites outside of the beds showed a decrease in carbon storage following restoration, indicating that some of the carbon may be relocated from other parts of the ecosystem, not a true enhancement of carbon storage. This project was funded by the Randolph College Summer Research Program and the Virginia Coast Reserve Long-Term Ecological Research project (NSF grant DEB-1832221).

Zeb Gray '21

"Ten Thousand Recollections and a Long Time Coming...Memorializing Nat Turner"

Faculty Mentor: Dr. Gerard Sherayko, History

Nat Turner and his co-conspirators met in Southampton County, Virginia in August of 1831, launching America's deadliest slave revolt. Despite efforts of enslavers to improve or "ameliorate" slavery, life for the enslaved remained grim and hopeless. Turner's Rebellion was a natural consequence. Convicted enslaved rebellion leaders have been commemorated, pardoned, and cast in bronze. But not Nat Turner...yet. My senior paper explores the Rebellion and the nature of slavery at the time. It follows the evolving Turner legacy and how memorializing him with community involvement will be useful in the ongoing struggle for justice and equality. I traveled to Southampton County and spoke with a local public historian whose family was greatly affected by the Rebellion. An ancestor of Nat Turner, Bruce Turner graciously shared time and his meaning of the rebellion as well. Research draws from primary and secondary nineteenth, twentieth, and twenty-first century documents, histories and periodicals.

Elijah Harrison '21, Madison Murphy '21

"The Influence of Stress on the Brain"

Faculty Mentor: Dr. Elizabeth Gross, Psychology

Inter-parental conflict is defined as continuous disagreements between parents. The objective of our research is to identify connections between inter-parental conflict, cognitive, and non-cognitive processes. Previous research addresses the negative impact that inter-parental conflict has on self-efficacy, accounting for the majority of our research pertaining to perseverance on tasks (grit). If an individual experiences stress it can erode brain functioning which may disrupt cognition. This study will measure grit, attention, and working memory by asking participants to fill out two surveys and perform two search and solve tasks. We hypothesize that individuals high in inter-parental conflict will have lower academic achievement and grit scores. Therefore, this study will demonstrate how one's home environment and parents share the role in shaping the minds of their children outside of the family unit.

Nicole Heddings '21

"Mindfulness and cognitive abilities: Can present moment awareness improve memory retention?"

Faculty Mentor: Dr. Elizabeth Gross, Psychology

The practice of mindfulness originates from Buddhism and requires one to be focused in the present moment, meaning to be actively aware of one's sensations and emotions. Research suggests that the practice of mindfulness can help increase cognitive abilities and decrease symptoms of several mental disorders. Specifically, several recent studies have shown that a brief mindfulness intervention before a lecture can potentially improve one's quiz performance afterwards. In the present study, an experimental group who completed a mindfulness meditation will be compared to the control group who only viewed a TedTalk. Afterwards, participants completed memory and cognitive tasks. It is hypothesized that the experimental group will be able to freely recall more words and score higher on the object location task than the control group. In conclusion, the current study serves to investigate whether a brief introduction of mindfulness can serve to increase short-term memory and cognitive load.

Rebecca Heidenfelder '21

"Costuming and Clothing the Human Body"

Faculty Mentor: Pamela Risenhoover, Dance

Dance uses human movement to communicate a story, an idea, or an emotion, to an audience. The physical presentation can reveal to the onlooker the craft and artistry of both the choreographer and the performer, while simultaneously displaying the athleticism of the dancer whose physical effort produces fluid, powerful movement. An important element of dance performance, costumes aid in the further communication of the idea or narrative, but must also take into consideration the actual movement and physicality while enhancing the line and aesthetic of the art form or specific dance style. Costume design for dance has a long history going back to the roots of dance when performances were of a more ritualistic nature.

Jackson Jacobs M.A.T. '21

"Special Educators' Responsibilities Versus Priorities: 'I'll Make Time'"

Faculty Mentor: Dr. Crystal Howell, Education

Special education teachers have many responsibilities besides the duties outlined in their contracts, so much so that it becomes difficult to balance

the various tasks in the classroom with those behind the scenes. This study examines special education teachers' personal sense of responsibility with the work tasks they actually find time to complete, over the course of a workweek. Pertinent to the discussion are job satisfaction, teacher workload, and retention rates.

Sabrina Johnson '21

"Deeper Learning: How do elementary mathematics and science teachers acquire strategies and content knowledge to promote student success?"

Faculty Mentor: Dr. Cheryl Lindeman, Education

Elementary education majors are interested in learning how elementary school teachers continue to learn and grow in their profession. Our research design will facilitate gathering targeted information that addresses deeper learning in math and science. Survey items from the 2018 National Survey of Mathematics and Science Education (NSMSE) were used to develop an online survey to ascertain the key professional learning pathways teachers report are valuable and effective in helping students excel in mathematics and science. A focus group from a sample of Virginia elementary teachers in grades two through five helped us gather insights into how they approach their own professional learning pathways. This study allowed us to design two infographics representing the collective deeper learning pathways most often implemented by practicing math and science elementary school teachers.

Sabrina Johnson '21

"Teach it, But How? Teachers' Changed Perceptions of Online Teaching during the Pandemic"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

The COVID-19 pandemic rapidly spread globally and has affected the education of many students. The current lockdown and social distancing guidelines due to COVID-19 has prompted the shift from face-to-face to virtual learning in schools in most countries. Now, a year into the pandemic, schools have loosened restrictions and embraced hybrid learning. This study evaluated the influence of COVID-19 on teaching and on the learning process through a virtual platform, while examining the challenges and opportunities of continuing online education. Teachers in Central Virginia participated in focus group interviews to share their perceptions on how online learning has influenced them and how they have changed their approach to teaching. Findings from this qualitative inquiry will help inform teachers' teaching practices.

Rebecca Jones '21

"Indigenous Land Rights in Brazil"

Faculty Mentor: Dr. Mari Ishibashi, Political Science

Many indigenous peoples, with a multigenerational trauma from past colonial practices, often experience challenges such as marginalization, low-quality education, and poverty, which impact their ability to realize self-determination. While the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) of 2007 was significant in establishing the international framework for their rights, it also left many issues untouched. Through a case study of Indigenous peoples of the Amazon in Brazil, this project will illustrate ways in which the issue of land rights for Indigenous peoples became politicized, posing a dilemma of resource distribution and equity in governance. The significance of this set of issues is discussed in order to address the shortcomings of the current frameworks and efforts of the indigenous movement, so as to stop the preference of ethnographic authority over the progression and realization of indigenous rights.

Samantha Landers '21

"Pilates? What's that?"

Faculty Mentor: Pamela Risenhoover, Dance

During this Pilates presentation, we will discuss what Pilates is, the history of Pilates, and why and how it can help with injuries, staying in shape, and gaining strength. Many people think Pilates is some form of yoga. In some respects it is similar, however, Pilates has many different pieces of equipment that can be used for the exercises. This allows the participant to use not only their own body weight as resistance, but also use the resistance of ropes and springs. Joe Pilates created this technique because he had several disabilities when he was a child. His disabilities were cured by doing these exercises out in the sun. Pilates is still slowly growing in knowledge by those outside of the dance and movement world, and as I transition out of training into a Pilates instructor, I am excited to share the knowledge I have gained.

Riley Lorson '21, Sarah Greene '24, Abby Whitlock '23

"Randolph Thrive"

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 time spent there. Inspiration for Randolph Thrive stems from the reported increase in the number of college students with mental health issues along with research showing the positive impacts of a campus nature program. We have worked under Allison Brooks' and Dr. Warren's supervision, with support from the Library, Health and Counseling Center, and Sustainability Council. The program identifies six outdoor spaces for students to practice mindfulness, as well as one indoor space in the Library to be accessible during unfavorable weather conditions. Our poster displays these Thrive spaces and highlights our ideas for involving the program in student life.

Erika Mabry, M.A.T. '21

"Rise and Shine: The Use of Movement Breaks to Improve Student Achievement"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

As remote and hybrid learning have replaced face-to-face instruction due to an international pandemic, high school students have been restricted from typical movement throughout the day. Pre-COVID, students were given opportunities to eat in the cafeteria, socialize with classmates, and freely roam the halls in between classes. Now, their schedules have been moved from seven class periods per day to four, each lasting seventy-five minutes including lunch with their third-period teachers. As students' sedentary behaviors during the school day have increased, they are more vulnerable to losing focus. Is there a way to implement movement to increase student focus?

Tomi McGinnis '22

"Remembering AIDS Victims"

Faculty Mentor: Dr. Gerard Sherayko, History

What do you think about when you hear "AIDS - Acquired Immunodeficiency Syndrome"? Maybe you think of famous faces like Freddy Mercury or Rock Hudson who were the center of attention in the tabloids at the height of the epidemic. Maybe you think about the Stonewall Inn in New York City, a hub for the LGBTQ+ community. Or, maybe you think about the similarities between the COVID-19 pandemic and the AIDS epidemic. At the center of whatever one thinks about are the victims. The victims who not only suffered from AIDS, but suffered under scrutiny and stigma. It is our responsibility to remember the victims and encourage others to learn about and to bring awareness to this significant time in American LGBTQ+ history. By discussing the ways in which victims are remembered, and how we can improve, is essential for future generations.

Samuel Mott '21

"Data Analytics Study for Pikes Peak Overhead Door"

Faculty Mentor: Dr. Michael Penn, Mathematics

From October 24th to November 24th of 2020, I did an internship at Pikes Peak Overhead Door in Colorado Springs, CO. This internship was done to analyze data from a marketing campaign that started during my time at the company. I was tasked with noting correlation and/or causation before, during, and after the marketing campaign. The results are being processed and will be completed by the time of presentation. Throughout the internship, I was able to work one on one with the owner of the company, Bob Bartlett. While working with Mr. Bartlett, I was able to learn leadership skills and do hands-on work in the community. This internship taught me real world application of data analysis, and showed me how a successful, small business runs today.

Kennedy Moulton '21

"Athletes and their Use of Social Media"

Faculty Mentor: Dr. Jennifer Gauthier, Media and Culture

This presentation is a reflection of the research I was able to do this past semester. My research consisted of looking at how student-athletes use their social media accounts to connect with fans. I created a survey and asked student-athletes who are currently in attendance at Randolph College, and Alumni who were athletes in the last three years, to participate. My goal was to learn what drives individuals to post on social media to connect with fans. This talk discusses my findings including what drives people to post and which social media they choose to use.

Dilawar Mubashir '21

"Solar Panels in a Remote Village in Pakistan"

Faculty Mentor: Dr. Peter Sheldon, Physics & Engineering

In a remote village in Pakistan where the average temperature during the summer can easily exceed 100° F, during peak electricity usage blackouts occur which can last several hours during the hottest times of the day. Setting up an off-grid solar panel system allows for several fans and lights to run during the hottest times of the day and throughout the night. The panels produce more than enough wattage during the day so that they can support the load and have excess power to charge the two batteries. I had to find the panels, batteries, and uninterrupted power supply with a budget and setup the entire system to work with the fixtures in the home. This included finding a suitable location for the panels and the orientation of the panels for maximum efficiency. The panels make life a little easier in the harsh climate of Pakistan.

Taylor Murphy '21

"Mind the Gap: Informal Inquiry STEM Learning to Fill in Learning Gaps"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

STEM education, which incorporates the disciplines of science, technology, engineering, and mathematics, has gained a lot of popularity in recent years. This increase in STEM learning has triggered a greater awareness of students' learning gaps within these disciplines, which the COVID-19 pandemic has only widened further. One of the causes of this learning gap is a lack of learning environments in which students are guided in their development of mental dispositions. Known as the habits of mind, this informal, inquiry-based STEM

learning can be used to fill in these learning gaps. My study examines how an informal, inquiry-based STEM learning environment allows students to exhibit habits of mind traits.

Dominique Nelson M.A.T. '21

"A United History: Middle School Students' Bias Detection in the Virginia Civics Classroom"

Faculty Mentor: Dr. Crystal Howell, Education

"What we need is not a history of selected races or nations, but the history of the world void of national bias, race hate, and religious prejudice." – Carter G. Woodson

When reading a historic text, how often have you considered whether that text contains varying degrees of racial bias? Renowned textbook publishing companies, in conjunction with state-endorsed textbooks, have authorized the use of texts that reflect a biased recounting of history, leading students to believe in the facts presented and consider the author's historical interpretation as truth. The implications of reading such texts create a perception built on deceit and hate, perpetuate false historical narratives, and will ultimately affect students' perception of the world. In my mixed methods study, I explored if students were able to detect racial bias within our civics textbook and then provided students with historical analysis strategies to broaden their historical bias detection skills.

Jeffery Oliveri '21

"Autonomous Solution to Fire Line Construction"

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

Fire line construction is the process of clearing brush and digging trenches to remove as much fuel as possible from a fire, and is the standard solution for containing a wildfire. The current process of firefighters using chainsaws and heavy machinery requires firefighters to be in the direct path of the fire. The main focus of this project is to reduce the risk of harm to firefighters. We are designing a remote-controlled, or autonomous vehicle (or team of vehicles), capable of digging at a rate faster than current speeds of hand crews. To ensure a viable solution, the robot must be able to dig a trench 24-36 inches wide and 1-2 inches deep, at a rate faster than 0.21 miles per hour. This presentation will cover the design and development of the vehicle frame and drivetrain, as well as the internal cooling system.

Agnes Reyes '21, Emma Carrico '21

"Using an Educational Strategy to Decrease Negative Attitudes towards Individuals with ASD"

Faculty Mentor: Dr. Holly Tatum, Psychology

Research suggests that educational training programs are essential in increasing knowledge and decreasing negative attitudes and stigma towards marginalized groups. The current experiment tested the effects of an educational training program on participants' attitudes and empathy toward a child with Autism Spectrum Disorder (ASD). An experimental group received educational training focused on ASD and then, a week later, completed the second part of the study, where they watched a short video and completed a questionnaire. The control group only completed the second part of the study. There were no significant differences between the experimental group (n=28) and control group (n=69) in positive attitudes or empathy toward the child with ASD. Additionally, the experimental group participants did not donate more money than the control group. These results are contrary to results of previous research and further experiments should be conducted to verify the effect that education has on attitudes and empathy.

Michaela Salerno M.A.T. '21

"Mix it Up: Social Emotional Learning in Montessori Education using Multiage Classrooms"

Faculty Mentor: Dr. Peggy Schimmoeller, Education

In Montessori's educational model, classrooms have multi-age groups of lower- and upper-level elementary school students. This model was developed with the goal of enriching each child's education. In this study, upper elementary aged students were examined in their roles as guides for lower elementary students, specifically in the domain of social-emotional learning. Through this presentation, I will elaborate on research-based observations, informal student interviews, and assessment surveys.

Andrew Scales '21

"Design of an Autonomous Vehicle for Fire Line Construction"

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

Wildfires have become increasingly common with the advancement of climate change. Clearing fire lines around a fire 24-36 inches wide are the most efficient way to contain a wildfire, but requires all fuel to be removed, and a team of 20

firefighters to dig. The purpose of this project is to build an autonomous tracked vehicle to construct a fire line faster than typical hand crews, and to remove these crews from the front lines of the fire to prevent injuries. The vehicle is equipped with an 18 inch plow being pulled from behind and will link with a second system to dig a 36 inch wide trench. Forces needed to pull the plow at a depth of 1.5 and 5 inches calculated to be 163 lbs. and 576 lbs. respectively. A turn radius test, hill climb, and obstacle course were designed to test the maneuverability of the system.

Shamir Scott '21 - withdrawn

"The Effects of Institutional Racism of Black Women"

Faculty Mentor: Dr. Danielle Currier, Sociology

This presentation will focus on an analysis of how institutional racism has affected Black women in the US in the past two centuries. I will focus on several social structures/institutions as examples – voting rights, education, and healthcare. The term "institutional racism" was coined the late 1960s by Stokely Carmichael and describes societal patterns and structures that impose oppressive or otherwise negative conditions on identifiable groups on the basis of race or ethnicity (Head, 2020). I will also address how institutional racism is connected to and understood through the concept of "intersectionality", a term coined by Kimberlee Crenshaw in 1998. Intersectionality is the ways in which our various identities (race, class, gender, sexuality, religion, and physical ability/disability) affect the life changes we do/don't have, the ways we see and interact with the world, and the ways in which the world views us. I will use the experience of Black women in America as a case study of these concepts.

Zachary Waugh '21

"Mathematical Modeling of the Infected Rate of COVID-19"

Faculty Mentor: Dr. Jasmine Wan, Mathematics

The goal for this study was to try and get as close as possible to the actual infected rate of COVID-19 by using mathematical modeling to predict an approximate infected rate. This study analyzed real world data in order to calculate an approximate infected rate in comparison to the actual infected rate for the pandemic over a 30-day period. The methods used in this study were the SIR Model and its variations. The SIR model is used during epidemics, and allows us to compute a value of the number of infected individuals that have a contagious disease. Next, given the SIR Model and its variations, differential equations were created to be implemented into Euler's Method. Euler's Method is a numerical method, which was used to solve ordinary differential equations with initial conditions. In conclusion, the approximate infected rate computed using our methods was not too far from the actual infected rate.

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

Special thanks

Pam Risenhoover, *Charles A. Dana Professor of Dance*

Student Scholarship Committee:

Danielle Currier, *Associate Professor of Sociology and Director of Summer Research Program*

Brenda Edson, *Director of College Relations*

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