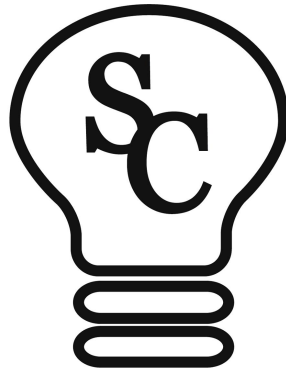


Student Abstracts



RESEARCH & CREATIVITY SYMPOSIUM



SIMPSON COLLEGE



April 21, 2022

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Oral Presentations

Division of Business Administration & Multimedia Communication

1. Stan Lee: The Evolution of Timely Comics

Faculty Advisor: Brian Steffen

Student: Bailey Earls

Abstract:

There are a fair number of publications, industries and organizations that have become power houses within their market. They all had to start somewhere but how did they get to where they are now? With the growth of entrepreneurs and local businesses it would be beneficial to understand how a small, no-name, organization can become largely successful.

Marvel Comics wasn't always a powerhouse publishing company. They started off as Timely Publications, a family-owned publication. Stan Lee wasn't always a big name either. He started off as a young boy selling subscriptions to the New York Herald Tribune newspaper.

This biography discusses Stan Lee's part in the development of Timely Publications. A small division of a publishing house to Marvel Comics; A multimedia corporation that has dominated film industries and comics.

2. Missing and Murdered Indigenous Iowans: an investigation into four Iowa cold cases

Faculty Advisor: Brian Steffen

Student: Amelia Schafer

Abstract:

Four out of five Indigenous women experience violence in their lifetimes. In fact, murder is the third leading cause of death among Indigenous populations. Missing and Murdered Indigenous Women, often dubbed MMIW or MMIWG2S, is an epidemic in North America. Indigenous women have gone missing or have been murdered in nearly every state, including Iowa. Over the past semester, I have been working with Iowa Watch to investigate four cold cases involving Indigenous peoples. Matthew Rice, 17 of the Winnebago Nation who was killed in a hit-and-run in 2002; Keara Lee Coshow, a 3-year-old Ojibwe child killed in 1979; Sandra Vanderhoef, 44 of an unidentified nation who went missing in 1986; Rita J. Papakee, of the Meskwaki Nation. Each of these four cases are instances of Indigenous people whose cases have gotten extremely inadequate attention from the media and often a lack of attention from police entities. My goal is to help not only spread awareness to these cases but to help boost the voices of the families who have gone years without answers about their loved ones. I rely upon several sources from families to the Iowa government to present an in-depth look into Missing and Murdered Indigenous Iowans. My article will be published in Iowa Watch at the end of the semester.

3. LGTBQ Students, Staff and Christian Education

Faculty Advisor: Brian Steffen

Student: Dominic William Lloyd

Abstract:

For my project I'm going to talk about LGTBQ students, staff and Christian education. In my presentation I'm going to talk about how the LGTBQ staff and students, who attend Christian schools and colleges, are treated unfairly just because they might love someone different. I'm also going to talk about how society is trying to change the rules, so LGTBQ students and staff don't have to worry about being judged, discriminated against, or even expelled from school. Finally, I will talk about how I believe that Christian schools can make changes so LGTBQ students and staff feel more accepted and welcome.

4. **The History of DEI Training**

Faculty Advisor: Brian Steffen

Student: Kyrsten M. Rehberg

Abstract:

Diversity, equity and inclusion, or DEI training emerged in the 1960's to help combat the remaining racial tensions that resulted after the Civil Rights Movement. The training was implemented into schools and common places of work to create a more comfortable environment for the "silenced minority".

Today, there are many ways to implement these trainings. Organizations can combine different topics and training tactics to create a training for their employees and/or students. Where many organizations fail is in remembering that DEI training is meant to be implemented for the long-term. It's not a quick fix or something to do to avoid a lawsuit. With so many different variations of trainings and so many different ways to run organizations, some topics and tactics will be more effective for certain companies, while they aren't for others. One study administered three versions of a one-hour training course to 3,000 people. Of the three courses; one focused on gender bias, one on biases of all sorts and the last didn't ever actually mention bias. The attitudes of those participating in the courses were analyzed multiple times to determine any changes toward minorities. From this study, they found that the overall attitudes of people that took the bias-related courses were more positive toward minorities after taking the course.

The study and constantly reanalyzing their attitudes forced people to keep thinking about what they learned in their courses. Many other studies, that have found DEI training ineffective, have a one-day DEI training session and avoid the conversation from there on out. The conversation needs to continue, DEI trainings need to be implemented for the long term, with constant reevaluation, to have any chance of making a difference.

5. **Struggles of the Unbroken: Acephobia in our current world through medicine, society, and media**

Faculty Advisor: Brian Steffen

Student: Anaka Wamstad-Evans

Abstract:

Within the total population, there is a small percentage of people who identify as asexual. Because of their sexual identity, there are varying challenges that asexuals face in their everyday life. Finding research on the medical, social, and media issues faced within the ace community can be hard compared to other sexualities, but information about asexuality is starting to flourish from social scientists and researchers. Looking into medical acephobia

examples can be found with diagnoses of HSDD and invasive questions from medical professionals. Acephobia is also found within our own hypersexual society filled with expectations and how “sex sells” in advertising. With advertising, acephobia can be found through media, such as TV shows like Riverdale or House M.D. with asexuals being portrayed as diseased or simply erasing the identity of a character. What can be gained from this research is simply that acephobia exists, and compared to other minorities, asexuality is also oppressed by the general majority. By recognizing acephobia there can also be an acknowledgment that asexuality exists. Asexual research is lacking and there is a need to provide insight into part of this small identity that exists in this world

6. What discrimination do Transgender people face?

Faculty Advisor: Brian Steffen

Student: Seth Mahedy

Abstract:

The main focus here is the issues of discrimination that transgender people face. Being transgender means your sex at birth and gender identity do not match up. Transphobia is treating these individuals badly or having negative connotations associated with them simply because they are transgender. This is actually fairly common in society. This can lead to discrimination. The most common places trans folk experience discrimination are in education, the workforce, and healthcare. Due to transphobia and discrimination largely, transgender individuals experience a much higher rate of mental illness and mental health issues. All of these put together also contribute to the higher rates of drug abuse, unprotected sex, binge drinking, and other impulsive or criminal behavior within the trans community. This is an important issue that society needs to face because of how prevalent and severe the issue is and the consequences for not only trans people but their loved ones and society as a whole that stems from this issue.

7. Effectiveness of Propaganda during WWI

Faculty Advisor: Brian Steffan

Student: Katelyn Burns

Abstract:

This research paper analyzes the history of propaganda during World War I in 1914 and how it was affected during that time, such as “I Want You for U.S Army” “Remember! The Flag of Liberty: Support It!” propaganda poster signaling people to join the war effort for their country. These examples set the stage on the types of posters that were being distributed at this time and to see the effectiveness of how it was used and the impact these kinds of posters have made during this time. Meanwhile, propaganda was known for being the top advertising of the war effort during this time to recruit men who wanted to support their country and keep their families safe to help defeat the Allies.

8. The Implications and Consequences of American Newsrooms Lacking Diverse Journalists

Faculty Advisor: Brian Steffen

Student: Danielle Blake

Abstract:

Newsrooms have been called upon to reform representation newsrooms since the Kerner Commission Report. In 1979, the American Society of News Editors pledged that racial minorities in the newsroom would be proportional to the general population by 200. Despite this, the majority of journalists today are white men. In 2022, we are nowhere near that goal of representation. On top of this, Newsrooms have downsized staffing exponentially in recent years, especially during the pandemic. Newspapers are struggling to stay afloat, and journalists feel the burden of this. As newsrooms get smaller and more predominantly white, this paper will examine how the lack of diverse representation in media impacts which issues do and do not get reported on.

Division of Education and Sport & Health Sciences

Division of Humanities

1. Fat Oppression and the Politics of Difference

Faculty Advisor: John Pauley

Student: Elise Sturgeon

Abstract:

The concept of fat oppression is relatively neglected in academic circles leaving the unjust treatment of fat people socially unrecognized. In this essay, I utilize Iris Marion Young's five faces of oppression to further clarify how fat oppression manifests in the lives of fat people in the U.S. Specifically, I look at the faces of cultural imperialism and violence. Under cultural imperialism, I look to Young's analysis of "the scaling of bodies" to show that fat oppression is based in normative standards of bodies that are then tied to further normative standards of rationality. The normative standard of thinness creates a fear of fatness among the American public, leading to widespread stigmatization of fat people which results in decreased economic opportunities and social standing. Cultural imperialism leads to systemic violence against fat bodies, manifesting in a lack of legal protection against violent crime and an inaccessibility to quality medical care. This paper is an attempt to further open a discussion of the ways in which the faces of oppression are applicable to the lived experiences of fat people.

2. Wealth Equals Health

Faculty Advisor: John Pauley

Student: Paula Carlson

Abstract:

This paper focuses on ethical dilemmas within the United States' healthcare system. Kant's Moral Theory is used throughout the paper to point out inequities that are occurring in the system and the theory is used to generate solutions to the inequities. An ecological understanding of the healthcare system provide a greater comprehension of how all pieces fit together. Healthcare is a direct result of numerous factors being mutually dependent on one another even if they seem to have no direct correlation to healthcare or one another. It is important to examine the healthcare system as every single individual interacts and is

so necessary for wellbeing for individuals and communities. Yet there is a large portion of the population that cannot afford healthcare. My proposal is to shift healthcare to a value-based care system which can be demonstrated to be more equitable to the largest amount of people and solve ethical dilemmas. The significance of these findings allows legislators to have evidence-based proof that requiring the healthcare field to be based on quality rather than quantity would satisfy and sustain the United States in a more ethical manner.

3. **Don't Tell Me, Show Me! Iowa's Response to the Post-Vietnam War Refugee Crisis**

Faculty Advisor: Nick Proctor

Student: Noah Trujillo

Abstract:

From 1975 to 1985 Iowa took a leading role in the resettlement of Southeast Asian refugees displaced by the Vietnam War. But in order to do this Governor Robert Ray and his newly formed task force on Indochinese resettlement needed to secure support from the national government, Iowa citizens, and refugees themselves. This study intends to use rhetorical analysis to understand how Governor Ray and his task force used economic, humanitarian, and political arguments to persuade these different audiences to support its resettlement plan. One of the most famous instances of this was when Governor Ray played on the humanitarian aspect by telling his supporters, “don't tell me your concerns for these people; you have a chance to save their lives; show me!”

This study will also explore the reactions to this rhetoric as well as moments when the Governor's task force went “off script” and the reactions to those moments. Ultimately, the success of Iowa's resettlement plan benefitted from the Governor and his task force being able to shift its rhetoric between economic, humanitarian, and political arguments to successfully sell the program to different audiences. Internal documents suggest that the government took great care to craft their message to different audiences.

Understanding the role of rhetoric in the refugee plan will be done through a historical analysis that utilizes documents made available by the Iowa Historical Society and other archives. These documents include speeches, memorandums, and testimonies made by government officials. They also include letters sent by government officials, NGOs, and Iowan citizens that showcase the reactions to the government's resettlement plan. Newspapers will also be used including the Des Moines Register and state-published Iowa Orienting Express. This study will show how state and non-state actors calibrated their rhetoric to shifting opinions on refugee resettlement.

4. **Are the Costs Too High? College Student Voter Turnout in the 2020 Elections: The Impact of Voting Laws and Battleground Elections**

Faculty Advisor: Adrienne Gathman

Student: Elise Sturgeon

Abstract:

College students are a unique population with differing factors relevant to civic engagement and voter turnout compared to the population at-large. Being a largely mobile population, likely living away from their home address during the election, students have many important

decisions to make regarding voting and whether to vote at all. While nonprofits, parties, and pundits have begun to pay special attention to the unique needs of college student voters, there is still much disagreement as to which factors are most relevant to student turnout and to what degree. Despite the pandemic, college students saw an increase in voter turnout by over eleven percent during the 2020 elections. Through analyzing the 2020 National Study of Learning, Voting, and Engagement, I examine to what degree battleground election status, institutional support for voter engagement, and voting laws impacted college student voter turnout during the 2020 elections. I hypothesize that decreasing the costs of voting through campus education programs and lowering legal barriers to voting will increase turnout. Additionally, I predict that students in battleground states will have a higher turnout rate because they have a sense that their vote matters. This is an ongoing project pending results. This analysis has important implications for college programs wishing to direct their resources at the most impactful practices that increase turnout and may indicate that resources may be best directed towards an investigation of restrictive state voting laws.

5. **Albert Einstein: The Acceptance and Rejection of Revolutionary Science**

Faculty Advisor: Nick Proctor

Student: Katie Pantzar

Abstract:

The early 20th century saw widespread revolution both in politics and in science worldwide. Throughout the global turmoil, one man was working on a theory that would later not only change the world of physics but lead to significant discoveries in the decades that followed. Albert Einstein published his Theory of Relativity in 1915, offering a theory on gravitation differing from Isaac Newton's accepted theory established and proven 200 years prior. The Theory of Relativity ended the idea of a fully discovered and measurable Newtonian physics and opened the door for a whole new world of scientific discoveries. Though revolutionary, Einstein's theories and even Einstein himself, were not always met with fascination but rather with hostility and fear. I will explore the ways in which Albert Einstein's Theory of Relativity, and Albert Einstein himself, were both accepted and rejected within the USSR, China, and the United States of America. In all three places political ideology, philosophy, and the studying of science itself had conflicting reactions to Einstein and his theory. Through a series of primary and secondary sources, I will trace the theory's acceptance and rejection within all three countries, offering a comparative look at the decades following Einstein's publication.

6. **Mind at War: Psychological Effects of Poison Gas in World War I**

Faculty Advisor: Judy Walden

Student: Taylor Johnson

Abstract:

From July of 1914 to November of 1918, a multi-national war was waged across Europe. Many old traditions began to clash with new technologies, and soldiers were learning to adapt to the constant changes as they were fighting for their lives. One of these new technologies was the use of poison gas as a weapon of war. Much research has been done about World War I as well as poisonous gas in general, but not much has been done to analyze the mental

effects that this weapon had on soldiers at the time. Although the gas was extremely deadly when soldiers were exposed to it, the weather conditions as well as other factors in which the fumes were deployed often dimmed the odds of physical harm. Rather, the deployment of the gas introduced yet another new method of active warfare: constant psychological trauma concerning an unknown and deadly weapon. Those who were severely injured or killed because of the gas cemented a new fear into the minds of the men who were fighting in the war. Gas was an unfamiliar weapon that they had never experienced before. In addition to being a soldier during wartime, this unknown fear of being gassed offered a much stronger terror for the soldiers during the first World War. The topic of this paper discovers how effective poison gas was in terms of physical and psychological damage as a military weapon in the first World War. This paper will argue that poison gas was designed to be a weapon of mass destruction, however, it quickly turned into a weapon of psychological terror instead. This paper analyzes soldier diaries, poetry, medical records, scientific journals, and secondary source analysis to support this thesis.

7. **A Step Beyond Yourself: Why Reacting to the Past and Simulations are Powerful Tools for Teaching Historical Empathy**

Faculty Advisor: Nick Proctor

Student: Brennan Waterman

Abstract:

The aim of this thesis is to explore the potential that Reacting to the Past (RTTP) games have for teaching subjects in history, as well as further examine the emotional sphere of such games and simulations, which have either been left out of studies on RTTP, or merely touched upon. This research will explain how the emotional and social aspects of RTTP have a beneficial effect on the learning of students that participate in them. In this study, I ask what Reacting Games provide to students that traditional lectures do not, how the game teaches history on a more personal level, contributing to historical empathy, and how the emotional responses that the game provokes, and social nature of the classroom contribute to learning. While this thesis will rely on existing literature on RTTP, such as (Stroessner, 2009), it will also incorporate studies that draw connections between emotions and learning, like (Immordino-Yang, 2016). The significance of this study is that it furthers our understanding of the empathetic, emotional dynamics of Reacting to the Past and how it can be used to impart a deeper and more personal understanding of history and sensitive subjects to students.

8. **Disability and American Politics**

Faculty Advisor: Adrienne Gathman

Student: Kylie Doupnik

Abstract:

The CDC reports that 26% of American adults have some type of disability. Often, these disabilities make them a target of discrimination, resulting a lessened ability to participate in society. This research project analyzes how societal ideas regarding disability influence disabled people's ability to participate in American politics. To answer this, one must first have a wide understanding of prevalent models of disability: the medical model and the social model. The medical model, as the primary way non-disabled people view disability, serves

as a tool of oppression. The social model allows disabled people to break down the barriers the medical model has built, and thus more fully participate in politics and political activity. This research establishes that the prevalence of the medical model has created institutions meant to bar disabled people from participating in politics through physical inaccessibility and the devaluation of disabled voices.

9. **Behind the Political Perspectives of Evangelical Christians**

Faculty Advisor: Adrienne Gathman

Student: Triniti Krauss

Abstract:

This presentation is based on an ongoing research project in class and there are no conclusions yet. The presentation addresses the voting behaviors of Evangelical Christians and two of the influences on their political perspectives. First, is the desire to protect the Evangelical Christian institution. Second, how biblical principles guide Evangelical Christians to vote. This presentation will share anecdotal evidence found through interviews with community members at a local Evangelical-Free Christian Church.

10. **Speaking and Listening in the College Writing Center**

Faculty Advisor: CoryAnne Harrigan

Student: Lucy Cockrell

Abstract:

Peer tutors and writing consultants have jobs that go far beyond their knowledge and understanding of composition. It is also required of them to be empathetic, trustworthy, and have the ability to communicate effectively with the peers they are working with. The Writing Center Journal, College Composition and Communication Conference, and several other publishers have highlighted research into discourse analysis in the writing center for decades, working to narrow the understanding of how strategic speaking and listening can positively impact a tutoring session. My project will use many of these published works to perform thorough research, synthesize information, and conclude the best practices for speaking and listening in the writing center. This information is detrimental to the meta-cognitive work that writing consultants must perform during every session, often determining how successful a session will be in helping the student. Through this work I will suggest specific ways for Writing Consultants and Tutors to utilize speaking and listening within peer tutoring sessions. Developing research-informed tools that writing consultants can use to foster fluency and effectiveness during sessions will benefit both consultants and the students they are working with. The goal of this project is to draw tangible conclusions that can benefit our own college writing center and consultants, and provide relevant guidance on how it can successfully instruct with the most current research information. In addition, this project will increase my own knowledge and understanding of writing instruction which will be extremely useful in my future career and education after graduating from Simpson.

11. **Stitching Together African American Quilting: A creative essay on exploring African American quilting through crochet**

Faculty Advisor: JJ Butts

Student: McKala Downing

Abstract:

The quilting community within African American culture is deep-rooted and holds significant historical value. This history and value I discovered as I sought to create a crocheted blanket portraying the content within Richard Wright's 12 Million Black Voices. Within the design phase of the blanket, I discovered a large community and history of African American quilters. These quilters and their work guided me through the style, purpose, and meaning behind African American quilts, as well as directed me towards the significance of Black history preservation, cultural resistance, and Black empowerment.

12. **Changing Demographics and Shaping the 2022 Midterm Elections**

Faculty Advisor: Adrienne Gathman

Student: Danielle Blake

Abstract:

This paper will discuss the implications of changing voting demographics on the 2022 midterm elections. The United States' ethnically diverse population is growing and can reframe elections. These communities traditionally vote Democratically or do not vote at all. If minority voters turned out higher for the 2022 midterm elections, the outcomes would be skewed in favor of the Democratic party. However, the rise of voter suppression and the incumbent disadvantage could drastically change this. The paper will examine several specific battleground states to understand how the change in demographics will affect the electoral outcome.

Division of Natural Science

1. **Food Pantry Accessibility in Iowa**

Faculty Advisor: Heidi Berger

Student: Laura Nielsen

Abstract:

My project looks at whether there is a difference in food pantry accessibility for English speaking communities versus Spanish speaking communities in Iowa. In order to do this, I determine food assistance deserts using Python and Excel Programming in 25 counties in Iowa, half of which have high Spanish speaking populations and half of which have low Spanish speaking populations. I then compare these communities to determine if there is a difference between these two groups. The second part of my project consists of cultural research on how Latinx citizens are affected by the hunger issue as opposed to white americans. This includes access to federal food assistance programs, poverty rates, and the difficulty of finding Latin American food supplies in pantries.

2. **Analysis of Virtual Learning Program in the Des Moines Public School District**

Faculty Advisor: Ross Sweet

Student: Emma Winterboer, Lara Kallem, Andrew Samountry

Abstract:

The COVID-19 pandemic has caused an increase of online learning for students of all ages. We have collaborated with the Des Moines Public School District to evaluate the virtual learning program they have implemented. We analyzed withdraw rates and level of engagement based on demographics such as gender, race, and grade level utilizing the program Tableau. Our analysis also compares the achievement status of virtual learning and in person students. Finally, we analyzed the financial impact that virtual learning has on the DMPS District. Our data analysis will allow DMPS to decide what steps to take next regarding the virtual learning programs in their district.

3. Counting Viable Pollen Grains Using a U-Net Neural Network

Faculty Advisor: Ross Sweet

Students: Mary Hendon, Allison Young, Elly Flaherty, Zachary Geery

Abstract:

Pollen germination assays are used to determine pollen viability. However, processing these assays by hand is tedious and time-consuming. With a convolutional neural network, we can automate that process saving industries time and money. We are using the Keras library with a U-Net neural network to build our model. Our objective is to create a neural network that can take an image of a pollen germination assay and determine how many of the pollen grains are viable.

4. The Existence of Photons and its Probabilistic Nature

Faculty Advisor: Heidi Berger

Student: Jade Thompson

Abstract:

With new advancements of technology throughout the past decades, the use of quantum theory has become more prevalent in sciences. Beam splitting is an operation that separates a beam of light into multiple beams of light. Looking at beam splitting quantumly, photons are sent into two different directions, reflected off or transmitted through the beam splitter. By using quantum mechanics, calculations can be done to find the probability of a single photon being reflected or transmitted. When testing the probabilities, the existence of photons can be proven by showing that light cannot be made of classical waves.

5. The Wrangling and Displaying of Insurance Data

Faculty Advisor: Ross Sweet

Students: Noah Nelsen, Christina Dietrich, Zach Steenhoek, Bryce Wilbur

Abstract:

In the world of property and casualty insurance, copious quantities of consumer data are essential to data analysts, actuaries, and management. Each group varies on data competence and utilization. It is imperative to create useful functions that can correctly and accurately organize various data types associated with the insurance field and display them in a comprehensive and aesthetically pleasing manner. We will use R to create functions to wrangle data into tables and graphs that can be imported into a robust form of display, such as PowerPoint. Through the functions in R and PowerPoint, data analysts and managers can interact and

edit information collaboratively on the consumer data. Our project was delegated to us by Sara Lawson, an actuarial assistant at GuideOne Insurance. It is our goal to create a novel way of wrangling data into editable tables that can then be presented effectively to business professionals to make future decisions driven by data.

6. Budget Management iOS App

Faculty Advisor: Heidi Berger

Student: Miguel Sanchez

Abstract:

Managing one's finances and budget can be easy, fast, and organized with the help of a computer. Existing apps allow the user to track previous transactions and show data based on this information. This iOS app will help the user to manage transactions in the future. The app, built using Apple's Swift programming language and SwiftUI, provides the user with the ability to visualize current and future transactions and provides useful information about the user's balance on any date now or in the future. Some other key features of the app include the ability to set recurrent transactions, see relevant information for each transaction, and have a calendar view for easy access to the balance up to a certain date. This is a user-friendly alternative to managing one's finances on paper or using a spreadsheet.

Division of Social Science

1. The Psychology of Fake News

Faculty Advisor: Sal Meyers

Student: Amelia Schafer

Abstract:

Climate change, COVID-19, and conspiracy theories - the three c's of misinformation. Everyone knows the theories surrounding these topics and has seen the immense spread of information from different groups, but how did we get here, and why? How has misinformation become so easily spreadable? The dominant explanation for the spread of misinformation is rooted in psychology, confirmation bias to be exact, the theory that individuals pick and choose to engage with information that supports their claims and ideals and disregard information that does not. Social media has also played an important role in the spread, allowing for information to be shared more rapidly and thoughtlessly than we've ever seen before. There are several new theories for how the public can fight against misinformation and disinformation, and additional theories explain the spread, but few pieces of literature feature a solid explanation for how journalists can fight the spread of misinformation and disinformation head-on. Through a series of primary and secondary sources, I will trace the origins of misinformation, the ties between psychology and misinformation, the spread of misinformation, and future implications.

Division of Visual and Performing Arts

Poster Presentations

Division of Business Administration & Multimedia Communication

1. Implications of Covid-19 on Small Businesses

Faculty Advisor: Shane Cox

Students: Trent Michael Pelzer, Katie Oosterhuis

Abstract:

This research examines the impact of Covid-19 and related shutdowns on small businesses in the Des Moines metro. During the pandemic, the government attempted to slow the spread of Covid by shutting down specific businesses. Some of the hardest hit businesses were restaurant and small retail shops. To help mitigate the impact of these closures on these businesses and their employees, the government made assistance programs available to financially support these entities. However, funding was limited and not all businesses were able to take part. This research identifies the perceived effectiveness of the various government programs as seen from the viewpoint of small business owners. Most of the businesses included in this study are restaurants and retail shops in the key Des Moines shopping areas of the East Village Downtown and Valley Junction.

Occurring nearly two years after the initial shutdown this research gathers insights from surviving businesses through interviews and questionnaires. Questions surrounding the timeliness, effectiveness, efficiency, and equality of government programs were answered by participants. Additional questions about which government programs were applied to and received provide insight into the way funds were distributed. Business owners were also encouraged to share additional thoughts and advice should this type of situation happen in the future.

The data collected from the surveys is analyzed in this research through summary statistics, charts, and graphs to draw relevant conclusions. It provides a glimpse into the impact of the pandemic and government assistance programs on small businesses in the metro. This could provide insights into a more effective way for government aid to be distributed should something of this magnitude occur in the future.

Division of Education and Sport & Health Sciences

Division of Humanities

Division of Natural Science

1. Storm Water Monitoring and Treatment as Essential to the Future of Iowa Water Quality

Faculty Advisors: Aswati Subramanian, Clint Meyer, John Pauley

Students: Brody Crouse, Mary Hendon, Katie Pantzar, Sarah Miller, Dayton Gatewood

Abstract:

Stormwater pollution is an ongoing issue in Iowa that is both unmitigated and unmonitored. The city of Indianola has begun construction of a new Water Resource Recovery Facility

(WRRF) to replace outdated and overburdened infrastructure that supports and attracts commercial and residential development. Though the WRRF includes important upgrades, there are no plans to address the issue of stormwater pollution. The purpose of this study is to investigate the impact of untreated pollutants on Iowa's waterways and to identify the likely types of pollution, the chemicals, their sources, their destination, and assessment strategies. In the absence of water testing, we would predict that the following pollutants increase in concentration coinciding with increased commercial and residential development: heavy metals (e.g., cadmium, chromium, copper, lead, nickel, zinc), nutrients (e.g., phosphorus, nitrogen, ammonium), pathogens (e.g., E. coli), suspended solids (e.g., soil debris, microplastics, and organic matter), litter, and oils. We make the prediction that without proper preemptive action Indianola's water quality will become a detriment to its citizens and those that live downstream. From this small case study, tentative inferences can be drawn in areas of replication to visualize the cumulative effects of continued mistreatment of waterways across the nation as it relates to the hypoxic zone in the Gulf of Mexico (dead zone).

2. Performance at the Olympic Games: The Effect of Lane Assignments

Faculty Advisor: Heidi Berger

Student: Keara Schmitt

Abstract:

Since the London Games in 1908, when swimming was first contested in a pool at the Olympics, the approach to lane assignments for the top-seeded swimmers has remained the same - with the top seeds placed in the central lanes. From the beginning, it was believed that the middle lanes were advantageous due to waves reverberating off the pool walls and the ability to monitor one's competitors. However, lanes one through eight have all historically won gold. This research evaluates the effect lane assignments in the swimming events have had on performance at the previous ten Olympic games. The following questions are addressed: are central lanes more likely to medal, and when are ties and out-touches most likely to occur? Preliminary findings indicate there exists more variability based on specific events, although overall the initial research does support the superior performance of the central lanes in terms of medaling as expected.

3. My Speech Therapy Software

Faculty Advisor: Mark Brodie

Student: Peter Walkwitz

Abstract:

After a stroke, many people struggle with their speech. Everyone's challenge is different, however many struggle to associate the proper word with what they are thinking about. This project is designed to help those people recover their speech primarily through seeing an image and correctly inputting the corresponding word through text and voice. This can be monotonous though, therefore the goal is to create some type of incentive to practice and a reward for doing well. Ultimately the program is being designed to create an engaging place to recover one's speech abilities.

4. Using a Speech Recognizer to Help Patients Recover with the Well-Spoken System

Faculty Advisor: Carolyn Brodie

Students: Zachary Geery, Lara Kallem, Sam McCoy

Abstract:

Speech therapy can be an intensive process for people with brain injuries, especially due to limited speech therapist availability. We have created a program to assist people during their speech recovery process. This system utilizes an automatic speech recognizer, allowing people to practice speaking without the presence of a speech therapist. To improve motivation, the program includes elements of gamification. The system logs the user's interactions and classifies their errors into different categories so that immediate feedback can be given to the user. A statistical model of simulated patients is used to validate the accuracy of the error classification. The user interface is written in Python and uses the data analytics and graphing capabilities of R to display and highlight the user's progress. Based on the results of the error analysis, the patient and therapist can view different charts and graphs of the user's progress and their type of errors. The idea is not to replace traditional speech therapy but to supplement it.

5. **Rapid Genetic Assay for Tracing HIV Mutants**

Faculty Advisor: Derek Lyons

Student: Megan LeMay, Zachary Geery, Tyler Williams

Abstract:

HIV is a highly transmissible, sexually transmitted virus that if improperly treated can lead to AIDS. Currently without a cure, long-term HIV infections in the population have led to an increasing number of mutations. Mutations in the virus can affect transmissibility and effectiveness of therapies. Disproportional tracing of mutations across the world population leads to less effective treatment. Our solution is to provide a rapid, enzyme-free genetic test that identifies mutations in the HIV protease gene using a continuous flow assay. In this case, an easier to use and more cost effective genetic assay can provide increased tracing of variants and allow more targeted therapy regimens. Our development of a standard operating procedure will encourage widespread adaptation of our rapid assay. Ten target sequences were designed in order to find the optimal target sequence for the G48V mutant. By titrating the amount of HIV protease gene present in the same, the lowest limit of detection for each sequence will be quantified.

6. **Client Choice and Network Demand on Preventive Health Care in Des Moines**

Faculty Advisor: Heidi Berger

Student: Tim Hornback

Abstract:

The goal of my research is to expand upon an article from Zhang et. al. regarding how client choice impacts preventive healthcare facility design. The original article applies their model to a real-world example of distance to mammography screening locations in Montreal. I intend to use the models presented in the original research and apply them to the Des Moines area for other relevant preventive healthcare, such as COVID-19 in-person testing locations. This will be achieved by replication of results concluded from the original text,

gathering and processing relevant data regarding preventive healthcare facilities in the Des Moines area, and modifying given mixed integer program (MIP) optimization to determine how limited resources can be best distributed throughout the area.

7. Classifying Histological Images Through the Application of Multiparameter Persistent Homology

Faculty Advisor: Ross Sweet

Students: Noah Nelsen, Marc Medici, Keara Schmitt

Abstract:

Analyzing and classifying histological images of cells based on composition is an essential practice to diagnosing various types of cancer. However, medical professionals must contend with the time spent and variability introduced when classifying the images by hand. We use persistent homology, a tool in topology data analysis, to automate the classification process. Persistent homology methods of classification were explored in previous studies using stain normalization and single parameter persistent homology to classify histological images. Utilizing an open-source data set of histological images of colorectal cancer, this project evaluated six different forms of image preprocessing, single parameter persistent homology, and multiparameter persistent homology to understand pixel composition. Using k-nearest neighbor clustering on the outputs of the persistent homology functions, we were able to classify images of colorectal histological images with an accuracy of 80.58%. Forms of image preprocessing include stain normalization, deconvolution, grayscale, and gamma correction. Across all forms of preprocessing, classifying images through the application of multiparameter persistent homology outperformed the application of single parameter persistent homology.

Division of Social Science

1. George Washington Carver - The Pocketbook of Highlights

Faculty Advisor: Carolyn Dallinger

Student: Heidi Ekborg-Ott

Abstract:

This project is meant to be a short introduction to the history and significance of George Washington Carver. At its core, it is supposed to be a synergized display of the important topics discussed in the various research projects done by the Carver Fellows over the course of the last four years. The project itself is actually a ten-page booklet that details a few of the highlights of George Washington Carver's life, his achievements, and what projects he was involved in. This Carver "pocketbook" will be converted into a poster format for the Creativity and Research Symposium. An overview of the topics that may be included are: Carver's love of nature, where he attended school (highlights on Simpson!), his love for art, his various scientific discoveries, his relationships with Booker T. Washington, Gandhi, and Ford, and the traveling agricultural college wagon that he used to help share valuable knowledge on agriculture with rural black communities. It is a project that is going to be a great way to teach other Simpson students and faculty about the important legacy of George Washington Carver and it is a way for me to combine all the interesting and unique aspects that I have learned over the course of my time at Simpson into a single project. This will

be an important part of the George Washington Carver Fellows (also known as the Carver Fellows) program.

2. Qualities of Police Chiefs

Faculty Advisor: Carolyn Dallinger

Student: Derrick Johnson

Abstract:

This Poster presentation will evaluate and review the qualities that make a great leader in law enforcement, more specifically the police chief position. The attributes that make a great police chief will further be reviewed to determine the impact of qualities the leader has and its role within communities and their workforce. The focus of the poster presentation will compare outcomes of these police chiefs qualities, be it good or bad, and the effects it has on their workforce and the various diverse communities they serve.

3. Women of Color in leadership

Faculty Advisor: Carolyn Dallinger

Student: Nina Ortiz

Abstract:

This poster presentation will demonstrate how three women of color have shown to be leaders by achieving something extraordinary. The three women include the President in Liberia, a doctor in Nebraska, and an attorney general in Guatemala. All three women have become leaders in these positions by defying the odds. These three women of color have fought the odds despite gender and race discrimination. They have developed unique leadership styles. This presentation will display the struggles that they had to go through as a woman of color to achieve something great, how they overcame these struggles, and why they are role models for all.

4. Electrodermal Activity Non-responders

Faculty Advisor: Don Evans

Student: Gizzy Keeler

Abstract:

The use of cell phones among the college student population is nearly universal, but there may be unwanted consequences to cell phone use. Previous research used electrodermal activity (EDA), a measure of emotional response, to measure a stress response to phone alerts. This research found that most people did respond to phone alerts, but a subset of the population showed no response. Having a population of EDA non-responders in a given study is a known occurrence but the specifics of this phenomenon are largely unknown. The present study aims to determine if EDA non-responders are always non-responders, or if those who are non-responders to phone stimuli may be responders to other stimuli.

5. Bias Response Team Implementation

Faculty Advisor: Carolyn Dallinger

Student: Jessica Orozco

Abstract:

This poster presentation will examine the continuing work to revise and bring forth the Bias Response Team at Simpson College. The Bias Response Team hopes to provide a safe space for any marginalized groups on Simpson through an Incident form. This form allows students and faculty to report any bias incident in detail and they have the choice to do so anonymously or not. The poster will show how the team would help advertise the form and they would talk with the reporting individual to discuss their different options once they've reported. It's important to have this team in place so that students and faculty have a space to be heard and that their experiences on a predominately white campus are seen. This would allow Simpson to build a community where students and faculty of diverse identities feel welcome, seen, and supported during their time here.

6. Imposter Syndrome on Simpson Campus

Faculty Advisor: Kelsey Bolton

Students: Jenna Pfeiffer, Dalaney Reese

Abstract:

Our group investigated factors relating to the imposter phenomenon on this campus. Some of the factors we evaluated included on/off campus involvement, declaration of major, academic year, and future plans among other factors. We did have one significant finding in our research. Our group wanted to investigate this because it has attracted more media attention lately and it is more common among those in higher education, yet there isn't much research pertaining to it and undergraduates. Also, many of us related to some of the symptoms. We did conduct this research last semester as part of a class project. The chance to present this to the rest of campus would benefit the entire student body, as many of them might not know it exists even if they suffer from the state. Allowing us to share our findings with them would allow students and faculty to be conscious of their mental state and watch for the signs of the imposter phenomenon before it becomes a real hindrance. Since we are an institution of higher education it is a necessity that we have this conversation regarding the imposter phenomenon to keep it off our campus. Our research can be the first stepping stone for this dialogue.

7. Modeling Diversity in Leadership: Our Community Leaders and Their Impact

Faculty Advisor: Carolyn Dallinger

Student: Teria Campbell

Abstract:

This poster presentation will examine the importance of diversity in leadership positions, along with the impact of our own community's leaders. For far too long, our country has struggled with people of color holding positions of leadership no matter how big or small. This has had a negative impact on many of our young people today. So, this presentation will focus on real examples of people who have overcome hardships, and broken barriers set to hinder them along the way.

8. CO2 Emissions and Factors That Affect it

Faculty Advisor: Ali Madanipour

Student: Jessica Orozco

Abstract:

Current research has found that climate change has become a significant concern and is due to the emissions of CO₂. In its natural form, CO₂ plays an important part of our survival; however, when too much of it is produced, then this is when it becomes a problem. This study aims to examine the effects of education, GDP, food production, and more on CO₂ emissions among 100 countries from around the world. I have created a few hypotheses for each variable. A couple of them are that I hypothesize that countries with less education will emit more CO₂, wealthy countries would emit more CO₂ whereas poor countries will emit less CO₂, and countries with higher food production will emit more CO₂ than countries who have low food production. The rest of the hypothesis will be explained during the presentation. To gather information on my variables I used a variety of different websites from ourworldindata.com, worldbank.com, and transparency.org. I have included data from 100 countries each gathered based on whether information was available for each variable I looked at. The results of bivariate and multivariate analysis will be discussed in detail during the presentation.

9. Leadership in Sports

Faculty Advisor: Carolyn Dallinger

Student: Karlie Hill

Abstract:

This research project focuses on leadership roles in the sports setting. The poster presentation will explain the path high level of sports took to get them to the leadership role they are currently in. It will focus on the hardships they have faced and how they overcame them. Lastly, it will share the advice these leaders would give to younger athletes looking to become a leader not only within their team but in their community.

Division of Visual and Performing Arts

1. Scenic Designer Fefu and Her Friends

Faculty Advisor: Jennifer Nostrala

Student: Ashley Kientoff

Abstract:

Fefu and Her Friends was a student-designed production which ran from February 4-6. Each student had to complete each step of the design process from conception to production. The poster presentation includes research photos, various renderings, technical drawings, and professional photos of the final product. These show where a scenic designer draws inspiration, how they communicate their ideas to the director, and how the dialogue between all members of a production team influences each other to create a cohesive and thoughtful scenographic design.

2. **Stage Manager** *Guys and Dolls*

Faculty Advisor: Jennifer Nostrala

Student: Garrett Livingston

Abstract:

The role of stage manager is to keep the communication lines between actors, directors, and design team open to allow the correct information to be received, and adjust information if needed when information changes or is incorrect. With *Guys and Dolls* in particular, the main focus is managing the schedule of the actors for the purpose of rehearsal and organizing paperwork with production reports, rehearsal reports, set movement, entrances of actors, and prop movement. The poster being created will have what some reports from all account production and rehearsal, a schedule of what actors did for rehearsals, and any other paperwork that showcases what went into the production.

3. **Costume Designer** *The Enchanted Pig*

Faculty Advisor: Jennifer Nostrala

Student: Sabrina Fullhart

Abstract:

As the costume designer, my job is to make decisions about all the clothing and accessory pieces that are seen onstage. My design for the costumes for this opera had an overall silhouette of fashion from the 1960s, but with a fantasy twist. I wanted to stress that this show was not set in the 60s, but I thought having a time period to start with would give all the characters something that grounded them and put them in the same world, but many of them had an element that would not be considered historically accurate to add some more visual appeal and help with the storytelling. For example, the character, Moon, was in a suit but I added over 600 rhinestones to the jacket, pants, and hat to make him shimmer under the stage lights. I will go into further detail in the poster I will create.

4. **Stage Manager** *The Enchanted Pig*

Faculty Advisor: Jennifer Nostrala

Student: Allison Crain

Abstract:

I was the stage manager for *The Enchanted Pig* in the fall of 2021. My duties before the rehearsal period began included facilitating auditions, meeting with the director to discuss expectations and scheduling, creating a pre-production analysis, and compiling a prompt book with all the essential information. During the rehearsal period I was tasked with organizing the call board, running production and company meetings, updating the prompt book, and filling and sending out rehearsal reports. For tech week and performances, I was recording and calling cues, conducting pre-show and post-show checklists, sending out rehearsal and performance reports, and collaborating with the directors, designers, assistant stage manager, crew heads, crew members, and actors. During the process I also created a company contact list and props tracking list. Overall, it was important for me to collaborate with everyone involved in the production to ensure that rehearsals and performances went smoothly.

Throughout the process I communicated effectively, problem-solved, and showed up prepared. My poster will explain the work I put into coordinating daily schedules, the frequent meetings I had with the director and lighting designer, and the collaboration it took to have successful shows. I would like to highlight the effort and organization that was needed for this process. And I would like to express my gratitude for this experience, because it showed me facets of theatre I had never known about or appreciated before.

5. **Stage Manager *Fefu and Her Friends***

Faculty Advisor: Jennifer Ross Nostrala

Student: Spencer Davis

Abstract:

As the stage manager for “Fefu and Her Friends”, it is my job to work close with the Director, Ann Woldt during the production process. My jobs included being in charge of the production team meetings in which the designers discussed their process in the creation of the show and keeping a record of their process. During rehearsals, I would reserve the space and clean the space before hand, and make sure that the actors had their props, were warmed up, and if anything went wrong, that I had the tools to fix it. I would write rehearsal report each night which would hold notes for the production team and be the means of communication between the performers and designers. Every night, I would make sure that all the members of the company were present when they were called and make sure that were on time during work call, company meetings, and performances. When the show was performed, I would call the lighting and sound cues during the performance to enhance the experience for the audience.

6. **Props Designer *As You Like It***

Faculty Advisor: Jennifer Nostrala

Student: Jocelyn Smith

Abstract:

I was the Properties designer for Shakespeare’s *As You Like It* which means I was in charge of choosing, collecting and creating all of the handheld items and decor for the production. Because the director’s concept centered around modern-day Iowa, my design process was perhaps the simplest out of the design team since everything I would need would be real items found in Iowa. However, acquiring a tandem bike, a (previously) functional office copier, thousands of scrap pieces of paper for a 2-foot-tall stack of paper, and creating over 250 handwritten love poems that not only covered the entire lobby of BPAC but also dropped from the ceiling is more complicated than it sounds. My poster will not only explain the process of designing and creating these props but include a variety of photos of the props throughout the creation process.

7. **Props Designer *The Enchanted Pig***

Faculty Advisor: Jennifer Nostrala

Student: Jess Doster

Abstract:

I held a designer position in which I designed props for the play *The Enchanted Pig*. The position allowed for me to take a professional shot at designing props for a production. The process of designing props was centered around almost everything that the actors would carry on stage or have on stage. I especially focused on making the props specifically fit the characters they were going to be meant for. Since the opera itself was very magical, that also took a strong focus while I was working on designing my props. The poster that will work as my presentation will hold all of what I worked on from initial ideas to the final works with more details as to how I came up with the final design.

8. **Costume and Hair and Makeup Design *Fefu And Her Friends***

Faculty Advisor: Jennifer Nostrala

Student: Allison Blades

Abstract:

I started my work by reading and analyzing the play. I noted every time characters would change. I collaborated with the director using her concept and made an analysis of each of the characters. Before I started designing the actual costumes, I researched the specific fashion from the 1930's. I also was searching for color palates and found inspiration from different art. I took my research and began translating it into designs specific for each character. I drew my designs, had them approved, then began making my final renderings. I had my budget that decided to use mostly for building a few of the costumes. I pulled stock and went fabric and clothing shopping. I supplied information to the actors on period accurate hair and makeup styles. One of the actors had tattoos and I had to learn how to properly cover up tattoos. One of my costumes had to be changed completely during the process, so I adapted and it worked out. There was a work call and I compiled a list of projects that needed to be finished. Finally tech week started and I took notes on things that needed to be changed or fixed and communicated to my costume supervisor and the costume crew of the adjustments. All throughout this process I was collaborating with the other designers and the director to make sure everything was cohesive.

Class Panels

Division of Business Administration & Multimedia Communication

1. **Simpson Speech Student Showcase**

Faculty Advisor: Marisa Mayo

Students: Elise Sturgeon, Kylie Douplik, Mo Marks , Abby Fry, Ryan Corcoran

Abstract:

Select students from the speech and debate team will perform interpretations of literature, original speeches, and limited preparation events.

2. **Building Capacity for HSL capstone internships**

Faculty Advisor: Jacy Downey

Students: Abby Ruby, Paula Carlson

Abstract:

This panel discussion will feature HSL students who have previously or are currently engaged in a HSL internship. I will invite HSL students who have yet to register for internships to participate in the discussion so that they will be better armed to be an advocate for starting conversations with potential host sites about developing high-quality, rigorous internship experiences. Currently, I have been developing internships for students, one-at-a-time, using a project-based model. This process is not sustainable nor does it empower students to engage with the professional community. The hope is that students will be further motivated to start conversations with potential internship hosts after hearing more about the great projects their peers have been involved in.

Division of Education and Sport & Health Sciences

Division of Humanities

Division of Natural Science

1. Optimizing Human Performance Through Physiology Research

Faculty Advisor: Jackie Brittingham

Students: Maddie Allen, Mackenzi Annis, Audrey Arnold, Brett Bobinet, Kacie Cowman, Eliza Frentress, Peyton Gallentine, Olivia Heerkes, Derrick Johnson, Kylie Jones, Morgan Kerkman, Hailey Kintz, Madison Luderman, Makena Morris, Jason Padilla, Isabella R. Mertens, Jacob M. Thomas, Kylie E. Tierney, Maria S. Veasey, Amanda C. White, Trenton A. White, Kaya F. Young

Abstract: How can you improve your performance in athletic pursuits and academics? At this session, you will learn new ways to tap into your own body's superpowers. Human Physiology students designed and performed research investigations to gain a deeper understanding of the biological basis underlying organ systems integration and human performance. Poster presentations of these student projects demonstrate a range of physiological techniques to quantify impacts on performance through manipulating the variables of blood glucose, core body temperature, body fat composition, imagination, or mouth breathing.

Division of Social Science

1. Diversity and Inclusion at Simpson College: Perceived Problems and Potential Solutions

Faculty Advisor: Ali Madanipour

Students: Elise Boulton, Hannah Duncan, Adrianna Ruble, Courtney Paxton, Kolbie Bass, Adam (Emmanuel) Velazquez, Akol Atask, Juan Sandoval, Avery Dickerson, Rachael (Rocky) Jackson, Brady Shannon, Bella Tranquilino, Zach Truitt, Angelo Palacios, Korbyn Ringer, Camden Ganzeveld

Abstract:

Feeling of inclusion, especially in diverse organizations and institutions, is related to outcomes such as positive emotions, interpersonal trust, productivity, creativity, efficiency, etc. Students in their Foundation II class have conducted qualitative interviews of 32 faculty and staff members at Simpson College to examine the main characteristics of diverse and inclusive

organizations, perceived problems related to social inclusion and exclusion, and potential solutions. In this class panel, students will share their main findings with Simpson Community.

2. Dr. George Washington Carver’s Spirituality and Selfless Acts to Help Poor Black Southern Farmers

Faculty Advisor: Carolyn Dallinger

Students: Kylie Rae Torres, Nadia Murobyi

Abstract:

This presentation will explain Dr. George Washington Carver’s selfless acts in helping Black Southern farmers not long after the end of the Civil War. He worked tirelessly to find methods to rotate crops, provide farming techniques, and build inventions to help the farmers. He didn’t just stay at Tuskegee University teaching about these discoveries but took his knowledge out to the farmers across the South. Additionally, this presentation will examine Dr. Carver’s spiritual connection through his mind, body, and soul poured into his work and life. Dr. Carver’s spirituality helped him to achieve greatness in being a successful professor, inventor, and so much more. We will also describe the Simpson Carver Fellows program and the first year Fellows’ research requirements within the program.

3. How do Students Evaluate the Quality of Life at Simpson College?

Faculty Advisor: Ali Madanipour

Students: Kaytee Van Clark, Treye Teske, Hannah Murphy, Zoe Baker, Alice Medick, Frank Cruz, Elayna Irving, Dylan McKinley

Abstract:

In this panel, students will discuss the results of their research on the quality of life at Simpson College. By designing a self-administrated questionnaire, student will select a representative sample of students to collect and analyze their data.

Division of Visual and Performing Arts

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