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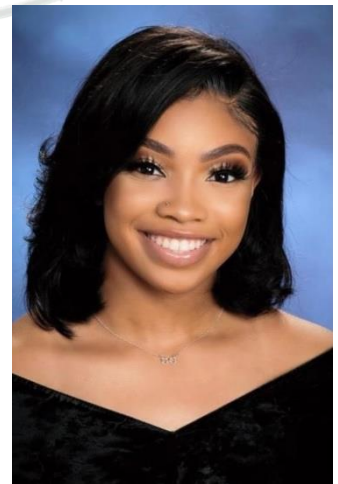
January 2022

The Southern Center for Broadening Participation in STEM is a minority-led non-for-profit organization, the Center's vision is the realization of "equitable representation and inclusion of underrepresented minorities in STEM across business, industry, policy and research sectors;" creating new possibilities in STEM career and college pathways for all students. The Center supports year-round STEM engagement K-20

THE SOUTHERN CENTER FOR
BROADENING PARTICIPATION
IN STEM

PROGRAM HIGHLIGHTS

2020 - 2021



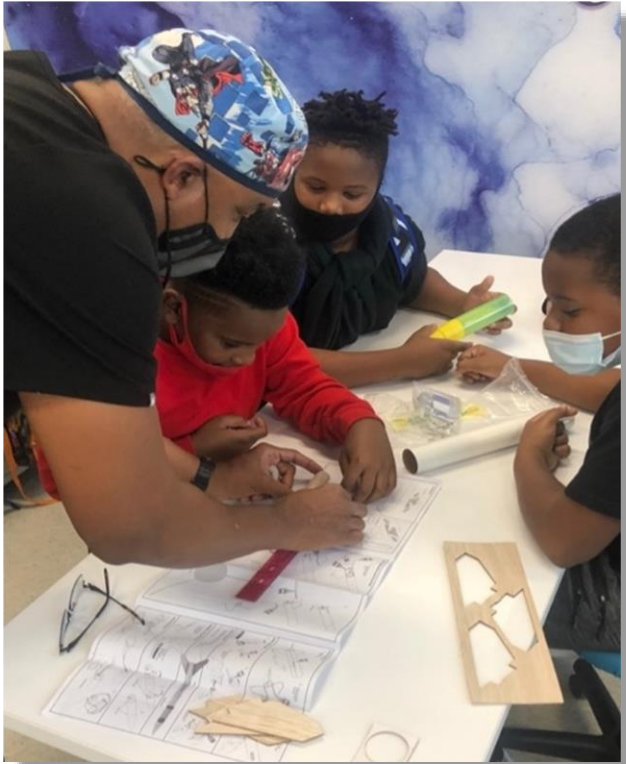
Dr. Calvin Briggs, Founder &
Executive Director
1628 Keswick Drive
Hoover, AL 35226
cbriggs@southernstemcenter.org

Dr. Anthony DePass, Board Chairman

Dr. Brian Stone, Beta Kappa Boule' Medical Scholarship
Advisory Committee Chairman



Donate
Today!



On November 9th and 16th, The Southern Center’s STEM Enrichment Experience (SEE) hosted the “To the Moon and Beyond” hands-on STEM activity at the A.G. Gaston Boys and Girls Club in Birmingham, AL. The activity included a presentation on the significance of rockets, college and career pathways related to the aerospace industry, and people of color who have and currently dominate in these spaces. The Club participants (20), ranging from 5th to 6th grade, engaged in discussions about aerospace design, engineering, and space exploration. We discussed why space exploration was important, such as the growing need for natural resources that are scarce on Earth; our need to create an expensive and



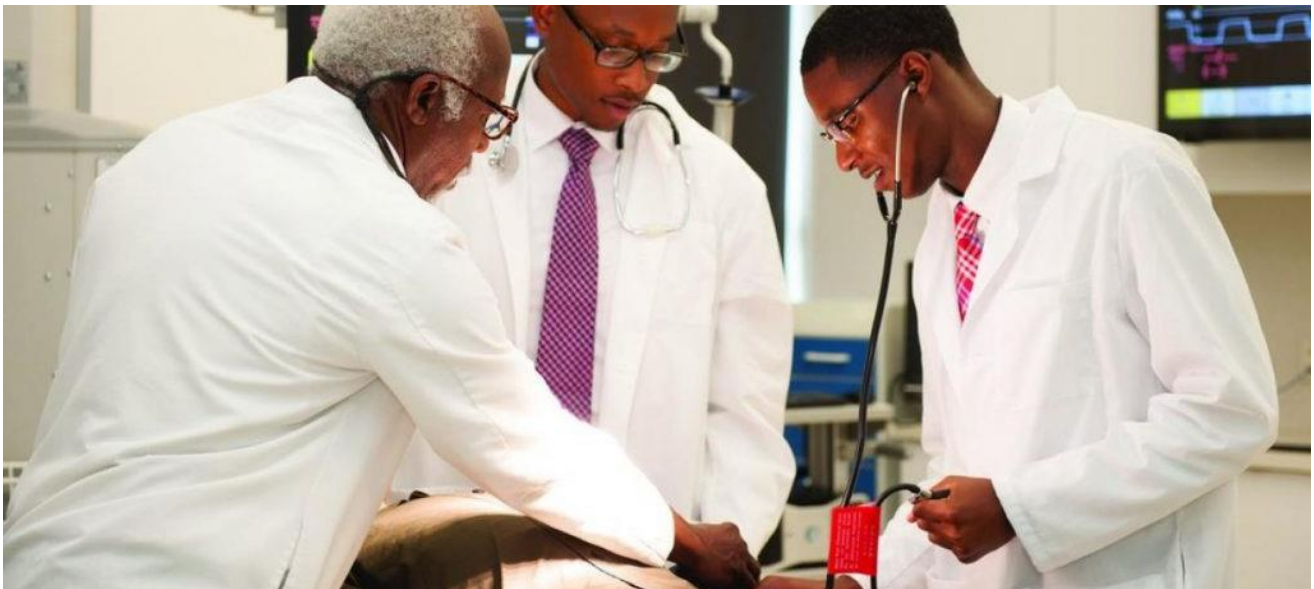
renewable way to travel through our solar system. Participants were given an overview of the Estes Model Rocket that they later assembled. Participants worked in groups of 3 to construct their model rocket, led by the Southern Center’s Executive Director, Dr. Calvin Briggs; SEE Board Chair, Dr. Brian Stone, and volunteers Mr. Dom Bowman and Mr. Jamari Rice. The two-hour long activity was full of excitement and questions as participants taped and glued rockets together. Participants debated the proper measurement of angles and placement of parts, heightening the anticipation of whether the craft would fly. Once completed, students showed off their rockets and prepared them for a test flight.



Beta Kappa Boule' STEM Medical Scholarship Update

The BKB STEM Medical Pathways Scholarship Award provides one Alabama student, admitted to the University of Alabama at Birmingham School of Medicine, with a tuition and book scholarship. Nominees must be admitted to the University Of Alabama School Of Medicine and an Alabama resident. Final selection will be determined by the Beta Kappa Boule' Scholarship Award Committee.

To date, the STEM BKB Medical Pathways Scholarship Fund has raised approximately \$29,500.00 toward our \$30,000.00 goal. The scholarship will provide one Birmingham area student, admitted to the University of Alabama at Birmingham Medical School with a tuition and book scholarship.



Donate
Today!

“Examining the COVID-19 Vaccine”

Examining the COVID-19 Vaccine
Research Proposal
Dr. Kameil Vlg, Dr. Calvin Briggs, Dr. Samantha Elliot Briggs, Mr. Pump, Mrs. Daphne Think
Na'Kyia Boykin

ABSTRACT
This research seeks to explore the impact of the new COVID-19 variants (Alpha, Beta, Delta, and Gamma) and whether the current COVID vaccine can be effective in treating those new variants. The research seeks to employ a quantitative experimental design to explore the impact of current vaccines on the new variants. Does the current COVID vaccine have any effect on the new variants? Does the current COVID vaccine have any effect on the new variants? Does the current COVID vaccine have any effect on the new variants?

THE PROBLEM
The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants.

RESEARCH QUESTIONS
1. What is the impact of the new COVID-19 variants on the current COVID-19 vaccine?
2. Will the current COVID-19 vaccine be effective in treating those new variants?
3. What is the impact of the new COVID-19 variants on the current COVID-19 vaccine?

INTRODUCTION
The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants.

THE NEW COVID-19 VARIANT
The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants. The current COVID-19 vaccine is not effective in treating those new variants.

FIGURE 1

FIGURE 2

FIGURE 3

FUTURE STEPS
1. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.
2. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.
3. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.

REFERENCES
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ACKNOWLEDGEMENTS
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Takeiyah Johnson
Park Crossing High School
Montgomery, AL

This research seeks to explore the causes of the new COVID-19 variants (Alpha, Beta, Delta, and Gamma) and whether the current COVID vaccine can be effective in treating those new variants? The research seeks to employ a quantitative experimental design to explore the impact of current vaccines on the new variants. Data has shown that the Delta variant is fueling new outbreaks across the country; could the United States be heading towards another lockdown if numbers continue to grow

The new variants. Data has shown that the Delta variant is fueling new outbreaks across the country; could the United States be heading towards another lockdown if numbers continue to grow

Calvin Elijah Briggs, Jr.

Hoover High School,
Hoover, AL

In this research proposal the researcher will explore the migration of African Americans and the location of more positive socio-economic opportunities. The research will use the overarching question of “Is there a new great migration among young African Americans?”

“Is there a New Great Migration”

Is there a New Great Migration?
Research Proposal
Dr. Kameil Vlg, Dr. Calvin Briggs, Dr. Samantha Elliot Briggs, Mr. Duval Pump, Mrs. Daphne Think
Elijah Briggs

ABSTRACT
The researcher will explore the migration of African Americans and the location of more positive socio-economic opportunities. The research will use the overarching question of “Is there a new great migration among young African Americans?”

THE PROBLEM
The researcher will explore the migration of African Americans and the location of more positive socio-economic opportunities. The research will use the overarching question of “Is there a new great migration among young African Americans?”

TREND MAPS OF MIGRATION BEHAVIORS

RESEARCH QUESTIONS
1. Is there a new great migration? (overarching research question)
2. Is there a new great migration for young African Americans? (sub question)
3. Where are young African Americans migrating to and why? (sub question)

INTRODUCTION
The researcher will explore the migration of African Americans and the location of more positive socio-economic opportunities. The research will use the overarching question of “Is there a new great migration among young African Americans?”

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ACKNOWLEDGEMENTS
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“Concussions in Football”

Concussions in Football
Research Proposal
Dr. Kameil Vlg, Dr. Calvin Briggs, Dr. Samantha Elliot Briggs, Mr. Duval Pump, Mrs. Daphne Think
Maya Caves

ABSTRACT
Concussions are one of the most common injuries in football. This research proposal aims to explore the impact of concussions on the brain and whether the current COVID vaccine can be effective in treating those new variants.

THE PROBLEM
Concussions are one of the most common injuries in football. This research proposal aims to explore the impact of concussions on the brain and whether the current COVID vaccine can be effective in treating those new variants.

RESEARCH QUESTIONS
1. What is the impact of concussions on the brain?
2. Will the current COVID-19 vaccine be effective in treating those new variants?
3. What is the impact of concussions on the brain?

INTRODUCTION
Concussions are one of the most common injuries in football. This research proposal aims to explore the impact of concussions on the brain and whether the current COVID vaccine can be effective in treating those new variants.

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FUTURE STEPS
1. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.
2. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.
3. The researcher will explore the impact of the new COVID-19 variants on the current COVID-19 vaccine.

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ACKNOWLEDGEMENTS
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Maya Caves
Central High School
Tuscaloosa, AL

Concussions are one of the most common injuries among players that participate in contact sports such as football. This research proposal aims to evaluate the effects that concussions have on the players. For this research proposal, the guiding question is how the brain's functional ability is affected by concussions. This research plans to use a quantitative approach to measure the results.



Oriana Coleman
A.H. Parker High School
Birmingham, AL

The study aim is to investigate the current prevalence of anxiety, depression, and PTSD among the self-isolating general population during the pandemic; along with the mental health risks in solitary confinement—how these illnesses affect individuals in their current way of life and what can be done about it. For this research proposal the researcher's guiding questions are to explore the mental health risks, find the long-term effects, and to see if the people are receiving help. The method reviews past articles and makes elaborate comparisons for a definite explanation for the rise of mental illnesses with the result of psychological effects, personal struggles, and needed improvement. The results have determined that both people in quarantine and solitary confinement still need mental assistance and therapy. Future studies will deal with finding more effective medications that are guaranteed to work quickly in hopes of more rapid progression in one's health.

"Effects of Social Isolation"



Effects of Social Isolation

Research Proposal
Dr. Konal V. Dr. Caren Briggs, Dr. Samantha Elliot Briggs, Mr. DuDell Plump, Mrs. Debrae Thack

ABSTRACT

The study aims to investigate the current prevalence of anxiety, depression, and PTSD among the self-isolating general population during the pandemic; along with the mental health risks in solitary confinement—how these illnesses affect individuals in their current way of life and what can be done about it. For this research proposal the researcher's guiding questions are to explore the mental health risks, find the long-term effects, and to see if the people are receiving help. The method reviews past articles and makes elaborate comparisons for a definite explanation for the rise of mental illnesses with the result of psychological effects, personal struggles, and needed improvement. The results have determined that both people in quarantine and solitary confinement still need mental assistance and therapy. Future studies will deal with finding more effective medications that are guaranteed to work quickly in hopes of more rapid progression in one's health.

THE PROBLEM

Social isolation is a serious mental health risk as there are many people who are socially isolated. Research shows that people who are socially isolated are at a higher risk of mental health problems. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD.

RESEARCH QUESTIONS:

Research Question 1: What are some of the mental health risks that are associated with social isolation and how can we help people who are socially isolated?

Research Question 2: Can social isolation cause long-term psychological consequences?

Research Question 3: What are some of the mental health risks that are associated with social isolation and how can we help people who are socially isolated?

INTRODUCTION

Social isolation (aka the pandemic) has increased the prevalence of anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD.

RESULTS FROM PREVIOUS STUDIES

A study by [Author] found that people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD.

CONCLUSION

Social isolation is a serious mental health risk as there are many people who are socially isolated. Research shows that people who are socially isolated are at a higher risk of mental health problems. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD. This is because people who are socially isolated are more likely to experience anxiety, depression, and PTSD.

"Social Media Engagement and its Impact of Communication Skill Among Gen Z"

ABSTRACT

The following research proposal seeks to explore the impact of social media engagement on communication skills among Generation Z. The researcher will use a series of surveys and interviews to gather data on the prevalence of social media use and its impact on communication skills. The study will also explore the relationship between social media use and communication skills among Gen Z.

THE PROBLEM

Social media engagement has become a major part of Gen Z's lives. However, there is a growing concern that excessive social media use is leading to a decline in communication skills. This is because people who spend too much time on social media are less likely to engage in face-to-face communication. This is because people who spend too much time on social media are less likely to engage in face-to-face communication.

RESEARCH QUESTIONS:

1. What is the impact of social media engagement on communication skills among Gen Z?

2. How does social media engagement affect communication skills among Gen Z?

3. What are the factors that influence communication skills among Gen Z?

INTRODUCTION

In this research proposal, we aim to explore the impact of social media engagement on communication skills among Gen Z. The study will use a series of surveys and interviews to gather data on the prevalence of social media use and its impact on communication skills. The study will also explore the relationship between social media use and communication skills among Gen Z.

RESULTS FROM PREVIOUS STUDIES

A study by [Author] found that people who spend more time on social media are less likely to engage in face-to-face communication. This is because people who spend too much time on social media are less likely to engage in face-to-face communication. This is because people who spend too much time on social media are less likely to engage in face-to-face communication.

CONCLUSION

Social media engagement has become a major part of Gen Z's lives. However, there is a growing concern that excessive social media use is leading to a decline in communication skills. This is because people who spend too much time on social media are less likely to engage in face-to-face communication. This is because people who spend too much time on social media are less likely to engage in face-to-face communication.



Jaylen Davis
Lee High School
Montgomery, AL

The following research proposal seeks to explore Generation Z's social media engagement throughout the COVID-19 Global Pandemic. The researcher will use the overarching question to guide his research: 1) What impact did the global pandemic and social isolation have on the increase in social media engagement and what were the unforeseen consequences regarding social isolation? Throughout the Pandemic, social media has become a vital component of communication for Generation Z (Gen Z). Through a series of interviews and surveys, data was collected that observed the user's increase/decrease in digital communication use throughout the pandemic. As far as the results, the data has found that the youngest quartile has the tendency to increase their digital communication use, whereas the oldest quartile has the tendency to decrease digital communication use. As the research to this topic expands over time, the studies highlight the importance of communication and could spread the focus group into older generations and how they're adapting to the ongoing advances of modern technology.



“Climate Change”



Lauryn Elliott
Hoover High School
Hoover, AL

This research proposal will explore issues related to climate change. The guiding question is how we can address issues related to climate change and outcomes like increased carbon emissions. The researcher will explore methods that will reduce the carbon footprint by reducing pollution related to transportation and food production. The

research will also explore alternative energies and policies that reduce carbon emissions.

Climate Change
Research Proposal
Dr. Koral Vlg, Dr. Cavin Briggs, Dr. Samantha Elliot Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift
Lauryn Elliott

ABSTRACT
This research proposal will explore issues related to climate change. The guiding question is how we can address issues related to climate change and outcomes like increased carbon emissions. The researcher will explore methods that will reduce the carbon footprint by reducing pollution related to transportation and food production. The research will also explore alternative energies and policies that reduce carbon emissions.

THE PROBLEM
If global temperatures continue to rise, the world is headed for more heat waves, wildfires and droughts. The United States economy could lose billions of dollars by the end of the century because of climate change. Carbon emissions are rising by 1.4 percent last year in the United States and by 3.7 percent globally, according to early estimates.

INTRODUCTION
In this research proposal we mainly focus on what we can do to combat climate change. People have caused most climate change to happen over the past without trying to stop it. This has caused global warming, droughts, wildfires and hurricanes. There are some things to help stop climate change. But even if we fail to stop it now by using more renewable energy we would be able to beat the effects for several more decades.

RESEARCH QUESTIONS:
1. How can we stop global temperatures from rising?
2. How can we reduce carbon emissions?

METHODS
This project uses an experiment model and has been observation to determine if various transportation such as driving and flying fuel, using wind and solar energy, and reducing your consumption of animal products. By fact, you can cut your daily carbon footprint by more than 40%, with a significant impact on climate change.

RESULTS
Global CO2 emissions continue to rise. Global temperature continue to rise.

ACKNOWLEDGEMENTS
MSEF Program
Center for Research Participation in STEM, Dr. Cavin Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift, GEAR UP Alabama at the University of Alabama at Birmingham School of Education, Dr. Samantha Elliot Briggs, Ms. Andrea Frew, and Ms. Stephanie Rusch.

“Cognitive Behavioral Therapy Programs for Criminal Offenders”

Cognitive Behavioral Therapy Programs for Criminal Offenders
Research Proposal
Dr. Koral Vlg, Dr. Cavin Briggs, Dr. Samantha Elliot Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift, Jessica Floyd

ABSTRACT
The purpose of this research proposal is to explore the effectiveness of Cognitive Behavioral Therapy (CBT) programs for criminal offenders. The research will explore how CBT programs can help reduce recidivism rates and improve the lives of offenders. The researcher will explore methods that will reduce the carbon footprint by reducing pollution related to transportation and food production. The research will also explore alternative energies and policies that reduce carbon emissions.

THE PROBLEM
Criminal offenders who are released from prison often face many challenges. They often struggle to find employment, housing, and support. This can lead to recidivism, which is a major problem for the criminal justice system. Cognitive Behavioral Therapy (CBT) programs have been shown to be effective in reducing recidivism rates and improving the lives of offenders.

RESEARCH QUESTIONS
1. How can CBT programs help reduce recidivism rates?
2. What are the most effective CBT programs for criminal offenders?

INTRODUCTION
The purpose of this research proposal is to explore the effectiveness of Cognitive Behavioral Therapy (CBT) programs for criminal offenders. The research will explore how CBT programs can help reduce recidivism rates and improve the lives of offenders. The researcher will explore methods that will reduce the carbon footprint by reducing pollution related to transportation and food production. The research will also explore alternative energies and policies that reduce carbon emissions.

METHODS
This project uses an experiment model and has been observation to determine if various transportation such as driving and flying fuel, using wind and solar energy, and reducing your consumption of animal products. By fact, you can cut your daily carbon footprint by more than 40%, with a significant impact on climate change.

ACKNOWLEDGEMENTS
MSEF Program
Center for Research Participation in STEM, Dr. Cavin Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift, GEAR UP Alabama at the University of Alabama at Birmingham School of Education, Dr. Samantha Elliot Briggs, Ms. Andrea Frew, and Ms. Stephanie Rusch.



Grace Floyd
Park Crossing High School
Montgomery, AL

The focus of Cognitive Behavioral Therapy (CBT) is to help change the ways of thinking and to help make better choices. Cognitive Behavioral Programs are designed to reduce the recidivism by offenders in order to improve their behaviors, skills, way of thinking positive and being more responsible at managing their thoughts and actions. the problem is Criminals have mindsets that stop them from making good decisions. They are in need of assistance This research is to show the effectiveness of Cognitive Behavioral Therapy Programs for Criminal offenders. The most effective CBT programs includes anger management and interpersonal skills training.



Jessica Hodges
Park Crossing High School
Montgomery, AL

Injury is a stressor for student athletes and one can cause many challenges. Student athletes must handle the rigor of academics as well as athletic demands that require time and many physical requirements. Trying to perform and be successful in the classroom and in sports increases psychological and physical stress, and especially if the athlete gets injured, which increases the psychological challenges. For this research proposal my

guiding question are to explore the impact/correlation of how to properly assess athletes' mental health after being injured. Research has shown that athletic trainers and other healthcare providers play an essential role identifying mental health risks among athletes.

“Psychological Response to Injury”

Psychological Response to Injury
Research Proposal
Dr. Koral Vlg, Dr. Cavin Briggs, Dr. Samantha Elliot Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift, Jessica Hodges

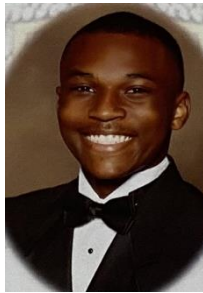
ABSTRACT
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THE PROBLEM
Injury is a stressor for student athletes and one can cause many challenges. Student athletes must handle the rigor of academics as well as athletic demands that require time and many physical requirements. Trying to perform and be successful in the classroom and in sports increases psychological and physical stress, and especially if the athlete gets injured, which increases the psychological challenges. For this research proposal my guiding question are to explore the impact/correlation of how to properly assess athletes' mental health after being injured. Research has shown that athletic trainers and other healthcare providers play an essential role identifying mental health risks among athletes.

RESEARCH QUESTIONS
1. How can athletes cope with mental health challenges after being injured?
2. How can psychological stressors be managed after an injury?

INTRODUCTION
Injury is a stressor for student athletes and one can cause many challenges. Student athletes must handle the rigor of academics as well as athletic demands that require time and many physical requirements. Trying to perform and be successful in the classroom and in sports increases psychological and physical stress, and especially if the athlete gets injured, which increases the psychological challenges. For this research proposal my guiding question are to explore the impact/correlation of how to properly assess athletes' mental health after being injured. Research has shown that athletic trainers and other healthcare providers play an essential role identifying mental health risks among athletes.

ACKNOWLEDGEMENTS
MSEF Program
Center for Research Participation in STEM, Dr. Cavin Briggs, Ms. DeDee Pump, Mrs. Debrae Thrift, GEAR UP Alabama at the University of Alabama at Birmingham School of Education, Dr. Samantha Elliot Briggs, Ms. Andrea Frew, and Ms. Stephanie Rusch.



Jearrod Johnson
Grayson High School
Lawrenceville, GA

The idea of winglets began in the 1800's but did not come into fruition until the 1970s as the price of fuel began to rise. Aeronautical engineers at NASA Langley Research Center, improved upon the original winglet concept with early wind tunnel tests and computerized studies. These tests resulted in between 6% and 9% gain in fuel efficiency. This research proposal seeks to gather data and analyze the effectiveness of winglets on today's aircraft performance.

"How Continued Development of Large Aircraft Winglets Can Reduce the Environmental Impact of the Aviation Industry"

How Continued Development of Large Aircraft Winglets Can Reduce the Environmental Impact of the Aviation Industry
Dr. Kumar Vaj, Dr. Carol Briggs, Dr. Samantha Elliott Briggs, Mr. Pump, Mrs. Debrae Thrift
Jearrod Johnson

ABSTRACT
The idea of winglets began in the 1800's but did not come into fruition until the 1970s as the price of fuel began to rise. Aeronautical engineers at NASA Langley Research Center, improved upon the original winglet concept with early wind tunnel tests and computerized studies. These tests resulted in between 6% and 9% gain in fuel efficiency. This research proposal seeks to gather data and analyze the effectiveness of winglets on today's aircraft performance.

INTRODUCTION
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THE PROBLEM
Aircraft fuel prices are consistently rising from many different factors. These costs range from petroleum, fuel tax, and other factors. These costs are increasing rapidly and are expected to continue to rise. This research proposal seeks to gather data and analyze the effectiveness of winglets on today's aircraft performance.

RESEARCH QUESTIONS
Research Question 1: Can changing the shape of current winglets reduce fuel consumption?
Research Question 2: What are the environmental impacts of winglets?
Research Question 3: How can winglets be designed to be more effective?

REFERENCES
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<https://www.nasa.gov/centers/dryden/About/AboutDrydenTechnology/AboutDrydenTechnology7a5.html>

ACKNOWLEDGEMENTS
I would like to thank my parents, Mr. and Mrs. Jearrod Johnson, for their support and encouragement. I also thank my teachers, Mr. and Mrs. [Names], for their guidance and advice. I am grateful to my friends, [Names], for their support and encouragement. I am also grateful to my classmates, [Names], for their support and encouragement. I am grateful to my school, Grayson High School, for providing me with the opportunity to participate in this research project.

"Effects of Climate Change"

EFFECTS OF CLIMATE CHANGE
Research Proposal
Dr. Vij Kumar, Dr. Carol Briggs, Dr. Samantha Elliott Briggs, Mr. Pump, Mrs. Debrae Thrift
Samyra Lane

ABSTRACT
Not enough people realize how important climate change is. This research proposal seeks to summarize the research found on the effects of climate change. How climate changes affect the economy and society in America will be discussed. Global warming is the result of the amplification of a natural process occurring in the atmosphere called the greenhouse effect. This amplification is caused by the addition of a range of gases to the atmosphere as a result of domestic and industrial activity. The main culprits are carbon dioxide and methane. The researcher will seek to explore the effects of climate change and its causes.

INTRODUCTION
Climate change refers to the long-term changes in the climate that occur over decades, centuries or longer. It is caused by the greenhouse effect. The greenhouse effect is the process by which the atmosphere traps heat from the sun. This process is caused by the addition of a range of gases to the atmosphere as a result of domestic and industrial activity. The main culprits are carbon dioxide and methane. The researcher will seek to explore the effects of climate change and its causes.

THE PROBLEM
The main cause of climate change is burning fossil fuels such as oil, gas, and coal. When these fuels are burned, they release carbon dioxide into the air, changing the planet's heat up.
Increased heat, drought and insect outbreaks, all linked to climate change, have increased wildfires. Declining water supplies, reduced agricultural yields, health risks to coastal areas due to sea level rise, and flooding and erosion in coastal areas are additional concerns.
The ocean absorbs about 30% of the carbon dioxide that is released into the atmosphere from the burning of fossil fuels. As a result, the ocean is becoming more acidic, affecting marine life. Rising sea levels due to thermal expansion and melting land ice sheets and glaciers add coastal areas of greater risk of erosion and storm surge.

RESEARCH QUESTIONS
Research Question 1: What are the effects of climate change and global warming?
Research Question 2: How can we reduce our carbon footprint?
Research Question 3: How can we adapt to climate change?

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ACKNOWLEDGEMENTS
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Samyra Lane
A.H. Parker High School
Birmingham, AL

Not enough people realize how important climate change is. This research proposal seeks to summarize the research found on the effects of climate change. How climate changes affect the economy and society in America will be discussed. Global warming is the result of the amplification of a natural process occurring in the atmosphere called the Greenhouse Effect. This amplification is caused by the addition of a range of gases to the atmosphere as a result of domestic and industrial activity. The main culprits are carbon dioxide and methane. The researcher will seek to explore the effects of climate change and its causes.



Danaea Miller
Marengo High School
Dixon Mills, AL

The following research proposal will explore the complications African American women face during childbirth. Specifically, this research aims to answer the questions of why the childbirth death rates of African American women are higher than that of other races. Additionally, this project will investigate the quality-of-care African American women receive while in the hospital, again when compared to that of other racial groups. The research plans to compare peer reviewed articles and websites collect and compare date.

"African American Mortality Rate During Childbirth"

A Comparison of COVID-19 Cases Among Elderly African American 65-90 to Younger African Americans 18-30"



Elisha Taylor
Aliceville High School
Aliceville, AL

In addition, these results should be considered when making decisions about re-opening middle schools, high schools and colleges, and the importance of wearing masks and social distancing in school settings.

Jasmine Thomas
Carver Senior High School
Montgomery, AL



Individuals who are a part of Generation Z utilize technology difficult for this generation to function the use of technology. This study understand what effects technology Gen Z'ers. For this research my guiding question are explore the impact/correlation of technology on Gen Z'ers and any negative or positive outcomes. The research plans to use a qualitative review method to collect data from peer-reviewed articles and other artifacts.

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"Generation Z (Gen Z) and Technology"

Generation Z (Gen Z) and Technology
Research Proposal
Dr. Komal Vigi, Dr. Calvin Briggs, Dr. Samantha Ector, Dr. Sippi, Mr. DuZell Plump, Mrs. Delphine Thrift, Jasmine Thomas

ABSTRACT
Individuals who are a part of Generation Z utilize technology daily. It is difficult for this generation to function without the use of technology. This study aims to understand what effects technology has on Gen Z'ers. For this research my guiding question are explore the impact/correlation of technology on Gen Z'ers and any negative or positive outcomes. The research plans to use a qualitative review method to collect data from peer-reviewed articles and other artifacts.

THE PROBLEM
Gen Z'ers are not able to function in their daily lives without the use of technology.

RESEARCH QUESTIONS
Does technology have a positive or negative influence on Gen Z?
Is Gen Z becoming less dependent on the use of technology?

INTRODUCTION
Generation Z (Gen Z) is the first generation that was born into a time where technology already existed. Older generations, starting with Gen X, began using Gen Z's use technology almost every second of the day. In reality, technology has both positive and negative influences on this generation. Although the tech world has allowed Gen Z to have more job opportunities, better resources and access to more information, the tech world has also created more insecurities and more cyberbullying.

METHODS
1. I used peer-reviewed articles and critical analysis to answer the research questions.
2. I used online, quantitative research with an interest toward on Generation Z and technology, research that the intergenerational relationship.
3. Researchers from Maxima Health Global conducted a non-scientific survey of Generation Z'ers between the ages of 13 and 22 to see if they are satisfied by the use of technology in their daily lives.
4. Global Research Insights conducted a online survey of 2,887 respondents between the ages of 18 and 40.

FIGURE 1: GEN Z
Figure 1: A bar chart showing the percentage of Gen Z'ers using various devices. Smartphones are used by 95%, laptops by 85%, tablets by 75%, and smart TVs by 65%.

FIGURE 2: THE PROBLEM
Figure 2: A bar chart showing the percentage of Gen Z'ers who are not able to function in their daily lives without the use of technology. 90% of respondents are unable to function without technology.

FIGURE 3: RESEARCH QUESTIONS
Figure 3: A bar chart showing the percentage of Gen Z'ers who believe technology has a positive or negative influence. 65% believe it has a positive influence, while 35% believe it has a negative influence.

FIGURE 4: INTRODUCTION
Figure 4: A bar chart showing the percentage of Gen Z'ers who are satisfied with their use of technology. 75% of respondents are satisfied, while 25% are not.

FIGURE 5: METHODS
Figure 5: A bar chart showing the percentage of Gen Z'ers who are satisfied with their use of technology. 75% of respondents are satisfied, while 25% are not.

FIGURE 6: ACKNOWLEDGEMENTS
Figure 6: A bar chart showing the percentage of Gen Z'ers who are satisfied with their use of technology. 75% of respondents are satisfied, while 25% are not.

ACKNOWLEDGEMENTS
Alabama State University, MSEP Program, Center for Brokering Participation in STEM, Dr. Komal Vigi, Dr. Calvin Briggs, Mrs. Delphine Thrift, Dr. Samantha Ector, Dr. Sippi, Mr. DuZell Plump, Mrs. Delphine Thrift, and Ms. Stephanie Ruppberg.

"Psychology of Plastic Surgery"

Psychology of Plastic Surgery
Research Proposal
Dr. Komal Vigi, Dr. Calvin Briggs, Dr. Samantha Ector, Dr. Sippi, Mr. DuZell Plump, Mrs. Delphine Thrift, Rachel Walters

ABSTRACT
In this research proposal, the researcher will explore the change in cosmetic surgeries between ethnic groups, as well as the links to mental health. The researcher will compare its decline with the indirect likeness of increased therapy as well as social awareness. Lastly, the researcher will look at the long-term effects with those that possess mental disorders and whether these procedures help or harm individuals.

INTRODUCTION
In 2020, nearly 7 million reconstructive procedures were performed, an increase of 2% since 2019 despite the global pandemic. During the pandemic, 11% of women surveyed indicated they are more interested in cosmetic plastic surgery or non-surgical procedures than before COVID-19, and the figure is even higher among women who have already had surgery or a procedure - 24%, respectively. Also, 35% of women who have already had at least one cosmetic surgical procedure or minimally invasive procedure plan to spend significantly more money on treatments in 2021 than in 2020. Based on research, Caucasian women have been the majority of those receiving both, minimally as well as minimally invasive surgery, compared to other ethnic groups. In this research, we will explore the indirect links between anxiety, depression, and other ethnic groups, and how they affect the desire for plastic surgery as well as long-term psychological health.

THE PROBLEM
Due to the global pandemic and the increase use of social media, patients and social media. More women (11% increase) have expressed an interest in plastic surgery. The success of such procedures could have a negative psychological impact on women.

RESEARCH QUESTIONS
Research Question 1: How do beauty standards differ between ethnic groups, and how are they changing over time?
Research Question 2: How often do these standards change? Compare 2020 to cosmetic surgery's peak in recent times.
Research Question 3: Responses of mental disorders compared to those that have, or were seeking plastic/cosmetic surgery.
Research Question 4: How long has been effect these plastic surgery have on those that have a performed?

METHODS
Patients with BDD seek cosmetic medical treatments with great frequency. In a study of 350 adults with BDD, approximately 75% sought nonpsychiatric medical treatments, and 85% received them. Unfortunately, patients have not benefited from these treatments. Seventy-five percent of the procedures led to no change, and only 15% led to a worsening of BDD symptoms. In 2017, more than 75% of patients with BDD reported dissatisfaction with the results of their cosmetic treatments. Nine individuals with BDD in one of those studies were so dissatisfied with their appearance that they performed "do-it-yourself" cosmetic procedures.

FIGURE 1: INTRODUCTION
Figure 1: A bar chart showing the percentage of women who are more interested in cosmetic plastic surgery or non-surgical procedures than before COVID-19. 11% of women are more interested, while 89% are not.

FIGURE 2: THE PROBLEM
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Rachel Walters
Park Crossing High School
Montgomery, AL



In this research proposal, the researcher will explore the change in cosmetic surgeries between ethnic groups, as well as the links to mental health. The researcher will compare its decline with the indirect likeness of increased therapy as well as social awareness. Lastly, the researcher will look at the long-term effects with those that possess mental disorders and whether these procedures help or harm individuals.

Deshaun Wormsby
H. Parker High School
Birmingham, AL



Today plastics can be found in nearly every corner of the globe, in landfills, rivers, streams, and oceans making it one of the most polluted materials on the planet. Based on literature plastic can take anywhere from 10 -1000 years to decompose. The researcher seeks to explore alternative materials to replace plastic products and containers. A viable replacement material could be mycelium. The researcher will explore if mycelium is an effective replacement for plastic.

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“Mycelium Replaces Plastic?”

Mycelium Replaces Plastic?
Research Proposal
Dr. Konal Vag, Dr. Calvin Briggs, Dr. Samantha Elliot Briggs, Mr. DeShaun Wormsby, Mrs. DeShira Thack, DeShaun Wormsby

ABSTRACT
Today plastics can be found in nearly every corner of the globe, in landfills, rivers, streams, and oceans making it one of the most polluted materials on the planet. Based on literature plastic can take anywhere from 10 -1000 years to decompose. The researcher seeks to explore alternative materials to replace plastic products and containers. A viable replacement material could be mycelium. The researcher will explore if mycelium is an effective replacement for plastic.

INTRODUCTION
In this research project we were mainly focusing on alternate ways of using more organic materials that don't harm our environment. Mycelium is the main material I am researching to replace plastic. Mycelium being used as a substitute for plastic has already been done, but only on a small scale. This solution has been around as early as 2007 when it was discovered by Elen Bayer.

The Problem
Plastic is the most pollute that we use. It can be so polluting that the pollution could cause the death of animals. It is made from oil and it takes a long time to decompose. Plastic is everywhere. The researcher wants to explore alternative materials to replace plastic. Mycelium is a viable replacement material that can be used to replace plastic. The researcher will explore if mycelium is an effective replacement for plastic.

Research Questions
1. How much plastic is used in packaging annually?
2. Why use mycelium instead of plastic?
3. How can mycelium be used to replace plastic?

Possible Solutions
The researcher is exploring the use of mycelium as a substitute for plastic. Mycelium is a natural material that can be used to create biodegradable packaging. The researcher will explore if mycelium is an effective replacement for plastic.

Methods
The process to make it is simple. First, you get some agricultural waste mixed with some mycelium spores or seeds. Then, place the mixture in a small which can hold anything from a brick to a large box. After that, just let it grow with the most air with the mycelium to stop it from growing. Seen in Figure 1 & 4.

Future Steps
1. Substitute at least 10% of plastic packaging with mycelium within the next 10 years.
2. Continue to make mycelium used effective as alternative the plastic.
3. Research other materials for plastic.
4. Research other uses for mycelium.

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“The Cause of Coronavirus (COVID-19)”

Mycelium Replaces Plastic?
Research Proposal
Dr. Konal Vag, Dr. Calvin Briggs, Dr. Samantha Elliot Briggs, Mr. DeShaun Wormsby, Mrs. DeShira Thack, DeShaun Wormsby

ABSTRACT
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Malik Minter
A.H. Parker High School
Birmingham, AL

The coronavirus (COVID 19) is a deadly disease that became a problem in late 2019. It became more of a problem when it rapidly started spreading in 2020. It has taken a countless number of lives. My research focuses on how the coronavirus can be eradicated.

STEM Talks

The Southern Center invited a team of STEM experts to share their STEM academic and social journeys with the 2021 “Bridge to STEM” participants. Our experts shared their personal motivations for choosing careers in STEM, in addition to the social and economic barriers they had to overcome to achieve their goals. Experts discussed career pathways in aeronautics, aerospace engineering, veterinary sciences, urology, dermatology, obstetrics and gynecology, orthopedics and sports medicine, and understanding vaccinations as a means of preventive care.



Gena Henderson, IE, Ph.D

Dr. Gena Humphrey Henderson, serves as chief of the Integration Branch of the Systems Engineering Division within the Engineering and Technology Directorate at NASA's John F. Kennedy Space Center.



Brian Stone, M.D.

Urology Specialist
Jasper Urology
Focusing in urologic Care and urologic surgery.



Rhesa Houston, DVM

Is a practicing veterinarian in Birmingham, Alabama, where she serves as Chief of Staff at her hospital. Rhesa is a general practitioner focusing on small animals. Her interest is in public health.



Corey Hartman, M.D.

Has a special interest in Dermatologic Surgery, Injectables, Hair Restoration and Laser Dermatology. He frequently speaks on cosmetic procedures and social media marketing in dermatology at meetings around the country.



Irby Rivera, Captain

Flight Captain at United Airlines



LoRissa Autery, MD

Board certified for the American Board of Obstetrics and Gynecology and is a Fellow of the American Congress of Obstetricians and Gynecologists.



Robert Agee, M.D.

MD from UAB followed by a residency in Pediatrics at The Children's Hospital of Alabama



Raegan Durant, M.D.

Associate Professor UAB - Preventive Medicine
Developing strategies to increase minority participation in clinical trials.

[Volunteer Today](#)

Bridge to STEM Pre/Post-Survey at-a-Glance

The Summer Enrichment Experience (SEE) engaged elementary, middle and high school students during an 8-week project-based program to enhance and enrich students' knowledge and understanding of STEM related activities, instruction, and career pathways. Students participating in the 2021 Bridge to STEM program consisted of 24- high school graduates, 14(58%) females and 10(42%) males; 24(100%) identified as African American. Participants received enrichment in medical and health pathways (biology and chemistry), aerospace engineering, mathematics, and public health. In addition, students completed research sessions that included: *Fundamentals of Research, Discovering Your Research Interest, Creating an Annotated Bibliography, Talk to the Experts, What research design do I use?, What type of research Instruments Do I Need?, This Doesn't Make Any Sense?, Now What?, Publishing Your Research, and a Research Symposium.*

Twenty-four participants completed the pre and post-survey. Likewise, a significant number of the students for both, the pre-survey 24(100%) and the post-survey 17(70%), indicated that they had already completed 3-4 science and mathematics courses. The following data are brief highlights from the 2021 external evaluation results (figures 1a. - 2b.)

Figure 1. I am confident I have the ability to learn the materials taught in science, technology, engineering, and mathematics (STEM) courses

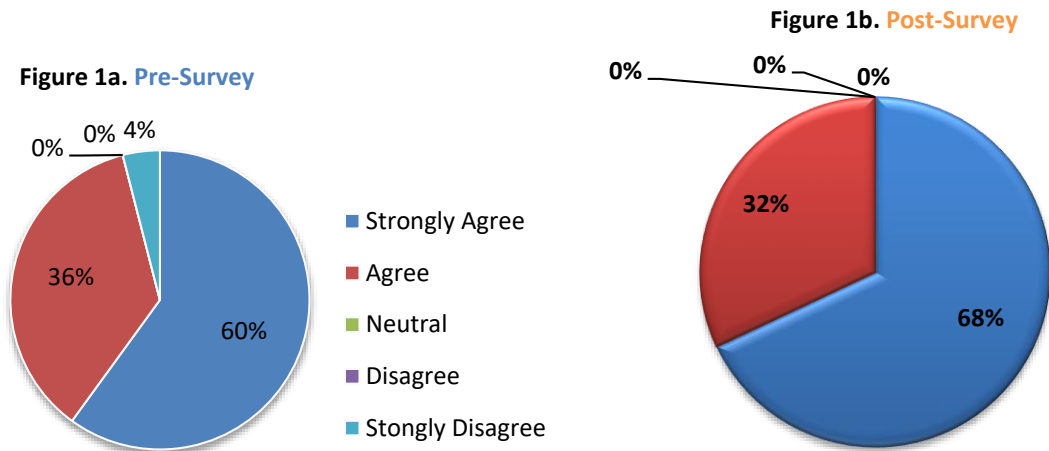


Figure 2. I am confident I can do well in a STEM major

Figure 2a. Pre-Survey

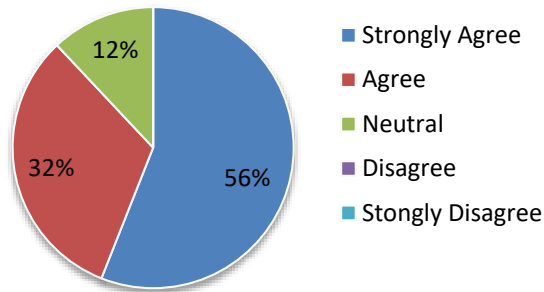
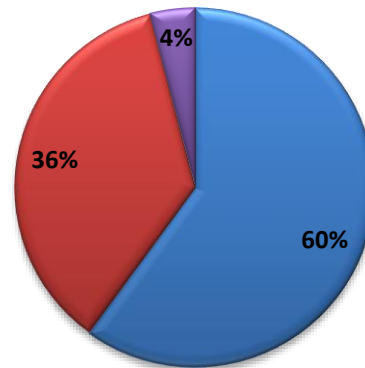


Figure 2b. Post-Survey



8% indicated higher confidence in a STEM
12% more students believe they will do well
 or better than other students in STEM majors

100%

of Parents strongly agree

SEE has met their expectations

SEE's Facilitators have done an excellent job facilitating

SEE has made a significant academic contribution to their child's development

SEE is preparing their son/daughter for future opportunities in STEM



Summer Enrichment Institute Participant (2007-2009)

Engineering Major at the University of Alabama at Birmingham College of Engineering

Jaylen Davis graduated from Lee High School in Montgomery, AL. Jaylen is currently majoring in civil engineering at the University of Alabama at Birmingham. The title of Jaylen's Bridge to STEM Research Proposal is "Social Media Engagement and its Impact of Communication Skill Among Gen Z."



Descriptive Summary

The success of the Southern Center for Broadening Participation in STEM has emerged from the extensive development, implementation, and evaluation of its pre-cursor programs. The STEP-UP in STEM, 2-PI-STEM, and STEM Cubed programs funded by the National Science Foundation at Lawson State Community College. The program was funded for 15 consecutive years, led by its Director, Dr. Calvin Briggs, evolving from only engaging high school students and undergraduates to developing a STEM pipeline from K – 20. The Southern Center for Broadening Participation in STEM expands the foundational work beyond its initial incubator, crossing state, regional, and national boundaries. The Southern Center has framed a Virtual STEM Learning Community posed to fulfil its mission to “increase the number of underserved and marginalized minorities in STEM college and career pathways.

Program Participants

This descriptive summary of the **Bridge to STEM Program 2021** consisted of the summer 2021 participants. The total number of STEM scholars recruited were twenty-four, 14 (58%) males and 7 (42%) females. To date 20 (83%) entered a post-secondary institution in the fall of 2021; 7 (50%) of those accepted were male and 2 (29%) were female.

Summer 2020 STEM Enrichment Experience (SEE). During the summer of 2020, the height of the COVID-19 global pandemic, SEE hosted 15 students virtually across 4 states one district (Alabama, Georgia, New Jersey, Indiana, and Washington, D.C.), 6 grade levels (7th – 12th), covering topics in **Biology:** cardiovascular function and disease; **Chemistry:** thermodynamics; **Mathematics:** integral calculus, geometry, and **The Art of STEM:** design, drafting, and visual communication.

The **Virtual Scholar Program Fall 2020** consisted of 9 undergraduate participants, 3(33%) males and 6(67%) females; class rank: 100% seniors. participant major’s were in the areas of biomedical, computer science, and forensics, more specifically, research participant research foci were “Determining PMI from Thanato Microbiome (Anterior and Posterior Pituitary Glands); artificial intelligence; Tissue Engineering/Bio Fabrication; and Drug Delivery Systems for Cancer. 50% of the students identified as African American and 50% identified as Asian or Other. 50% of the participants indicated that their parents had a career in a STEM field and 100% of the participants indicated they would pursue a STEM career pathway. 88% of students plan to pursue advance degrees in STEM, and 12% indicated they would enter directly into the workforce. When participants were asked “**What did you enjoy most about the Virtual Scholar Program/ASU- MSEIP?**” They indicated that they enjoyed networking, the insight into their fields, the ability to do research and develop their skills under the guidance of a mentor, and exposure to different industries. I believe the quote by one of our participants sums up the importance of the work we do.

“The feeling you get when you actually see the final product. You spend time trying to figure out the best way to get the results, you end up making some errors, having to redo the work, run it again, and then you finally see amazing results! The fact that you actually get to use your brain in the smartest and most logical way possible; where every assignment thrown at you is a challenge. I will be forever grateful for being allotted such an opportunity!”



Activities, Collaborations and Presentations

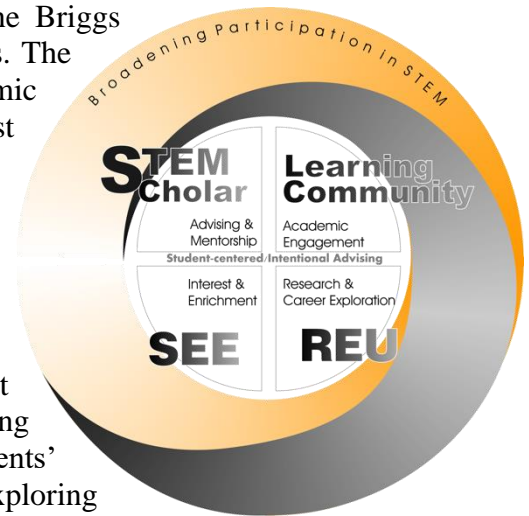
From 2019 - 2022 The Southern Center has hosted more than thirty program activities, research projects, collaborations, and presentations. These accomplishments provided STEM facilitators, students, collaborators and partners opportunities to recruit, retain and enrich STEM students. In addition, program leadership disseminated best practices, research findings and expanded collaborative efforts state and nation-wide. A notable collaboration was established with Alabama State University providing research and career exploration opportunities to 15 undergraduate STEM majors during the height of the global pandemic. In addition, Dr. Calvin Briggs, Executive Director of the Southern Center, served as one of the inaugural editors for the American Association for the Advancement of Science (AAAS) Disruptor Blog. The Southern Center's STEM Enrichment Experience (SEE) hosted the "To the Moon and Beyond" hands-on STEM activity at the A.G. Gaston Boys and Girls Club in Birmingham, AL. The activity included club participants (20), ranging from 5th to 6th grade engaging in a discussion on the significance of rockets, college and career pathways related to the aerospace industry, people of color who have and currently dominate in this space, and the construction and launch of model rockets. Dr. Briggs also presented a research poster titled: *Building Bridges to STEM College and Career Pathway Completion*, at the American Association of Colleges & Universities ([AAC&U](#)) Transforming STEM Conference held November 4-6, 2021. In addition, the Southern STEM Center has partnered with [Complete College America](#), a national leader and advocate for implementing strategies for college completion, to explore digital learning across Historically Black Colleges and Universities (HBCUs) titled, [Digital Learning Infrastructure Initiative](#). The initiative's goal is to reduce equity gaps for racially minoritized students, The Southern Center for Broadening Participation in STEM assist CCA in its efforts to gain a comprehensive view of the digital learning challenges facing Historically Black Colleges and Universities. The Southern Center assists in building a co-design partnership, scaling up the DLI Body of Work, through a unique perspective, culturally-responsive lens, and ability to leverage the Center's cultural credibility among HBCUs. The DLI initiative includes improving availability, awareness, and adoption of digital infrastructure, which includes the technologies, services and implementation supports, and models required to develop, deliver, continuously improve, and sustain high quality digital learning infrastructure, with the ultimate goal of reducing equity gaps for racially minoritized students.

Summary

The Southern Center, in collaboration with its partners, provided funding for fifty-four students, across 6 states, and 25 high schools, attending more than 12 colleges/universities. Participant majors include, but are not limited to pre-med/biology, mathematics, biomedical engineering, forensics, chemistry, and computer science.

Student-Centered Advising

The Southern Center follows the Briggs conceptual model (The Briggs Model) based on the Center’s programmatic goals and objectives. The conceptual model consists of advising and mentorship, academic engagement, research and career exploration, and increased interest and enrichment opportunities for students. According to Jennifer Varney, intrusive advising involves intentional contact with students with the goal of developing a caring and beneficial relationship that leads to increased academic motivation and persistence (2007). Earl defines it as proactive interactions with students, with the intention of connecting with them before a situation occurs that cannot be fixed (1987). If you believe that intrusive advising is “hand-holding” or parenting, it is not, according to Upcraft & Kramer, but rather it is active concern for students’ academic preparation; it is a willingness to assist students in exploring services and programs to improve skills and increase academic motivation (Upcraft & Kramer, 1995).



Briggs Intentional Advising Model

The framework of the conceptual model includes advising and mentorship, research and career exploration, and interest and enrichment; these components radiate into projects and activities: learning communities, research experiences elementary, middle, high school, and undergraduates; summer enrichment experiences, and college bridge opportunities. The projects and activities are encompassed by guided pathways to success and broadening participation; emphasizing the need to increase underrepresented minorities. All the components of the conceptual model essential, however, student-centered intentional advising is the central force which binds the model.

Intentional advising is action-oriented; involving motivating students to seek help when needed. Intentional (Proactive or Intrusive) advising: (mentoring; enrichment; academic enhancement, accountability, and advising; social, and economic resources, academic monitoring (progress reports; study plans; time management), social enhancement (social accountability), and enrichment.

Why is Intentional advising needed?

It is essential to teach students to seek help when they need it, and before it’s too late.

- **Increasing Cognitive Bandwidth** [familial, socio-economic barriers, cultural norm (racial stereotypes, gender bias)]
- **Academic self-efficacy** [Improving mathematics self-efficacy, enhanced study skills, peer support, peer tutoring, social accountability, academic accountability, faculty support, enhanced research skills, time management, academic engagement, social/academic engagement].



Best Practices

The success of the Southern Center's programmatic activities increasing STEM interest and persistence of underrepresented minorities in STEM, has resulted in best practices which supports the intentionality of its mission. These best practices have enhanced instructional strategies; student learning, leadership, and engagement, academic enrichment activities, and curriculum.

1. **Digital Learning Infrastructure**

- a. Reliable access to Wi-Fi;
- b. Adequate and secure devices to engage in web-based learning and communications.
- c. Access/subscriptions to web-based instructional resources and learning management
 - i. systems;
- d. Access to web-based student support resources;
- e. Access to web-based student engagement tools.

2. **Student Advisement/Mentorship**

- a. Students are advisor/mentored by highly qualified academic professionals;
- b. Students receive direct (virtual and face-to-face) contact with STEM professionals

3. **Cohort Format**

- a. Students complete STEM enrichment and research in cohorts;
 - i. Providing peer support;
 - ii. Supporting and enhancing STEM learning community model;

4. **Weekly Student Led Meetings**

- a. Emphasizing student leadership development;
- b. Students provide input regarding activities and experiences (buy-in)

5. **STEM Student Engagement**

- a. Students commit to STEM engagement (5 hours a week);
 - i. Mentor/Advisor;
 - ii. Research/Peer Tutoring;

6. **Community & Service-Learning Commitment**

- a. K-12 tutoring and enrichment, 4-year and business collaborations;

7. **Research Commitment/Development**

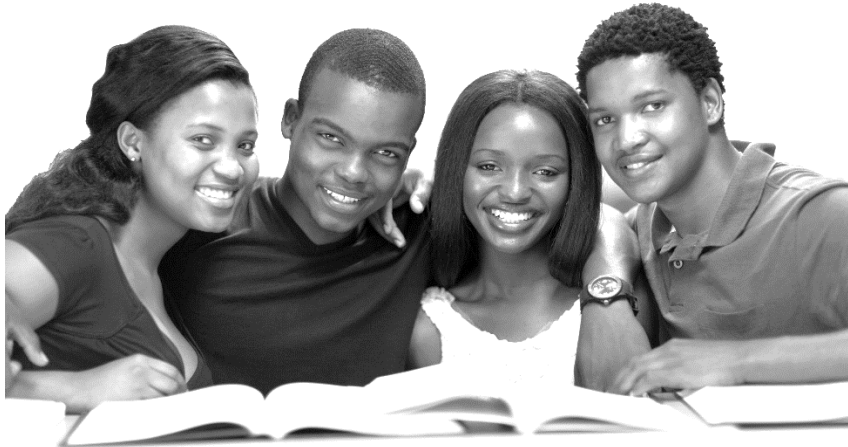
- a. High school and undergraduate students complete summer research experiences, i.e.,
- b. Bridge to STEM, Research Experience for Undergraduates (REU);

8. **Curriculum Enhancements**

- a. Bridge to STEM Program provides recent high school graduates with the opportunity to enhance their research skills and explore STEM career pathway.



The Center is supported through your tax-exempt donations.



The Southern Center for Broadening Participation in STEM
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“Creating New Possibilities in STEM Career and College Pathways”

