



## Development of a STEM Summer Program for Underrepresented High School Students – A Success Story

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Dr. Villiers is an Associate Professor in the U.A. Whitaker College of Engineering (WCOE) at Florida Gulf Coast University. He received his Ph.D. in Civil Engineering with a concentration in Materials and Construction from the University of Florida in 2004. Dr. Villiers' areas of principal research interest are Civil Engineering Materials and Asphalt Technology, Highway and Pavement Design, Transportation, Specifications and Construction Variability of Pavement Materials, Quality Control/Quality Assurance, Pavement Management and Rehabilitation, and Statistics related to Pavement Materials.

In the past, Dr. Villiers worked on several projects sponsored by various agencies including the Florida Department of Transportation, Federal Highway Administration, and University Transportation Research Center Region-II. Some of his most recently completed and on-going work include the use of driving simulator to investigate patterns of drivers' behavior during various rainfall event using different roadway geometries. Deliverables from this project may help Florida Department of Transportation and other agencies with future decision making, such as variable message signs, determining appropriate corrective measures on existing roadway sections, and/or designing future roadway sections to reduce hydroplaning. He is a Co-PI for the grant submitted to NSF to allow Florida Gulf Coast University (FGCU) be a member of the Florida – Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP). This program is committed to substantially increasing the number of degrees awarded to underrepresented populations within STEM areas. Last year, Dr. Villiers in collaboration with the Director of the Office of Community Outreach Programs, Associate Provost at FGCU along with the National Association for the Advancement of Colored People successfully initiated and completed a successful Pre-Collegiate Summer Camp to engage high school students from underrepresented groups in research and STEM activities. Dr. Villiers is also the founding faculty advisor for the American Society of Civil Engineers in WCOE at Florida Gulf Coast University.

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## **Development of a STEM Summer Program for Underrepresented High School Students – A Success Story**

### **Abstract**

Research shows that fewer students, and particularly minority and low-income students, enter and persist in STEM (Science, Technology, Engineering, and Math) programs in the United States than in other programs. This is often attributed to a lack of knowledge and exposure to opportunities in STEM. Southwest Florida is one such area where minority and low-income students especially lack an awareness of STEM as a viable career option. To address this concern, Florida Gulf Coast University (FGCU) in partnership with the Collier County National Association for the Advancement of Colored People (NAACP) hosted a two-week on-campus STEM camp during summer 2014. The program objectives were to increase the students' awareness of STEM fields by exposing them to real-world math and its application in related career fields. The camp also introduced students to practicing professionals in local STEM industries, creating potential internship opportunities for program participants. Through these experiences, the summer STEM camp sought to improve students' skills in mathematics, thus increasing their likelihood of being accepted into college or university to pursue STEM related degrees.

Thirty-eight (38) students from 10 different local high schools participated in the summer camp. The group was closely split among males (N=20) and females (N=18), with 75% of the camp participants coming from groups that are traditionally underrepresented (Black or Latino descent) in STEM fields. The students also represented high-performing students among high school freshmen (23%), sophomores (27%), and juniors (50%) and had an average GPA of 3.83.

In order to meet the objectives presented above, a committee of individuals from various backgrounds including academia, business, and community outreach designed a curriculum incorporating math and hands-on projects in STEM. The camp was delivered in three (3) phases. The morning phase was math instruction delivered by a certified high school mathematics teacher. The afternoon phase included exposure to careers in STEM fields and hands-on projects offered by regular university STEM faculty. The third phase consisted of panel discussions with local STEM professionals, panel discussions with university admissions and financial aid officials, and field trips to companies and organizations with major emphasis in STEM fields.

In order to assess whether students' mathematics skills improved as a result of participating in the summer camp, a combined practice SAT and ACT mathematics pre-test was given to the students on the first day of the camp. The students were given a practice SAT/ACT post-test on the last day of the camp. Thirty-five percent (35%) of students increased their SAT math scores, and 23% increased their ACT math scores. The highest increase, 43%, was noticed among 10<sup>th</sup> graders on the SAT practice test and 27% among 11<sup>th</sup> graders. Surveys were also given throughout the camp in order to assess the students' perceptions of STEM fields to evaluate its effectiveness. By the end of the summer camp, over 95% of the students expressed an interest in

pursuing STEM-related careers, and five students received paid internships. These results emphasize the need for more programs to expose minority students to opportunities in STEM.

It is hoped that the information in this article can assist others in developing effective and sound STEM related programs that will aid in overcoming the barriers that challenge the realization of diversifying the pool of individuals who enter into STEM related fields.

### **Camp Objectives**

The objectives of this camp were to:

- Improve students' skills in mathematics;
- Expose students to real-world math and its application in related career fields;
- Increase the students' awareness of STEM fields;
- Expose students to programs that will increase their likelihood of being accepted into college;
- Expose students to practicing professionals in STEM fields; and
- Create internship opportunities for camp participants.

### **Scope**

Last summer, Florida Gulf Coast University's Office of Community Outreach Programs, College of Engineering, College of Arts and Sciences in collaborations with the National Association for the Advancement of Colored People successfully completed a Pre-Collegiate summer STEM camp from June 8 – June 20, 2014.

The program was well received by the faculty and administration at FGCU, STEM professionals associated with the program and various organizations dedicated to making a difference in the education of our students. To evaluate the effectiveness of the math component of the program, the students were given Pre and Post SAT and ACT tests consisting of questions commonly found in the official test. Surveys were also given throughout the camp in order to assess the students' perception of STEM fields to evaluate its effectiveness. This paper presents the structure of this camp, as well as, highlights major successes.

### **Identity and Role of Partners Involved**

#### ***Florida Gulf Coast University***

Florida Gulf Coast University (FGCU) was established by the Florida Legislature as the tenth public university within the State of Florida system in January 1991, and classes began in August 1997<sup>1</sup>. The Office of Community Outreach was founded in the university with the mission to create a cohesive outreach and support system for students from underserved and underrepresented backgrounds. The Office of Community Outreach at FGCU, under the leadership of Director J. Webb Horton, fosters strong university/community partnerships;

increases visibility and participation of the university in the Southwest Florida community; and assists with the recruitment and retention efforts of the university.

The U.A. Whitaker College of Engineering (WCE) at FGCU has been launched as a truly multidisciplinary engineering education endeavor with simultaneous development of four (4) B.S. degree programs in bioengineering, civil engineering, environmental engineering, and software engineering. From the very beginning, the establishment of an outreach program was a priority of WCE. In the summer of 2009, the college of engineering in collaboration with Florida Education Fund, and the Office of Outreach Programs held a summer program. To the knowledge of the authors, this program was also the first to be held on campus with STEM focus. However, due to lack of funding, and being a new engineering program (debuted in 2005) in a relatively young university, the initiative met several unique challenges.

### ***Collier County National Association for the Advancement of Colored People (NAACP)***

To address this concern, Florida Gulf Coast University (FGCU) in partnership with the Collier County National Association for the Advancement of Colored People (NAACP) raised sufficient funds for a two-week on-campus STEM Program. The mission of the NAACP is to ensure the political, educational, social and economic equality of rights of all persons, and to eliminate racial hatred and racial discrimination. The Collier County Branch of the NAACP has been actively involved in programs such as STEM summer camp and ACT-SO (Academic, Cultural, Technological and Scientific Olympics). Mr. David Hinds along with the other executive members of the NAACP of Collier County worked closely with FGCU and raised more than half of the funds for the 2014 STEM summer program. Plans are on the way to continue this interaction for the next five (5) years. Although a large number of people think the organization is just about civil rights, it actually has a strong educational mission as well.

## **Program Structure and Results**

### ***Program Demographics***

The 2014 FGCU/NAACP Pre-Collegiate summer camp was initiated by the NAACP of Collier County along with the Office of Outreach Program at FGCU. The Associate Provost at FGCU, Dr. Tony Barringer, and Associate Professor at FGCU, Dr. Claude Villiers joined this effort with the mission to improve high school students' future outlook on STEM by increasing their exposure to opportunities in STEM careers, and improving their math skills. A committee of five (5) people was formed. The committee highlighted the objectives of the 2014 summer camp, as well as, the long term goals of the program. The committee members also created a curriculum for the program. A copy of the daily schedule is presented in Appendix 1. The camp acceptance committee set criteria including a minimum GPA of 3.0. Each participant must have been recommended by appropriate personnel from a school and/or community agency. The application was designed in such a manner that the applicants were required to write a short essay about extra-curricular activities in which he/she is participating while in high school, their favorite subject, and the reason they were interested in participating in the FGCU/NAACP Pre-Collegiate

summer camp. All measures were taken to seek applicants who were highly motivated for academic success; had demonstrated readiness for a rigorous/challenging/demanding summer camp; and had demonstrated responsibility for themselves and had consideration/respect for others.

From the very early stage, the camp committee met with leaders of after school programs, such as Boys and Girls Club, who serve a large population of minority high school students regularly. The idea was to sell the program to these organizations and seek input from them. It gives them a sense of ownership which gives them an opportunity to get involved in the structure of the summer camp. This move paid off. By the closing of the deadline for the summer camp (late March), over one-hundred (100) students, mostly from under-represented groups, applied to the program. This is not common because the reality is that Blacks and Latinos, in particular, fall short in participating in STEM activities. On two occasions, the College of Engineering had to cancel previously planned summer STEM programs that targeted women and minorities due to lack of applicants.

The 2014 FGCU/NAACP Pre-Collegiate committee met on the last week of March and selected 40 rising 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade high school students from Lee and Collier counties. Twenty (20) of these students were male and eighteen (18) were female. The demographics of the selected students who participated in the camp last year is presented in Table 1. As presented in the table, 76% of the students were Black/African American, Hispanic, or Latino. The average GPA for those students was 3.8. Although it was not the intent of the committee members, the average GPA for the male students was exactly the same (3.8).

Table 1 - 2014 FGCU/NAACP Summer Camp Participants (Average GPAs)

Race	Male			Female			Total
	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	
American Indian/Alaskan Native	0	0	1	0	0	0	1
Asian or other Pacific Islander	0	0	1	1	0	0	2
Black or African American (Not Hispanic)	3	1	3	1	2	4	14
Hispanic or Latino	3	3	1	0	4	4	15
White (Not Hispanic)	1	0	3	0	0	1	5
Other	0	0	0	0	1	0	1
GPA	3.7	3.7	3.9	3.7	3.8	4.0	3.8

***Phase I - Mathematics SAT/ACT Prep Summer Program***

The first two objectives of the 2014 FGCU/NAACP Pre-College summer camp was to improve students' skills in mathematics and to expose them to real-world math and its application in related career fields. To meet these objectives, a certified high school math teacher from Lee County was hired and the teacher structured the math curriculum (in collaboration with Dr. Villiers, Associate Professor in Engineering), and delivered the math component of the camp. As

presented in Appendix 1, the math class was taught every morning from 8 am to noon. Figure 1 shows the instructor teaching a math class and a student taking a SAT/ACT test.



Figure 1: Mathematics Module of the Camp.

On the first day of the camp, the students were given a Pre SAT and ACT math test. All the students (9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> graders) were given the exact same test. The results of the SAT and ACT test scores are presented in Figure 2. Throughout the duration of the camp, the instructors taught the students algebra, trigonometry, and geometry. The authors of the paper are aware that a two-week period is not adequate to teach the students all the basics necessary to master high school math. The instructors equipped the students with the key components of test taking strategies that can be used in ACT and SAT testing. Every afternoon, the students were exposed to a particular STEM discipline and efforts were made to expose the students to math concepts in relation to the STEM projects.

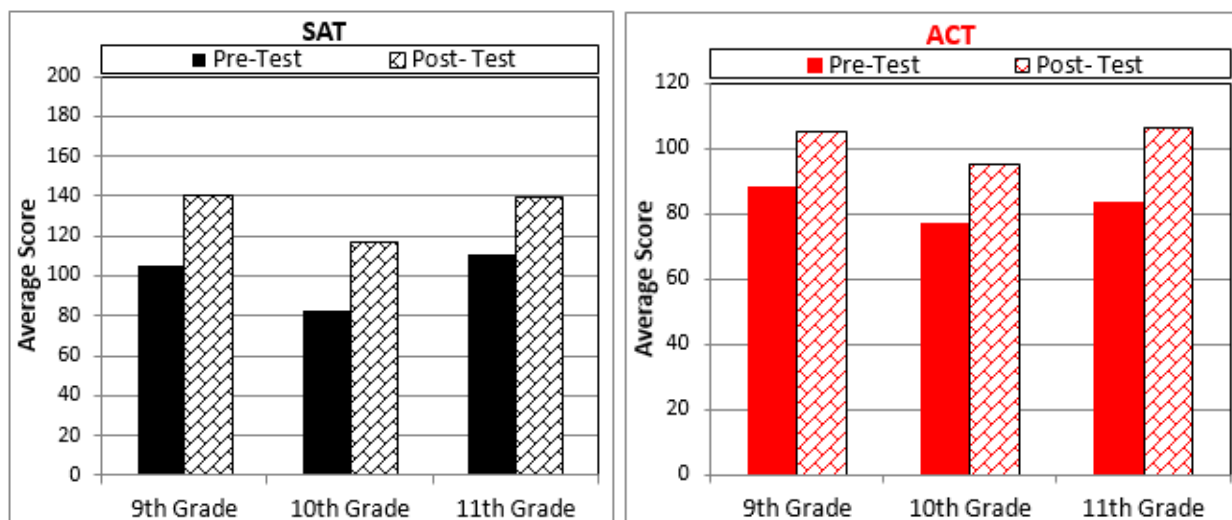


Figure 2: Pre and Post SAT and ACT Test Results.

As presented in Figure 2, the students performed well on both the SAT and ACT Pre-tests. The 9<sup>th</sup> graders performed extremely well as compared to their counterparts given all the students were given the exact same test. All the students' grades improved on both the ACT and SAT

tests. On average, 35% and 23% of the students increased their scores on the math SAT and ACT practice tests, respectively. The highest increase (43%) was noticed on the 10<sup>th</sup> graders for the SAT test and 27% on the 11<sup>th</sup> graders for the ACT, respectively (Figure 3). Surveys were also given throughout the camp in order to assess the students' perceptions of STEM fields. A copy of the survey is presented in Appendix 2. Eighty-nine percent (89%) of the students reported (strongly agree or agree) that their math skills improved as a result of the camp. Also, ninety-two percent (92%) of the students strongly agreed or agreed that they were exposed to real-world math and its application (Figure 3).

**Phase II – Science, Technology, Engineering, and Mathematics (STEM) Component**

The objective of this phase was to increase the students' awareness of STEM fields. Every afternoon the students were exposed to STEM fields either in the College of Engineering or College of Arts and Sciences at FGCU. The different components involved all of the engineering programs including bioengineering, civil, environmental, and software engineering currently being offered at FGCU. The Science and Technology component included Marine and Ecological Sciences, Biotechnology, Nursing, Chemistry, and Science in Forensic Studies. Figure 4 includes three (3) photographs taken during the STEM projects.

Gain, %	SAT	ACT
9 <sup>th</sup> Grade	34	19
10 <sup>th</sup> Grade	43	24
11 <sup>th</sup> Grade	26	27

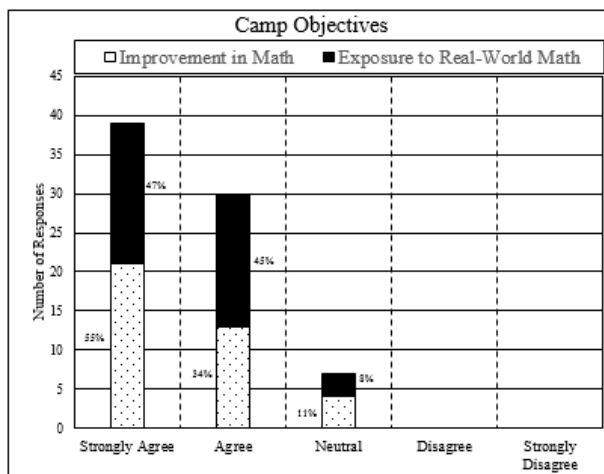


Figure 3: Effectiveness of the Math Component of the Camp.

Each engineering session started with a 20-minute introduction to a particular field of engineering. The students were then divided into groups for hands-on application. The projects in Engineering included the water filtration, popsicle stick bridge building, slimes and basic structure of polymers application. The foundation of these projects was highlighted by Villiers et al<sup>2,3</sup>. Two new engineering projects were introduced in last year's camp whereas the instructors utilized software and robotic methods modeling to simulate human motion and the functional evaluation of a variety of prosthetic devices. The goal was to increase the mobility and manipulability of persons with a disability to enable them to live healthy, happy, and



independent lifestyles. Dr. Dahai Guo, Associate Professor and Chair of the Software Program at FGCU and his assistant gave the students an overview of the Robotic lab in the department. The students were given a unique opportunity to work/understand the functionality and to operate the different robots in the lab. Similar interaction was developed with the faculty in College of Arts and Sciences to introduce the students to Science and Technology.



Figure 4: STEM Component of the Camp.

In addition to the exposure to the STEM projects in the College of Engineering and College of Arts and Sciences, three (3) field trips were scheduled during the camp to connect the students with the STEM concepts and its applications. The field trips included a visit to a global industrial biotechnology company in the area, Algenol. This company is commercializing its patented algae technology platform for production of ethanol and other biofuels. The students also visited COVANTA Lee County's Waste Energy Plant. This facility processes 1,836 tons-per-day of solid waste while generating up to 57.3 megawatts of clean, renewable energy with approximately 50 megawatts sold to the Seminole Electric Cooperative. Finally, the students took a four hour bus ride to a VIP tour of NASA in Cape Canaveral Florida. They received a life time experience of being exposed to the various facilities at the Kennedy Space Center.

This module also included Solar Go-kart and miniature solar car projects. The students formed eight (8) groups of about 5 students each to design and race a miniature solar car. They started with training by the Engineering Librarian at FGCU, Ms. Kim Reycraft. The students were provided with instruction on how to conduct a literature review relevant to their projects. Time was also provided to them to design their project. On the final day of the camp, they presented the findings of their work in a poster presentation format in front of their parents and invited guests. Shortly thereafter, they raced their cars in order to select a winner. In addition to the miniature solar car projects, the students raced the camp solar-powered go-kart. Additional information about the solar-powered go-kart is provided by Chris Umpierre<sup>4</sup>.

### **Gauging Overall Perceptions**

As mentioned before, surveys were administered throughout the camp in order to assess the students' perceptions of STEM fields to evaluate the effectiveness of the camp. A copy of the survey is presented in Appendix 2. The survey results related to this module are presented in Figure 5. All the students (100%) reported (strongly agree or agree) that the camp increased their awareness in STEM fields. Also, eighty-two percent (82%) strongly agreed or agreed that they

will consider STEM fields as a career path as a result of the camp. However, when they were asked about their level of interest in STEM, the answers were mixed. Seventy-four percent (74%) were interested (extremely interested or very interested) in science. However only 34% felt the same way about engineering. In addition, sixteen percent (16%) reported that they have no interest in engineering. This was the highest negative response in any of the categories. This number demonstrated that a lot more work is needed in order to attract under- represented students in Engineering.

***Phase III – Increase the likelihood of being accepted into college; practicing professionals in STEM fields; and create internship opportunities for camp participants.***

The objective of this phase was met through a series of panel discussions. Personnel from the Office of Financial Aid, Office of Admissions, Honor Programs, and Accelerated Collegiate Experience (ACE) presented the students with information about each of their areas of specialty. Information about cost of college, grants, scholarships; including Florida Bright Futures Scholarship, loans, work study, and study abroad was well presented and detailed to the students. The students also learned about college admissions and waivers, as well as housing. Also, they were provided with resources provided by the Honors and ACE Programs. The Accelerated Collegiate Experience (ACE) at Florida Gulf Coast University is designed to bring a unique educational experience to qualified junior and senior high school students who are seeking advanced study options. The program provides part-time or full-time study at FGCU in which students earn college credit while simultaneously completing a high school diploma.

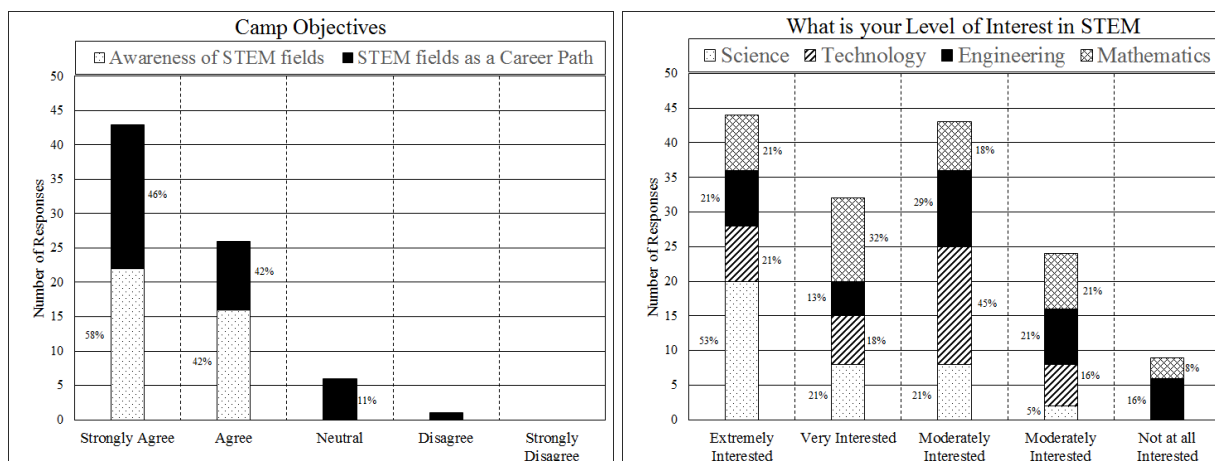


Figure 5: STEM Components of the Camp.

Another panel discussion session was structured with six practicing professionals in STEM fields (Figure 6). The panel members had varied backgrounds ranging from directorship of the Department of Transportation to owner and founder of a web design and strategic marketing company. The students had the opportunity to interact and ask questions to each of the individual panelists. They asked questions related to the challenges Blacks/African Americans, and Latinos

faced when entering science, technology, engineering, and math (STEM) careers in America. The panelists spoke from their hearts to the students about the opportunities in STEM fields. They also highlighted the challenges, including “feeling alone and invisible,” associated with being from an underrepresented group when entering STEM practicing fields.

The camp organizers built close relationships with local STEM companies including Algenol and ARTHREX. In addition to financial support, these companies provided other opportunities including STEM research internships to the students. At the end of the summer camp, Algenol provided paid internships to four (4) students for the duration of the summer of 2014. This interaction can be viewed as a direct connection to encourage more students to pursue STEM specific majors and ultimately lead to STEM related professions. "It's important to make these participants realize that science isn't just a boring textbook," Algenol CEO Paul Woods said. "That when it's applied, it can be amazing. There's something real about it<sup>4</sup>."

The authors of this paper strongly believe that these panel discussions and the other activities presented in this module were effective. The activities equipped the camp participants with information that can be used in the future for college admission and career choice. All the participants/students (100%) reported that they are better prepared for college as a result of the camp. Eighty- seven percent (87%) strongly agreed or agreed that they are better prepared for standardized tests, which in turn will increase their likelihood of being accepted into college.

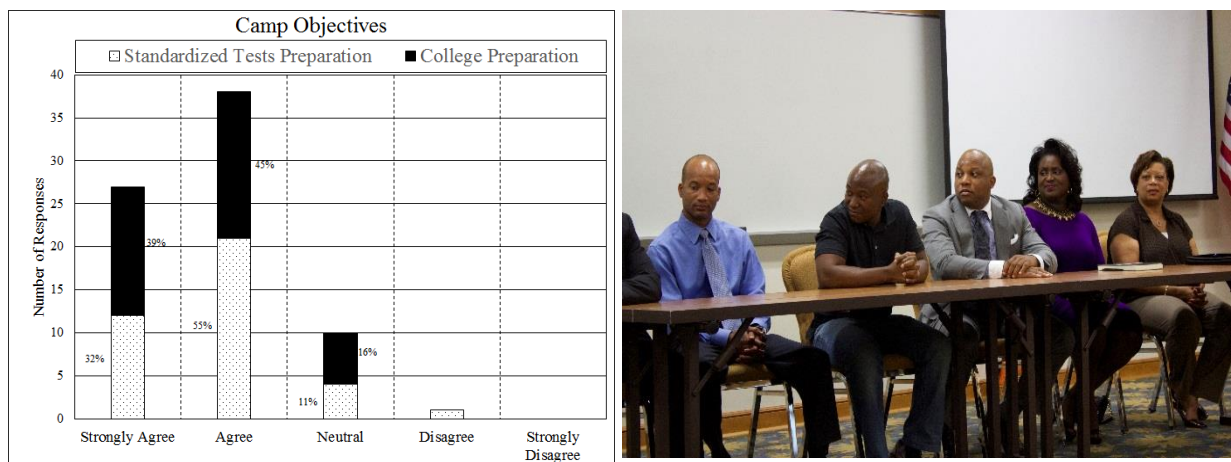


Figure 6: Photograph taken during a panel discussion with STEM professionals

### Summary and Limitation of the Program

In general, the 2014 STEM camp provided an enriching experience for the participants. The participants acknowledged more awareness about STEM fields and many demonstrated an improvement in mathematical skills as well as on SAT and ACT test scores. There was also a noted more favorable perception change in regards to STEM related courses and the field in

general. Many of the participants viewed the camp as a life changing experience as they were able to hear and see various aspects of STEM that were not previously provided to them. That in itself made the camp a success. The fact that a vast majority of the participants announced that they would now consider a STEM related field as a major and ultimately a career, this demonstrates that the camp met its goals and objectives. Although the goals were met for the 2014 camp, an effort will be made to track the participants in order to see how they fare over time. The aim will be to monitor whether or not the improved test scores, etc. at the conclusion of the camp right after the intense program carries over into the classroom and/or collegiate experience. The tracking will also provide an opportunity to monitor the percentage of the participants who actually end up choosing a STEM major and then matriculating to a degree and career in the field.

### **Acknowledgements**

It is a great pleasure for us to thank and acknowledge the many individuals who assisted and supported us during the 2014 FGCU/NAACP STEM Summer Camp at Florida Gulf Coast University. First of all, we would like to express our sincere appreciation to the math teacher, Mr. Jim Giesen for his invaluable guidance and support. Special thanks to the four undergraduate student counselors at FGCU (Danielle, Amber, Jose, and Magdonald). They mentored and supervised the students throughout the camp. We would also like to thank all the donors and the STEM professionals in the community, leaders of after school programs, and everyone who made the field trips possible. We would also like to express our gratitude to all the faculty in the College of Engineering, College of Arts and Sciences, and College of Health Professions who participated in the program. The program would not have been a success without your dedication and hard work. Thank you to Dr. Dawn Martin and the rest of the NASA team who made the experience at Kennedy Space Center a life time experience.

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Appendix 1 - 2014 FGCU/NAACP Summer Camp Schedule Activities

(June 8 – June 14, 2014) - Morning Session (MS): 8:00-12:00 am; Lunch 12:00-1:00; Afternoon Session (AS): 1:00-4:45 pm Evening Session (ES): 5:00-7:00 pm

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8	9	10	11	12	13	14
<p>MS:</p> <ul style="list-style-type: none"> <li>• Parent Drop-off</li> <li>• Introduction to STEM Summer Camp</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Applied Math</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Welcome</li> <li>• Student/Parent Mixer</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• Introduction to Applied Math</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Library Session</li> <li>• Introduction to the Solar Go-Kart Challenge</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Meet/ Get to know each other</li> <li>• Meet the Mentors</li> <li>• Pizza Social</li> <li>• FGCU Tour</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• Applied Math</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• FGCU Laboratory tour in STEM related Fields</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Introduction to the Engineering Profession</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• Applied Math</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Field Trip</li> <li>• COVANTA Lee County Waster Energy Plant</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Project Preparation</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• Applied Math</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Introduction to Marine and Ecological Sciences</li> <li>• Intro to Biotechnology (Biotech)</li> <li>• Marine Sciences/Biotech Project</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• College/ University Admission and Financial Aid Info Session</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• NASA</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Introduction to Civil Engineering (CE)</li> <li>• CE Bridge Project</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Jeopardy</li> <li>• Fun Evening</li> </ul>	<p>MS:</p> <ul style="list-style-type: none"> <li>• Applied Math</li> </ul> <p>AS:</p> <ul style="list-style-type: none"> <li>• Introduction to Civil Engineering (CE)</li> <li>• CE Bridge Project</li> </ul> <p>ES:</p> <ul style="list-style-type: none"> <li>• Jeopardy</li> <li>• Fun Evening</li> </ul>

Appendix 1 - 2014 FGCU/NAACP Summer Camp Schedule Activities (continued)  
 (June 15 – June 3, 2015) - Morning Session (MS): 8:00-12:00 am; Lunch 12:00-1:00; Afternoon Session (AS): 1:00-4:45 pm Evening  
 Session (ES): 5:00-7:00 pm

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
15 MS: • Applied Math  AS: • Recreational Activity  ES: • Continue Project Preparation	16 MS: • Applied Math  AS: • Introduction to Bioengineering (Bio) • Bio Project  ES: • Career Opportunities in STEM fields • Summer Programs/Scholarship opportunities in STEM Fields	17 MS: • Applied Math  AS: • Introduction to Science in Forensic Studies (SFS) • SFS Project  ES: • Meet the Professionals • Panel Discussion	18 MS: • Applied Math  AS: • Introduction to Environmental Engineering (ENV) • ENV Project  ES: • Projects – Final Preparation	19 MS: • Applied Math  AS: • Introduction to Software Engineering • Robotic Project  ES: • “Black Tie” Professional Dinner	20 MS: • Check-out of Housing  AS: • Final Project Showcase and Presentation/ • Closing Session  ES: • Student Departure

Appendix 2 - 2014 FGCU/NAACP S.T.E.M. Summer Camp Survey

**Part A. Demography**

Gender:  Female     Male                      Current Grade:  9     10     11                      County:  Lee                       Collier

Race:  American Indian/Alaskan Native                       American Indian/Alaskan Native                       Asian or other Pacific Islander  
 Black or African American (not Hispanic)                       Hispanic or Latino                       White (not Hispanic)  
 Other

**Part B. Circle the best (only one) answer that fit best your experience...**

**Scale:** Strongly Agree (SA)                      Agree (A)                      Neutral (N)                      Disagree (D)                      Strongly Disagree (SD)  
Extremely Interested (EI)                      Very Interested (VI)                      Moderately Interested (MI)                      A Little Interested (LI)                      Not at all Interested (NI)

1. Camp Objectives

a. Did you improve your math skills as a result of the Camp? .....SA    A    N    D    SD

b. Did you learn more about test-taking strategies during the Camp? .....SA    A    N    D    SD

c. Were you exposed to real-world math and its application in related career fields as a result of the Camp? .....SA    A    N    D    SD

d. Did your attitude towards math change positively as a result of the Camp? .....SA    A    N    D    SD

e. Are you less nervous about or better prepared for standardized tests as a result of the Camp? .....SA    A    N    D    SD

f. Did you learn more about how to prepare for college as a result of the Camp? .....SA    A    N    D    SD

g. Did the Camp increase your awareness of STEM fields?.....SA    A    N    D    SD

h. Are you more likely to consider STEM fields related career as a result of the Camp?.....SA    A    N    D    SD

2. What is your level of interest in the following subjects?

a. Science .....EI    VI    MI    LI    NI

b. Technology .....EI    VI    MI    LI    NI

c. Engineering .....EI    VI    MI    LI    NI

d. Mathematics .....EI    VI    MI    LI    NI



**Part C.** "Essay" type questions

3. Name(s) of teachers/Professors/Staff, counselors, or guest speaker(s) who deserve(s) special mention to you? \_\_\_\_\_

Why do they deserve special mention? \_\_\_\_\_

4. What was the most important thing you gained from attending the Camp? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. What could we do to make the Camp better? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Would you return to the Camp next year (if you are a senior would you return to serve as a mentor)? Yes  No

Why or why not: \_\_\_\_\_

\_\_\_\_\_

7. Would you recommend the Camp to a friend or relative? Yes  No

Why or why not: \_\_\_\_\_

\_\_\_\_\_

**Any additional remarks and/or recommendations**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

