

Co-Applicants Halifax County Middle and High School and Southside Virginia Community College

Dr. Christy Lowery-Carter
Professor of Mathematics

Professional Development Workshops

Katherine Clatterbuck, Ronnie Cole, Pardha Gadiyaram, Jorge Gavillan, Dr. Sarah Horne, Dr. Christy Lowery-Carter, and Amy McClure

Spring 2013

- All teachers at Halifax County Middle School and math and science teachers at Halifax County High School were given a bag of supplies and asked to build and test a device that would seal the Deepwater Horizon Oil Spill.
- Cup, spoon, 3 feet of ribbon, 4 popsicle sticks, 4 paperclips, 4 rubber bands, and a sheet of cardstock.

- Jorge and I trying the device.

Spring 2014

- Middle school math teachers
 - Algebra tiles and fraction circles
- High school math teachers
 - Algebra tiles and word problem solving strategies
- High school science teachers
 - Prezi, Smartboard resources, Edmodo, graphic blogs, screencasting, Camtasia, and other technology to increase students success and collaboration

Spring 2015

- Halifax County Middle School English Teachers
 - Compared grade level SOL test scores with statewide SOL test
 - Compared the student by question report focusing on areas of greatest need
 - Increasing Bloom's Taxonomy using Think Well Learn Well strategies
- Halifax County High School Math Teachers
 - Hands on activities with direct and inverse variation, mean/median/mode, rational expressions, and geometry and the higher-level thinking strategies



Summer 2013 STEM Academy

Dr. Christy Lowery-Carter

The TEAM

- Director Jorge Gavillan
- Curriculum Team
 - Katie Clatterbuck
 - Ronnie Cole
 - Christy Shook
 - Myself
- School System Educators
 - 9 trained educators

The Challenge

- Students divided into nine groups each lead by an educator from the school system and they were asked to find a way to eradicate or prevent the spread of Zombiism in a given urban area.
 - Richmond, Baltimore, San Antonio, Seattle, Miami, Denver, and Chicago.

Each group then selected a certain number of biostatisticians, epidemiologists, designers, CAD techs, urban planners, and communication directors.

The Builders

- Lead by Ronnie Cole
- Students used the CB Model Pro software package to design something that would fit into or over the human ear to stop the spread or eradicate Zombiism.
- Students then printed their device using a 3-D printer and made revisions as needed.

Epidemiologists and Urban Planners

- Lead by Katherine Clatterbuck
 - Epidemiologists researched the differences in viruses, bacteria, and protozoa focusing on ways they are spread and how to stop the spread. They determined how Zombiism was being spread.
 - Urban planners reviewed the layout of the city to denote the places the disease would most likely appear, emergency management, what to do with infected citizens, and how to get non-infected citizens out of the area.

Communication Directors

- Lead by Christy Shook
- Students created a news broadcast to alert the public to Zombiism, share how the disease is transferred, what infected and non-infected people should do, and what scientists were doing to stop this.

Biostatisticians

- Lead by Dr. Christy Lowery-Carter
- Students created a tree diagram and used a spinner to see how diseases are spread from person to person. They used their infection rate to determine the number of people in their city they believed would be infected and how long it would take for Zombiism to take over the city if it was not cured.

The Final Collection

- Each team presented their device, news broadcast, and emergency management plan while five educators from the school system and an infectious disease control expert from the local hospital judged their performance.

Closing Ceremonies

- The five educators and the infectious disease control nurse determined the best in various categories after the judging.
- Parents were invited Thursday evening to see their child's work and the awards were given to each group.

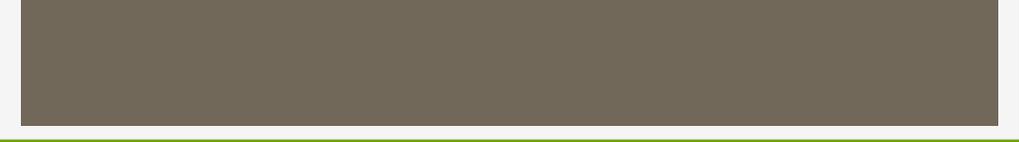
The Thirteen Question Survey

- Students were more interested in attending a community college (2.83 to 3.26).
- Students were more interested in majoring in a STEM field (3.5 to 3.88).
- Interest in science (3.69 to 4.01).
- Interest in technology (4.16 to 4.37)
- Interest in math (3.59 to 3.97)
- Motivation to take higher level math and science classes (4.05 to 4.16).
- Motivation to prepare themselves for college (4.46 to 4.63).

Published Article

- Published in Academic Exchange Quarterly

- STEM 2013 STEM student interview



2014 Creating Teaching Excellence Award Winners

Ronnie Cole and Clint Johnson

- CBS News clip about Cyborg Beast Hand

Show of Hands

- Snap Pin
- Small Model of Cyborg Beast
- Full Scale Cyborg Beast

Abby's Hand

- WSET clip

2014 STEM Academy



The Team

- Director Dr. Christy Lowery-Carter
- Curriculum Team
 - Katie Clatterbuck
 - Ronnie Cole
 - Clint Johnson
 - Christy Shook
- School System Educators
 - 9 trained educators

The Challenge

The students were asked to divide themselves into builders, researchers, and historians focusing on the construction of the 3-D printed Cyborg Beast Hand.

The builders

- The builders were led by Ronnie Cole and Clint Johnson
 - Assemble 3-D printed components of the hand
 - Apply orthoplastie
 - Stringed the hand
 - Tested and made revisions

The researchers

- The researchers were led by Katie Clatterbuck
 - Research the past, present, and future of 3-D and 4-D printer
 - Share new 3-D printing advances in the medical field
 - Created a tri-fold poster board for the group

The historians

- The historians were led by Christy Shook
 - Captured images of the building of the hand, interviewed students, and put together a newscast related to the Cyborg Beast Hand.

- STEM 2014 student clips

Abby



The results

- Students were more interested in attending a community college (2.98 to 3.03).
- Students were more interested in majoring in a STEM field (3.24 to 3.56).
- Math is fun (3.37 to 3.60)
- Science is fun (3.48 to 3.69)
- Technology is fun (4.24 to 4.37)
- Motivation to take higher level math and science classes (4.05 to 4.15).

Adam Reaves

Lead Mathematics teacher at Halifax County High School and
Sponsor of the Creator's Club at Halifax County High School