

# The PAC-Involved Gazette

By Meaningful Evidence

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## Students Use Popular Media to Learn Science

The National Science Foundation (NSF) awarded an Innovative Technology Experiences for Students and Teachers (ITEST) grant to PAC-Involved, a pilot program at Howard University. Led by Dr. Izolda Fotiyeva, this program used clips and trailers from science fiction movies like Sandra Bullock's 2013 film *Gravity* to engage tenth grade students in Physics, Astronomy, and Cosmology. 30 Dunbar High School physics students participated in this eight-session long Saturday class, which took place on Howard University's Campus. PAC-Involved focused on two themes: 1) Newton's law and 2) the scale of the galaxies.

A student asserts, "The most

interesting part was the opportunity to have students to have once in a lifetime experience of learning about physics and the rewards for it."

Each student received a brand new laptop and a \$300 stipend for their participation.

For more information log on to <http://pacinvolved.com> or contact Dr. Fotiyeva at [iforiyeva@howard.edu](mailto:iforiyeva@howard.edu).



## STEM in Everyday Life

Some students acknowledged in their reflective journal writing that they could see how physics related to everyday life. One student said, "...I feel as though everything evolves around physics." They are absolutely correct. The students proved that hypothesis by examining

Newton's Laws using toy cars. Students also watched science fiction videos to learn more about everyday organisms. These videos made physics more interesting and relatable. Shortly thereafter, students were able to identify the laws of motion from television shows and other

non-science fiction movies. One participant said, "The world of science is all around us and I really think it's cool."

"Cool" is definitely one way to describe science. Yes, even science is on fleek.

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### Special points of interest:

- Why Participate?
- Who is Meaningful Evidence?
- Going to College
- Using Camtasia

## The Evolution of PAC-Involved

PAC-Involved was a huge success and its contributions will continue to be recognized by the students involved in the program. Nevertheless, Meaningful Evidence met with faculty, teachers, and students to identify areas for future development.

First, the program would benefit from expanding its reach by revising admissions criteria. This includes

allowing participation from mature and responsible high school students in various science classes and schools.

Second, the program needs to continue to involve parents in the recruitment process. This includes inviting parents to an orientation and Q&A session.

Third, students must be given expectations, rules, and consequences on paper

(contract).

Fourth, the high school students must have more supervision during the every other week meetings in order to keep them focused.

Fifth, identify popular media sources that all students can relate to (i.e. film). Finally, allow student groups more time to complete assignments.

A student asserts, "At first when I first came to the program I really didn't understand any of the things they were talking about. I thought the program was boring. Then during the second half of the program I started to like it because we got to do hands on activities...". You spoke, we listened. After making all of those changes PAC-Involved is ready for another exciting semester of fun learning!

*"For me the most interesting part of PAC-Involved is how we got to experiment different scientific ideas."*

### What's Hot

Short, lectures  
Coming to Saturday sessions  
Hands-on experiments  
Lab time  
Camtasia  
Short sessions  
Full lunch

### What's A Hot Mess

Long lectures  
Staying home  
No engagement  
PowerPoints  
Camcorders  
All day classes  
Cheese cubes and water

## Top Three Reasons Students Became Involved in Pac-Involved

- 1) Learn Physics
- 2) Interest in STEM Careers
- 3) Cool Incentives

Honorable Mention: Improve grades in Science & Math

## Physics: The Real

Students need two science classes for science credit in order to graduate with a high school diploma. The question is, who really wants to take Physics? According to Physics instructors, more students than we may think. One instructor quotes, "Students are genuinely interested in physics, especially because of its practicality." This was demonstrated by their eagerness to build roller

coaster models in class. Students were able to apply science to places and activities they enjoy, particularly amusement parks such as Six Flags and Kings Dominion. This really brought home the lesson for many students.

The PAC Involved experience converted doubtful students into science enthusiasts. "...This experience actually made me interested in science. Originally I did not like science...." Said one student,

while another stated, "This program got me into liking science again."

With the overwhelming interest in Physics it is important to ask if the school districts can handle the demand. Many inner-city schools do not yet offer a Physics course.

Nevertheless, there are more than enough teachers qualified and ready to teach the subject and anxious to resurrect the STEM Academy at Dunbar High School.

## STEM Careers are "On Fleek"

Interest in STEM related careers are on the rise. According to the PAC-Involved study conducted by Meaningful Evidence, more students are considering a STEM related career after participating in PAC-Involved. Although an overwhelming majority of the participants believe a STEM career would be challenging, over 75% of the participants enjoyed learning

about science while participating in hands on activities. One student quotes, "One of my career choices is an Air Force pilot, so learning as much as possible about science and math is a plus". Moreover, students are getting a taste of college by getting instruction from college professors and teaching assistants. The experience allowed some participants to make the informed decision that they

were, in fact, not interested in pursuing STEM careers and were looking at liberal art majors. Others disclosed they are interested in pursuing careers in areas such as accounting and medicine. That is great news they can take all the way to the bank. According to the Department of Labor the average wage for all STEM occupations is \$85,570, nearly double the average for all occupations. That can only mean one thing: STEM careers = BLING!



## Lights! Camera! Action!

No one is more technologically savvy than students. Several students already knew how to make videos and how to post them to social media outlets like Facebook, YouTube and Snapchat. That's why the students were able to navigate Camtasia screen recording and video editing software like pros. Student groups shot and edited their

own videos to reflect what they learned. This is something they would not have done in their typical physics class, but it should be considered. Unfortunately, many students in PAC-Involved ran out of time before they could finish their videos. Limited summer availability was

a major factor as well. The completed educational videos included "Newton's Third Law of Motion", "Laws of Motion" (example "for every action there is a reaction"), "The Big Bang Theory" using Hubble's Law," and time travel according to Einstein's theory. Participants upload their respective videos by

themes: G-Forces and Newton's Laws or The Galaxy and the Universe. By unanimous decision it is recommended that students continue to participate in these kinds of activities. As a student quotes, "I hope to come back another year to expand my knowledge on science, Camtasia and the program period..."

## Blazing Collegiate Paths



College anyone? There's nothing as cool as being a college student. Being able to study in the same class as the best and the brightest and having the opportunity to be tutored by them is definitely one of the main reasons why students woke up early on Saturday mornings and pressed their way to the historic Howard University, one of the nation's historically black universities (HBCU) founded in 1867. Actress Taraji P. Henson (*Empire* and *Baby Boy*), television personality and wife of NBA superstar Carmelo Anthony

La La Anthony, United States Supreme Court Justice and civil rights trailblazer Thurgood Marshall, and music mogul Sean "P. Diddy" Combs are among the famous people that walked this campus and probably sat in some of the same classes or even learned from the same college professors.

Obviously, these students are on the right road to success. A future STEM major quotes, "I do want to learn more about space and how it works....I hope to make sure that in college this would be my major."

Hopefully these types of programs will continue to be funded and readily available to expose students to the ideal American dream—education exposure and attainment for all.

Meaningful Evidence LLC  
1069 W. Broad Street  
#141  
Falls Church, VA 22046

[info@meaningfulevidence.com](mailto:info@meaningfulevidence.com)

[www.meaningfulevidence.com](http://www.meaningfulevidence.com)

### Where Research Meets Results

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