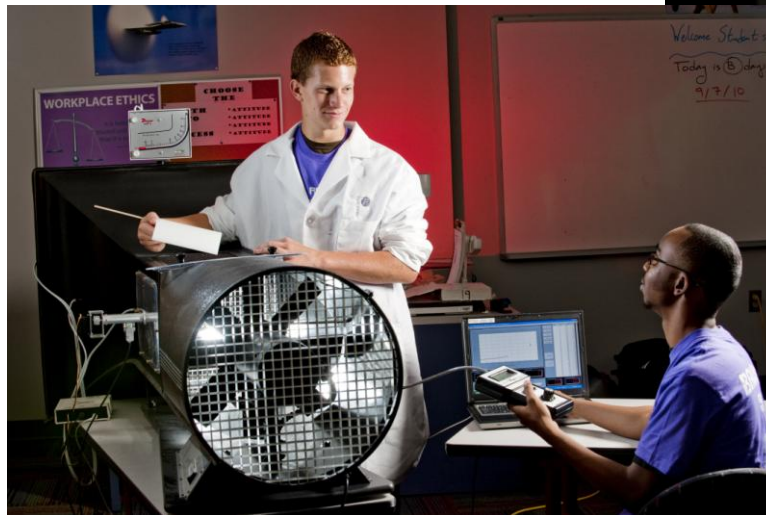


Success in Two STEM Academies: What Francis Tuttle Technology Center Has Learned



Francis Tuttle Technology Center

- Serves most of the NW of Oklahoma City
- Three Campuses
- Six School Districts
- Ten Partner High School

Mark Pierce

- Chemistry and Physics High School Instructor 1996 – 2004
- University of Oklahoma High School Physics 1998 – Present
- Pre-Engineering Academy Instructor 2004 – 2009
- Assistant Instructional Director of Health Sciences Center Biosciences and Medicine Academy 2009 - Present

Overview

- Pre-Engineering Academy
- Biosciences and Medicine Academy
- Why do we have these academies?
- Why do WE have these academies?
- What makes the model work?
- What is the data?



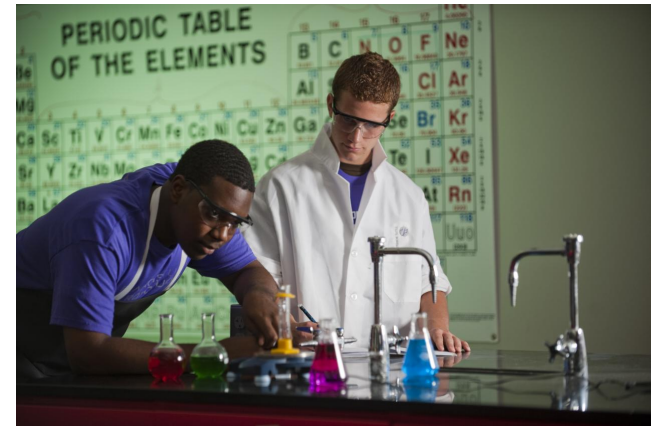
Pre-Engineering Academy

- Innovator of the Year – 2006
- PLTW Model School – 2008
- High school 10th – 12th Grade
- Rigorous Math and Science
- Engineering Related Project Based courses

PEA Continued

Math Courses:

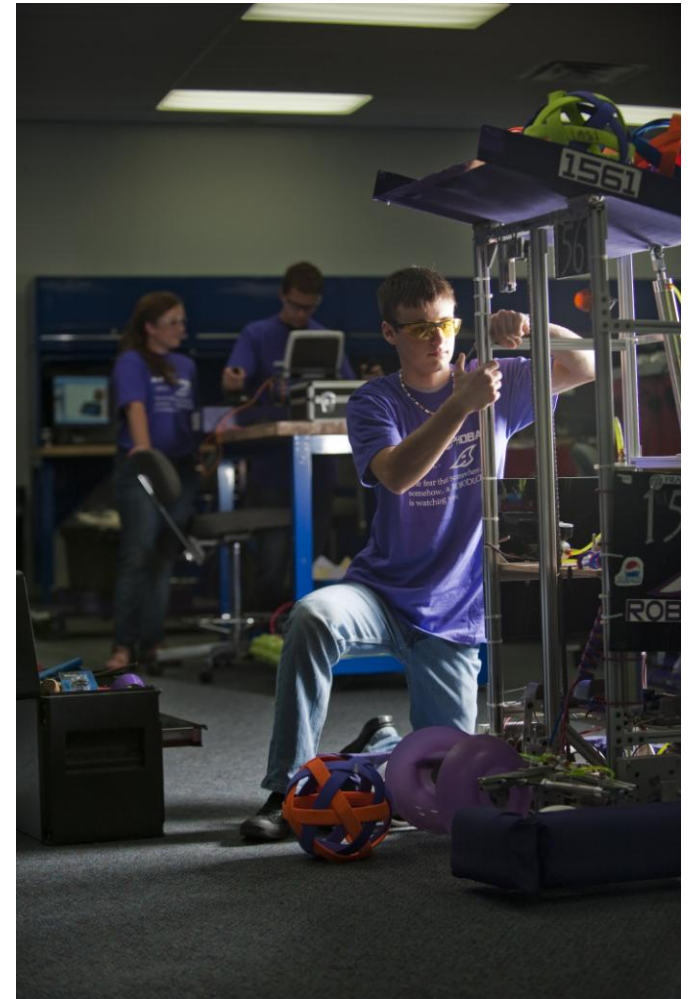
- Pre-AP Geometry
- Pre-AP Algebra II
- Pre-AP Pre-Calculus/Trigonometry
- AP Calculus AB and BC



PEA Continued

Science Courses:

- Pre-AP Chemistry
- AP Chemistry
- Pre-AP Physics
- AP Physics



PEA Continued

Project Lead the Way Courses

- Principles of Engineering
- Introduction to Engineering Design
- Digital Electronics
- Computer Integrated Manufacturing
- Aerospace Engineering
- Civil/Architectural Engineering
- Engineering Design and Development



Biosciences and Medicine Academy

- Innovator of the Year – 2008
- SREB – Best Practice
- High school 10th – 12th Grade
- Rigorous Math and Science
- Bioscience and Medicine Related Project Based Courses

BSMA Continued

Math Courses:

- Pre-AP Geometry
- Pre-AP Algebra II
- Pre-AP Pre-Calculus/Trigonometry
- AP Calculus AB and BC



BSMA Continued

Science Courses:

- Pre-AP Chemistry
- AP Chemistry
- Pre-AP Physics
- Pre-AP Anatomy and Physiology
- Pre-AP Microbiology



BSMA Continued

Project Lead the Way Courses

- Principles of Biomedical Science
- Human Body Systems
- Medical Interventions
- Biomedical Innovations

Why do we have these academies?

Pre-Engineering Academy

- Attrition rate of engineering colleges in Oklahoma
- Students are not Calculus ready
- Students are not science ready
- Students do not know what engineering entails

Why do we have these academies?

PEA Continued:

Overall Increase in jobs 11% by 2018

- Biomedical Engineering 72%
- Environmental Engineering 31%
- Civil Engineering 24%
- Petroleum Engineering 18%
- Industrial Engineering 14%

Why do we have these academies?

Biosciences and Medicine Academy

- Oklahoma ranks 49th in number of Primary Care Physicians
- Physicians and Surgeons – 22%
- Physicians Assistants – 39%
- Registered Nurses – 22%
- Physical Therapists – 30%

Why do we have these academies?

BSMA Continued:

Governors Council on Workforce
Development Study 2006

“In order to help assure that
Oklahoma will have an
adequate talent pool ...
Oklahoma must successfully
target high school students”

Why do WE have these academies?

Location, Location, Location

PEA at Portland Campus:

- Computer Networking
- Cyber Security
- CAD
- Precision Machining
- Welding
- Advanced Manufacturing Center

Why do WE have these academies?

Location, Location, Location

BSMA Rockwell Campus

- Health Lab
- Health Resource Center
- Simulation Lab
- Licensed Practical Nursing
- Respiratory Care
- Medical Assisting
- Dental Assisting
- Orthotics and Prosthetics

Why do WE have these academies?

PEA Resources:

- 5 – Academy Instructors
- 3 – Faculty with engineering degrees
- 1 – Machinist
- 1 – Welder
- 5 – Computers
- 2 – CAD
- 2 – Instrumentation

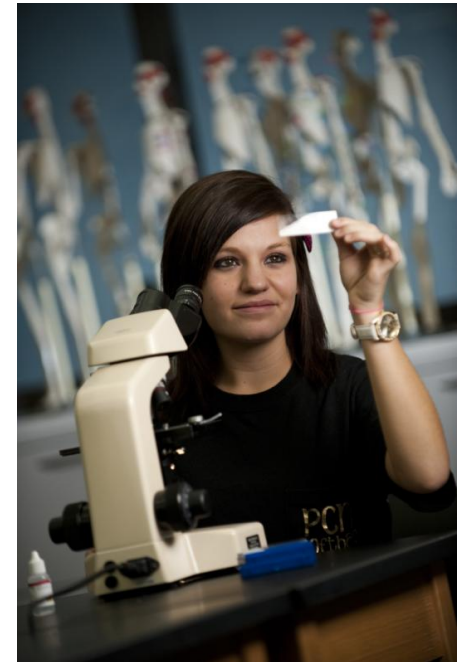
Why do WE have these academies?

BSMA Resources:

- 4 – Academy Instructors
- 12 – Registered Nurses
- 2 – Medical Assistants
- 1 – Dental Hygienist
- 7 – Respiratory Therapists
- 1 – Certified Orthotist
- 1 – Certified Orthotist/Prosthetist
- 3 – Academic Instructors

Francis Tuttle's Model

- Rigor
- Relevance
- Relationships



Rigor

- All classes are taught at or above the Pre-AP and AP level
- AB Block Schedule
- We do not consider PLTW elective courses to be “elective” courses
- Rigor is not a scary word

Relevance

The number one rule of an academy is to keep focus on the purpose of the academy

We are not schools of science and math

Examples given in science and math relate to the area of interest

Relevance Cont.

Exceptional Experiences:

- Engineer for a day
- FIRST Robotics
- Real World Design Challenge
- Engineering Design and Development
- SkillsUSA
- Student Leadership Academy
- Girl Tech

Relevance Cont.

Exceptional Experiences:

- Mentorships
- Mini Medical School
- Cross Curricular Activities
- HOSA
- Health Careers Day
- Community Service
- Children's Health Fair

Relationships

The most important “R”

We are a school of choice

Students must understand what we
are about

Parents must understand what the
academy is about

Relationships

- Recruitment
- Tours
- Information Night
- Interviews
- Contact with Parents
- Contact with High School Counselors
- Career Counselors
- Principals

Results of Last Years Graduates

PEA

Graduated Twenty-nine in 2010

Twenty-seven in Engineering
Related Major

Colleges: Oklahoma State
University, University of
Oklahoma, Bowdoin, Oklahoma
Christian University, MIT,
Westpoint, Oral Roberts
University

Results of Last Years Graduates

BSMA

Graduated Seventeen Students in 2010

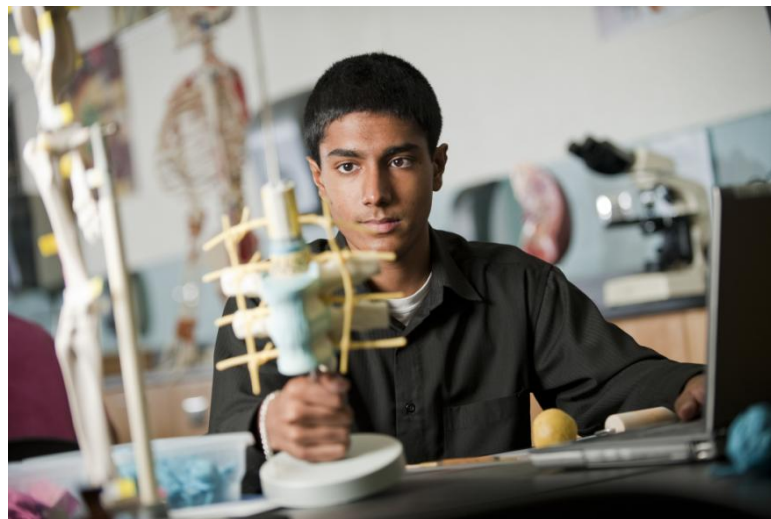
All Students Continued in Related
College Major

Colleges: University of Oklahoma,
Oklahoma State University, University
of Central Oklahoma, Oklahoma
Christian, Southwestern Oklahoma
State University, Baylor, Texas Tech
University, Virginia Commonwealth
University

Results of Last Years Graduates

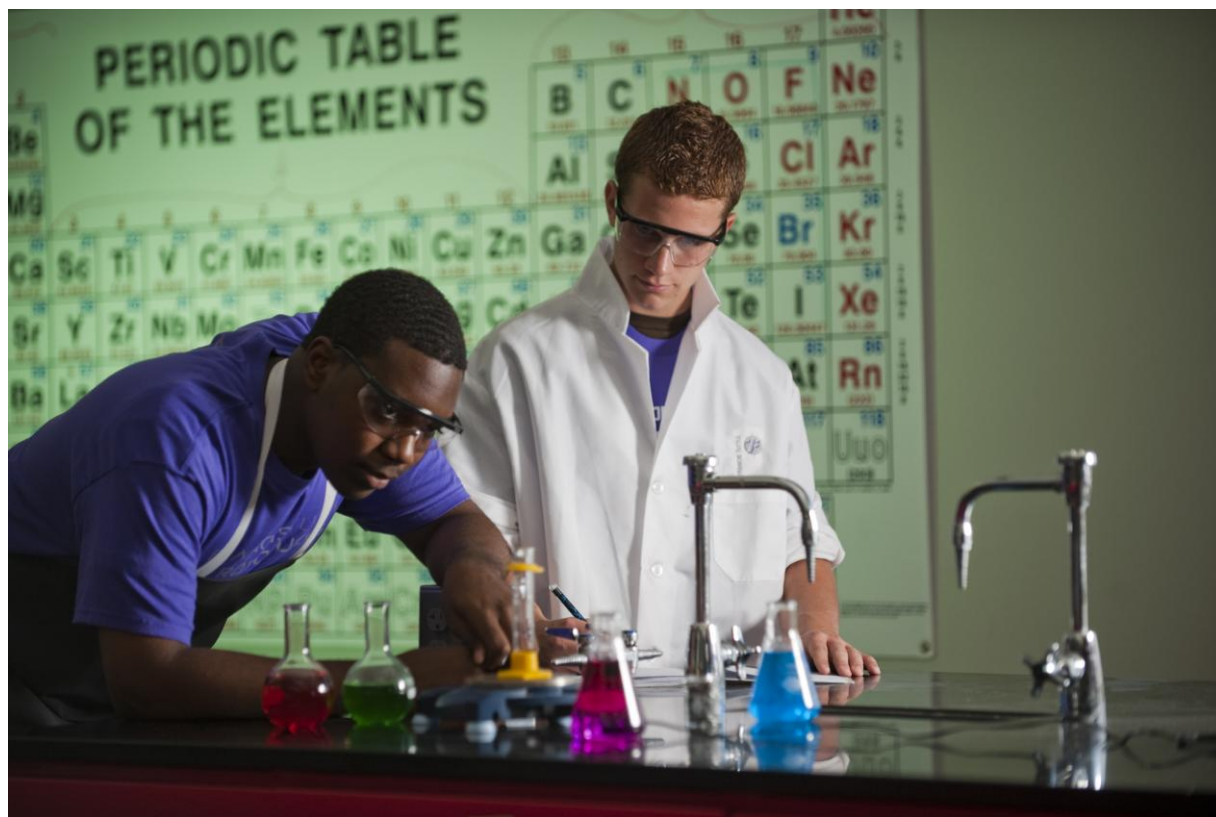
Combined ACT Scores 2010

Science	Math	Composite
26.0	26.8	26.1



Results of Last Years Graduates

Scholarships Offered
Over \$2,000,000



Results of Last Years Graduates

AP Courses

24 AP Math Courses

48 AP Science Courses



Mark's Tips

- Location, Location, Location
- Show Them
- Tell Them
- Relationships is the Key
- It has to be FUN!
- **Involve Sending Schools from the Start!**



FRANCIS TUTTLE TECHNOLOGY CENTER

