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**Greetings!**

"Not everything that can be counted counts, and not everything that counts can be counted."

~Albert Einstein

Eighteen school days to go and so much to do...

There are amazing students to thank; MCAS tests to be taken; great colleagues to brainstorm with; MassTEC Annual Conference to prepare for; ideas to be stored away for next year; chores to be done; and new worlds to conquer.

Here's a great note to a fellow Technology Engineering Education Teacher from Pennsylvania:

"Joanne [Trombley] has been an innovator all her life and she is 100% spot on target with what we all should be doing. Instead of giving lip service she leads by example. Technology and engineering teachers need to promote themselves and when we do it is outstanding. We, as a group, are more of risk takers just by the nature of what we teach but for some reason we fail to be active in what is conceived as political in nature. We need to realize that everything that happens to us and our students is

always political in nature just because we do what we do with tax dollars (public servants). It is a very difficult task keeping up on everything that is happening in the world and it is constantly changing second by second, not hour by hour. One of the easiest ways a person can keep up with the happenings is by belonging to professional organizations that support and are connected to what we are a part of. Yes membership costs you money but if you take advantage of what they offer you get more than your money's worth. You may not always see what is happening behind the curtain but be assured that there are many people working on the behalf of the profession as a whole. Thank you all for what you do day in and day out — you are truly outstanding."

~ William F. Bertrand

We all know "Joanne"s and "Don"s and "Bob"s and "Gerry"s who have shared our work, adventures, and laughs. Take a minute and contact some of our peers who influenced our lives, our teaching, and improved our world views. Thank you all for all you do!



**RSA Animate - - WHERE GOOD IDEAS COME FROM**

by Steven Johnson

<http://www.youtube.com/watch?v=NugRZGDbPFU&feature=related>

**MassTEC Annual Conference**  
**Friday October 14, 2011**  
at  
**Fitchburg State University**

Don Bjorn, Bob Hughes and Gerry Boudreau—three of the original founders of MassTEC, retired Technology Education teachers, and friends— are retiring from the MassTEC Board of Directors as of June 30. We will miss their leadership, wise council and funny senses of humor. Thank you , Don, Bob, and Gerry for all you have done. Enjoy life to its fullest in your next adventures!

"Continuous effort not strength or intelligence is the key to unlocking our potential."

~Black Elk [Hehaka Sapa]

(1863-1950); Lakota Chief

And changes happen:

I am retiring from public school teaching after 35 great years of teaching IA, Ind. Tech, Tech Ed, & Tech Eng. Ed.

I have already started my encore career as a doctoral level professor at Northeastern University. We need to share what we know!

I am running for MassTEC President for next year so contact me for more in Technology Engineering Education!

*Ray McCarthy*



**Dr. Ray McCarthy**  
MassTEC President

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**See You In Fitchburg!**

**MORE at**

<http://www.masstec.org/conference.html>



Fitchburg- **MassTEC Annual Conference**

**STEM—We make the Connection**

Dear MassTEC Members,

The next **MassTEC Conference** will be held on **Friday, October 14, 2011** at **Fitchburg State University**. The theme of the conference is *sTEM—We Make the Connection*.

One item we receive feedback on after every conference is the need for **teacher led workshops**. Many teachers are looking for ideas and activities to take back to their classrooms. So, this year we are looking for additional teachers who will be willing to offer workshops on what they do in the classroom.

As one who has offered a number of workshops in the past, you get a great deal of personal satisfaction when you share what you do with others in your profession. Also, if you offer a workshop you will be eligible for Profession Development Points (PDPs) [and a free lunch!]

So, please consider sharing your classroom experiences and offer to lead a workshop at the coming conference.

[Follow this link to] a workshop application. Please fill it out and send it in.

Take care,

<http://www.masstec.org/conference.html>

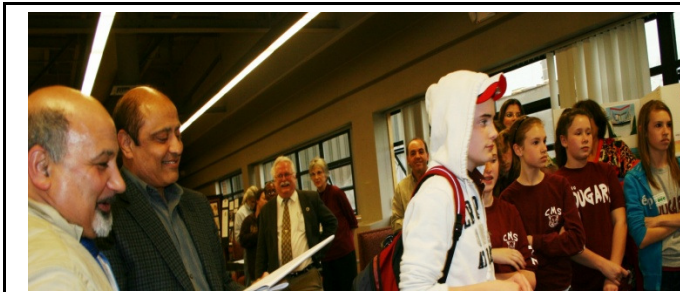
Charlie Corley, DTE

Attleboro-

**LAUNCH – presenting solutions to closing the STEM gap**

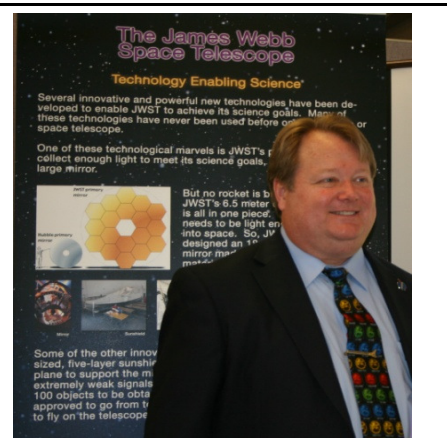
How do you engage the non-STEM community in supporting STEM education? How does technology education and engineering link to everyday living? How does an art teacher or English teacher introduce the engineering design process to students? How can literacy centers, libraries, and early childhood centers introduce STEM language to young children and their families? Why is it important for students and teachers to understand how to protect their ideas (intellectual property) and bring them to the marketplace? How are the humanities and STEM connected?

These were some of the questions that were addressed at LAUNCH, which was held on April 8, 2011 at Bristol Community College in Attleboro, MA. LAUNCH brought together people of all ages who want to find out how to develop and protect their ideas and/or people who seek to develop 21<sup>st</sup> Century skills in youth, in particular science, technology, engineering, math (STEM) skills. The theme was economic, business, and personal development and how STEM skills support personal and professional endeavors for people of ages living in the 21<sup>st</sup> Century.



Over 195 participants from Maryland, Maine, New Hampshire, Connecticut, Rhode Island, and Massachusetts connected with people and resources to support their personal and professional goals. Inspiring and useful were just some of the adjectives participants used to describe their experience at LAUNCH 2011.

Presently, there are not enough U.S. students graduating in STEM to meet the demand for their skills (STEM Gap.) If the U.S. is to maintain its position as a leader in scientific innovation and the global economy, then the U.S. needs to double the number of STEM college graduates by 2015. At LAUNCH, representatives of over fifty national, state, and local organizations provided resources on what they are doing to address the need to graduate more students in STEM fields. Organizations included NASA, Lockheed Martin, MA Governor’s STEM Education Council, National Institutes for Health, Department of Labor, Women’s Bureau, Massachusetts Academy of Science, and the University of Rhode Island.



**Closing the STEM Gap**

LAUNCH workshops and exhibits illustrated how multiple approaches and collaborative efforts facilitate closing the STEM Gap. Presenters represented the various segments of society that play a role in closing the STEM Gap and included business, elected officials, underrepresented populations, museum/cultural organizations, higher education, K-12, families, and birth-preK. Efforts included using personable and charming animals to deliver STEM concepts to school-age children, generating career motivation through programs focused on construction, providing STEM programs to senior citizens, informing students and businesses about protecting ideas (intellectual property), and how to find assistance for business development initiatives.

**Introducing STEM Language in the Earliest Years**

Research shows that 90% of brain development occurs by the age of five. Consequently, introducing language before the age of five is critical. Workshops and several exhibits presented by Attleboro organizations illustrated how STEM language could be introduced to young children and why it was important to later STEM concept development.

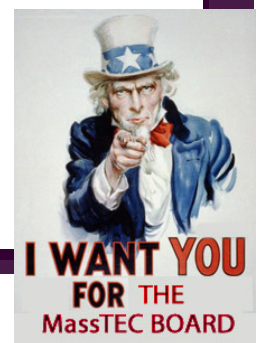


The Busy Bees Learning Center serves children (infant-5 years old). Staff demonstrated activities that utilized everyday activities to introduce and reinforce STEM language. Teachers from the Hyman Fine Elementary School presented activities that involved student, teachers, and family members in differentiating between the natural world and the human-made world as well as exploring how technology is used to improve the human-made world. The Attleboro Public Library and the Literacy Center showed simple ways for children and adults to explore STEM concepts together through children’s literature. Examples included *The Three Little Pigs*.

**Art – building a foundation for STEM Literacy**

Art is the process of arranging symbolic elements that stimulate thoughts and emotions. In the 21<sup>st</sup> Century, people need skills in critical thinking, problem solving, collaboration, creativity, and innovation. Art teaches all these skills. Applying math concepts and the engineering design process was the focus of the art exhibit presented by the Attleboro Public Schools.

MORE at  
<http://www.masstec.org/conference.html>



The work of kindergarten students showed how they applied math concepts inspired by nursery rhymes and stories such as *There was a Crooked Man* and *The Very Busy Spider*. Math concepts demonstrated included polygons, radial and orbital patterns, and symmetry. These activities increase symbolic imagery, which is essential to understanding math concepts. Albert Einstein, whose theories of relativity helped explain our universe, used imagery as the base for his mental processing and problem solving. He said, "If I can't picture it, I can't understand it."

Middle school students demonstrated their understanding of the engineering design process and how it connects to academic areas. Also on display was *Amazing Attleboro Architecture*, a sketchbook of historic architectural treasures created by middle school students.



Charlie Corley, MasTEC Executive Board Member, noted, "Overall, LAUNCH was an enjoyable and informative event. One of the best workshops I attended featured intellectual property lawyers who gave practical information on how to protect ideas an individual develops. They explained why it is important to do a product and/or a copyright search before moving forward with filing a patent. Early childhood and elementary schools showed how they introduced STEM language and the engineering design process through children's literature and art. Several vendors illustrated technology education concepts including Bristol Community College (BCC) and The Hall at Patriot Place. Using an underwater robot as an example, BCC demonstrated how students can build remotely operated vehicles (ROVs). A vehicle was demonstrated during the conference and was very impressive. The Hall at Patriot Place showcased engineering design challenges with a sport theme they offer to students who visit. I invited BCC and representatives of the Hall to participate in the MasTEC Conference on October 14, 2011 because I believe these vendors will be of interest to technology/engineering teachers especially in the southeast part of the state."

*Charlie Corley, is a member of the Framework, Standards and Assessment Subcommittee of the MA Governor's STEM Education Council, Retired Technology Education Teacher, Winchester Public Schools and LAUNCH Moderator: STEM Programs & Collaborative Efforts.*

#### **Technology and Engineering Applications to Real World Experiences**

Several exhibitors illustrated how they involved students in activities that encouraged students to apply technology and engineering knowledge and processes to real world experiences.

~Katherine honey <khoney@comcast.net>

Charlie Corley <cjcorley1@verizon.net>

## **PBS Teachers Newsletter May 18, 2011**

### **PBS and Member Stations to Launch PBS LearningMedia**

As America's largest classroom, PBS and WGBH, along with other PBS member stations, announced plans this week to launch **PBS LearningMedia**, a new public media education platform available to every teacher and student across the country in time for the 2011-2012 school year. Bringing together the best available high-quality media from 1,500 public media producers and more than 350 local PBS stations, **PBS LearningMedia** is a next-generation digital media platform for PreK-16 classrooms to help re-imagine classroom learning, transform teaching, and more creatively engage students.

<http://www.pbs.org/teachers/news/2011/may/item-39/>

Washington DC -

## “ Dirty Jobs' Mike Rowe Goes to Washington

by Lori Cuthbert  
Fri May 13, 2011

I'm assuming everyone knows who the guy above on the right is? Good. It wasn't the first time Mike Rowe of "Dirty Jobs" had testified before Congress, but what he had to say to them on Wednesday sure was fresh.

Rowe and Discovery Communications are starting an initiative to promote skilled labor, in an effort to help narrow the gap between the demand for skilled manufacturing labor and people who have the right skills to fill those jobs.

Rowe noted in his testimony that manufacturers in the United States can't fill 200,000 jobs, and that "there are 450,000 openings in the trades, transportation and utilities."

A lot of U.S. skilled tradesmen are only about a decade from retirement, and there aren't young people coming up behind them to take their places, Rowe noted.

"In high schools, the vocational arts have all but vanished. We've elevated the importance of 'higher education' to such a lofty perch that all other forms of knowledge are now labeled 'alternative.' Millions of parents and kids see apprenticeships and on-the-job-training opportunities as 'vocational consolation prizes,' best suited for those not cut out for a four-year degree," Rowe said.

I hadn't actually seen those numbers before, and it was an eye-opener. So was Rowe's description of his grandfather as a "magician" who just seemed to know how to fix and build most anything.

Rowe's testimony got me thinking that if we're all pursuing the "dream" of higher education and the supposed rewards it brings, what happens to a nation that doesn't have the person power to maintain its basic infrastructure, let alone build the computers we're all using to scream into the future?"

For more:  
<http://news.discovery.com/human/dirty-jobs-mike-rowe-goes-to-washington-110513.html>



MORE at

<http://www.masstec.org/>

The video from Mike Rowe is outstanding...

[http://youtu.be/3h\\_pp8CHEQ0](http://youtu.be/3h_pp8CHEQ0)

Mike Rowe <http://www.mikeroweworks.com/>

John Ratzenberger

<http://www.nutsandboltsfoundation.org/>

Mike Holmes

<http://www.skillsusa.org/about/presskit/speaker.shtml>

## NASA lands at Clinton Middle School

Clinton— Last April 8, 2011, about 120 Clinton Middle School students were given firsthand insight into what NASA does, what is it like to work there and how important their science and engineering education is to their future. James Ristow, an aerospace engineer, came to present the space agency's current focus and what it would take to work for NASA.

Ristow, 27, accepted an invitation from Clinton Middle School (CMS) Technology and Engineering teacher Scott Karpuk and Principal Michael Vetros to speak to seventh- and eighth-graders. Ristow received his undergraduate degree at

Embry-Riddle Aeronautical University in Daytona Beach, Fla., and is currently working on a master's in mechanical engineering at University of Massachusetts, Lowell.

He began his talk by asking students what they thought of when they heard "NASA," which stands for National Aeronautic and Space Administration. Students mentioned: astronauts, the space shuttle and walking on the moon. He said he was impressed that so many Gaels had an understanding of what NASA is and does.

He explained that each spacecraft offers unique challenges, with a clear beginning and end to each mission, and that



working at NASA is service to the country by keeping the United States first technologically in the world.

~ Scott Karpuk

For more, go to:

<http://www.telegram.com/article/20110408/>

MORE at

<http://www.masstec.org/>

Pensacola-

**NORTHWEST FLORIDA’S ANSWER TO STEM EDUCATION**

In my quest for the perfect contribution to MassTEC’s newsletter, and one that would benefit its national and international readership, I stumbled upon a true STEM treasure. The National Flight Academy, located at the Naval Air Station Pensacola based in sunny Pensacola, Florida, is definitely doing its part to put the Panhandle on the map as a leader in STEM education.

The National Flight Academy’s answer to the ever increasing need for technology, engineering, math, and science instruction in the United States, is a five and a half day in-residence, educational flight program for students in grades 7th-12<sup>th</sup>, enriched with hands-on activities presented through classroom and real-world experiences using a variety of technologically-advanced methods.

The Academy itself is located in a 102,000 sq. ft. four-story structure, with an interior that is modeled after a modern day aircraft carrier, complete with berthing spaces designed to replicate junior officer staterooms found on aircraft carriers; Ready Rooms where “mission briefs” and “mission debriefs” will be held; Joint Intelligence Centers where the squadrons and facilitators will plan fun and exciting missions prior to execution in the Joint Operations Centers and flight simulation bays! The Recreation and Leisure Rooms, Galley and Mess Decks, Sick Bay, and Security will provide the student with all the “comforts” from home during their stay aboard the *Ambition* aircraft carrier.

The core curriculum of the program is aligned to the findings of the National Council of Teachers of Mathematics and the National Science Education Standards and will include aerodynamics, propulsion, navigation, aviation physiology, and meteorology. In addition to these academic components, students will receive instruction and training to include humanitarian assistance and disaster response, weather studies, air races, aircraft design, search and rescue, aircraft carrier qualification missions, leadership development, effective communication, and public speaking.

The mission of the National Flight Academy is to inspire and educate future generations of leaders through positive exposure to naval aviation by blending culture and excitement of aviation with 21<sup>st</sup> century technology and core competencies in an exclusive, entertaining, and engaging immersive environment to provide a best in the world learning adventure. While the National Flight Academy is modeled after an actual aircraft carrier, the National Flight Academy student should prepare to undergo a unique and invaluable educational experience like none other!

The National Flight Academy, authorized by the United States Navy, is planning to accept its first students in 2012. There are national and international distance learning and financial aid opportunities available. For additional information on how your child can take part in an innovative educational experience, please contact the National Flight Academy directly at 850.458.7836 or visit the website at <http://nationalflightacademy.com/>. For more information on planning your trip to Florida visit <http://www.visitpensacola.com/>.

~Rosie N. Cooper, M.A.T.L.  
Northeastern University



So, is there a camp for teachers in the winter months?  
~RMc

**Thanks, Rosie!**

Please consider writing an article for a future

***MassTEC Express!***

This newsletter is your vehicle to tell the world about the great things that you and your students are doing in the world of **sTEm**.

**Send articles and picture's to me at:**  
[ray.mccarthy.masstec@gmail.com](mailto:ray.mccarthy.masstec@gmail.com)

**MORE at**

<http://www.masstec.org/conference.html>

Providence-

## Toxic reform movement demonizes teachers

“To Diane Ravitch, one of the nation’s most influential writers on education, nearly everything about Rhode Island’s current path of school reform is wrong. Worst of all, she says, the debate over how to improve schools has turned toxic, “demonizing and belittling” teachers.

Ravitch came to Rhode Island Tuesday to say so — privately to Governor Chafee, who urged the state’s teachers union leaders to invite her — and publicly to nearly 500 teachers who turned out to hear her speak at Rhode Island College.

Expanding charter schools isn’t the answer, she says. Nor is paying bonuses to the best teachers, or tying standardized test scores to teacher evaluations and certification.

In fact, she thinks American students are tested too often. And the real problem plaguing schools is not bad teachers, she says, but **the insidious impact of poverty.**

In short, Ravitch soundly rejects Rhode Island’s education-improvement plan, which is supported by a \$75-million Race to the Top federal grant.

The policies embraced by U.S. Education Secretary Arne Duncan and by his ally state Education Commissioner Deborah A. Gist have demoralized teachers, says Ravitch, herself a former assistant secretary of education under

President George H.W. Bush. Ravitch once shared their zeal for teacher accountability and market-driven incentives such as merit pay, she says, before she witnessed their damaging effects.

Now is the time to question their logic, she said, and to investigate more closely their ties to philanthropic arms of wealthy corporations that have their own agendas, in particular the Broad, Gates and Walton Family foundations that Ravitch refers to as “the billionaire boys club.”

“What happened in Rhode Island this past year was of national significance,” Ravitch told her audience of educators at RIC, referring to the mass firings at Central Falls High School in February 2010. “Central Falls was a wake-up call.”

She ended her remarks to a standing ovation.

“I ask you to be strong and stand up for public education,” she said. “Don’t let the private entrepreneurs and corporate-reform movement destroy public education.”

Prior to speaking at RIC, Ravitch met behind closed doors with Chafee, Gist and three union officials who had invited her — Marcia Reback, the former president of the Rhode Island Federation of Teachers, Frank Flynn, the federation’s current president, and Colleen Callahan, a director with the federation and a member of the state Board of Regents for Elementary and Secondary Education.

“We welcome the debate and Diane Ravitch’s courage to question the tone of the education-reform-du-jour,” Callahan said. “We do not agree with everything she says, and we certainly don’t have an organizational position on her views. But we have long tried to say some of the things that she has a platform to say,” in particular, concerns about the growing importance of standardized testing for high-stakes decisions about students’ graduation and teacher evaluations, she said.

When they all emerged from the hour-long meeting, Gist, Ravitch and Chafee said it had been a positive, spirited discussion with some moments of agreement. “It was a lively debate,” Chafee said. “There was a lot of common ground.” But Reback presented another view of the meeting.

“Well I was in the meeting, so you can imagine what it was like,” Reback joked. “No confrontation, no argument....” Reback said she was distressed by the tone of some of Gist’s reforms that she perceived as anti-teacher.

Chafee jumped in. “We haven’t seen that here in Rhode Island, that kind of criticism of teachers,” he said.

Reback responded, “Well, we are trying to change that. That’s what we were discussing.”

In her latest book, “The Death and Life of the Great American School System: How Testing and Choice Are Undermining Education,” Ravitch says she underwent a profound philosophical crisis in recent years, abandoning many of her earlier beliefs and embracing views that have made her popular with teachers and unions across the country.

She signed a copy of the book for Chafee Tuesday.

“The short answer is that my views changed as I saw how these ideas were working out in reality,” Ravitch wrote. “... But over time, I was persuaded by accumulating evidence that the latest reforms were not likely to live up to their promise.”

**“The more I saw, the more I lost the faith”** — Diane Ravitch.

~ jjordan@projo.com

[http://www.projo.com/news/content/diane\\_ravitch\\_visits\\_05-04-11\\_ALNSGGD\\_v42.1786cde.html](http://www.projo.com/news/content/diane_ravitch_visits_05-04-11_ALNSGGD_v42.1786cde.html)

MORE at

<http://www.masstec.org/>

WASHINGTON (AP) —

**“Poll: As preparation for life, students give colleges good grades but high schools fall short**

<http://www.chicagotribune.com/news/nationworld/sns-bc-us--appoll-gradingtheschools.0.1588397.story>

April 19, 2011

Young people give mediocre marks to America's high schools but put great faith in its colleges.

A new Associated Press-Viacom poll suggests most high schools are failing to give students a solid footing for the working world or strong guidance toward college, at a time when many students fear graduation means tumbling into an economic black hole.

Most of the 18- to 24-year-olds surveyed gave high schools low grades for things that would ease the way to college: A majority say their school wasn't good at helping them choose a field of study, aiding them in finding the right college or vocational school or assisting them in coming up with ways to pay for more schooling.

If schools did these things better, it could make a significant difference, because young people already are enthusiastic about higher education. Two-thirds say students should aim for college, even if they aren't sure yet what career they want to pursue. Almost as many say they want to get at least a four-year degree themselves.

The majority of high school students probably won't end up with a college degree, however. Among those a few years ahead of them — today's 25- to 34-year-olds — only about a third hold a bachelor's or higher degree, according to the Census Bureau. Less than 10 percent get an associate's degree.

So getting students ready for work remains central to high schools' mission. And most young people say their school didn't do a good job of preparing them for work or helping them choose a future career. They also give high schools low marks on exposing them to the latest technology in their field and helping them get work experience, according to the poll conducted in

partnership with Stanford University.

Learning real-life job skills is important to students such as Mary Margaret Rice, 18, who likes her regional vocational high school in Wakefield, Mass. "I'm getting training to weld," she said.

Rice is interested in joining the military, but not in more schooling after graduation. "Money is a reason," she said, "but the main reason is I can't really focus on classwork and homework."

Overall, only 4 in 10 young people voice strong satisfaction with their high school education. About as many are "somewhat satisfied." Almost a fifth are unsatisfied — twice as many as expressed unhappiness with college.

Lovina Dill says she wishes the two high schools she attended in California had taught her how to deal with the ups and downs of the real world. She could have used a class in "what happens if you can't get a job, and the unemployment rate rises and nobody can find a job." Dill said she was briefly homeless when she was laid off and unable to find a job using her certification in massage therapy.

Dill, now 21, self-employed and living with her father in Arcadia, La., thinks high schools should offer juniors and seniors workshops on how to get a job, how to build a career and the many educational options besides a four-year degree.

The one category where young people rated high schools best was preparing them for further education: 56 percent say their school did a good or excellent job at that. Those who went on to college or trade school gave their high schools better marks than those who didn't.

The bulk of college students — 6 in 10 — declare themselves either "very" or "extremely" pleased with their higher education.

Most say a career-focused college education is a high priority, and students feel their schools are providing it. A strong majority of students and recent grads give their college high marks for preparing them for the workforce, helping them choose a field of study, exposing them to the latest technology and helping them get internships.

Six in 10 even say their college was "excellent" or "good" at helping them find money to pay for their education.

Young adults' opinions are mixed on whether the nation's education system understands their goals and values. Almost half of college attendees feel that the schools "get" them. That's significantly more than among those whose education stopped at high school; just 3 in 10 say the school system could identify with them.

Young people credit their own ambition and abilities most for their progress in life, followed by parents, family and friends. But beyond that tight-knit circle, teachers are the heroes, with 4 in 10 saying high school teachers helped a lot. College teachers earn similar praise.

High school and college counselors are a step behind. Most students give them some credit, but less than one-fourth say their counselors were a lot of help, and about 3 in 10 think they didn't help at all.

Nonwhite students were more likely than whites to say their high school counselors helped them, and also gave their high schools better ratings for helping find money for college.

Young adults overall see brighter days ahead for education. About half think kids entering elementary school today will get a better education than they did, more than double the number who predict schools will get worse.

The AP-Viacom telephone survey of 1,104 adults ages 18-24 was conducted Feb. 18-March 6 by GfK Roper Public Affairs & Corporate Communications. The margin of sampling error is plus or minus 3.5 percentage points.

Stanford University's participation in this project was made possible by a grant from The Bill & Melinda Gates Foundation. "

~ CONNIE CASS

"Perhaps we need to encourage DESE to help school systems do post school surveys and find out what graduates found helpful and what would have been useful to learn. Many years ago Amherst Public Schools conducted one."

~ Katherine Honey

MORE at

<http://www.masstec.org/>



## Women Pass Men In Gaining Advanced Degrees.

The AP (4/27) reports, "For the first time, American women have passed men in gaining advanced college degrees as well as bachelor's degrees, part of a trend that is helping redefine who goes off to work and who stays home with the kids." This increase in overall education has given women "greater access to a wider range of jobs, contributing to a shift of traditional

gender roles at home and work." There are more women than ever in the workplace, fewer stay-at-home mothers and more stay-at-home dads. The gender wage gap has also closed somewhat. And, experts say, the increase in degree-holding women will give them better protection against employment instability in the future. Some experts "have dubbed the current economic slump a 'man-cession' because of the huge job losses in the male-dominated construction and manufacturing industries, which require less schooling."

<http://www.chicagotribune.com/news/nationworld/sns-bc-us--census-educatedwomen,0,7381962.story>

From April 2011 MassMEP Next Generation Manufacturer Newsletter

“Workforce Development

### Demand for Shop Floor Skills Training Increasing

There is an interesting trend developing with respect to the demand for technical skills training on the shop floor. This training typically focuses on foundation skills such as shop math, blue print reading and interpretation, and training in metrology or the use of precision measuring instruments.

When trying to understand the increased demand for this type of training it is important to listen to the voice of the customer and what they are telling us is very revealing. A question often asked is, “What are your major challenges as they relate to workforce skills?” When they respond, you will hear some interesting similarities. Many manufacturers are coping with an aging workforce and retirements are beginning to impact the company’s knowledge base. This is often referred to as a “brain drain”. There was a recent article in this newsletter entitled, “Why Can’t I Find Skilled Workers?”

Some of the same factors that companies face with new hires also apply to incumbent worker skill deficiencies.

Even if new employees are not added to replace the retirees there will be some reallocation of staff to fill the vacancies. Soon the employer realizes that Joe or Jane, who are experienced employees and performed well in another department prior to the new assignment, simply do not have the skills required to effectively function in the new position.

Another dynamic that is challenging incumbent workforce skills is the rapid implementation of new technology on the shop floor. For example, a manual machine is replaced by a computer operated model. The

justification for making such an investment is the promise of productivity improvements and the ability to operate to closer tolerances that will enable the company to compete in the higher-end markets that most U.S. manufacturing companies strive to operate in.

Unfortunately, the workers who had mastered the operation of manual machines that made products to less exacting tolerances are challenged to apply the old skills that once served them well to the new technology. All of a sudden they need new skills to program machines. This requires upgraded math skills. The new machine is capable of more precise tolerances so the operator now has to learn to interpret more sophisticated drawings with GD&T callouts and to use more sophisticated measuring tools to validate output and it goes on. Does any of this sound familiar to the issues you face?”

<http://www.massmac.org/newsline/1104/article03.htm>

Ted Bauer @ 508-831-7020

~ Jack Healey

reply-to: [kathiem@massmep.org](mailto:kathiem@massmep.org)

### STEM Initiatives (Science, Technology, Engineering and Math)

#### “STEM Adult and Youth Activities

STEMPower, the Mid-Massachusetts STEM Pathways Initiative, works collaboratively with a broad cross-section of businesses, community-based organizations and education and training partners to reach its goal of increasing the pipeline of displaced workers, veterans, and disadvantaged youth into STEM careers. This program is focused primarily on Advanced Manufacturing, Biotechnology, Renewable Energy and Aerospace sectors.

The Worcester region hosted a STEM Speed Networking event in February. It was set up to provide a means for jobseekers to be able to gather more industry information about the sector they are looking for work in, as well as expand their network of contacts and have face time with STEM companies and recruiters. Nine industry representatives facilitated conversation at their table with 5 jobseekers at a time. The sessions were timed so that when the specified time had elapsed, the jobseekers moved on to the next table and industry rep. The event was a positive experience for industry reps and jobseekers alike. Industry reps became more aware of the talent pool that STEMPower has access to. Jobseekers gained new contacts and became more comfortable with networking. The Worcester region is hosting another STEM Speed Networking in June. If you would like to participate to represent your business or industry, please let us know.

The STEM Club at Worcester Technical High School kicked off with its inaugural meeting in February. Club members have been learning about STEM careers and college access. Several field trips are planned to Worcester State University, Quinsigamond Community College, Becker College, and Worcester Polytechnic Institute so that the students can see first hand what the schools offer for STEM-related academics. Other field trips are also planned to local businesses.

To learn how to become involved in the program as an employer, mentor, advisory council member, or on STEMPower.org,” contact Lisa Derby Oden at [odenl@worcesterma.gov](mailto:odenl@worcesterma.gov).

# Can we really teach creativity?



“Can we really teach creativity? That’s a challenging question for educators under increasing pressure from society to produce a new generation of problem solvers and innovators.

Why is it a challenge? Because teaching creativity—or even its close cousin, critical thinking—is not remotely similar to teaching the photosynthesis cycle or the causes of World War I. The skills of innovation and creativity can be lumped into a mysterious set of processes used by human beings to make sense of their world, enter a dark tunnel of confusion, and reemerge with a solution in hand. How this occurs, no one knows. How we teach the process, we’re not quite sure. Assessing the journey through this dark tunnel or evaluating the end product are even more difficult. Think of judging a piece of modern art. It’s that subjective.

This is where the rub begins for educators. Teaching creativity requires that we ‘go deep’ with children rather than providing them with more information. And, given that human performance is not directly teachable, it means setting the conditions under which creativity flourishes. It also means, as in the case of the modern art example, that we may not know creativity until we see it. None of these methods fits well with a data-driven, standards-based accountability system.

In fact, the evolution in the mission of schools places the

current system at direct odds with the future. Teaching people instead of stuff requires educators to draw upon the fields of psychology and human performance, which consider the industrial structure and mindset as barriers to peak performance and creativity. But the good news is that thoughtful educators can apply important lessons from the human performance field to the classroom, including the following:

Speak the language of creativity. A teacher’s attitude can spur creativity or squelch it. Research confirms that IQ is malleable, and that performance is affected by self-fulfilling belief systems. Students who move from a ‘fixed mindset’ to a ‘growth mindset’ will believe in themselves, and in their creative potential. Yet in every school I visit, I hear teachers talking about who is ‘smart’ or ‘gifted’ or a ‘slow’ learner. Aside from the placebo effect this conversation induces, it violates what we know about the brain: The brain is a plastic organ capable of change over a lifetime—and is particularly shifting between ages 5 and 18. Sorting students by assuming who has potential and who doesn’t kills the creative urge, not to mention the damage it does to Algebra I scores (“I can’t do math—I didn’t get the math gene.”)

Emphasize questions and inquiry. Charles Leadbeater, the British futurist and educational innovator, has good insights into creativity. In *Learning from the Extremes*, a recent report for Cisco

Systems, he recommends that schools start, “learning from challenges that people face rather than from a formal curriculum.” Teachers can either ‘cover’ standards, or turn them into concepts and problems to be solved. Inquiry works towards supporting the kind of ‘out of the box’ thinking we need for the future.

**Project Based Learning.** Let’s put in a plug for PBL. The best way I know to start with questions in a classroom is to do inventive activities that pose a challenge, or extended projects that begin with a rich, authentic, and interesting question. The primary reason that PBL has exploded is that teachers recognize that students need to creatively address important questions. If you want a tested method for doing this, use PBL. It works.

**Use breakthrough assessments.** I recommend rubrics with a ‘breakthrough’ category—a blank column that invites students to deliver a product that cannot be anticipated or easily defined in words. It’s not the ‘A’ category—that’s Mastery or Commended or a similar high-ranking indicator. The breakthrough column goes beyond the A, rewarding innovation, creativity, and something new outside the formal curriculum. It’s a ‘show me’ category. Students like it, and so do teachers. It particularly appeals to high-end students who feel current offerings are drab, or to the middling student who will not work just for a grade, but who seeks the psychic reward of creating something cool. For samples of these rubrics, please go to [www.thommarkham.com](http://www.thommarkham.com) and click on ‘PBL Resources.’

Teach to the iceberg. It’s last on the list, but first in importance. An unfortunate legacy of the cognitive model that dominates education is the belief that everything important in life takes place from the neck up. But creativity originates in the deeper self and is not immediately accessible or public. In workshops, I share the iceberg model of skills developed at the Massachusetts Institute of Technology, which shows skills as the tip of the iceberg—the demonstrable, visible part. Below the tip of the iceberg is 90% of the human being. Teaching creativity requires shifting our attention to the process of inner discovery, allowing students time to reflect, discuss, and brainstorm, as well as using proven methods for getting the creative juices flowing, such as mindfulness, meditation, silence, or structured interactive exercises.”

~ Sent to the IdeaGarden by;  
William F. Bertrand  
[Technology Education Advisor  
[wbertrand@state.pa.us](mailto:wbertrand@state.pa.us)  
Bureau of Teaching and Learning  
Division of Curriculum  
Pennsylvania Department of Education  
333 Market Street | Harrisburg  
PA 17126



MORE at

<http://www.masstec.org/>

## Yale University physics student killed inside chemistry lab when lab machine snags hair

NEW HAVEN, CT (AP) —

“A Yale University student nearing graduation was killed inside a school chemistry lab when her hair was pulled into a piece of machine-shop equipment, school officials said Wednesday.

Michele Dufault, a senior majoring in physics and astronomy, died Tuesday night after her hair became caught in a fast-spinning lathe, university President Richard Levin said. Her body was found by other students who had been working in the building, he said.

"This is a true tragedy," Levin wrote in a message to Yale students and faculty.

In a Facebook profile picture, Dufault is shown with long brown hair that fell below her shoulders. She died from accidental asphyxia by neck compression, according to the Connecticut medical examiner's office.

The U.S. Occupational Safety and Health Administration has opened an inspection that will look into factors surrounding the accident and whether the lab complied with safety standards, said Ted Fitzgerald, an agency spokesman in Boston.

Dufault was from Scituate, Massachusetts, and was graduating in a month, said her grandfather Robert Dufault. She studied constantly and loved sports, he said.

"She was a living saint," the grandfather said. "She was a good, smart girl."

An uncle called her brilliant.

"She's a wonderful, wonderful kid and that should be celebrated. There's nothing but good things to say about her," said Frederick Dufault, of Holliston, Massachusetts.

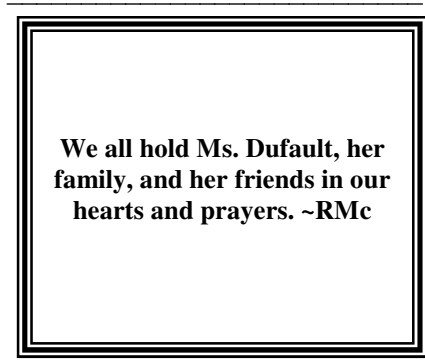
Dufault intended to work in

oceanography after graduating and played saxophone in the Yale Band, Levin said.

On its website, Yale's chemistry department says it maintains a state-of-the-art machine shop in which students, faculty and staff can build or modify research instruments. Access is limited to those who have completed a shop course, according to the website."

<http://www.chicagotribune.com/news/nationworld/sns-bc-us--yalestudentdies.0,4429355.story>

~ JOHN CHRISTOFFERSEN  
Associated Press  
April 13, 2011



## Laboratory Safety

One of the most important issues concerning laboratory safety is class size.

When we work in a laboratory it is very important how many fingers and eyes we alone are responsible for during each individual class.

Consider too that not all of our students are academically strong. Some have behavior issues, learning disabilities, and some might not want to even be there.

When you throw into the mix the fact that each tool, including hand, portable and stationary has the ability to permanently disable and/or disfigure, safety is the most important consideration in a technology engineering class.

Class size should be a realistic reflection of the students and their social skills that we are working with at the time.

What is your take on safety and class size? Contact me at: [ray.mccarthy.masstec@gmail.com](mailto:ray.mccarthy.masstec@gmail.com)

<https://mail.google.com/mail/?shva=1#inbox/1300e409a9fd35e5>



# Technology Engineering Education

## ITEEA Task Force 3

### Building A Presence For Technology / Engineering In All Schools

As indicated recently:  
Task Force 3 members

1. Jared Bitting - Fleetwood M.S. - Pennsylvania
2. Chuck Goodwin - NYSTEEA Advisory Council Chair - New York
3. Travis Lehman - Bala Cynwyd Middle School - TEEAP - Pennsylvania
4. Dr. Ray McCarthy - Northeastern University - MassTec - Massachusetts
5. Andy Pron - Bala Cynwyd Middle School - TEEAP - Pennsylvania
6. Dr. Yvonne Spicer - Boston Mus. of Science - Massachusetts

Steps Completed:

1. Previous Task Force Members have been contacted.
2. Most of the previous Task Force members are interested in continuing on.
3. We have two new Task Force members - Andy Pron and Travis Lehman
4. Charge for the ITEEA Task Force 3 has been distributed to our Task Force members
5. 2011-2012 Task Force 3 Goals have been shared with members and ITEEA (Attached)

#### Immediate Next Steps:

1. Share and gather recommendations, from members, made on behalf of Task Force 3 between 2009 - 2011
2. ITEEA needs to share any Task Force 3 recommendations / findings reported between 2009 - 2011 [with ITEEA leadership and members]
2. Set up a 1 hour phone conference

- between now (May 13th and 3rd Week in June)
3. Request to ITEEA to provide phone conferencing support & capability for 3 separate 1 hour conferences.
  4. Begin developing a list of viable strategies and prioritize.

Thanks,

Charles H. Goodwin, DTE  
N. Y. S, Technology & Engineering Educators Association  
Advisory Council Chairperson  
12 Tudor Drive  
Endicott, New York 13760-4332  
cgnystea@stny.rr.com  
607-785-1680 - Office  
484-885-0045 - Cell  
\*\*\*\*\*

**Send me any suggestions!** ~ RMc.  
ray.mccarthy.masstec@gmail.com

### MassTEC

- \* Teacher of the year
- \* Program of the Year

Apply or Nominate Today!  
<http://www.masstec.org/recognition/index.htm>

Hudson-

## POY—TOY

MassTEC is offering two recognition programs for technology/engineering teachers: Program of the Year, and Teacher of the Year. The recipients of Teacher of the Year, and Program of the Year will receive a plaque and a \$150 gift certificate to the vendor of their choice. The top two finalists of Teacher of the Year will receive a free MassTEC membership, admission to the following year's MassTEC conference and a year's membership to ITEA. The top two finalists of Program of the Year will receive a free MassTEC membership, admission to the following year's

MassTEC conference. The award recipient(s) will receive a one year membership to ITEA for up to 3 members of the department.

The recipients for the Teacher of the Year and Program of the Year will be eligible to submit an application to the International Technology Education Educator Association (ITEEA) for consideration for the ITEEA Teacher Excellent or the Program Excellent Awards. These awards will be presented at their annual conference.

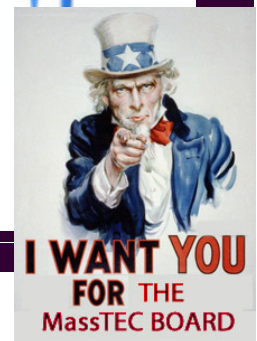
I ask you to think about applying for one or both of these awards. For additional information and an application for either of the awards please go our web site and look under Recognition Consider Applying for Program of the Year and Teacher of the Year. This section is located on the left side of our web page.

<http://www.masstec.org/recognition/index.htm>

~Charlie Corley, DTE

**MORE at**

<http://www.masstec.org/>



From **Edutopia-**

## There is an "E" in STEM!

"Quite often, STEM discussions focus solely on traditional science and mathematics courses. However, a growing emphasis is being placed on the role of engineering in K-12 education. A few years ago, the National Academy of Engineering and the National Research Council commissioned a study of the status of engineering in K-12 education. In their 2009 report, the commission outlined three general principles for engineering education.

Principle 1) K-12 engineering education should emphasize engineering design.

The design process, the engineering approach to identifying and solving problems, is (1) highly iterative; (2) open to the idea that a problem may have many possible solutions; (3) a meaningful context for learning

scientific, mathematical, and technological concepts; and (4) a stimulus to systems thinking, modeling, and analysis. In all of these ways, engineering design is a potentially useful pedagogical strategy.

Principle 2) K-12 engineering education should incorporate important and developmentally appropriate mathematics, science, and technology knowledge and skills.

Principle 3) K-12 engineering education should promote engineering habits of mind.

These include (1) systems thinking, (2) creativity, (3) optimism, (4) collaboration, (5) communication, and (6) attention to ethical considerations."

The National Academies of Science, Achieve Inc, The National Science Teachers Association, and the American Association for the Advancement

"~ Eric Brunsell

<http://www.edutopia.org/blog/science-technology-engineering-math-stem-education-eric-brunsell>

### NASA Engineering Design Challenges:

The NASA project includes 7 design challenges including designing a thermal protection system (my favorite!), spacecraft design structures, electrodynamic propulsion, propeller design, personal satellite assistant, water filtration, and plant growth chamber design. These challenges are geared towards middle and high school students.

### Boston Museum of Science:

The Boston Museum of Science provides a variety of curricular material and professional development related to K-12 engineering. They have a searchable database of reviewed engineering lessons. In addition, their Engineering is Elementary program provides excellent ways to integrate engineering careers and design projects into science units commonly taught in elementary grades. For example, the Catching the Wind module reinforces science concepts related to weather while introducing students to mechanical engineering through a windmill design challenge (Note: There is a cost associated with EiE modules).

### Engineering: Go for it!

(eFGI): eFGI is a web magazine produced by the American Society for Engineering Education. You can access weekly lesson plans, activities, and feature articles about engineering. The feature articles like this one about the making of Avatar are always highly engaging

and showcase the diversity of engineering careers.

**TeachEngineering** is a digital library of free resources for K-12. The library can be searched in a variety of ways and registration allows you to save favorites and review resources.

### Engineering Pathway:

*Engineering Pathway* is another digital library that is working to merge resources from multiple sources in an effort to be a one stop resource for "K-gray" engineering lessons, activities, and other resources.

**A World in Motion:** *A World in Motion* is a program of the Society for Automotive Engineers. The program includes a variety of design activities appropriate for elementary, middle and high school students including designing jet-toy cars, skimmers (wind powered vehicle), fuel cell cars, and other activities. *A World in Motion* also actively attempts to match engineers willing to do classroom presentations with teachers.

**PBS Design Squad:** I saved my favorite for last... PBS's Design Squad is an engineering-based reality show for kids. Each episode pits two teams against each other to design solutions to problems ranging from creating usable furniture from cardboard to tricycle-based drag racers. The *Design Squad* website provides full video of episodes, teacher and event guides (including tons of design challenges), user submitted challenges and solutions (like, "I wish I could have an eco-friendly solar powered heater"), games, and a great blog.

<http://www.nasa.gov/audience/foreducators/plantgrowth/home/index.html>

### Links from the IdeaGarden:

From DVISE-  
**9 renewable energy solutions that can fit in your pocket**

**Kinetic Energy Generators** All that time we spend walking around is just wasting energy, but the nPower PEG is a device that can get some of that back.

**2. Wi-Fi Power Harvesters** The ideal power-harvesting device is something that just sits in your pocket and spontaneously generates power without you ever having to do anything.

**3. Piezoelectric Motion Harvester** If you've been thinking that a micro generator would be great for your cellphone, you're not the only one.

**4. Solar Thermal Generator** Why rely on just one way of generating power when you can take advantage of two at the same time? Fujitsu has created a thin and flexible

device that works as both a solar panel and a thermoelectric generator all at once.

**5. Flexible Nanogenerator** Georgia Tech researchers have figured out how to embed [tiny piezoelectric nanowires on flexible polymer sheets](#), and when the sheets are squeezed, the wires pump out electricity

**6. Transparent Solar Panel** A French company called Wysips has developed an entirely invisible solar panel film.

**7. Solar Fabric** The Engineering and Physical Research Sciences Center in the UK is working on military uniforms that also function as power generators, harvesting solar energy directly through a new type of fabric

For the rest go to:

<http://dvice.com/archives/2011/04/renewable-energ.php>



<http://www.iteconnect.org/Networking/IG/IG.htm>

And Join!

<http://www.iteea.org/Membership/>

From The IdeaGarden-  
**Celeste Baine's thoughts, perceptions and ideas about marketing engineering education.**

For the last twelve years, I have been giving presentations on engineering careers. Below is a list of the top 20 disciplines that students ask about.

Engineering is a diverse and challenging field of study. With more than 25 major branches of engineering and 100 specialties, there is something for everyone who pursues the field.

**Aeronautical / Aerospace Engineering** - Aeronautical/aerospace engineers design and develop technology for commercial aviation, national defense and space exploration. They may help design and manufacture military aircraft, missiles, helicopters, and spacecraft. Within this field, they may specialize in the structure of the aircraft, aerodynamics, guidance and control, propulsion and design, manufacturing, or a certain type of aircraft...

**Agricultural and Biological Engineering** - Biological and agricultural engineering, two closely integrated disciplines often called biological systems (biosystems), bioresources, or natural resources engineering, are concerned with finding solutions for life on a small planet. Our swelling world population places great demands on our limited natural resources...

**Architectural Engineering** - Architectural engineers apply engineering principles to the design and technical systems of buildings - mainly their structural, mechanical, plumbing and lighting/electrical design. Engineers need to be aesthetic as well as technical, creative ...

**Biomedical Engineering** - The objective of biomedical engineering is to enhance health care by solving complex medical problems using engineering principles. Those who specialize in this field want to serve the public, work with health care professionals, and interact with living systems. This broad field allows a large choice of sub-specialties. Many students say they choose biomedical engineering because it is people-oriented. The field includes many branches: biomechanical, bioelectrical, biochemical...

**Chemical Engineering** - Everything that our senses enjoy consists of chemicals in one way or another. Chemical engineers have worked on creating the purple rose that has no thorns, the caramel on a caramel apple, and even your tennis shoes. The chemical engineering profession has improved water and waste systems, created new drugs and drug delivery systems, and improved the crop yields...

**Civil Engineering** - Traditionally, civil engineers planned and designed such things as roads, bridges, high-rises, dams, and airports. Because of population growth and a booming economy, however, the civil engineer now also designs new things such as underwater tunnels...

**Computer Engineering** - Computer engineering deals with the many aspects of computer systems. These engineers may design computer systems, networks, operating systems, or software. They may design the future automobile dashboard computers that will ...

**Electrical Engineering** - The developments of electrical and electronic engineers are everywhere. There are thousands of electrical devices and systems available today that electrical engineers have somehow touched. Anything you plug into the wall – stereos...

**Environmental Engineering** - Environmental engineering focuses on the

development of a sustainable future, preventing pollution, assessing the environmental impact of everything, water distribution systems, recycling methods, sewage treatment plants, and pesticide prevention. This fast-growing field offers a challenging and satisfying chance...

**Heating, Ventilating, Refrigerating, and Air-Conditioning Engineering - Heating, ventilating, refrigeration, and air-conditioning (HVR&AC)** engineers have dramatically improved our lives. HVR&AC engineers develop systems to create ...

**Industrial Engineering** - Industrial engineers figure out how to improve everything. They work with people to help them do things better. Industrial engineers save employers money by streamlining systems, often making the workplace better for employees too. They improve productivity and quality ...

**Manufacturing Engineering** - Just as the mechanical engineer designs parts, the manufacturing engineer designs the processes that make them. Wherever there's a production process to be designed and managed, you'll find manufacturing engineers ...

**Materials Engineering** - Materials engineers design, fabricate, and test materials. They may work to make automobiles lighter and more fuel efficient by creating stronger and lighter metals. They may help to create artificial knees and ...

**Mechanical Engineering** - Mechanical engineers is one of the broadest and most diverse disciplines. Mechanical engineers design, develop, and manufacture every kind of vehicle, power system, machine, and tool: jet engines, steam engines, power plants, underwater structures, tractors...

**Metallurgical Engineering** - Metallurgical engineers turn raw materials into useful products. Metallurgical engineering includes processing mineral and chemical resources into metallic, ceramic or polymeric materials; creating new high strength...

**Materials Engineering** - Materials engineers design, fabricate, and test materials. They may work to make automobiles lighter and more fuel efficient by creating stronger and lighter metals. They may help to create artificial knees and elbows using special polymers, or they may design new materials for the space ship. A materials engineer can work with any type of material ...

For more go to:  
[http://www.engineeringedu.com/celestes\\_blog/2011/04/top20.html](http://www.engineeringedu.com/celestes_blog/2011/04/top20.html)

**The Technology Engineering Teacher This month!**

- Crash Test Kids: Stealth
- Learning at its Best
- Prospecting for Wind
- The Characteristics of a Model
- Technology Education Teacher
- 2011 Professional Recognition Awards
- "Sky Glider" Hands-On Challenge
- Minneapolis Conference
- Photos
- Online: Understanding Designs of Mechanical Systems &



The good folks at **Design Squad** have asked me to post two questions on their behalf. If anyone has a response to either question, please email [marisa\\_wolsky@wgbh.org](mailto:marisa_wolsky@wgbh.org). Marisa is the Executive Producer of *Design Squad*.

Here is what they are looking for:

1. Can anyone identify research that has been conducted to show how tech ed can address the high school drop out crisis?
2. Does anyone have any anecdotal data of how *Design Squad* had helped kids who are at risk for dropping out?

<http://eweek.org/Home.aspx>

There are many challenges facing our world that require immediate engineering solutions. At the same time, we are challenged to prepare the next generation of talent by helping to remove the social, education and economic barriers that deter young students from engineering and technology education and careers. The National Engineers Week Foundation delivers programs and resources used by partners locally, nationally and internationally to overcome these barriers.

Gary Wynn, DTE  
[gwynn160@yahoo.com](mailto:gwynn160@yahoo.com)

Want Your Students College Ready? Use PBL <http://www.edutopia.org/blog/project-based-learning-buck-thom-markham>

According to recent research, nearly two out of five graduates are not equipped to handle the academic, financial, and social responsibilities of college. Find out how you can help your students succeed after graduation.

Go figure it would be **Project Based Learning! Who does that ???**

William F. Bertrand | Technology Education Advisor  
[wbertrand@state.pa.us](mailto:wbertrand@state.pa.us)

## “Want Your Students College Ready? Use PBL

By Betty Ray  
 2/7/11

Editor's note: Today's guest blogger is Thom Markham, a psychologist, educator, and president of Global Redesigns, an international consulting organization

College readiness, always a hot topic, is getting hotter. The Obama administration has set a national goal of having the highest proportion of college-educated citizens in the world by 2020. Yet at the same time, researchers tell us that two out of five college students are not equipped to handle the academic, financial, and social responsibilities of college. (Download a recent report on college readiness from ACT) In other words, 40% of high school students aren't "college ready."

### Predictors of College Success

What's really interesting is that, once again, the research reminds us that the deficiencies in college readiness don't represent cognitive deficits. I realize that many high school graduates require remedial courses to learn to write an essay or master basic math. But this research shows that the biggest *predictor of college success is a student's conscientiousness, as measured by dependability, perseverance, and work ethic*. The next best predictors are agreeableness, including teamwork, and emotional balance. All this, in my mind, leads to one conclusion: **More project-based learning.**

### Role of Social-Emotional Learning in PBL

What do these personality attributes associated with college readiness - dispositions, as they're known to psychologists -- have to do with PBL? Let me briefly digress to explain how PBL and social-emotional learning support one another.

In the last two decades, social-emotional learning experts have settled on three factors that support the success of a young person: (1) A solid relationship with an adult mentor, such as a parent, priest, teacher, or coach; (2) a sense of mastery that develops as the mentor guides the young person forward and reviews their performance; and (3) an internal sense of meaning and purpose that comes as the young person is offered opportunities to explore questions of value and relevance. PBL draws upon these exact elements for success. Great PBL begins with a respectful relationship between teacher and student. PBL is also a process of learning, not merely a method for ingesting information for a test at the end of the unit. This process allows for plenty of regular, ongoing feedback, which leads to student mastery. And, at the heart of a good project is a relevant, open-ended, student-centered question that speaks to a student's innate desire to know more about the world and how he or she fits into it.

Bottom line: If you use PBL in the classroom, you are not only teaching the stuff of school, you are supporting the social-emotional development of your students and getting them ready for college.

### PBL to Teach Student Behavior

I'll just add one other thought: What if you want to specifically teach work ethic, perseverance, or dependability — the kinds of dispositions that really prepare a student to be a self-managing learner in college?"

<http://www.edutopia.org/blog/project-based-learning-buck-thom-markham>



## Massachusetts Technology Education/ Engineering Collaborative

From the Webmaster,

Stephen VanVoorhis  
coertevanv@msn.com

<http://www.masstec.org/>

Celebrate 20 Years of NCGS Schools Leading the Way for Girls and STEM With *Advancing Girls in STEM: An NCGS Symposium, June 21, 2011*, 8am to 4pm, **Wellesley College**, Wellesley, MA <http://www.masstec.org/new.html#ncgs> 5-30-2011

**NASA Summer of Innovation Mini-Grant Program**, Join forces with NASA and help your students reach for the stars! <http://www.masstec.org/new.html#nasasoinnigrant> 5-30-2011 **Applications due: late Spring 2011**

### Electronic Professional Development Network Course: Engage and Educate — Podcasts in the Classroom

NASA's Learning Environments and Research Network and the Georgia Institute of Technology have teamed up to offer the ePDN, an initiative dedicated to preparing K-12 teachers to engage their students in STEM through the use of NASA-developed learning materials and resources.

**Engage and Educate: Podcasts in the Classroom** (June 8–July 12, 2011) <http://www.masstec.org/new.html#epdnc> 5-30-2011 A link to a video about a space solar power concept has been added to the Framework Based Web Resources page. It relates well to standard 4.4 specifically alternative energies. <http://www.masstec.org/fwr.htm#spcvideo> 5-28-2011

The **MasTEC Mission statement** has been updated. <http://www.masstec.org/mission.html#mission> 5-14-2010

**Massachusetts Board of Elementary and Secondary Education** is soliciting public comment on proposed amendments to 603 CMR 35.00, Regulations on Evaluation of Educators. The proposed amendments would rename and replace the current Regulations on Evaluation of Teachers and Administrators and accompanying **Principles of Effective Teaching and Principles of Effective Administrative Leadership**, as adopted in 1995. The deadline for submission of public comment is **June 10, 2011**. <http://www.masstec.org/new.html#mdeseeval> 5-15-2010

What is the **Fueling Family Fun Challenge**? Make those miles fly by with a good car game idea or an invention for the backseat. Tell us how you can survive long road trips! Deadline: Mail us your idea by **August 31, 2011**, 5:00pm (ET)! Prizes: **One Grand Prize: \$1,000 Gas Card & \$1,000 Retail Gift Cards, 4 Finalists: \$250 Gift Cards** <http://www.masstec.org/newstudent.html#ffc> 5-14-2010

**Summer Pathways for Girls at Boston University**, BU is hosting an exciting one-week, residential program for high school girls entering their junior or senior year in September 2011. The year the program will be held from **July 8 - 15th**. <http://www.masstec.org/newstudent.html#6> 5-1-2010

**6 Week Summer 2011 Program Become a STEM Leader!**, NSF - Research Experiences for Teachers, Biophotonics - Sensors, Imaging and Systems, Benefits: - \$7000 stipend for veteran teachers; \$5250 for Pre-service teachers (paid in installments over summer and academic year upon completion of program requirements). pre-

workshop June 29-30; work in research lab July 5-August 12, 2011 <http://www.masstec.org/new.html#stemleader> 5-1-2011

MassTEC President, Dr. Ray McCarthy, urges all **Technology Engineering Education teachers to join MasTEC & the ITEEA** to support the great courses and learning opportunities that we all create for our students. **We all need a voice** in our communities, our state and our nation. That is where MasTEC and ITEEA come in. These organizations provide professional development, curriculum support, peer teaching, and political voices that support YOU, the class room teacher. Check out the latest from the ITEEA: **Yes, STEM Connections is open to anyone**, sign up here to receive it - <http://www.iteea.org/Publications/STEMconnections/STEMconnections.htm>. 4-21-2011

The Foundation for Technology and Engineering Educators (FTEE) has announced the establishment of the **Claussen/FTEE Memorial Scholarship**. Through the generosity of donors, this scholarship is being created in memory of **Larry Claussen**, former technology teacher, TECA advisor, mentor, and friend. <http://www.masstec.org/new.html#fteclaussen> 4-21-2011 \

The Virginia Space Grant Consortium (VSGC) is coordinating two NASA Exploration Systems Mission Directorate (ESMD) **internship opportunities at NASA Langley Research Center** during the **summer of 2011. June 6th and ending August 12th**. <http://www.masstec.org/newstudent.html#nasainternship2011> 4-21-2011

The **University of Massachusetts Lowell** and **iRobot** invite you to participate in the STREAM interactive workshop for K-12 educators. This full day workshop will focus on **integrating robotics into STEM education**. STREAM 2011 will be held at the Sturbridge Host Hotel in Sturbridge, MA on **June 29, 2011 from 8:00am to 5:00pm**. <http://www.masstec.org/new.html#streamrobot> 4-11-2011

A member of the MasTEC E-board arranged for a **speaker** to visit his classroom and talk about **NASA**, [click here to view a newspaper article about the visit](http://www.telegram.com/article/20110408/COULTER01/104080421/1189/coulter01) <http://www.telegram.com/article/20110408/COULTER01/104080421/1189/coulter01> 4-9-2011

**U.S. high school students are invited to participate in NASA's Interdisciplinary National Science Program** Incorporating Research Experience, or INSPIRE, **Applications are being accepted through June 30**. <http://www.masstec.org/newstudent.html#NASAINSPIRE> 4-5-2010

**Museum of Science PD Opportunities, SUMMER TEACHER-IN-RESIDENCE POSITIONS, July 5 - August 5**, Looking for a new way to stay connected during your vacation? Spend this summer at the Museum of Science as a Teacher-in-Residence. <http://www.masstec.org/new.html#mossummer> 4-5-2011

**Engineering is Elementary: Integrating Engineering and Mathematics Institute**, Dates: **Monday, July 11, 2011 to Wednesday, July 13, 2011**, Location: Westfield [http://www.mos.org/eie/workshops\\_info.php?id=71](http://www.mos.org/eie/workshops_info.php?id=71)

STEM ToDos

**Dinner for 2 and a Movie in Boston**

The weekend has arrived and you and your significant other are considering dinner for 2 and a movie in Boston. Let's turn the calendar ahead a year or two and see how this simple task will change with STEM implications.

You clearly state to your "SMARTER" phone, "Dinner for 2 and a movie in Boston." Your phone asks a few clarifying questions that you also respond by voice. "What type of food and what part of the city?" You reply, "Thai in the Back Bay."

Now the action begins and you're phone's "My City Way" application launches project management using GPS, your NISSAN Leaf (totally electric car) app also on your phone, and social media applications to consult recommendations from those who have made the same request and provided "thumbs up" feedback. Within minutes your evening appears on your phone with a dinner reservation and two movie tickets. This also includes a parking reservation in a garage complete with car charging station. Your phone has interacted with your NISSAN Leaf and determined that your current charge will not be sufficient for your night out. All you have to do is edit, accept and pay with a credit card, already loaded on your phone. Your evening is now complete with Dinner for 2 and a Movie in the Back Bay in Boston.

STEM ToDo's for your students from this example:

- Call your local NISSAN dealer in September 2011 when the totally electric Leaf is available in the Northeast. Arrange a demo at school for your students.
- Have your students mind-map "Dinner for 2 and a Movie in Boston" showing all the possible options and decisions your "smarter" phone may have to make. Engineering and computer solutions begin with great documentation.

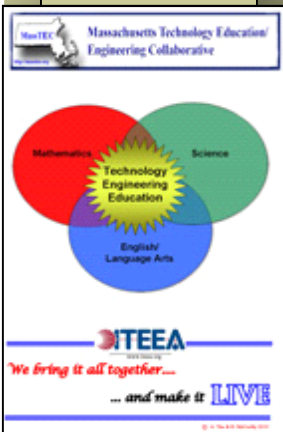
~ Mark Bireley  
[mgbireley@gmail.com](mailto:mgbireley@gmail.com)

Many have asked if we still had this MassTEC Poster in the 12 x 18 format.

Short answer: No.

However, you can download it and print with our permission if you go to:

<http://www.masstec.org/conferencefolder/conference2009/images/TechEngED%20LIVE%208x11%20poster.pdf>



**Lynn Camp students play a big game of rummy with world's largest cards**

By Bill Estep — [bestep@herald-leader.com](mailto:bestep@herald-leader.com)

LYNN CAMP —

Students at Lynn Camp High School may have played their way into the record books Wednesday with a game of rummy using giant cards 7 feet, 4 inches tall by 4 feet wide that they made from fiberboard. Students in the design and engineering program at Lynn Camp, which is in Knox County near Corbin, designed the cards using computer software and wrote programs to have them machined robotically, then students in the art program painted them. Arthur Canada, a technology teacher, said the project helped students learn skills with computer-aided design and programmable automation software and also in working as a team.

In art, teacher Earl Gregory used the project to teach painting techniques.



It's not the first time Canada has had students design and create large objects as a learning tool. Students built a chess set last year with pieces 10 feet tall.

"We just try to find things that have a neat factor to them," Canada said.

The cards created by students at Lynn Camp were more than twice that size.

The project turned out well, but he'll try something different next time, Canada said.

I'll swear off large card games after this," he said. "We'll attempt something next year.

It may not be larger than life."

Read more:

<http://www.kentucky.com/2011/05/12/1738087/lynn-camp-students-play-a-big.html#ixzzIMVNsgfeE>

