

Business and Education: Building the Future Workforce Together

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Introduction

With the connection between education and business so strong, it is amazing how little dialogue has actually occurred between the two entities. In a perfect world, the recipient of a product would play a major role in the designing of that product to ensure it meets the required criteria, needs and expectations. Our education system which is expected to prepare the future workforce in the past has received very little input from corporations and advanced manufacturing. That is all changing just as professions are rapidly changing. Much of this change is due to the shortage of students with STEM skills and capabilities to meet current and projected employment needs.

What needs to be in place to prepare the highly skilled workforce of the 21st Century, a workforce where “adaptability to new conditions” and “creativity for innovations” is the measure of success? Research is showing that the “it takes a whole village” concept needs to be applied if we are to inspire and prepare students for the STEM careers. Every employer that relies on the education system to produce 21st Century competent employees needs to take notice of the growing necessity for cross-sector collaborations and partnerships to advance STEM (Science Technology, Engineering and Mathematics) learning.

How Cross-sector Collaborations are Advancing STEM Learning, 2014, Kathleen Traphegen & Saskia Traill

The Growing Problem:

The anticipated growth in STEM occupations and sectors, as well as reported recruitment difficulties due to students not being “job ready” and not possessing the “right skills” and has focused attention internationally on STEM workforce development. And, in the US and Europe, there is a significant gender gap. The U.S. News/Ratheon STEM Index shows that multi-million dollar efforts by both public and private sectors have failed to close gender and racial gaps in STEM and The EU Skills Panorama 2014 reports in EU-28 as a whole, 14% of female students graduate with a STEM qualification, compared to 40% of male students.

United Kingdom: *Centre for Business and Economic Research, Staffordshire University*

Poland: *e-Skills in Europe, Poland Country Report*

USA: *STEM Education Coalition, National Math & Science Initiative, 2015 STEM Index*

Europe-28: *EU Skills Panorama 2014*

“We need to move the needle - immediately and sustainably – on student performance in critical STEM areas.” *Rex Tillerson, Chairman and CEO of ExxonMobil.*

Solution: Looking at Collaborations and Business Education Partnerships

1) STEM Learning Ecosystems:

STEM Learning Ecosystems are emerging across the United States and have caught the attention of the influential STEM Funders Network, with the overall goal to advance STEM education by leveraging the collective voice, resources and strategies of its philanthropic members. The Ecosystem concept is to harness the unique contributions of the diverse learning opportunities across a geographic region. The Ecosystem looks at pathways that enable young people to become engaged, knowledgeable and skilled in the STEM disciplines as they progress through childhood into adolescence and early adulthood. These Ecosystems open the STEM door to all

stakeholders, including for business and industry, to work collaboratively across the Ecosystem to maximize their positive impact on young people's STEM learning. Orange County, California is a leading STEM Ecosystem in which Science@OC where Sue Neuen is Executive Director, is playing a major role.

"In a STEM Learning Ecosystem, young people's experiences could connect horizontally across formal and informal setting at each age, scaffolding vertically as they build on each other to become deeper and more complex over time." *Report from the Field: How Cross-sector Collaborations are Advancing STEM Learning, 2014*

2) *21st Century Competencies*

We face a challenging world of rapid changes; emerging technologies; and workforce outsourcing, offshoring and automation.

"Students must be able to: think critically, solve problems, be creative, be innovative, communicate, collaborate, use technology and media, self-direct, lead, be ethical, be adaptable, be versatile, have a great work ethic, be passionate, be curious and learn for a life time. *"Empowering Your Students for the 21st Century" Christian LeButt*

There is "a need to combine the STEM skills of graduates with the "soft" employability skills as communication skills, team working, and creative thinking which help apply STEM skills in the business world and which are important to innovation." *DG Research, 2012*

3) *Project-Based Learning(PBL)*

PBL integrates knowledge and skills. Students apply what they know to solve authentic problems and produce results that matter. PBL students take advantage of digital tools to produce high quality, collaborative products. PBL provides a spectrum of opportunities to engage the expertise of STEM professionals in the field, with the project planning and student experiences.

"PBL refocuses education on the student, not the curriculum--a shift mandated by the global world, which rewards intangible assets such as drive, passion, creativity, empathy, and resiliency. These cannot be taught out of a textbook, but must be activated through experience." *Markham (2011)*

Call to Action:

Realizing that the STEM pipeline is critical to innovation that supports the economy of every country, business and education alike should be attentive to the STEM workforce issue. STEM education pathways (middle school – college) and innovative initiatives designed to address the challenges impact all employers in the micro, nano and emerging technology industries. Small businesses need to join the larger companies like Boeing, IBM, Broadcom and Chevron in making a commitment to take action and become involved in business/education collaborations that successfully inspire and prepare students for the future workforce.