EC4: The Corporate Perspective

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How can corporations strengthen STEM education? Educator Corporate Collaboration on the Common Core (EC4) is a research-based approach. After helping to plan and implement Southwest PA's 2011 STEM Summit, the Math & Science Collaborative (MSC) compiled regional deliberations in a 2012 published report, "Moving toward U.S. Goals for STEM Education, Recommended Actions for Southwest Pennsylvania." Summit discussions had been based on consideration of the National Academies report, "Effective K-12 STEM Education." Summit sessions had featured the National Academies How People Learn research and the newly released Common Core State Standards (CCSS) and the emerging Next Generation Science Standards (NGSS). In March, 2012, MSC Steering Council considered which recommendations it chose to move forward. Representatives of corporations and K-12 administrators agreed that developing "meaningful partnerships between business and K-12" would advance STEM learning.

A subcommittee was formed to take action. After considering the needs and expertise of the corporate and education sectors, the committee selected corporate visits by educators as a strategy that capitalized on employer capacity to address the educator need to see the CCSS and NGSS in action in the workplace-- to develop first hand understanding of why they matter so greatly.

Three area school districts and three local corporations committed to moving forward with this pilot. MSC staff briefed a leadership team from each corporation on the practices included in the CCSS and NGSS. Seven person educator teams, consisting of an administrator and elementary math and elementary science teachers, middle school math and science teachers, and high school math and science teachers, each spent a full day of immersion at each of the three corporations during the 2012-2013 school year. This approach was based on the premise that for the greatest impact, it is

teachers who can most effectively, year after year, convey workplace experience to educate the student about the applied, practical aspects of STEM. How did this experience impact the corporations? Reflections from the corporate groups follow.

Alcoa:

During Q4 2012 and Q1 2012, Alcoa hosted groups of science educators for three full-day sessions of industrial problem solving at the Alcoa Technical Center, in Alcoa Center, PA. These sessions were immersion-based, real-life exercises that demonstrated the roles and expectations of cross-functional team members for efficiently solving practical problems using the scientific method. An additional requirement was the communication of these findings to impacted parties not directly involved in the problem solving process.

Our participation in this initiative positively impacted Alcoa staff in several ways. During the preparation of these sessions, we were able to reflect on our own values regarding team dynamics for efficient problem definition, resolution and communication. During session execution, we had opportunities to discuss student perspectives with the teachers and the importance of overall communication and problem solving skills in the workplace. Perhaps most rewarding was the ability to see how positively the teachers responded to our real-life problem solving sessions, and how excited they were regarding incorporating lessons learned in their own classrooms.

PPG Industries:

The EC4 experience at PPG was interactive and mutually beneficial. The hosts at PPG's Glass and Discovery Center participated in several planning sessions to develop specific agendas for each of the three days of the teachers' site visits. The planning process, that the MSC people also participated in, was thought provoking and a break from the routine: How can we capture the imagination of our guests and keep them focused on the process of industrial research for a full working day? At the end, unique agendas consisting with multiple product and process development teams, analytical laboratories, and real technical reviews were put together for each of the three visit days.

The day of the visits were rewarding for the PPG hosts. Scientists and engineers enjoy sharing their experience, discoveries and tools of research and development. A combination of show & tells, hands-on activities, and dialog between the PPG technologists and the school teachers and administrators demonstrated many principles of math, science, and design at work. During the full technical review sessions, the presenters went about describing their project results without modifying the session for the non-specialists. The ensuing discussions, in which both PPG people and the visitors participated, were to the point, productive and technically challenging. Finally, each day ended with a thorough review of the take-aways by the teachers and their comments on the quality of their experience on that day. The hosts took part in these reviews, sharing their take-aways as well. Each session was modified based on what we learned from the previous session(s).

ThermoFisher Scientific:

Even though the primary goal was to provide teachers with real-life, hands on examples of using math and science in various STEM careers, the Thermo Fisher Scientific participants were able to benefit from the experience as well. Many of us chose a STEM career because of the influence and passion that our educators had demonstrated in math and science. In turn, through the course of higher education and our career experiences, we have developed a love and passion ourselves. Our collaboration with EC4 allowed us to return the favor to the teachers who are helping to shape future generations. If we were able to instill or enhance their enthusiasm for math and science by demonstrating how scientists and engineers can make an impact in the world, then their students will surely benefit.

If you are interested in experiencing an industry-based problem-solving experience, register for Network Connections Session C: Common Core Practices in the Workplace, October 24, 2013 at Carnegie Science Center. Register at www.octobernetworkconnections.eventbrite.com