The Global STEM Education Center

DOME Foundation
Diversity and Outreach in Mathematics and Engineering

GTEC Global Technology and Engineering Consortium

BLC - Building Learning Communities
Annual Conference
July 17, 2014
Boston, Massachusetts

Educating students who can succeed in a *flat* and *diverse globe*—

Preparing for learning & doing we cannot yet imagine

Preparing students for the professions which already exist

Will your students work for:

- Apple
- Microsoft
- Google
- Novartis….

- Or, a law firm, a pharmaceutical company?

The questions we said we would answer:

- **What kind of technology are STEM professionals using and would like our students to be able use as well?**
- **What kind of skills and knowledge do STEM professionals want our students to have?**
- **What is the process of transferring innovative knowledge from the STEM professional world to STEM K-12?**

Professional Collaborative Technology being used:

- Windchill (manufacturing/product development - including 3D printing)
- Perforce (collaborative coding, software, computer games, embedded systems or hardware)
- Virtual Cloud: base Labs, telescopes, diagnostic tests equipment (including tele-medicine)
- Collaborative data collection & data analysis technology
- Remote sensing …

21st Century Skills.1

- Learning, innovating, being creative
- Critical thinking; cross-disciplinary thinking
- Communication & Collaboration
- Visual Literacy
- Scientific & Numerical Literacy,
- Information, Media & Technology Skills

21st Century Skills.2

- Global Awareness
- Financial, economic, business, entrepreneurial literacy
- Civic literacy; environmental literacy
- Flexibility & adaptability
- Initiative & Self-direction
- Social & cross-cultural skills
- Productivity & accountability
- Leadership & responsibility

The challenge: ***How do we transfer innovative knowledge from the STEM professional world to STEM K-12?***

- **The best way is to simulate the way STEM professional work and teach the students the content, skills they need to solve the problems the companies are dealing with**

Two major components of the Global STEM Classroom

- **Intercultural competency**
- **Global team work skills**

  (based on NASA 4D systems methodology)

Diversity Skills Needed for Working Globally

- **Knowing the foundations of intercultural communication & mastering multicultural communication skills**
- **Knowing one's own beliefs & assumptions about differences & stereotypes**
- **Ability to consider cultural differences while participating in a project & building a multicultural team**
- **Examining one's personal values & their impact on one's actions, reactions, & perceptions**

Next steps

- **Mapping of the Global STEM programs to the National Standards**
- **Developing curriculum guides and model lessons**
- **Documenting practice (video case studies)**

A little history

- **In existence since 2007**
- **Piloted with Spirit of Knowledge Charter School, Newburyport HS & Dennis Yarmouth HS & schools in the UK**
- **Collaboration with Franklin Olin College of Engineering, PTC, November Learning, KMA Diversity & Connecting the Differences Consultants, Davis Square Research Associates, NASA, CELT**

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