Global STEM Education

Succeeding in Tomorrow's World Today

- Isa Kaftal Zimmerman, Ed.D.
- MASCD Executive Director
- Chair of Board, Global STEM Education Center, Inc.

…The future is now…

- We need to prepare students for their future, not our past. …David Thornburg

- It turns out that Daniel Pink said the same thing on February 20, 2009.

What is global STEM Education?1.0

- More than pen pals & exchange visits: active, engagement so students learn to work in teams across language, culture, time & space differences on authentic challenges from multinational companies

What is global STEM Education? 2.0

- Learning & using the most up-to-date technologies
- Mirroring professional STEM workplace

The 4th Industrial Revolution

- Holoportation…a new way to communicate
- Holograms…a new way to envision
- Big data and data visualization…a new way to research & develop
- Cognitive computing (IBM Watson)..a new way to think
- 3D printing

Why is global STEM important?

- Understanding how to work with people from other cultures & geographies using new skills will make the difference in the workforce
- Problem solving to keep the globe safe & productive
- Using modern communication methods & technology is key to work now & in the future
- Acclimating to innovation driven work place

Current vocational themes

- Demand driven
- Focused on alignment with work-based opportunities
- Considering career pathways

Engage all populations

- Students
- Teachers
- Educational leaders & institutions
- Parents
- Local and state communities

BVT Global STEM Classroom® students at the annual MA STEM Summit (2016) with Governor Baker and Congressman Kennedy

Change is needed in:

- Higher Education esp. for educator preparation
- Funding sources
- Internships/other in situ opportunities

Current educational themes

- Personalized education (see next slide!)
- Social & emotional learning
- Technology education

Current global themes

- Today's profession may be obsolete tomorrow
- Problems are not nation specific—the world is flat

From EL March 2017

- Personalized learning must be based on "some set of facts…technology can help elicit and capture student thinking…[and technology] empowers educators in ways that will enhance student learning and usher in innovative practices…"

That apparently also means learning spaces

- Research shows groups of four to five students work best. But groups of five or six are sometimes required due to growing class sizes.

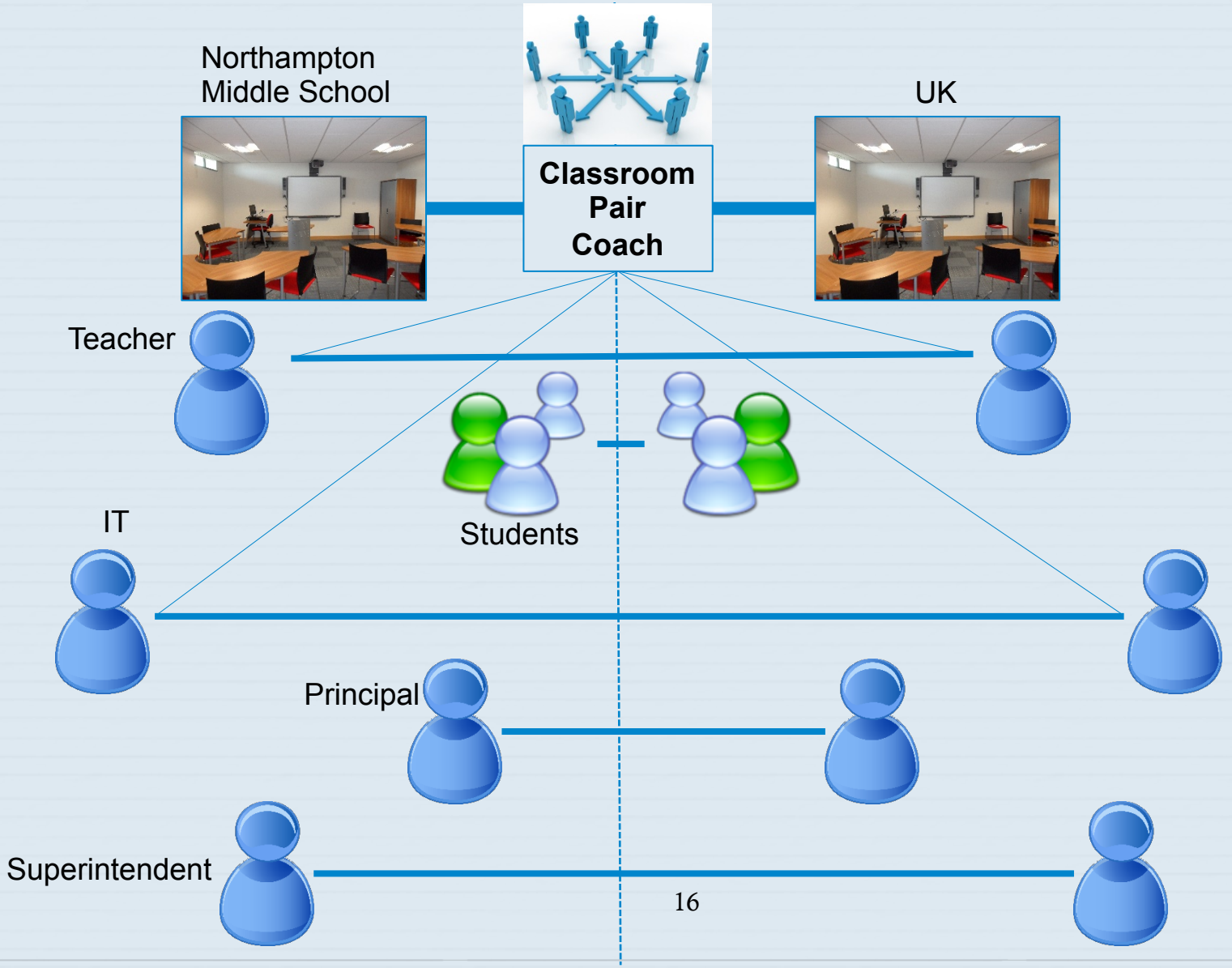
- Crescent
- Arc 8
- Two-Student
- 3-2-1
- Huddle
- Diamond
- Wing
- Flex

Furthermore

- Across Massachusetts, teachers are increasingly embracing a lesson learned from the dot-com world: different types of seating can make folks more comfortable, which in turn can boost productivity and creative thinking.

  - Boston Globe, 3/20/17

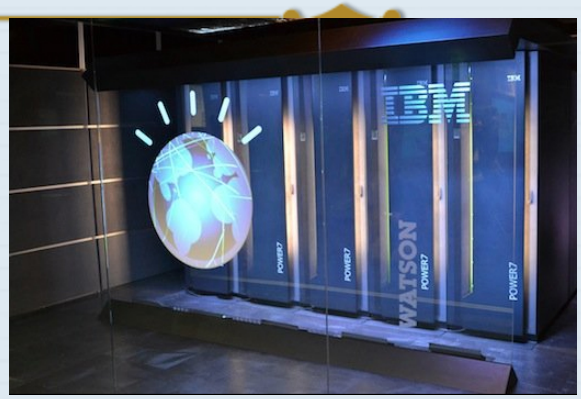
Simple Pair Configuration

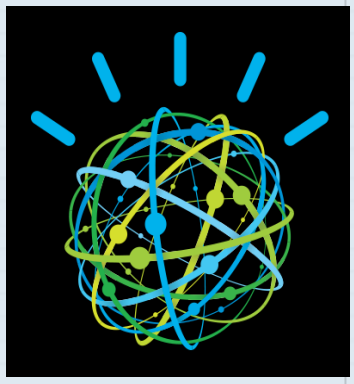


Global Competencies

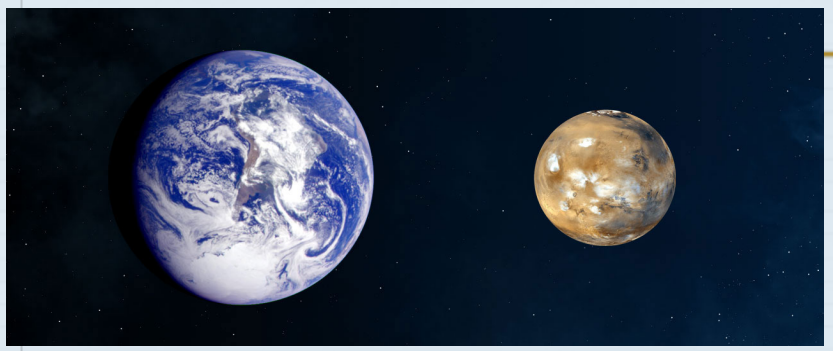
- What do educators need to be able to do?
- What do students need to be able to do?

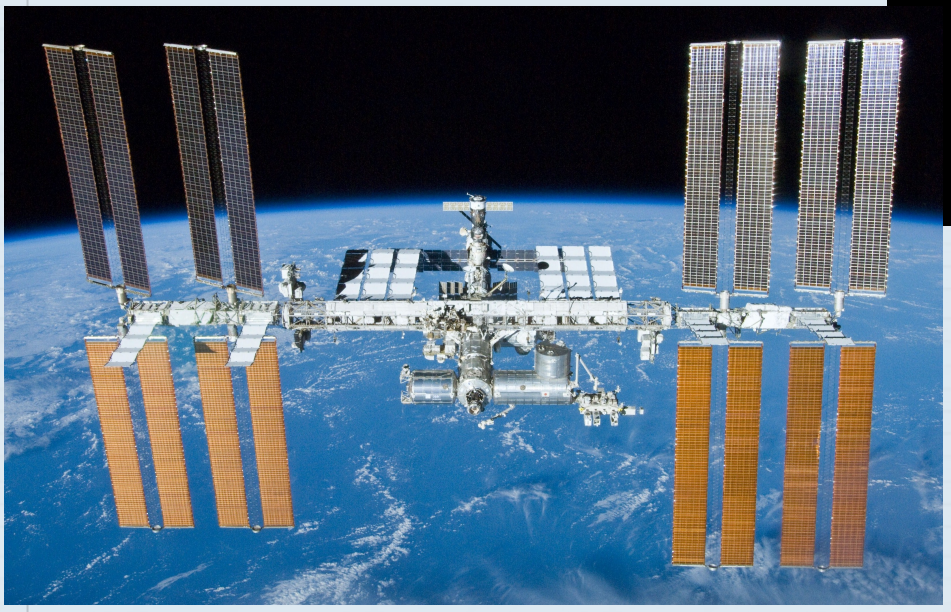
FROM THE 1ST INDUSTRIAL REVOLUTION TO THE 4TH





Beyond Boundaries





Watson & Cognitive Computing

What are the competencies? 1.0

- Use of the most advanced technologies:
  - Virtual Reality
  - Teleportation
  - Wearable tech
  - Robotics
  - 3D printing
  - Collaboration programs

What are the competencies? 2.0

- Understanding diversity in culture, personality, background, life experience; Cross-Cultural Competencies
- Interdisciplinary Global Teams
- Understanding & using new technologies
- Being diplomatic
- Employing all 21c Skills

What are some unexpected results from our Global STEM classroom?

- The technology we use can be used to teach other subjects
- Students want to learn foreign languages
  - *Davis Square Research Associates*

Global STEM Classroom® Well Developed Projects

- Uses emerging technology
- Translates into authentic problem for a classroom project
- Aligns problem with project-based learning objectives
- Has a step-by-step procedure to implement project

Global STEM Classroom®
Well Developed Projects 2

- Includes a guide for teachers
- Contains activities for students to achieve Global STEM outcomes
- Is relate to Global STEM curriculum outcomes
- Is a collaborative research opportunity for students

Examples of projects 1.0

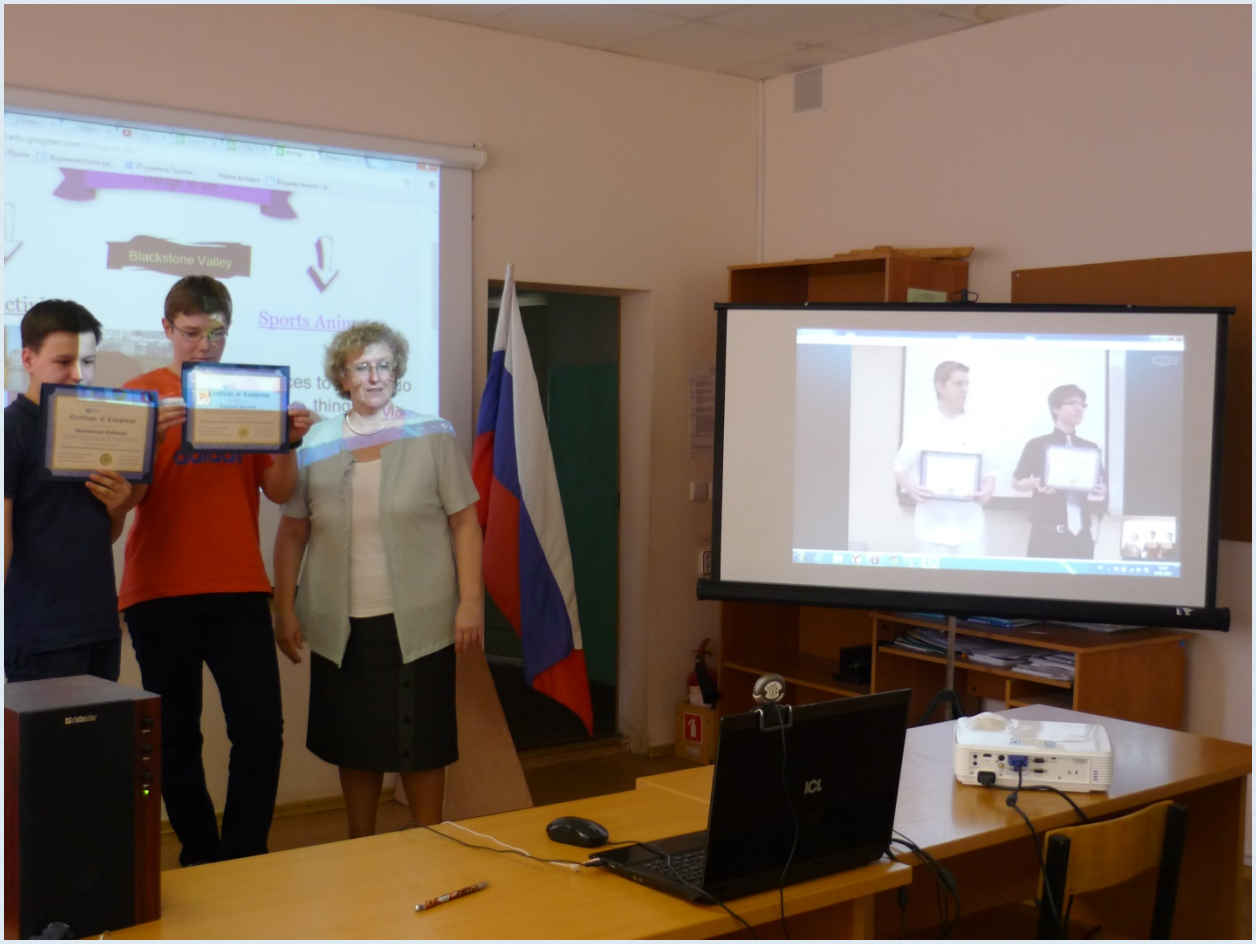
- Wind turbine design & 3D printing
- Nanotechnology applications
- NASA GRACE Mission, NASA MARS Mission, NASA Astronomy & Virtual Observatory; Hubble Telescope; International Space Station – electrical wiring & hydraulics in space

Examples of projects 2.0

- My Blue Planet & Global Citizenship (Clean Water Project, Sustainability Project)
- Data visualization (based on IBM Data Visualization & on NASA GRACE)

From the UK

Russian classroom



What was happening…

Some of our school connections:

In MA:
Knowledge Charter School (SOKCS)
Newburyport High School
Dennis Yarmouth Regional School District
Blackstone Valley Technical High School

Abroad:
Haywood Engineering College (UK); schools in France, The Netherlands, Russia, Ukraine

Our Signature Event

The Fourth Global STEM Education Symposium at the Harvard Graduate School of Education in Cambridge, MA

May 12, 2017

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