

Bringing AI to K-12 Education via Global STEM Classroom®

AAAI Fall 2019 Symposium AI K-12
November 9, 2019
Washington, DC



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@GlobalSTEMClass



Credits

Larisa K. Schelkin, Global STEM Education Center, Inc.
Boston, MA, USA

Dr. Julia Sigalovsky, Dennis Yarmouth Reg. High School,
South Yarmouth, MA, USA

Dr. Paco Martín González, Porta Mosana College,
Maastricht, The Netherlands,

Ing. Raziel Cázares, Instituto Neil Armstrong (K-12
school), San Nicolas de los Garza, Mexico

Uliana Novikova, Angstrem K-12 School, Kharkiv, Ukraine

Dr. Russell Faux, Davis Square Research Associates,
Cambridge, MA, USA

Just few words of introduction



Few more words of introduction



WPI



Tufts
UNIVERSITY



Tyco Electronics



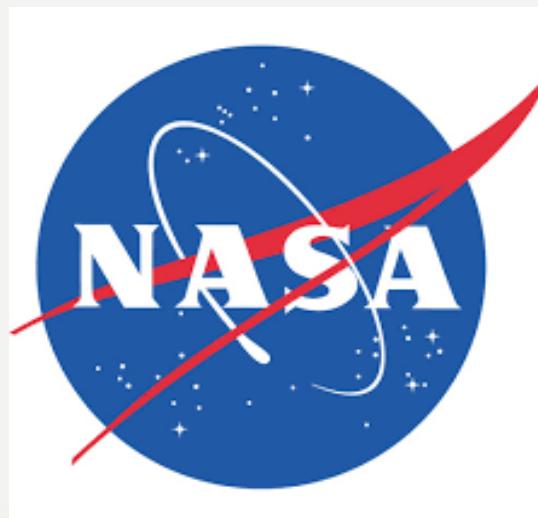
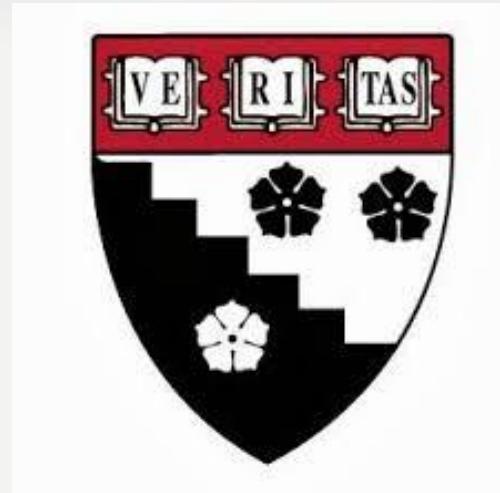
DOME Foundation
Diversity and Outreach in Mathematics and Engineering



And few more words of introduction...



Institute for
Educational
Leadership
Leading Across Boundaries





The 21st Century Globally Competent Workforce



The skills we need today and in the future are dramatically different
than what they were only five years ago

“Preparing Globally Competent Workforce”

Readiness for college and career



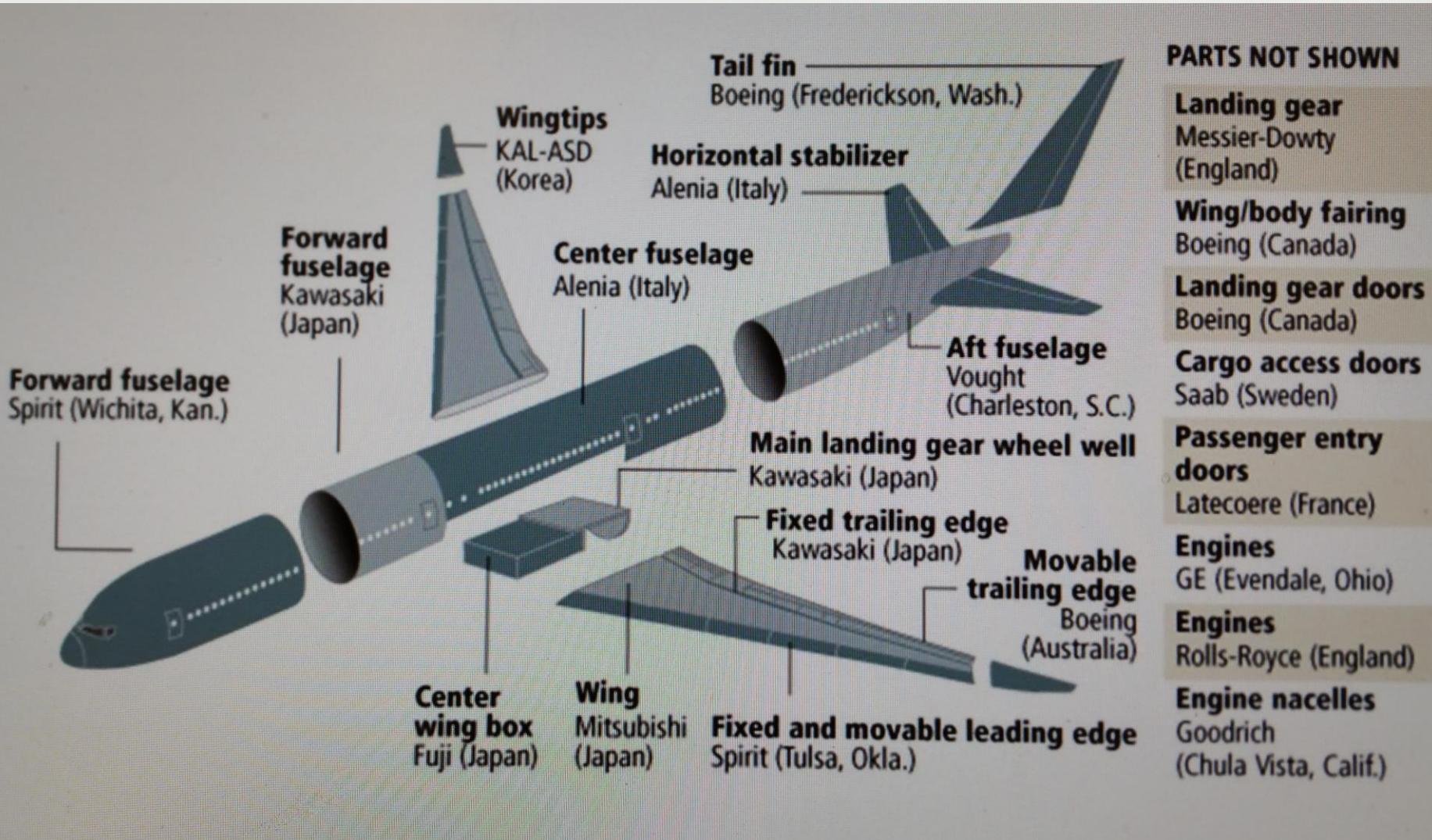
- The 21st-century workforce is GLOBAL
- “Rapid economic, technological, and social changes are creating a world that is ever more interconnected” (Asia Society)
- See more at: “Global Human Capital Trends 2014 engaging the 21st-century workforce” A report by Deloitte Consulting LLP and Bersin by Deloitte <http://goo.gl/Eb4i0c> (see a quote below)

*..*The 21st-century workforce is global, highly connected, technology-savvy, and demanding.*

- *The world is much more global and interdependent*
- *Mobile, social, and cloud computing continue to explode;*
- *Demographic shifts are creating a diverse, multigenerational workforce*
- *Technology has transformed the workplace. Technology is changing how we work and the skills we need*
- *Technology has changed the nature of collaboration, expertise sharing, and the skills one needs to succeed. Collaborative technologies continue to make it possible for teams to work in remote locations across the world, easily accessing experts within and outside the organization*
- *The skills we need today and in the future are dramatically different than what they were only five years ago*
- *These changes in the workforce and workplace are significant, disruptive, and here today..”*



Think about this....(global team work)



Collaborating on global STEM projects via

* Global STEM Classroom®



The unique features and components:

- Students engage in STEM project-/problem-based (both research and hands-on) learning with students from a partner school in countries around the world in the collaborative learning and teaching environment that simulates the actual global STEM working environment. Students work together in multicultural globally dispersed teams on multidisciplinary problem-based, project-based, research and hands-on authentic, industry-responsive STEM projects.
- Teams use online innovative cutting-edge collaborative tools/platforms, communication technologies as well as project-related STEM technology. Each technology encourages and enhances student engagement.

*

Global STEM Classroom® Larisa Schelkin 2008-2020 © All rights reserved

Collaborating on global STEM projects via

* Global STEM Classroom® (continued)



The unique features and components (continued)

- Teachers engage in unique professional development (on the topics detailed below*) that enables them to become successful global educators who have mastered collaborative teaching and learning for 21st century
- Teachers engage in a COLLABORATIVE project planning and TEACHING with teachers from partner schools in different countries and student teams in all schools complete and present Global STEM projects via international virtual conferences and Global STEM Classrooms®

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Global STEM aligned to the ISTE Standards: Global Collaborator*



- **Global Collaborator**
- Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
- Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.
- (*ISTE 2019)

Global STEM aligned to the ISTE Standards: Computational Thinker*



- **Computational Thinker**
- Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
- Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
- Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
- (*ISTE 2019)

Global STEM aligned to standards for educators: ISTE Collaboration and cultural competency*



- Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.
- Educators:
- Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.
- Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.
- Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.
- Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.
- (*ISTE 2019)

Global STEM aligned to the ISTE Standards: Creative Communicator*



- **Creative Communicator**
- Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
- Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- Students create original works or responsibly repurpose or remix digital resources into new creations.
- Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- Students publish or present content that customizes the message and medium for their intended audiences.
- (*ISTE 2019)

Global STEM aligned to ISTE standards for educators: Data Analyst*



- Educators understand and use data to drive their instruction and support students in achieving their learning goals.
- Educators:
- Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.
- Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.
- Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.
- (*ISTE 2019)



Holoportation...new way to communicate...



Microsoft Hologram.....



Microsoft hologram speaking Japanese



▶ ▶ 🔍 1:07 / 1:41

Scroll for details

CC HD +

- https://www.youtube.com/watch?v=eCseYtBd5_4

AI and college & career readiness



- “A [recent Gartner report](#) predicts one in five workers will have some form of artificial intelligence as a coworker”
- That means most of today’s K–12 students will enter the workforce by the time AI is well established. In order to compete, K–12 schools will need to create curricula around artificial intelligence
- You can/should lead where this is going
- Developing new curriculum to understand what is coming, where the world is going
- New priorities: global competence, skills to work in globally dispersed virtual teams; AI, Big Data, machine learning, “deep learning”, project-based learning, social emotional intelligence; digital emotional intelligence, entrepreneurship, design thinking
- DYHS brings AI to their students via Global STEM Classroom® since 2018.

- *“We want people to understand what’s going on so they can participate in the evolution of the technology as the technology is deployed; ..While the guidelines are being drafted, a few schools are going ahead and implementing AI curricula” (Dr. Touretzky) .*

The scale of change that AI will bring to education



- The scale of change that AI will bring to education and to all aspects of our lives is the same if not larger than the scale of change of “before and after the Internet”.

AI will be behind of everything in education:

- Curriculum Development
- Assessment
- Professional Development
- Personalized Learning
- Logistics/Transportation/Scheduling etc.
- Hiring
- We will be preparing the students for the computational professions – as ALL professionals will be computational (no exclusions - including lawyers, doctors, scientists, engineers, writers, pilots, mechanics, managers, etc. etc)



Percentage of public schools with AI courses offering

- What is the percentage of public schools with AI courses offering?
- “High school AI programs are still rare, and the development of an AI curriculum is in its early stages”
- The AI course at DYHS was offered in 2018-2019 academic year

Remember:

On 6 August 1991.....twenty years ago, the World Wide Web **became** publicly **available**. In 1994 about 35% of public schools had access to the Internet.

So, again - do you know what is the percentage of public schools with AI courses offering?

How fast do you think it will grow?

Building a "road map" for Artificial Intelligence integration in your school district



- “Organizing a successful AI integration and education plan will take collaboration and proper planning on the part of school decision-makers”
- This is an open call for YOUR leadership!

Some of the recommended steps are:

- Teacher professional development on how to integrate the use of AI into the curriculum (on-going at DYHS)
- Develop and run a pilot AI program in your school district (on-going at DYHS)
- PD for all on use of AI to provide opportunities and information for teaching and learning (planning for 2020-2021 at DYHS)
- Technologies and procedures to prevent student access to inappropriate materials (planning for 2020-2021 at DYHS)

The AI course at Dennis Yarmouth Regional High School



- The AI course at DYHS was offered first in 2018-2019 academic year – thanks to the innovative Global STEM teachers DY school/district leadership
- Successful implementation in collaboration with STEM professionals (IBM, Google/Verily, Dell/EMC Technologies; ATTIVIO), higher ed (MIT) and non-profit (Global STEM Center)
- In collaboration with DYHS global school partners in the Netherlands, Mexico and Ukraine



Finham Park Two in Coventry, Mid-Land, UK

Invitation: Global Stem @ ... X International schools in Chennai X Home X +

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Latest News

English Trip - Yr7 - Treasure Island
13 October 2016
[Click here for more ... Read More](#)

English Trip - Yr8 - A Christmas

Welcome to the website for Finham Park 2

Dear Parent/Carer,

Do you want to send your son or daughter to a school that:

- Aspires to be 'world class'?
- With the aim of achieving the highest possible qualifications?

USA-Netherlands Global STEM Classroom®



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Final assign... My Drive - G... Conceptual ... Conceptual ... ISTE 2015 - G... ISTE 2015.ppt... Instituto Neil... 4 Onderwijs... +

www.het4egymnasium.nl/home/onderwijs/ Google Bookmark

het 4e gymnasium

School Organisatie Onderwijs Schoolleven Praktisch

Home > Onderwijs

Onderwijs

Het 4e Gymnasium is een school die leerlingen wil uitdagen en stimuleren om hun talenten te ontwikkelen. We bieden een onderwijsprogramma met onder meer de vakken Grieks, Latijn, filosofie, sterrenkunde, drama en film. Dit programma combineren we met een breed aanbod aan excursies en meerdagse projecten, waarbij de opgedane kennis in praktijk wordt gebracht.

Snel naar

- > Aanmelden nieuwe leerlingen
- > Absentie en verlof
- > Inhaaluur
- > Bekijk al het nieuws

[Like 45](#)

[Volg ons op Facebook](#)

[Volg ons op Twitter](#)

Decanaat	Examenreglement
Krantenbank	Mediatheek
Mentoren	Overgangsnormen
Proefjeskist voor basisscholen	Profielkeuze
Projecten	Richtlijnen Bronvermelding
Rooster	Ruimte voor talent



USA - Ukraine Global STEM Classroom®



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www.ochag.kh.ua/galer/ Google Bookmark

Очаг ЧАСТНАЯ ГИМНАЗИЯ

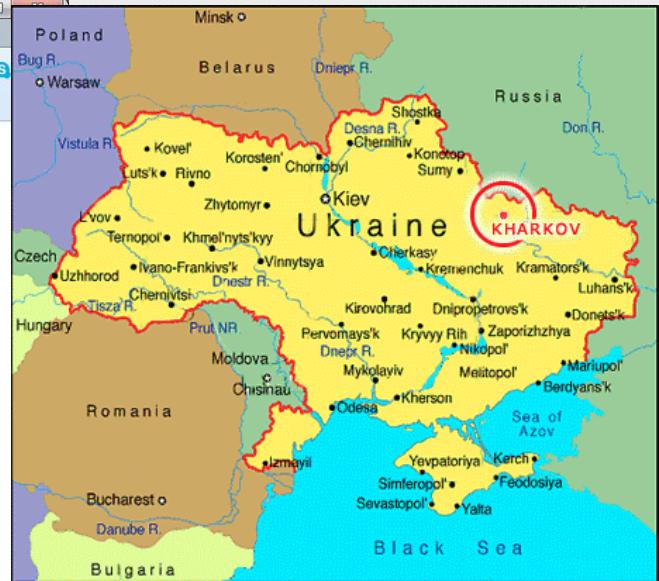
Главная О гимназии Условия поступления и обучения Статьи, публикации, материалы Очаг для меня Дистанционное обучение Фотогалерея Контакты

Галерея выпускников

Образование, создающее личность

Великолепный преподавательский состав, уникальные авторские учебные программы, внимательное и достойное отношение к каждому ученику.

Бот так всё начиналось



Pokrovsky Cathedral, Kharkov, Ukraine by Cartabrigensis (2007) https://www.flickr.com/photos/cartabrigensis/403362072/ Attribution (http://creativecommons.org/licenses/by/2.0) Photo Attribution by PhotosForClass.com

USA- UK Global STEM Classroom®



Inbox (27,435) - larisa.s... ISTE 2015 - Google Drive ISTE 2015.ppt - Google... http://www.school09.ru/ Finham Park School

www.finhampark.co.uk Google Bookmark

CLICK HERE FOR FINHAM PARK 2

FINHAM PARK SCHOOL A Mathematics & Computing College

WELCOME TO FINHAM PARK
A MESSAGE FROM OUR HEADTEACHER

HOME
KEY INFORMATION
PARENTS & STUDENTS >
STAFF >
ABOUT THE SCHOOL >
DEPARTMENTS >
SEN INFORMATION >
TRAINING SCHOOL >
FRIENDS OF FINHAM >
VACANCIES >
LETTINGS
SIXTH FORM
CONTACT US

Privacy settings

NEW YEAR 7 PARENTS' EVENING

Bring your smartphone or tablet to complete the mandatory online consent form on the evening of 1st July.
(Guest Wi-Fi will be made available)

Finham Park is a popular, successful and exciting secondary comprehensive school, located in the south-west of Coventry. The school became an 'Outstanding' convertor to Academy status in August 2011. Currently oversubscribed, the school attracts students from across the city.

We have an excellent academic track record. In 2014:

- 68% of our Year 11 students achieved 5 or more A*-C at GCSE including English Language & Mathematics.
- One third of Finham Park students achieved at least 3 A*/A grades and over one fifth achieved 5 or more A*/A grades at GCSE.
- Reflecting our specialism, over 60% students achieved 2 GCSE qualifications in Mathematics.
- Our A Level results are the highest in Coventry and well above national averages.
- 100% of those students who applied to University gained a place at a destination of their choice (over 80% first choice).

Standards are consistently above national averages - a credit to the students, their families

Future Foreign Trips
Click here to see a list of future foreign school trips with more information and estimated prices.

Key Dates for Year 10s
Download a copy of all the key dates for current Year

NEXT NOTICE ▾

PAY AN INVOICE **NOT PARENTS** **STUDENT EMAIL** **RADIO FPS**



USA- Arkhangelsk, Northern Russia

Global STEM Classroom®



Official site
Гимназии №3
г. Архангельска

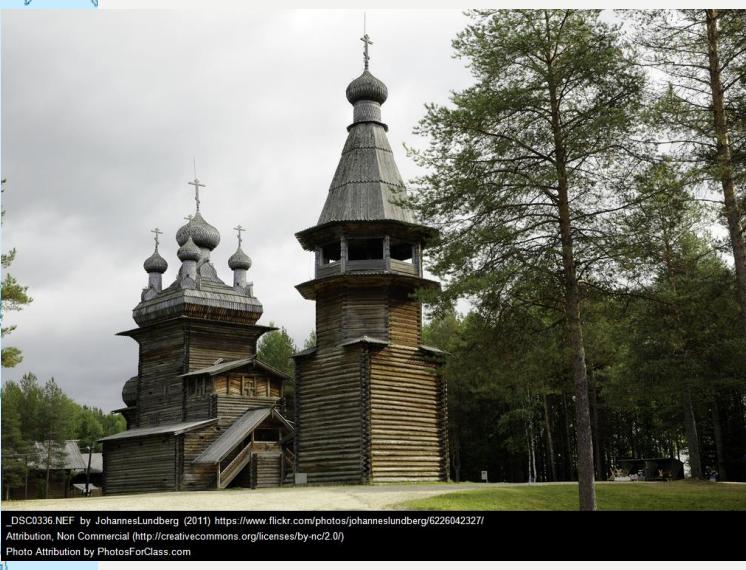
Главная Сведения о гимназии Фотоальбом Интернет-приёмная Контакты Страница директора

Главное меню

- Муниципальные услуги
- Научно-методическая работа
- Воспитательная работа
- Служба сопровождения
- Информация для учителей
- Информация для гимназистов
- Информация для родителей
- Приём в гимназию
- Библиотека
- Роснефть-класс
- Методическая копилка
- Выпускники гимназии
- Карта сайта



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USA-France Global STEM Classroom®



VIEW EDIT

FrontPage

last edited by Mrs Descroix 4 months ago

Page history

Global Technology and Engineering Consortium (GTEC) Program

USA - France Collaborative School Program

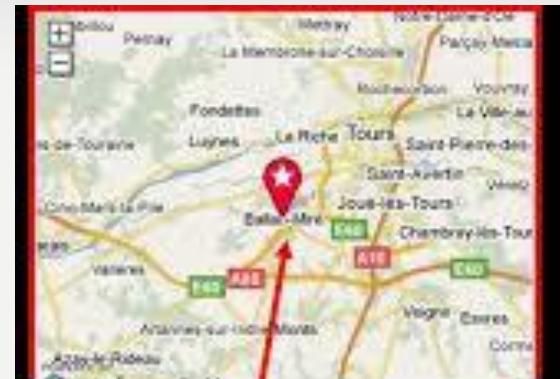


Dennis Yarmouth Regional High School, Cape Cod, Massachusetts



Collège René Cassin, Ballan-Miré France

Click on your team's link to go to the page for your communication and collaboration.



USA-Norway Global STEM Classroom®



Some note... Velkomm... My Drive ... Concept... Concept... ISTE 2015... ISTE 2015... http://...139.ru/ college re... +

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Skoleportalen It's learning Fag- og temabank

NORDAHL GRIEG VIDEREGLÆNDE SKOLE Skolen for dristige hjerner i samspill

nettstadsart | Større skrift HORDALAND FYLKESKOMMUNE

Informasjon om skolen Pedagogikk og saltingsområder Utdanningsprogram Knutepunktskole Biblioteket English avd. Sykehusskolen avd. Klokka

Du er her: Velkommen til Nordahl Grieg videregående skole

Hjertelig velkommen til
Nordahl Grieg videregående skoles

Avgangsfest
for vg3-elevene

Torsdag 18.juni 2015
kl 18:00-19:30
Sted: Skoletorget, NGV

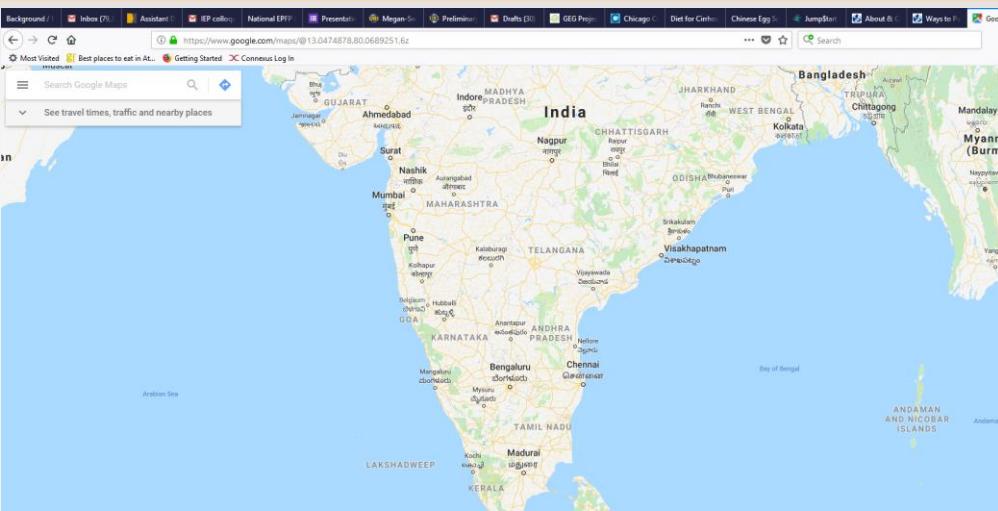
Program:
18:00-18:30 Jordbær, flygel og mingling
18:30-19:30 Offisiell avslutning

Elever, lærere og foresatte



Henningsvær, Lofoten, Norway by Martin de Lusenet (2014) https://www.flickr.com/photos/martindelusenet/13192000545/
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USA-India Global STEM Classroom®



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www.trileavesinternationalschool.com

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USA-Moscow, Russia Global STEM Classroom®



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www.sch2.ru

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Сайт лицея Адрес лицея Письмо в Лицей

Цена деления: 1 год

ВМШ при лицее

2

Ф М Ш

«Вторая школа» место, где учат и учатся

Официальный раздел Олимпиады и конференции После уроков Лицейский журнал Родительская страница Фонд друзей «Второй школы» Фотохроники Службы поддержки Физкультура и спорт Кафедра математики Психологическая служба

А дальше... Из истории «Второй школы» Доска медалистов 50-летие «Второй школы» 55-летие «Второй школы» Мы помогаем

Если еще не... Набор в лицей Как мы учим В помощь определяющимся Вечерняя школа (ВМШ) Кarta сайта Ссылки Проезд во «Вторую школу» Новости

Samsung IT School

IT ШКОЛА SAMSUNG

Samsung IT School - фактически единственная бесплатная школа программистов, **ориентированная на проектное (промышленное) программирование**. Самая удобно-расположенная московская площадка находится при Техническом образовательном центре Samsung (**Москва ТОЦ Samsung**). Подать заявку на обучение

Летняя ФМ школа

Уважаемые родители и второшкольники! Родительское собрание по [Летней физико-математической школе Л2Ш](#) пройдет 17 июня 2015 г. в 19:00 в актовом зале. Здесь [справка документов](#), необходимых для участия в выезде, и требования к их оформлению. Формы заявления, согласия, [медицинской справки № 159/у-02](#) также приложены. Убедительная просьба [заявление](#) и [согласие](#) принести на родительское собрание. Кроме того, необходимо до 17 июня заполнить анкету, пройдя по ссылке: <https://12sh.timepad.ru/event/216252/>. По всем вопросам обращайтесь:

- по тел.: 8-499-137-69-31
- по почте: camp@sch2.ru

Второшкольные новости

После уроков 11.06.2015 г.



USA-Mexico Global STEM Classroom®



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INSTITUTO
Neil Armstrong

Inicio Nuestro Instituto Niveles Académicos Espacios e Infraestructura Contacto

BIG THINGS
happen when you aim for the STARS

Videoconferencia con la Estación Espacial

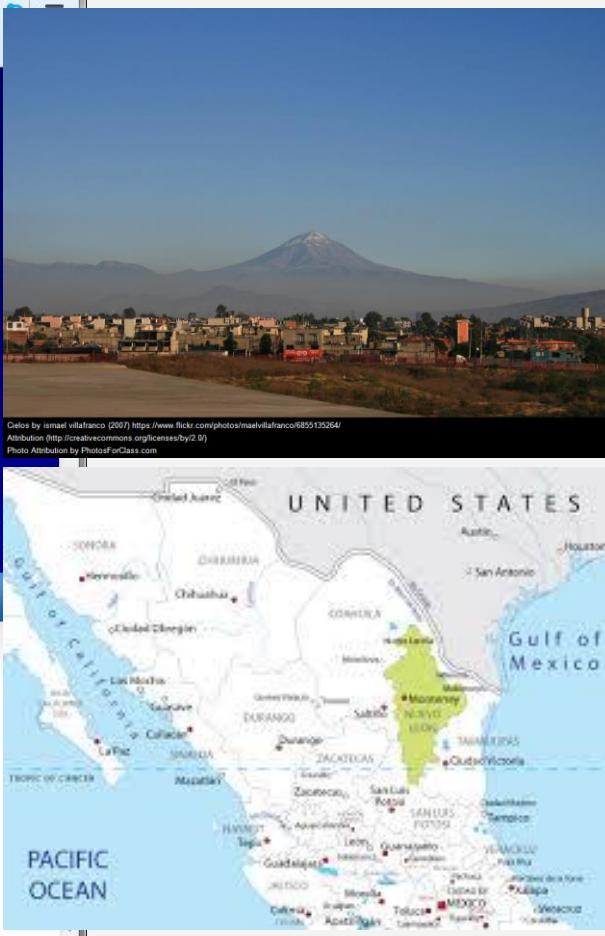
 

INA INSTITUTO NEIL ARMSTRONG MONTERREY, MEXICO

BIENVENIDOS

En nuestro instituto creemos firmemente que una **educación de excelencia** es la clave para llevar a tus hijos a grandes alturas.

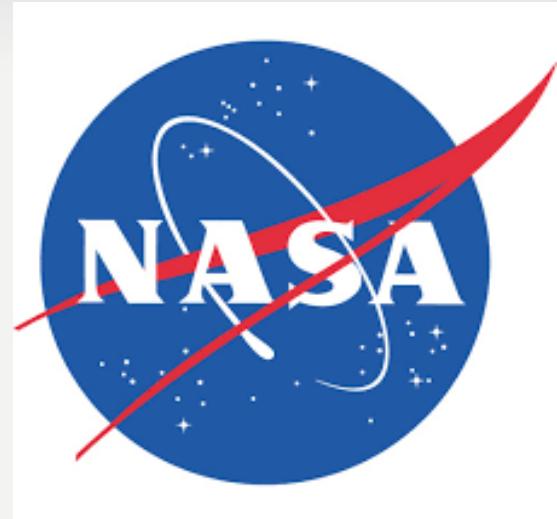
¡Hola! 



AI at NASA



- “AI for NASA Science Applications”
 - Areas: Heliophysics, Astrophysics,
 - Earth Science and Planetary Science
- “AI for NASA Engineering Applications”
 - Areas: Advanced Manufacturing, AI for
 - Integration & Testing (I&T), Corporate Knowledge Capture,
 - Organization and Retrieval, Model Based System Engineering (MBSE) and Mission Design
- “AI for Intelligent Mission Autonomy”
 - Areas: Spacecraft and Instrument Health Monitoring, Intelligent and Collaborative Constellations (ICC), Autonomous Mission Operations, Onboard Image Data Understanding (OB IDU)



AI in the Global STEM Classroom 2018-2019



- History of AI
- What is AI? Multiple projects focused on various sections
- Hands-on project(s)/activities
- Applications

Big data series:

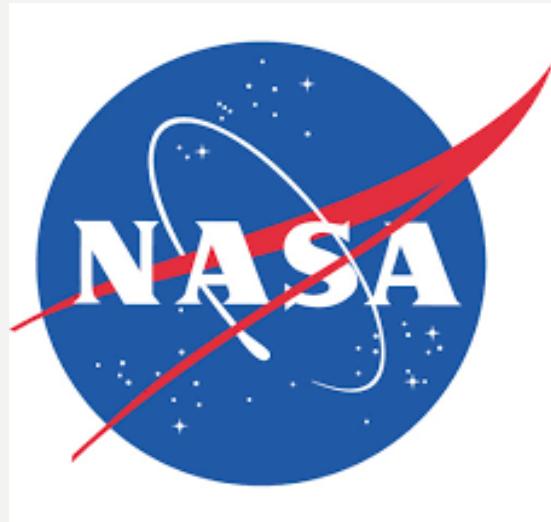
The Earth Systems

NASA's satellites studying the Earth systems

The Smart Buoy project

The Earth budget project

GRACE program (NASA GRACE Mission: The Gravity Recovery and Climate Experiment)



SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



17 PARTNERSHIPS FOR THE GOALS

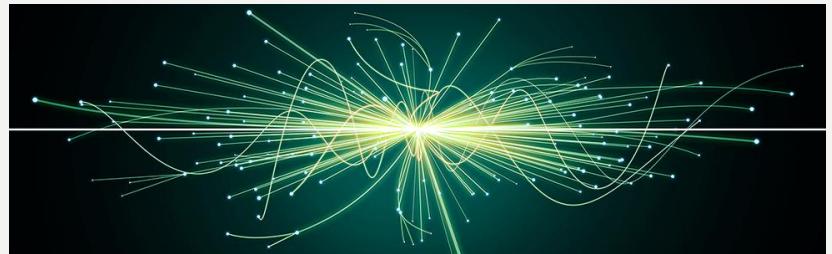


SUSTAINABLE
DEVELOPMENT
GOALS



US National Academy of Engineering Grand Challenges

- Advance Personalized Learning
- Make Solar Energy Economical
- Enhance Virtual Reality
- Reverse-Engineer the Brain
- Engineer Better Medicines
- Advance Health Informatics
- Restore and Improve Urban Infrastructure
- Secure Cyberspace
- Provide Access to Clean Water
- Provide Energy from Fusion
- Prevent Nuclear Terror
- Manage the Nitrogen Cycle
- Develop Carbon Sequestration Methods
- Engineer the Tools of Scientific Discovery



ALL OF THESE ARE GLOBAL PROBLEMS... WE CAN ONLY SOLVED THEM TOGETHER

* NAE Grand Challenges <http://www.engineeringchallenges.org/>



Global STEM Classroom® Projects examples:

- NASA Space Exploration projects (NASA GRACE Mission, NASA MARS Mission, NASA Astronomy & Virtual Observatory)
- NASA International Space Station (Electrical Wiring, Hydrology and Food Science)
- NASA Globe (Clean Air, Clean Water, NASA Data/Data Visualization; Atmosphere, Hydrosphere, Biosphere, Climate Change)
- My Blue Planet & Global Citizenship (Clean Water Projects, UN Sustainability Development Goals, Global Citizenship Project)
- Data visualization (based on IBM Data Visualization and based on NASA GRACE)
- Global Collaboration & Global Communication technology (comparative analysis)
- Wind turbine design and 3D printing
- Nanotechnology applications
- Minecraft (computer gaming) in studying science (Minecraft and Space Exploration; Minecraft and Arctic Research)
- Automotive Engineering projects
- Material Science projects
- Artificial Intelligence, BIG DATA, Data Science, Machine Learning

Global STEM Classroom® : Teacher Professional Development



- Global education and an innovation-driven global workforce of 21st century – what has changed; how it's affecting K-20 education and how these new challenges can be addressed
 - Global education in the environment simulating a real innovation-driven global workforce
 - Global achievement gap and skills needed for global workforce of 21st century
 - Global educational systems and collaborative curriculum development
 - “How-to guide” for K-12 educators developing projects and working collaboratively with STEM professionals
 - Foundations of “science diplomacy” and how to develop and maintain successful international relations with global partners
 - Global STEM Classroom® Model (all components) and the implementation approaches bringing all the “pieces of the puzzle” together and the next steps for a developing and implementing a (discipline specific/country specific) global education program in your school/college/university
 - Intercultural Computer-supported collaborative learning
 - Intercultural Communication and Global Competency
 - Global STEM Team-building (based on NASA 4D)
 - Innovative collaboration and communication technologies
-
- Global STEM Classroom® Larisa Schelkin 2008-2020 © All rights reserved

Global STEM Classroom®: skills



Bringing it all together:

- Global competencies
- Intercultural Communication
- Global Teamwork
- Working in Virtual Multicultural Multidisciplinary STEM Teams
- Using innovative technology for collaboration
- "Problem identification...";
- Critical thinking and problem solving;
- Communication and collaboration across networks and leading by influence;
- Agility and adaptability;
- Initiative and entrepreneurship;
- Accessing and analyzing information;
- Curiosity and imagination" (Tony Wagner)
- Financial, economic, business and entrepreneurial literacy
- Civic literacy
- Health literacy
- Environmental literacy
- Learning and Innovation Skills:
- Information, Media and Technology Skills:
- Life and Career Skills (P21)



Global Competence by PISA

PISA's definition of global competence

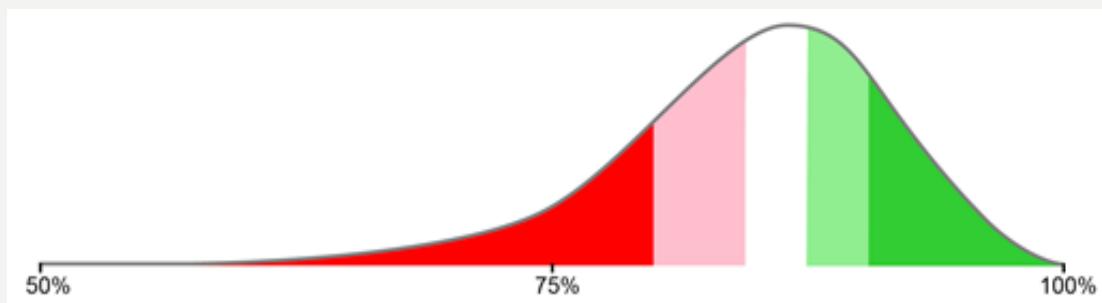
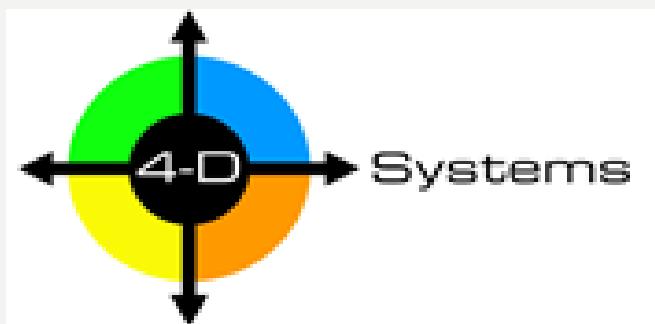
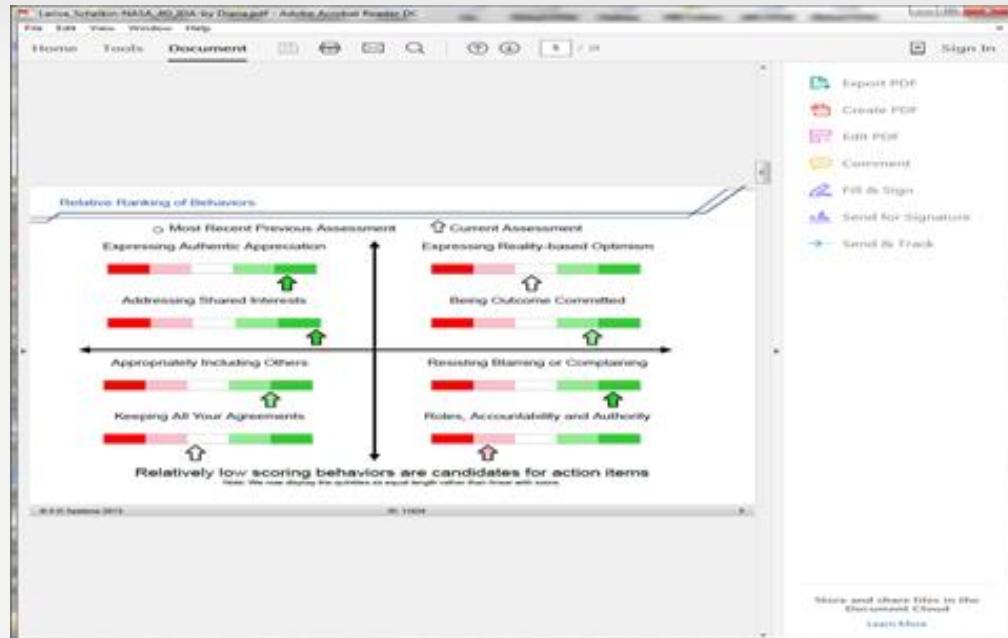
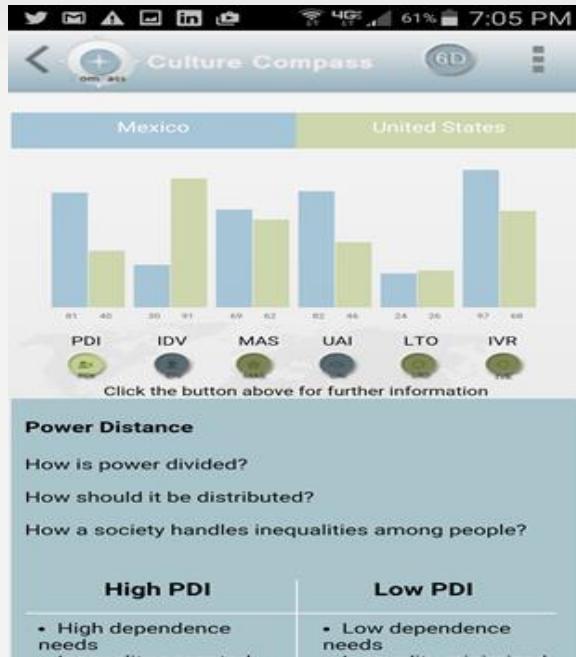


Knowledge of global issues and
intercultural issues

Content domains:

- Culture and intercultural relations
- Socio-economic development and interdependence
- Environmental sustainability

Global Competencies/Teamwork skills/Intercultural Communication



Human – AI Collaboration



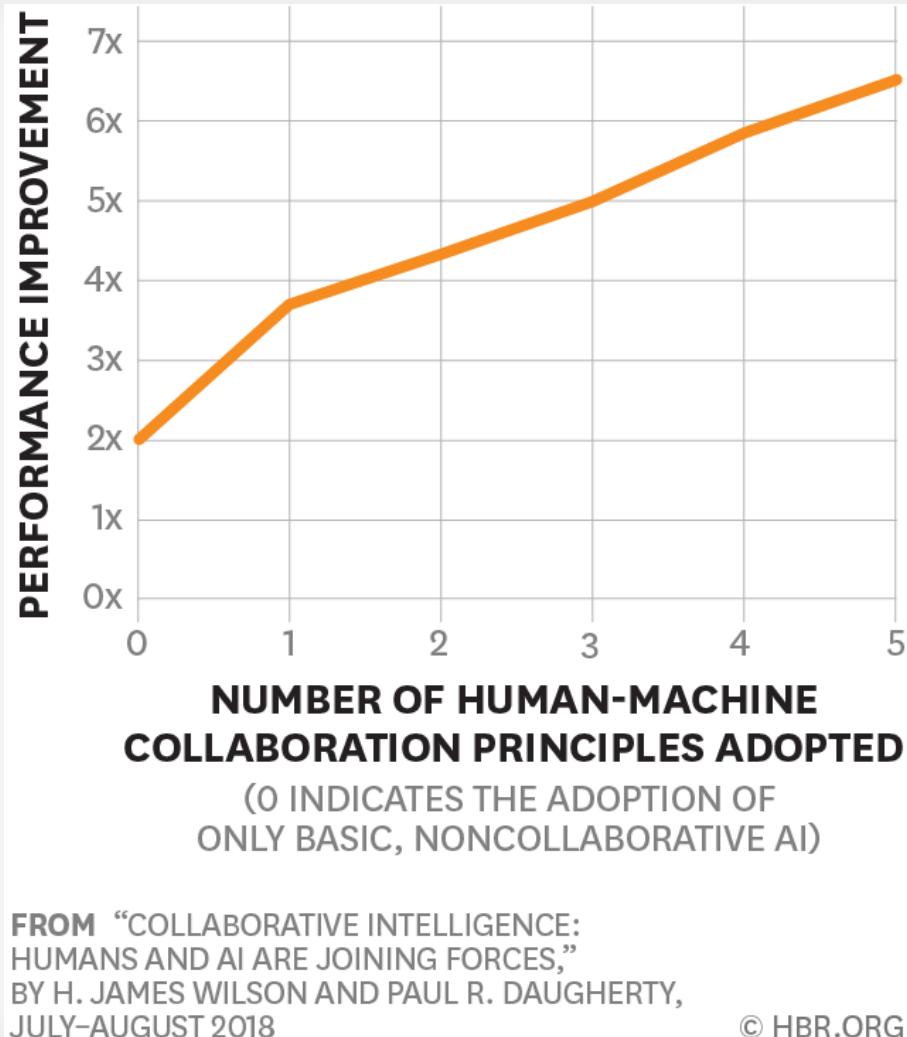
- “Through such collaborative intelligence, **humans** and **AI** actively enhance each other's complementary strengths: the leadership, **teamwork**, creativity, and social skills of the former, and the speed, scalability, and quantitative capabilities of the latter”.

“Collaborative Intelligence: Humans and AI are joining Forces” by H.James Wilson Paul R.Daugherty, 2018



Human – AI Collaboration

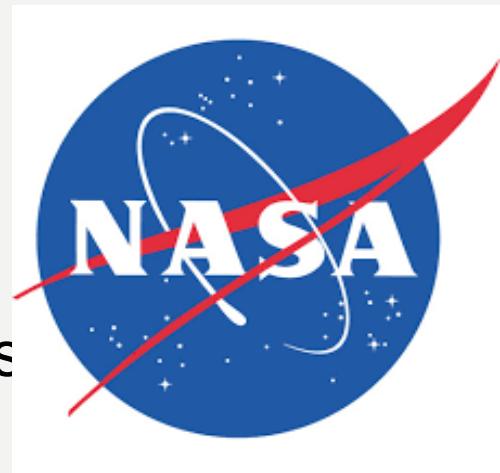
- Human –
AI Collaboration
“Collaborative
Intelligence: Humans
and AI are joining
Forces” by H.James Wilson
Paul R.Daugherty
2018



Teaming Intelligence



- “No AI is an Island: the case for teaming intelligence” – Matthew Johnson, Alonso Vera
- What Is Teaming Intelligence?
- The 4S Interdependence Framework for Understanding Teamwork
- Interdependence Framework for Understanding Teaming Intelligence
- The Risks of Ignoring Teaming
- *“While AI continues to demonstrate remarkable achievements, the future lies in its ability to work well with people”*



Diplomacy 4.0 and AI



- DIPLOMACY and Artificial Intelligence



Artificial Intelligence: IBM WATSON HEALTH



Cognitive Software Engineer
at IBM Watson Health



Via Global STEM Classroom with Dennis Yarmouth
Regional High School (US) with global school Partners:

- INA Neil Armstrong K-12 School, Mexico;
- Porta Mosana College, The Netherlands,
- K-12 School Angstrem, Kharkiv, Ukraine



BIG DATA: DELL EMC Technologies



Data Scientists on Big Data, Data Analytics

Via Global STEM Classroom with Dennis Yarmouth Regional High School (US) with global school partners:

- INA Neil Armstrong K-12 School, Mexico
- Porta Mosana College, The Netherlands
- K-12 School Angstrem, Kharkiv, Ukraine

Artificial Intelligence, BIG DATA: Google AI, MIT, Verily Life Science



Dr. Ned McCaugue

Artificial Intelligence, BIG DATA

Leveraging Big Data in Global Health

Via Global STEM Classroom with Dennis Yarmouth

Regional High School (US) with global school Partners:

- INA Neil Armstrong K-12 School, Mexico;
- Porta Mosana College, The Netherlands,
- K-12 School Angstrem, Kharkiv, Ukraine



**Massachusetts
Institute of
Technology**

verily

Google

Artificial Intelligence, Machine Learning: ATTIVIO



Dr. Raymond Lau Chief Architect ATTIVIO
Artificial Intelligence, Machine Learning

**Via Global STEM Classroom with Dennis Yarmouth
Regional High School (US) w/ global school Partners:**

- **INA Neil Armstrong K-12 School, Mexico;**
- **Porta Mosana College, The Netherlands,**
- **K-12 School Angstrem, Kharkiv, Ukraine**

Artificial Intelligence, Machine Learning: ATTIVIO



Dr. Rajiv Narula, Director of Software Engineering
Artificial Intelligence, Machine Learning

**Via Global STEM Classroom with Dennis Yarmouth
Regional High School (US) with global school Partners:**

- **INA Neil Armstrong K-12 School, Mexico;**
- **Porta Mosana College, The Netherlands,**
- **K-12 School Angstrem, Kharkiv, Ukraine**

ATTIV/O®

Artificial Intelligence, Machine Learning, Big Data - from STEM professionals to the classroom – THANK You!



- "A BIG THANK YOU to Ray and to Attivio for an amazing presentation and for sharing a unique experience! The kids were at AWE with the presentation and your success story as they told me at the end of the class. It is a great role model for the students. We are wishing you the biggest success in your future work in this cutting-edge field. We hope to see you again in our Global STEM Classroom and we are interested to learn about your new successes in the future. Thank you!"
- -Julia Sigalovsky, Ph.D. , Teacher: Chemistry, AP Chemistry, Physics, AP Physics, Global STEM Program, Dennis-Yarmouth Regional High School
- "Thank you Ray for sharing your valuable time and expertise with our Global STEM Classroom! You did a remarkable job in explaining and sharing concepts that require a deep understanding and experience in a simple, relatable way for the kids. I'm grateful for it and we'd love to hear from you and Attivio again in our projects. It does make a difference, especially when the students are learning from such passionate professionals like you! THANK YOU!! Best regards from Mexico"
- -Ing. Raziel Cázares Rangel, Director de Tecnología Educativa, Instituto Neil Armstrong, San Nicolas de los Garza, Mexico
- <https://www.attivio.com/blog/post/attivio-talks-stem-education-students-about-ai>

Where are we going next



- We are planning on building on the first year AI course successful implementation, expanding it, and continuing our collaboration in the 2019-2020 academic year.
- We are also planning on conducting a formal study in collaboration with Dr. Russell Faux, Davis Square Research Associates (DSRA). The previous study was undertaken by Dr. Faux and published by ASEE International Forum (Popov, V., & Schelkin, L. K., & Faux, R. (2016, June), Preparing globally competent and competitive STEM workforce of the 21st century in the Global STEM Classroom® Paper presented at 2016 ASEE International Forum, New Orleans, Louisiana).
- We are planning: (A) to conduct a new study and to compare findings (of a new research that is specifically targeting the AI in the Global STEM Classroom®) with the findings in a previous study and (B) to answer the following research question:
- What are the attitudinal effects of participation in the AI high school course at the Global STEM Classroom® program - in terms of (I) student's motivation for participation in AI global collaborative learning, levels of engagement, and interest in continuing to participate in similar AI project-based learning? (II) In term of the teacher's motivation for participation in global collaborative teaching the AI course.
Based on our experience in 2018-2020, we are also interested in studying the benefits of AI collaborative teaching and learning to both K-12 educators and students



We are also planning on:

- PD workshop for Global STEM teachers from US and 12 countries (AI/Machine Learning/BIG Data/Global Collaboration/Human Factor and AI/ Teaming Intelligence/Diplomacy 4.0/SDGs/)
- In collaboration with
- K-12 schools in MA
- Tufts Fletcher School of Diplomacy
- MIT
- Olin College of Engineering
- Boston University
- NASA Globe
- Looking for sponsors (SMILE!)

Global STEM Classroom® program students at MA STEM Summit with Governor Baker and Congressman Kennedy



Opportunities to present at Global STEM Education Annual Symposium at Harvard University



**Global STEM teams presented at 25 State, National
and International Conferences;
Participated in 25 field trips including NASA HQ & Capitol Hill in Washington, DC**



Global STEM Education Center, Inc

www.globalstemcenter.org



The screenshot shows the website's header with a navigation bar including Home, About, Our Team, Programs, School Enrollment, Information, Donate, and Contact. Below the header is a large photo of a group of students holding certificates. To the left of the main content area is a sidebar with social media sharing icons for Twitter, Google+, Facebook, and Print.

The Global STEM Education Center

Home About Our Team Programs School Enrollment Information Donate Contact

Welcome to 21st Century Education

Join us in our journey to provide Global STEM (Science, Technology, Engineering and Mathematics) 21st century Education and to increase participation in STEM disciplines by all students to meet the needs of an innovation-driven



- Certificates of Completion (students)
- Certificates for Global Educator's Leadership (teachers)
- Teacher Professional Development
- Teachers & students presenting at many Conferences in the USA and virtually worldwide
- Possible exchange visits: Finham Park School (UK) visited MA and Washington, DC in 2013

Many great “lessons learned”!



- Relationship building takes time and efforts - it's greatly REWARDING and EXCITING!
- Finding PASSIONATE TEACHERS and COMMITTED SCHOOL LEADERSHIP is a “MUST”
- Great results require a lot of hard work and preparation
- It's difficult (if not impossible!) doing it alone - running global programs/projects is a team-effort - BUILD YOUR TEAM (with your IT Directors, Technology Integration Specialists, Curriculum Developers, IT technicians, Foreign Language and all STEM Teachers, parents and, of course - with your students!)
- A special word about wonderful parents - their enthusiastic support is priceless!

...and more on “Lessons learned”



- Studying cultural differences is a “must”- there are no “surprises” here - it really makes a difference in how educators from different countries are working together
- Language “barrier” is not a real barrier - it’s manageable
- Students are much more “adaptable” and often “leading” the process
- *Schools leadership/administration around the world are ready/supportive of global collaboration moving from “WHY?” to “WHAT?” and “HOW”*
- A special word (again!) about the importance of teacher preparation - intercultural communication, global competence, global team-work, global education systems, collaborative curriculum and instructional design, collaboration technology and STEM diplomacy - all are a “must”
- Logistics - challenging, time consuming - but manageable
- and it’s all VERY REWARDING!!

Looking ahead!



- We are expanding our global collaboration with schools in different countries including Ireland, Iceland, Canada, China, India, Singapore, Australia and etc.
- We would like to collaborate with innovative educators and schools devoted to Global STEM – science, technology, engineering and math and to intercultural communication and global team-work
- For all future school-partners: it is important to have your school's leadership commitment and support; students and teachers' interest in Global STEM and parent's permission for student's participation
- Reliability, responsibility, passion for global collaboration in education are the important factors for a successful partnership



THANK YOU!

THANK YOU!

@GlobalSTEMClass