

Global STEM Classroom™ - 21st Century Skills, Technology and beyond11

ISTE 2015

**Larisa K. Schelkin
Isa K. Zimmerman
Antonio Pagán**

**info@globalstemcenter.org
www.globalstemcenter.org**



The 21st Century Global Workforce



***“..The 21st-century workforce is global, highly connected, technology-savvy, and demanding. Its employees are youthful, ambitious, and filled with passion and purpose, awakening to a new world after the great global recession**

- The world is much more global and interdependent**
- Mobile, social, and cloud computing continue to explode**
- Demographic shifts are creating a diverse, multigenerational workforce**
- Global social, political, and regulatory shifts are changing the focus of business**

The 21st Century Global 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
- Corporate learning redefined - prepare for a revolution
- These changes in the workforce and workplace are significant, disruptive, and here today..”

The 21st-century workforce is GLOBAL

**“Global Human Capital Trends 2014 engaging the 21st-century workforce”*
A report by Deloitte Consulting LLP and Bersin by Deloitte

US National Academies Grand Challenges* and why all educators need to know about it



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



The unique features and components:

- **Students engage in STEM project/-problem-based (both research and action-oriented) 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 2009-2015 © All rights reserved***

****Global STEM Classroom™***



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**

Global STEM Classroom™ Project 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)**
- **My Blue Planet & Global Citizenship (Clean Water Projects, Sustainability Projects, Global Citizenship Project)**
- **Data visualization (based on IBM Data Visualization and based on NASA GRACE)**
- **Global Collaboration & Global Communication technology (comparative analysis)**
- **Global STEM Classroom™ Larisa Schelkin 2009-2015 © All rights reserved**

Global STEM Classroom™ Project EXAMPLES



- **Wind turbine design and 3D printing**
- **Nanotechnology applications**
- **Minecraft (computer gaming) in studying science (Minecraft and Space Exploration; Minecraft and Arctic Research)**
- **Minecraft (computer gaming) in studying science (Minecraft and Space Exploration; Minecraft and Arctic Research)**
- **Automotive Engineering projects**
- **Material Science projects**

Global STEM Classroom™ - Technology



.....Communication technology

.....Collaboration technology

....STEM professional technology

Remember - technology is an excellent tool, but it's just a tool..don't start planning your program from technology, start from what you would like to teach and then find the right tools (technology) that would help you accomplish your goals!

Global STEM Classroom™ : Teacher Professional Development



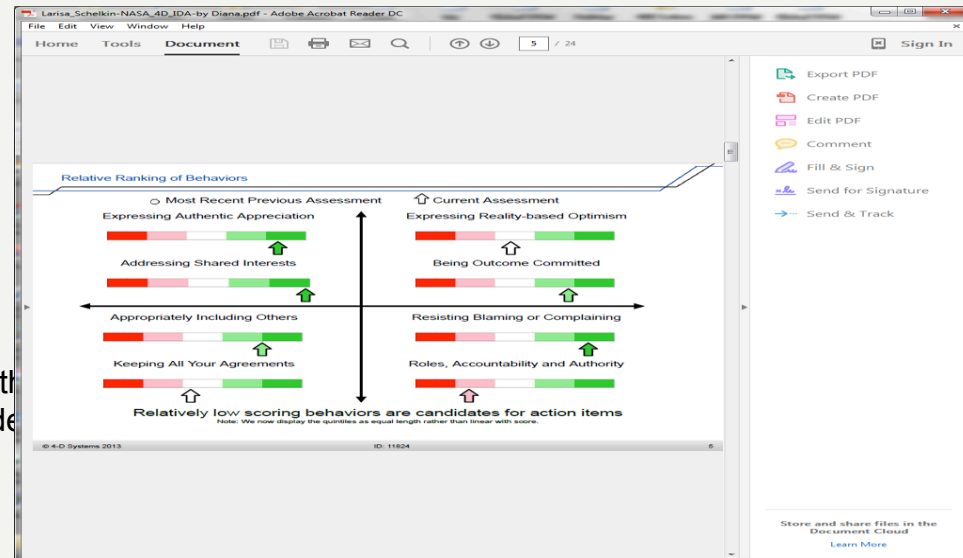
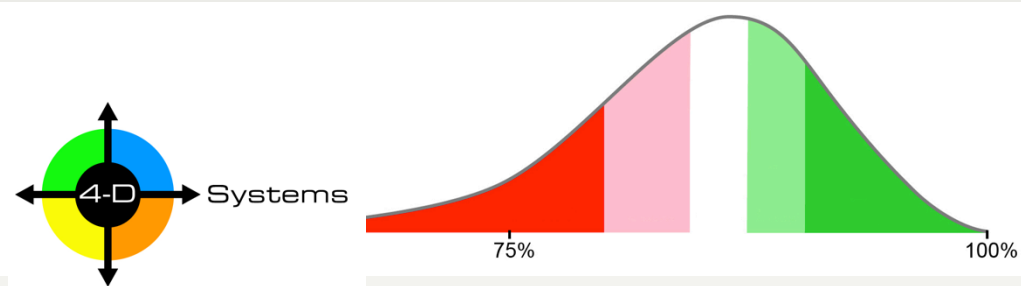
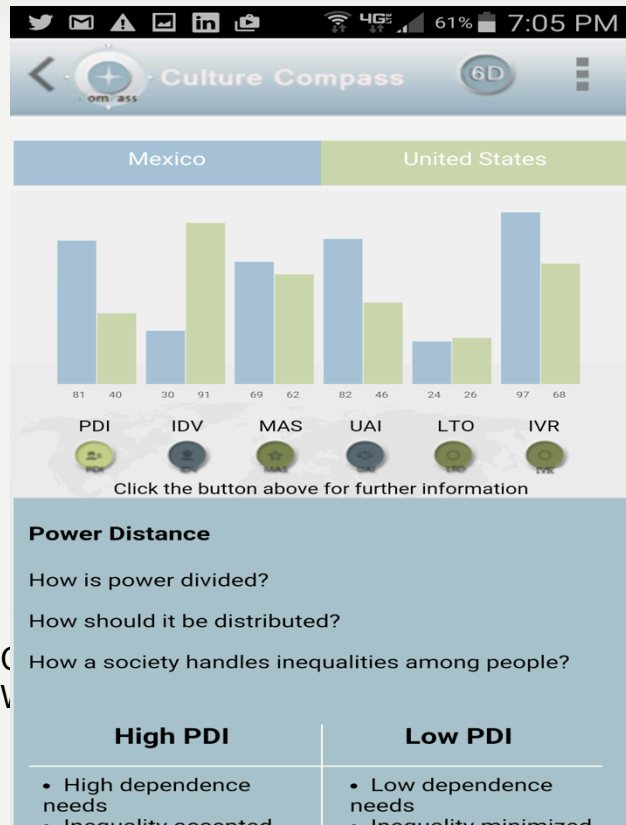
- Global education and an innovation-driven global workforce of 21st century – what has changed; how it's affecting K-20 education and how these new challenges can be addressed
- Global education in the environment simulating a real innovation-driven global workforce
- Global achievement gap and skills 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™: Teacher Professional Development

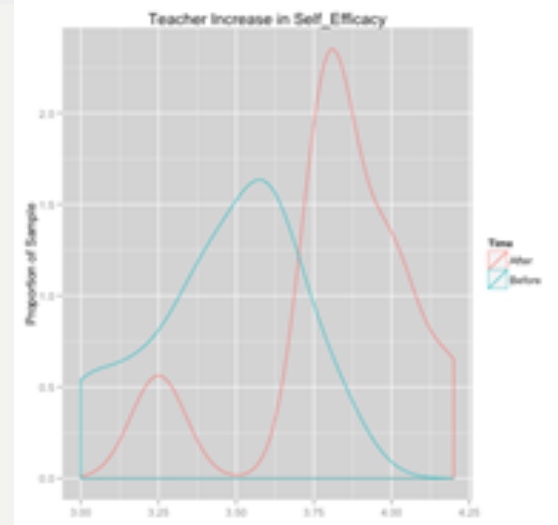
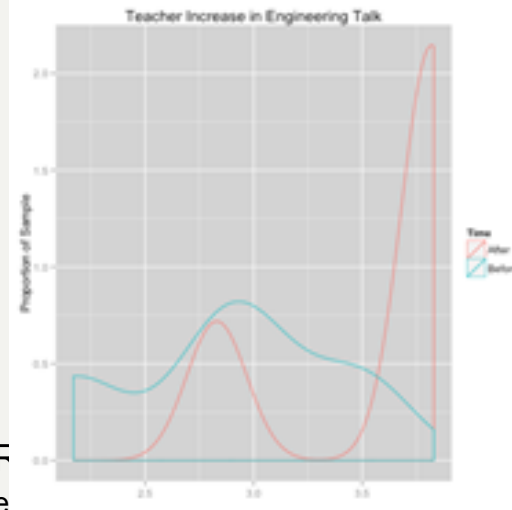
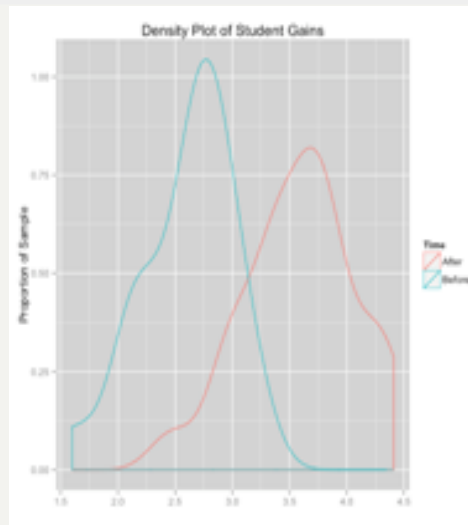


- **Global STEM Classroom™ Model (all components) and the implementation approaches bring all the “pieces of the puzzle” together and the next steps for a developing and implementing a (discipline specific/country specific) global education program in your school/college/university**
- **Intercultural Computer-supported collaborative learning**
- **Intercultural Communication and Global Competency (including the assessment - IDI, IDP)**
- **Global STEM Team-building (based on NASA 4D) (including the assessment - IDA, TDA)**
- **Innovative collaboration and communication technologies**

Evaluating intercultural communication, global competencies & global team-work



Some interesting findings (quotes for presentation)
from a preliminary research by Dr. Russell Faux, DSR



Global STEM Classroom™: skills

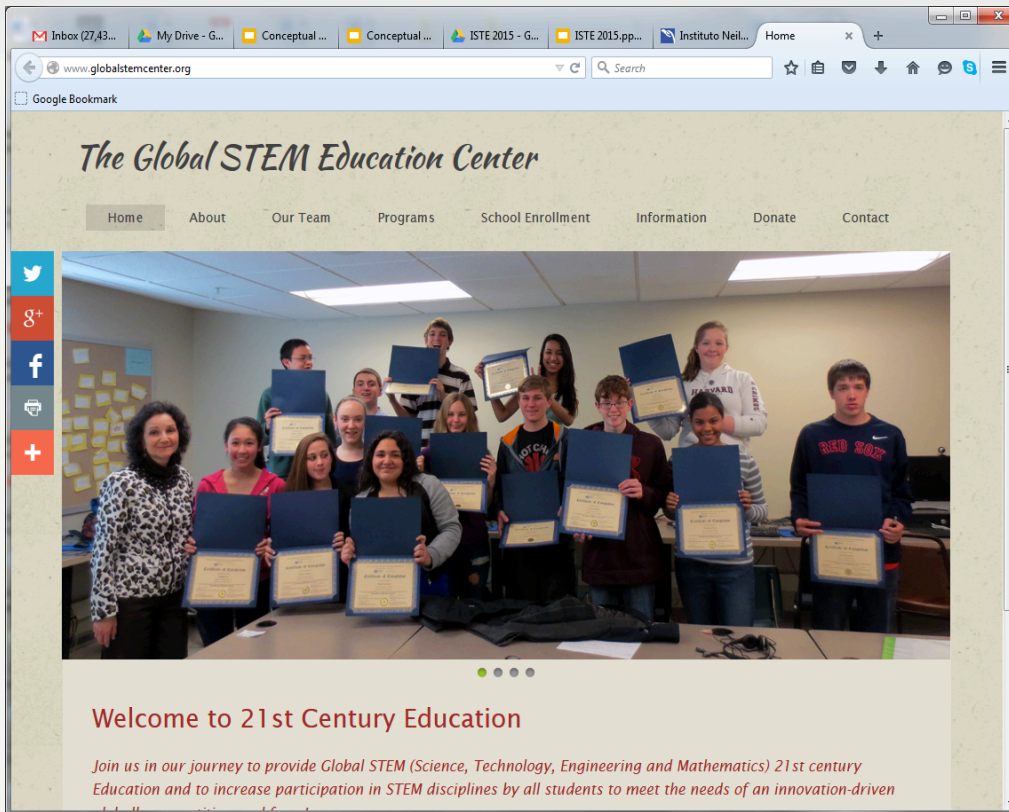


Bringing it all together:

- "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)
-
- Content Knowledge and 21st Century Themes
 - Global awareness
 - Financial, economic, business and entrepreneurial literacy
 - Civic, Health and Environmental literacies
 - Learning and Innovation Skills
 - Information, Media and Technology Skills
 - Life and Career Skills (Framework for 21st Century Learning)

Global STEM Education Center, Inc

www.globalstemcenter.org



Global STEM Classroom™ in Massachusetts public schools



www.dy-regional.k12.ma.us/dennis-yarmouth-regional-high-school

DENNIS-YARMOUTH REGIONAL HIGH SCHOOL
Pursuing Excellence, Demonstrating Character

BEST HIGH SCHOOLS
A WORLD REPORT
USNews
SILVER
2015

Welcome
The mission of Dennis-Yarmouth Regional High School is to prepare our students intellectually, physically, and socially for their roles as educated and responsible citizens.

www.valleytech.k12.ma.us/SkillsUSA/Home.htm

BLACKSTONE VALLEY REGIONAL VOCATIONAL TECHNICAL HIGH SCHOOL
65 Pleasant Street Upton, MA 01568 (508)529-7768

BVT SkillsUSA

SkillsUSA
Champions at Work



USA- UK Global STEM Classroom™



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Address bar: www.finhampark.co.uk

Google Bookmark

CLICK HERE FOR FINHAM PARK 2

FINHAM PARK SCHOOL
A Mathematics & Computing College

Log in to INSIGHT Parental Portal Online Services

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

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

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



USA-France Global STEM Classroom™





VIEW EDIT

☆ FrontPage

last edited by Mrs Desroix 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.

Team 1 : Ian, Joshua, Pierre-Louis, Quentin Si, Dylan	Team 2 : Emma, Juliana, Quentin Sz, Nattan, Eliso	Team 3 : John, Makenzie, Nicolas, Dmitri, Matthieu	Team 4 : Virginia, Paula, Marion, Pauline, Céline
Team 5 : Maxime, Shane, Ilona, Maëva	Team 6 : Lauren, Molly, Marie, Solenn	Team 7 : Philson, Olivia, Théo, Hugo	

[Pictures of our video-con](#)

We were in the local new



France



USA-Moscow, Russia Global STEM Classroom™



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Google Bookmark

Сайт второшкольников

Цена деления: 1 год

ВМШ при лицее

12 11 10 9 8 7 6 5 4 3 2 1

Физтех, МГУ...

Линейка качественного образования

«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 \(ВМШ\)](#)
[Карта сайта](#)
[Ссылки](#)
[Проезд во «Вторую школу»](#)
[Новости](#)

Сamsung IT School

Samsung IT School - фактически единственная бесплатная школа программистов, ориентированная на проектное (промышленное) программирование - проводит набор учащихся на новый учебный год. 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 список 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://l2sh.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-Norway Global STEM Classroom™



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Google Bookmark

Skoleportalen | It's learning | Fag- og temabank

Nettstadkart | Større skrift

NORDAHL GRIEG VIDEREgåENDE SKOLE
Skolen for dristige hjerner i samspill

Informasjon om skolen | Pedagogikk og satsingsområder | Utdanningsprogram | Knutepunktskole | Biblioteket | English | avd. Sykehusskolen | avd. Klokkarlia

Du er her: Velkommen til Nordahl Grieg videregående skole

**Hjertelig velkommen til
Nordahl Grieg videregående skoles
Avgangsfest
for vg3-elevne**

**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



USA - Ukraine Global STEM Classroom™



Some notes ... My Drive - G... Conceptual ... Conceptual ... ISTE 2015 - G... ISTE 2015.pp... http://w...ol39.ru/ Частная гим...

www.ochag.kh.ua/gallery/ Search

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ОЧАГ ЧАСТНА ГИМНАЗИЯ

Образование, создающее личность

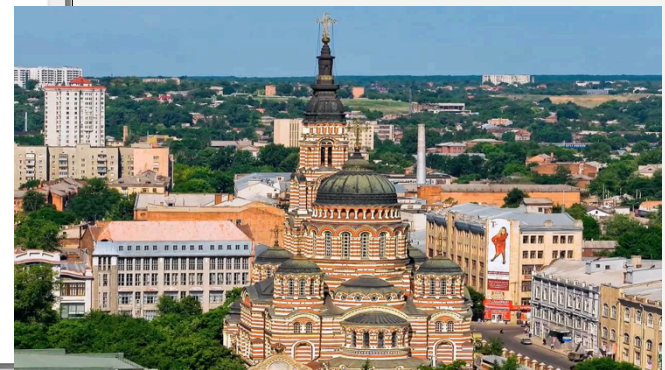
Великолепный преподавательский состав, уникальные авторские учебные программы, внимательное и достойное отношение к каждому ученику.

Главная

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

Галерея выпускников

Вот так всё начиналось



USA-Mexico Global STEM Classroom™



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ina.edu.mx Search

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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

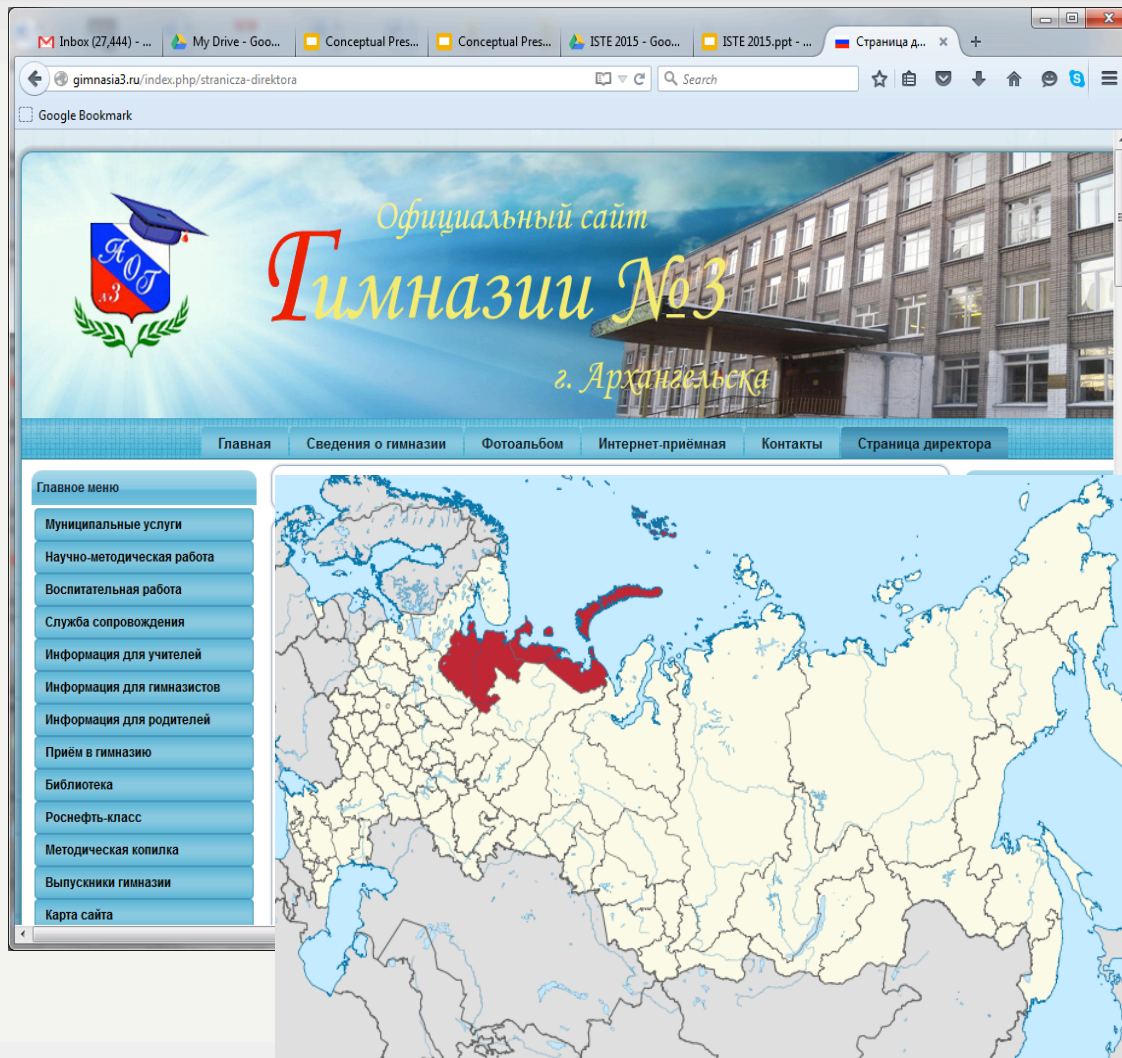
En nuestro instituto creemos firmemente que una **educación de excelencia** es la clave para llevar a tus hijos a grandes alturas.

iHola! blog



USA- Arkhangelsk, Northern Russia

Global STEM Classroom™



USA-Netherlands *Global STEM Classroom*™



Screenshot of the website www.het4egymnasium.nl/home/onderwijs/.


het 4^e gymnasium

020 584 90 10 Mail Contact Sitemap Zoek...

School Organisatie **Onderwijs** Schoolleven Praktisch

Home > Onderwijs

Onderwijs


 Het 4^e 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 meerdaagse 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



Global STEM Classroom™

Classroom Pairs to Date (2010 – 2015)



1,000 students, 100 educators, 45 technical collaborators
25 projects
8 countries

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 (Surprise/ smile!!)
- Don't underestimate the importance of teacher PD (prior, during and after)
- It's difficult (if not impossible!) to do 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 absolutely priceless!
- Be prepared for a great “flipping classroom” effect - your **STUDENTS** will **OWN** the **LEARNING!**

...and more about “Lessons learned”



- Studying cultural differences is a “must”- there are no “surprises” here - it really makes a difference in how educators from different countries work together
- Language “barrier” is not a real barrier - it’s manageable
- Students are much more “adaptable” and often “lead” the process
- School leaders/administrators 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 PD - intercultural communication, global competence, global team-work, global education systems, collaborative curriculum and instructional design, collaboration technology and...diplomacy - all are “must”
- Logistics - challenging, time consuming - but manageable
- and it’s all VERY REWARDING!!

Global STEM Ed Center

Getting the word out



- **Regional Round tables (Regis, Blackstone Valley)**
- **Meeting with higher education institutions and superintendent groups**
- **Annual Symposium at the Harvard Graduate School of Education**
- **Website**
- **Email announcements**

Global STEM Education Work To Be Done



- Organizing support campaigns
- Public Policy development
- Legislation
- Publication

What's next and how you can join?



Sign up for our contact list and we will send you the updates and the exciting news!

Looking for a school-partner and would like to participate in our programs? Let us know!

Not sure yet if you are ready to participate, but have questions and may be need a consultation?

We would like to hear from you!

www.globalstemcenter.org
info@globalstemcenter.org