A Pattern Language for the Design of the Learning Revolution Environments

THE IMMERSIVE LEARNINGSCAPE 2.0

A Pattern Language for the Design of the Learning Revolution Environments



Friday, September 6, 13

Learning Objectives

At the end of this program, participants will be able to:

- 1. Explore the 'Sign of the Times' in education that are leading us into the Learning Revolution.
- 2. Learn about key factors of the Learning Revolution
- 3. Understand A Pattern Language for creating Immersive Learning Environments
- 4. Case Studies:

Sarasota's TechActive Classroom of Tomorrow

The Immersive LearningScape







QUESTIONS

Is our current education making us competitive in the global marketplace?



QUESTIONS

What skills will be needed to excel as we further move into the 3rd millennium?

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8 JOBS THAT WILL EXIST IN THE FUTURE

- 1 Digital Death Manager ("Life-Logging" Expert)
- 2 Un-Schooling Counselor (Evolution of the Traditional School Counselor)
- 3 Armchair Explorer (Digital Travelers/Problem Solvers)
- 4 3-D Printing Handyman (Future Mr. Fix-it)
- 5 Microbial Balancer (Feng Shui of the Future)
- 6 Corporate Disorganizer (Masters of Organized Chaos)
- 7 Digital Detox Specialist (Fighting the Digital Overload)
- 8 The Urban Shepherd (Sustainable Infrastructure Maintainers)



QUESTIONS

What will their jobs be like?

"8 New Jobs People will Have in 2025" Fast Company

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10 JOBS THAT DID NOT EXIST 10 YEARS AGO

- App Developers (Creative Tech)
- Market research Data Miner (Library science Info gathering/summarizing)
- Millennial Generational Expert (Social Networks)
- Social Media Manager (Social Networks)
- Chief Listening Officer (Social Spy)
- 6 Cloud Computing Services (Data Storage and Sharing)
- Elder Care (Health and Communication Baby Boomers)
- 8 Sustainability Expert (Global Warming / Green Economy)
- User Experience Design (Right Brain thinking)
- Academic and Admissions Consultant (Education and Access)

#10 jobs that did not exist 10 years ago" FORBES MAGAZINE
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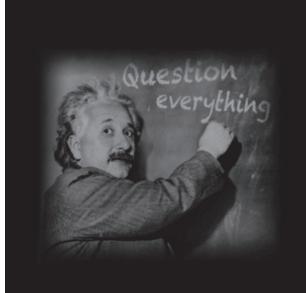
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QUESTIONS

As acquiring content becomes more automated, and teamwork across disciplines becomes critical to a creative, conceptual, and innovation society, what kinds of learning spaces promote trans-disciplinarily collaboration?



QUESTIONS

How do you create the ultimate inquisitive learning environment?





QUESTIONS

Why are we teaching in the same spaces as we did in the 19th Century?

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QUESTIONS Given the increasing introduction of technology in the classroom, what will be the role of the teacher?

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The Immersive LearningScape 1.0 Recap







Student Discontent

Changing Technology

3 Empowered Individuals







4 Teaching Dilemmas

6 A Customizable World

6 Global Equalization

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LEARNING OBJECTIVE #1 SIGN OF

As the world flattens, education will heighten.

THE TIMES

COUNTRIES ____ VS ____ **COUNTRIES**



19th 20th 21st

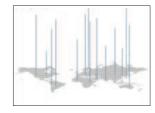
CORPORATIONS _____ VS _____ CORPORATIONS



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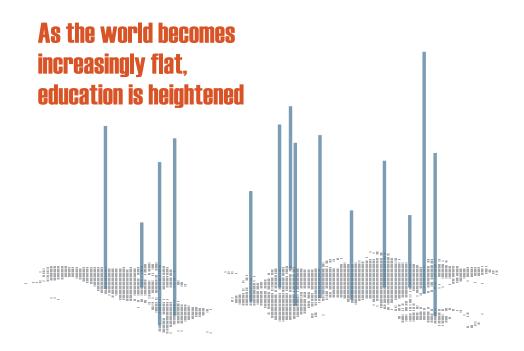
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INDIVIDUALS _____ VS _____ **INDIVIDUALS**



Friday, September 6, 13 Friday, September 6, 13 As the world becomes increasingly flat,





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COMPLEX
CHALLENGES

IN A

GLOBAL WORLD

Menters within An oil well

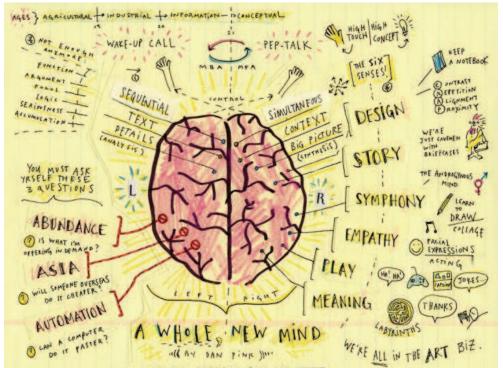
Menters within An



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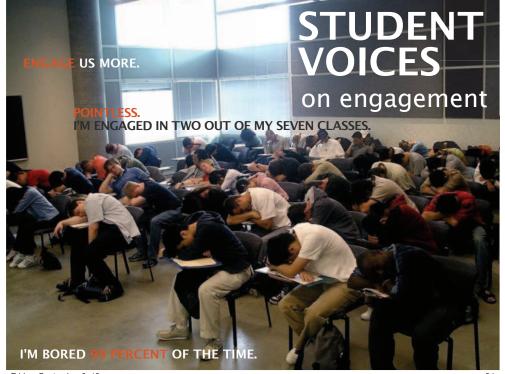








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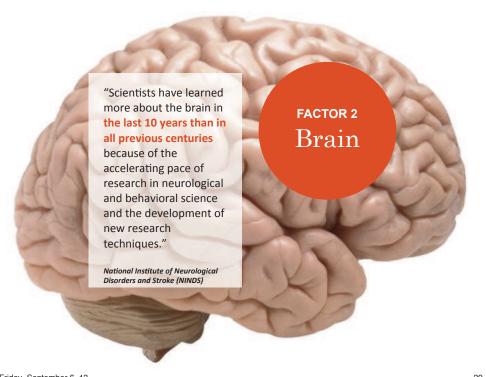
Overall, teachers ranked "Lack of motivation" as the #1 reason

The state of the s	TOTAL	ES	MS	HS
Lack of participation in CP	2%	2%	2%	3%
Poor reading and comm. skills	19%	20%	17%	15%
Lack of critical thinking skills	17%	18%	16%	17%
Lack of encouragement	27%	34%	22%	15%
Lack of motivation	34%	25%	43%	49%
Not sure	1%	1%	0%	1%

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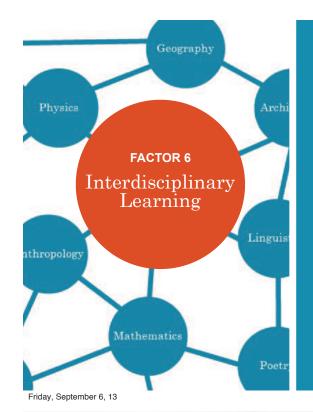


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20th Century

Linear Learning = 1 isolated discipline per hour

21st Century

Cross-Disciplinary Learning = Multiple disciplines simultaneously

learn here. apply there

FACTOR 7

Relevance





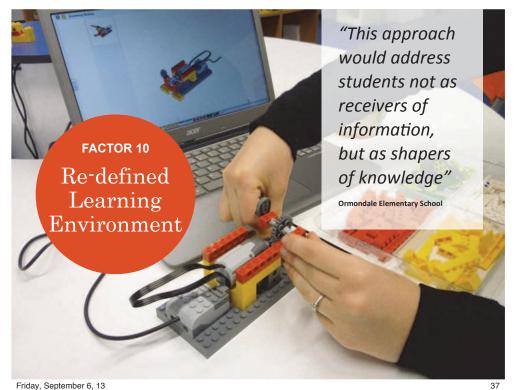
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Technology Blended Learning



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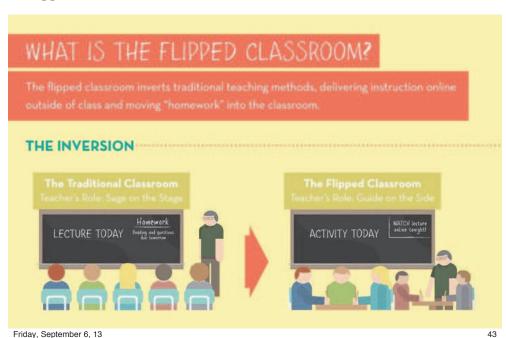
Technology

1-to-1 learning



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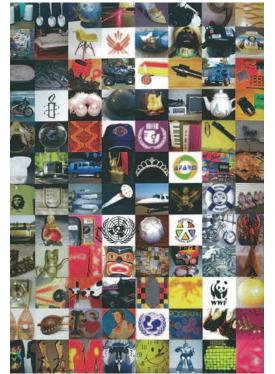
Technology Flipped Classroom



Technology Teacher 1-to-1 supervision



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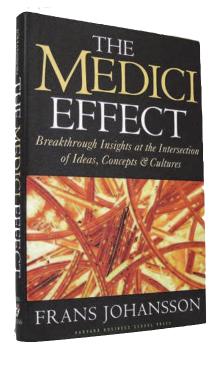
Technology
Prosumer =
Producing + Consumer

With the proliferation of digital networks the world over, the electronic marketplace has gone from empowering the consumer to supporting a global civic society. Power to the people.

SOURCE: The Third Wave, Alvin Toffler

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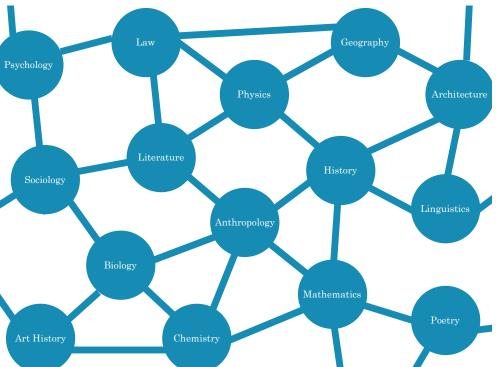




INTERSECTION AND INNOVATION

Diverse teams create far more ideas than homogenous teams

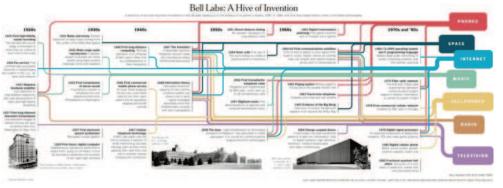
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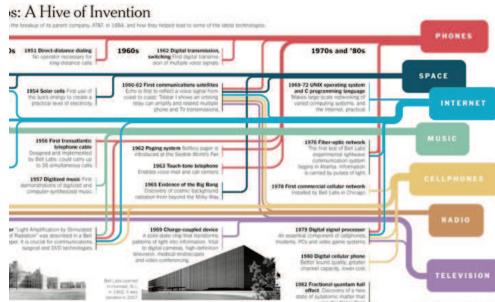




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LEFT AND CENTER PHOTOS COURTESY OF ALCATEL LICENT USA INC. AND THE ATAT ARCHIVES AND ISSTORY CENTER. RIGHT PHOTO 128A STOLLER/ESTO

BELL MARSH/THE NEW YORK TIMES

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$\begin{tabular}{ll} \textbf{Interdisciplinary thinking for solving challenges}\\ \textbf{Volvo and Locusts} \end{tabular}$





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Pattern 1: Sketch-Scape Sharing Knowledge



Pattern 2: Transparency Cross-Pollination of Ideas









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Pattern 4: Immersive-Scape
Relevance of Knowledge



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Pattern 3: Tinkering Space Creative Space



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Pattern 5: Unifying Space Collaboration



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Pattern 6: Play-Scape Fun-scape







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Pattern 7: Adaptability Flexibility









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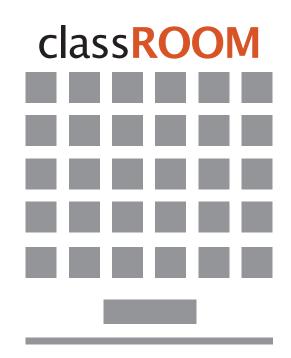
Pattern 8: Technology-infused Learning Active & Engaging Tools



methodologies of TEACHING vs. LEARNING

typologies of

Friday, September 6, 13 Friday, September 6, 13 methodologies of typologies of Vs. LEARNING



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typologies of **LEARNING – space**

typologies of LEARNING-SPACE

























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Think-Scape

A Space that Supports a "Thinking Curriculum"



A Space for Research





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Think-Scape

A Space for Contemplation



Think-Scape A Space for Assessment



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Think-Scape

A Space for Critical Thinking



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Think-Scape

A Space for Visual and Audio Recording



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Think-Scape

A Space for Individual Distance Learning

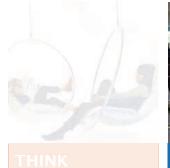


Create-Scape A Space for Teamwork



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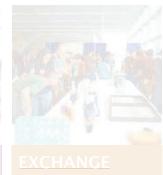




CREATE







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Create-Scape

A Space for Collaboration



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Create-Scape

A Space that Supports Communication



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Create-Scape A Space that Supports Cross-Cultural Distance Learning



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Create-Scape

A Space that Records Collaborative Ideas



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Create-Scape

A Space that Supports STEM & STEAM Education









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Create-Scape

typologies of

Case Study Sarasota's Classroom of Tomorrow

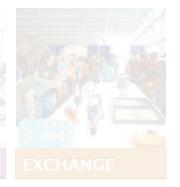


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Create-Scape

A Space that Supports Project-Based Learning



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Discover-Scape

A Space for Hands On Investigative Learning



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Discover-Scape

A Space for Tinkering



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Discover-Scape A Space for Failure



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Discover-Scape

A Space for Production



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Discover-Scape

A Space for Idea Application



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Discover-Scape

A Space for Specificity



Impart-Scape
A Space for Sharing

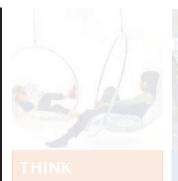


typologies of

LEARNING –

SPACE



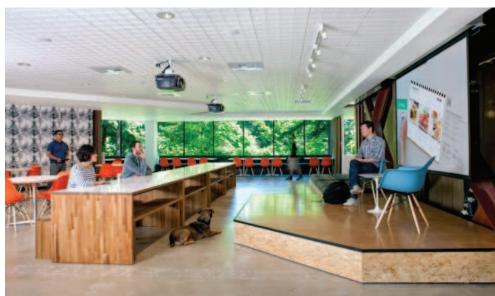






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Impart-Scape A Space for Teaching



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Impart-Scape

A Space for Distance Learning



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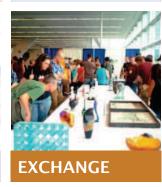
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typologies of LEARNINGSPACE









Exchange-Scape
A Space for Social Learning



Exchange-Scape

A Space for Co-Teaching



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Exchange-Scape

A Space for Informal Conversation



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Exchange-Scape

A Space for Interactions



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Exchange-Scape A Space for Serendipity



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A Space for Exhibiting



CASE STUDIES

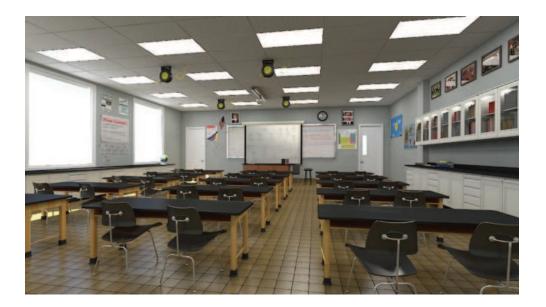
Sarasota's TechActive Classroom of Tomorrow
Re-Thinking the Knowledge Community

The String of the S

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Gulf Coast Community Foundation
Grant to support STEM teaching and learning



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The STEM Challenge

- How can middle schools deliver instruction to the current generation of digital learners that is in keeping with their incredible level of online connectivity?
- 2 How can classrooms be restructured to reflect the functional realities of the 21st century workplace?
- 4 How can math and science classes become a "magnet" for student learning?





Considerations we acknowledged...

- Students born into the digital age think and learn differently from any generation before them
- Students need 21st century learning skills for success in a global economy
- All learning is based in language

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Collaboration

Middle School Executive Director

Middle School Principals

Science Department Chairs

Science Teachers

Science Students

Prioritizing

- Lesson design and classroom space must allow for flexible interactions where teams of students can become **immersed** in **innovative approaches** to learning.
- Equipment must include state-of-the-art technology appropriate for collaborative learning opportunities where students can explore and manipulate, create, and interact in a multi-sensory manner.

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Student Input

The teacher's desk would be in the **back** of the

Have tables with built-in computers where you can keep & store assessments / papers.

Have a mini-Activboard at every table. Sometimes **learning from kids** is easier than learning from adults. Just **reading** about doing things isn't the same as doing it.

Student Input

The chairs should be **comfy** and have padding.

The **teacher** wouldn't be in the front of the classroom.

I would like colorful desks big enough for 4 students. I would like the class to be a **hands-on** style.

I think it would be cool to have an **electronic** device built into the desks for each

Circular tables that seat 4 - 6 students.

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student.

Process

Collaboration of a small team committed to realizing the vision of middle school STEM learning spaces:

Director of Construction

Director of Facilities

Director of Technology

Executive Director of Middle Schools

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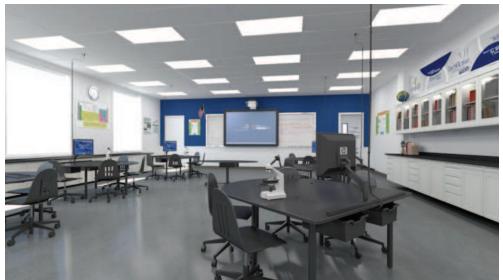
STEMGroup Table Testing



STEM
Group Table Mock-up



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Key Instructional Components

- Latest teaching methods
- State-of-the-art instructional technology
- 3 Student teams learn together over time
- 4 Lab environments specifically designed to involve students in meaningful and engaging inquiry through rigorous, collaborative tasks

Annual Teacher Agreement

Acknowledging willingness to participate in the TechActive Classroom of Tomorrow teacher cohort, per the responsibilities for:

- Using the customized resources
- 2 Implementing inquirybased learning
- 3 Engaging in teacher collaboration
- Integrating learning from professional development



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STEM

Teacher Professional Development



STEMBranding Outside



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STEMBranding Inside



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STEM 'Rolly Chairs'





STEMCustom Tables



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STEM
Cutting Edge Technology



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STEM Advanced Software



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STEM Teacher Coach



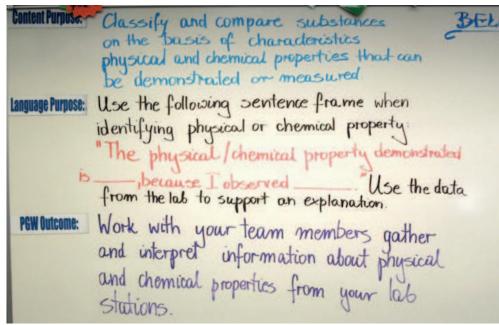
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Student Teams



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STEM Daily Learning Purpose

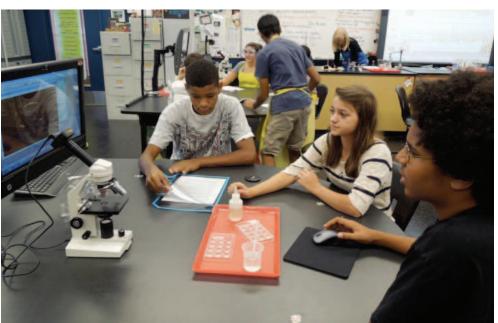


STEM Interactive Learning



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STEM Flexible Space

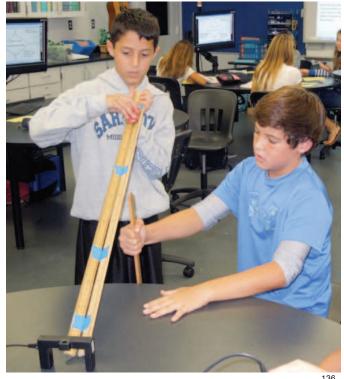


STEM Engaging Tasks



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STEM Movement



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STEM
Communication Outside of Classroom



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Outcomes
Inspiring Deep Thinking



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Outcomes
Inspiring Curiosity



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Outcomes
Inspiring a Love of Learning



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Classroom Structural Renovation

\$10,000 per classroom

- 1 Electric and data to six student tables

 Ceiling tile that allows flexibility
- 2 Electric box attached to table
- 3 Removal of teacher demonstration in front of room
- 4 New flooring
 Rubber in science classes; carpet in math classes
- Paint in "branding" colors
- Door wrap to identify classes
- 16' decal on wall about initiative

TechActive Classroom Budget

Item	Unit Cost	# Needed	Total
Student tables	\$800.00	6	\$4,800.00
Student chairs with wheels	\$65.00	24	\$1,560.00
Touchscreen computers	\$1460.00	6	\$8,760.00
Teacher slate computer	\$750.00	1	\$750.00
Teacher table with wheels	\$1,200.00	1	\$1,200.00
TI handhelds	\$6,200.00	1 set	\$6,200.00
Probes	\$1,730.00	1 set	\$1,730.00
Digital Microscope/Camera (grade 6 – 7 science only)	\$215.00	7	\$1,505.00
Total Grades 6 – 7 Science			\$26,505.00
Total Math and Grade 8 Science			\$25,000.00

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Professional Development

Format	Cost	Teacher's Time	Total
Attending workshops for learning Lesson design, Discovery/Inquiry (+ substitute teacher cost)	\$130.00 / day	3 days	\$390.00
Lesson Study cycle Collaborative lesson planning Collaboratively observing lesson Reflection	~ \$30.00 / hour	20 hours	\$600.00
Collaborative lesson design by course Planning Productive Group Work discovery learning experiences during the summer	~ \$30.00 / hour	22.5 hours	\$675.00
TI workshops • Learning to use the handhelds (+ substitute teacher cost)	\$130.00 / day	6 days	\$780.00
Total Per Teacher For Professional Development			\$2,445
TI trainer workshops / In-class coaching			

Project Managers

- Technology
- Construction and Renovation
- Purchasing and Warranty

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EVALUATION RESULTS: YEAR 1

Teachers report ...

- Increased use of inquiry-based practices
- Inquiry approaches deepen student understanding, improve problem solving, and communication skills
- Inquiry practices increase student motivation
- They've never worked so hard and had so much fun!

EVALUATION RESULTS: YEAR 1

Students report ...

- More collaborative learning in classes
- Increase in team activities and experiments
- Increased interest in science
- Enjoying STEM learning

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EVALUATION RESULTS: YEAR 1

FCAT Science Results

- 19 Grade 8 TechActive Science teachers taught students who participated in the Grade 8 Science FCAT in 2012-2013.
- In more than half of these classes, over 90% of the students demonstrated proficiency on the Grade 8 Science FCAT as compared to an average of 59% for the District and 47% statewide.
- In four of these classrooms, 100% of the students demonstrated proficiency.

EVALUATION RESULTS: YEAR 1

FCAT Mathematics Results

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- In SY 2012-2013, 68 percent of all middle school students were proficient in mathematics while 91 percent of middle school students in TechActive classrooms were proficient in mathematics.
- In half of the TechActive classes, 100 percent of the students were proficient on the FCAT in SY 2012-2013.

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EVALUATION RESULTS: YEAR 1

FCAT Algebra Results

- 10 Algebra teachers instructed within TechActive Classrooms
- In 9 out of the 10 TechActive Algebra classrooms, 100 percent of the students were proficient and passed the Algebra EOC in 2012-2013 as compared to a District average of 73% and a statewide average of 64%.

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CASE STUDY 2

Re-thinking the knowledge community

IMMERSIVE - MEDIUM SCALE - LOW IMPACT - APPLICABILITY TO ALL SCHOOLS



Click for the Classroom of Tomorrow video

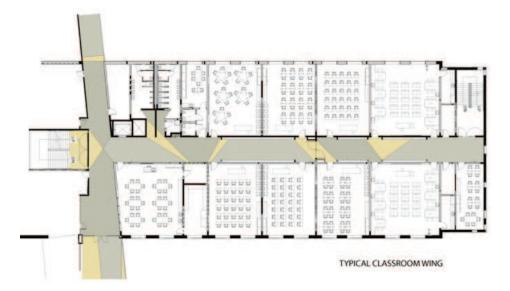
PILOT MOUNTAIN MIDDLE SCHOOL, Pilot Mountain, NC





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Integrated Curriculum Model

ITEEA Recommendations



INTERNATIONAL TECHNOLOGY AND ENGINEERING EDUCATORS ASSOCIATION

"The current mainstream school facility models restrict the teaching of science, math, technology and engineering subjects to individual rooms designed around isolated topics/disciplines.

The National Governors Association report—"Innovation America: Building a Science, Technology, Engineering and Math Agenda", pg. 8 further describes it. "The existing core curriculum, which is divided into silos and focuses on traditional math and science, is often criticized as being irrelevant and boring to today's students.

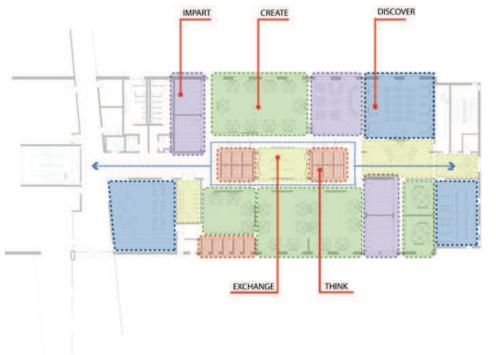
Studies report that the interest levels of American students, especially girls, in science begin to drop around middle school. As factors in turning off high numbers of students to STEM disciplines and professions, researchers point to the artificial separation in the curriculum of natural phenomenon into subjects, the focus on natural sciences and lack of attention to the human-made world of engineering and technology, and the disconnect of coursework from the lives of students."

ITEEA (International Technology and Engineering Educators Association) report, a May 3, 2011





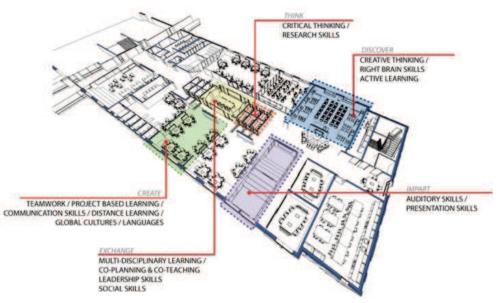
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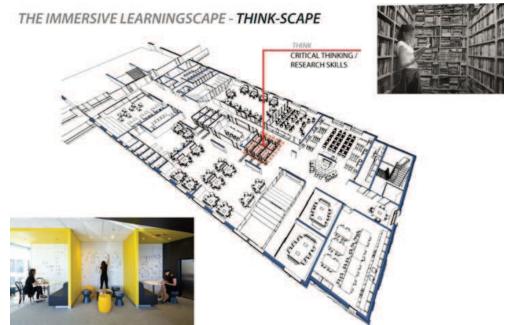




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21st CENTURY SKILLS IN THE IMMERSIVE LEARNINGSCAPE





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Think-Scape



Think-Scape



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Create-Scape



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Create-Scape



Create-Scape



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Discover-Scape



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Discover-Scape

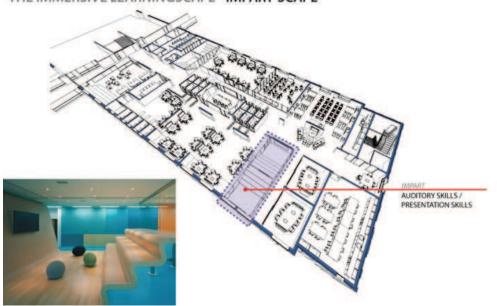


Discover-Scape



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THE IMMERSIVE LEARNINGSCAPE - IMPART-SCAPE



Impart-Scape



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Impart-Scape



Impart-Scape



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THE IMMERSIVE LEARNINGSCAPE - EXCHANGE-SCAPE



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Exchange-Scape



Exchange-Scape



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Exchange-Scape



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Exchange-Scape

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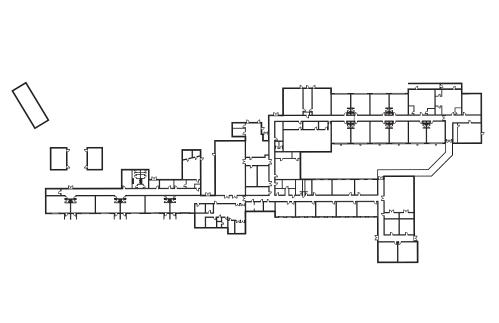


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Invest Collegiate Charter School, Charlotte, NC



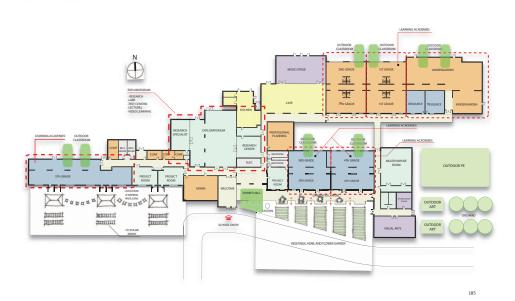
Oakdale Elementary School, Rock Hill, SC



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Oakdale Elementary School, Rock Hill, SC

OAKDALE ELEMENTARY SCHOOL



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Fulton County Middle School Prototype, Atlanta, Ga New Prototype



Fulton County Middle School Prototype, Atlanta, Ga Existing Prototype



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Fulton County Middle School Prototype, Atlanta, Ga Multi-media



Fulton County Middle School Prototype, Atlanta, Ga Neighborhood

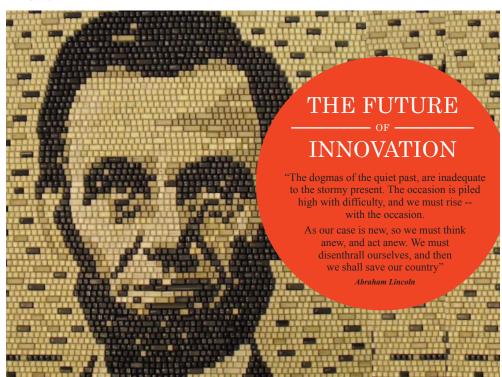


Click here for the Immersive LearningScape video

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