Wireless EdTech
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Track 3: Education (Hashtag: #edtechE1)

Moderator:
Leslie Wilson, Chief Executive Officer, *One-to-One* Institute

Panelists:
Darryl LaGace, Chief Information and Technology Officer, San Diego Unified School District
Jere Confrey, The Joseph D. Moore Distinguished Professor of Mathematics Education, North Carolina State University
Bernie Dodge, Professor of Educational Technology, San Diego State University

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i21 Interactive Classroom & LOGO

Darryl LaGace
Chief Information Technology Officer
San Diego Unified School District

Transformation of the learning environment

Quality technology-based teaching and learning tools

Shift in the model for delivering instruction

Engaging, student-centered classrooms

Equitable learning opportunities for all students

Allow all students to become expert learners

i21 goals

US Department of Ed. Technology Goals

District 2020 Vision

Goals for Students Achievement GSA2

Board Goals

LEA Plans Component

i21 initiative aligns with…

English Language Arts 2.3.1
Math 2.3.2
Science 2.3.3
Social Studies 2.3.4
Student will communicate in at least two languages 2.4
Student explore, understand, and value fine arts 2.5

Students will effectively use technology to access, communicate, and apply knowledge and to foster creativity 2.6

Goals for Student Achievement


NETS
Digital
Thinking
Collaboration
Information
Communication
Making
Fluency
Technology
Innovation
Solving
Citizenship
Research
Operations
Creativity
for
Students
Decision
Problem
Critical

Promethean boards installed 2548

Teacher tablets distributed 2,838

Student Netbooks distributed 78,857

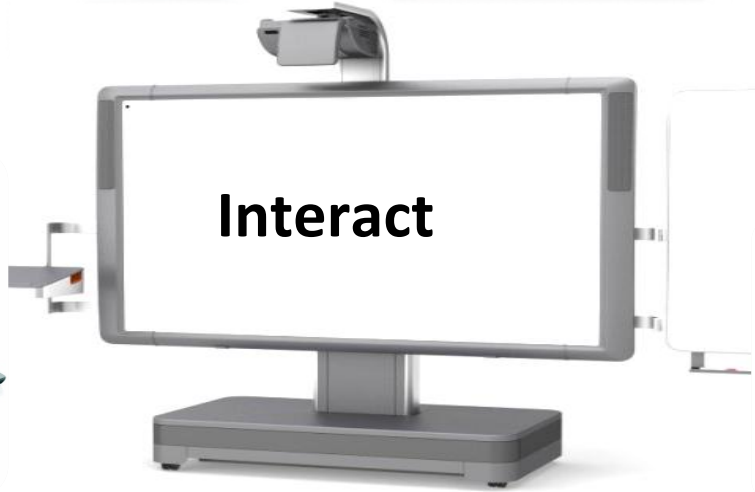
Grade level rollout:

- **2009 3rd, 6th, HS Math**
- **2010 4th, 7th, HS Language Arts**
- **2011 5th, 8th , HS History-Social Studi**

43.6% of core classrooms converted to *smart rooms*

Hear

Compute



Interact

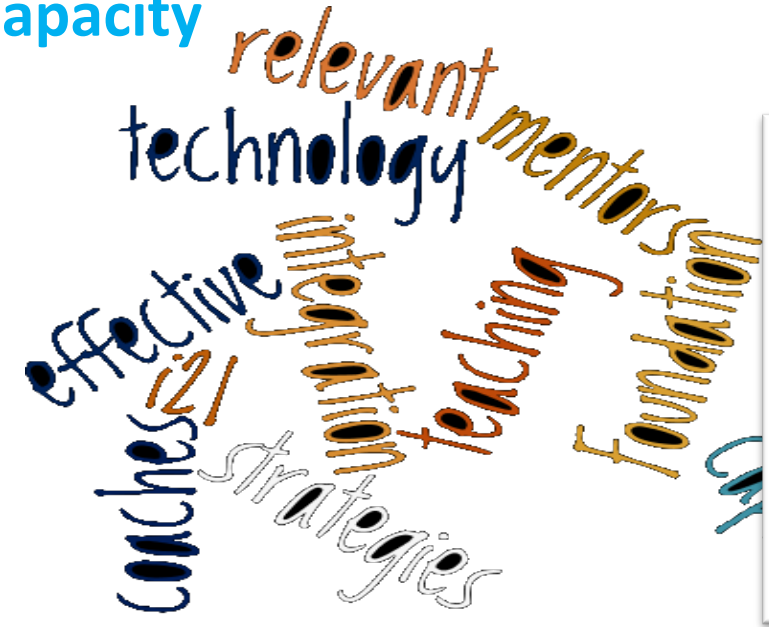
Print

i21 interactive classroom equipment

BUILDING CAPACITY

Ongoing training and support

Key teachers who are academic leaders at their individual schools will serve as i21 Digital Teacher Leaders to build site capacity



i21 digital teacher leaders

Learning-on-the-Go (LOGO)
Taking i21 to the Next Level

Pilot program funded by the FCC to support off-campus wireless Internet connectivity for mobile learning devices

Connects students to the Internet anytime, anywhere to increase access to digital textbooks, cutting-edge interactive learning tools and other innovative wireless technologies

Builds on the ubiquitous i21 infrastructure and interactive classroom

What is Learning-on-the-Go?

- 3200 Students
- Netbooks with 3G & 4G
- 6th grade at 8 Schools
- 7th and 8th at Innovation MS
- 6th, 7th and 8th at MTM

Learning-on-the-Go

Reflects a **shift in the FCC's rules** for e-Rate and internet access

Approximately **38% of our students** do not have Internet or computer access

Closes the digital divide and allows the Teacher to truly move to a **digital delivery model**

Significance of Learning-on-the-Go

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Learning Progress Profiles: Just-in-Time Diagnostic Information for Teachers, Students, and Parents

Jere Confrey

Joseph D. Moore Distinguished University Professor of Mathematics Education
Friday Institute for Educational Innovation
College of Education
North Carolina State University

We gratefully acknowledge support for this work from:
The National Science Foundation (DRL 0733272)
The Qualcomm Corporation
The Pearson Foundation

LPPSync Project

Learning Progress Profiles Synchronized for Networked Mobile Devices

Jere Confrey, Principal Investigator

Alan Maloney (NCSU), Co-Principal Investigator

Kenny Nguyen (NCSU), Research Associate
Drew Corley (NCSU), Graduate Research Assistant
Nadia Monrose and Zuhal Yilmaz (NCSU) Graduate Research Assistants
Ko-Sze Lee (NCSU), Research Associate
Shirley Varela (NCSU), Project Manager

Andre Rupp (U. Maryland), Measurement Consultant
Software Engineers: Role Model Software
Austin Programming Solutions
William Penuel (SRI), Evaluator

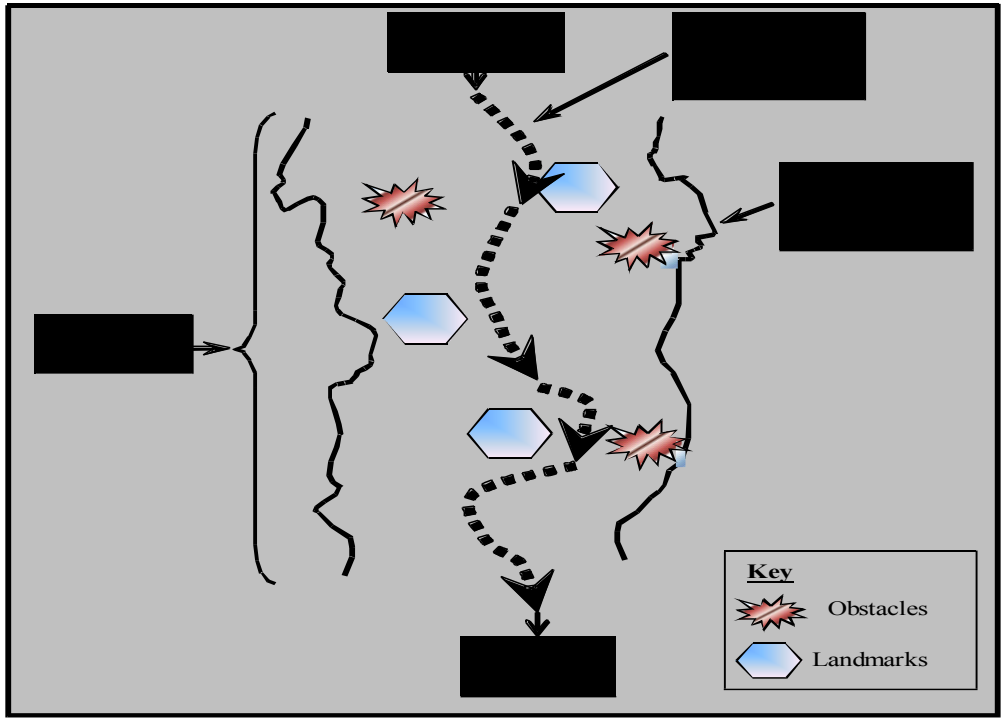
Schools and Outreach Centers:

Al-Iman School, Raleigh NC
Centennial Campus Magnet Middle School (Wake County Public Schools)
Forest View Elementary (Durham Public Schools)
Neighbor-to-Neighbor, Raleigh, NC

Goals--

- **Build Diagnostics Based on Empirically-verified Learning Trajectories**
- **Design and Implement an Interactive Diagnostic Assessment System**
- **Support Engaged and Interactive Guided-classroom Instruction**

Learning Trajectory, within a Conceptual Corridor



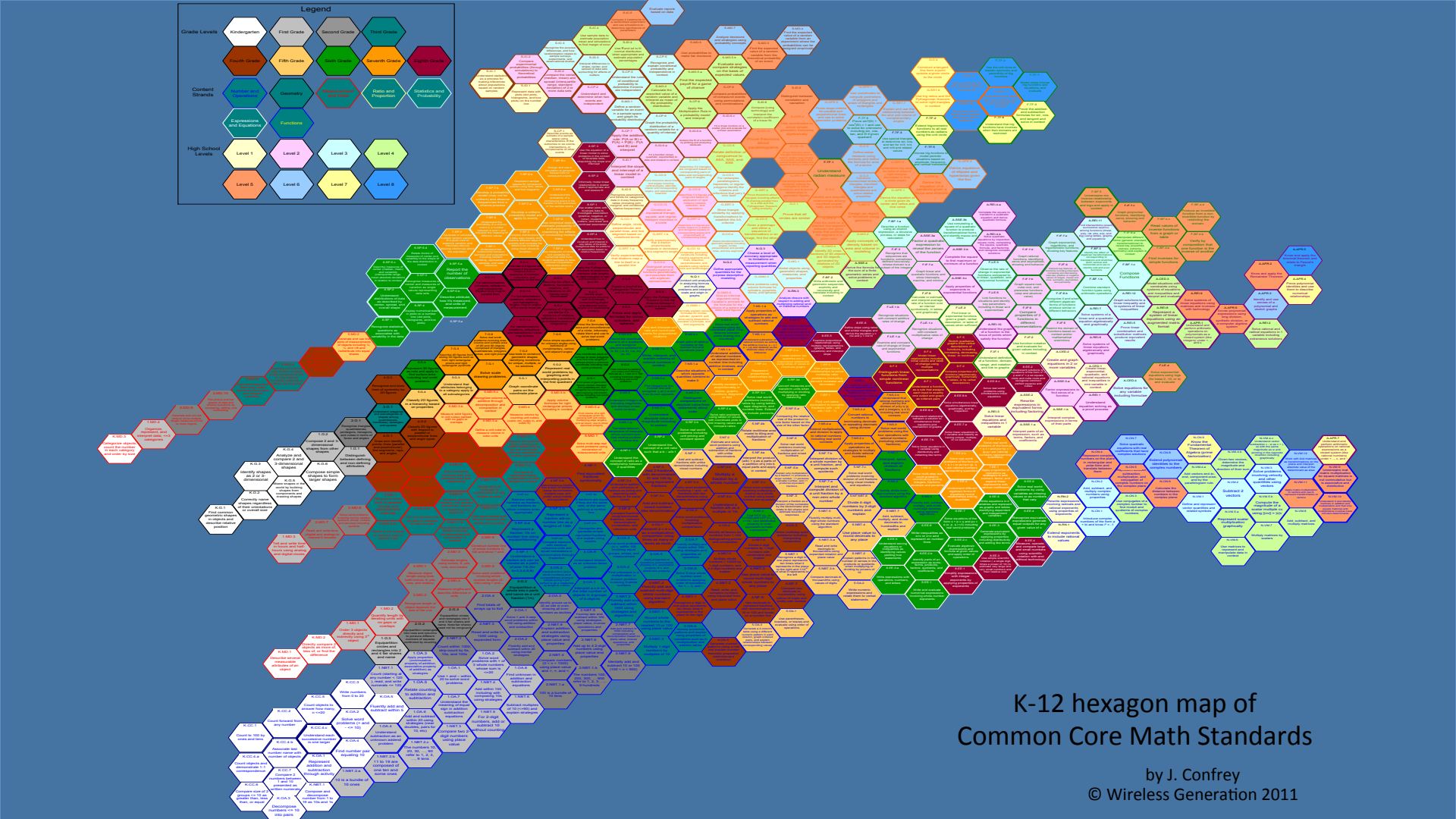
Confrey (2006) Design Studies Chapter
Cambridge Handbook of the Learning Sciences

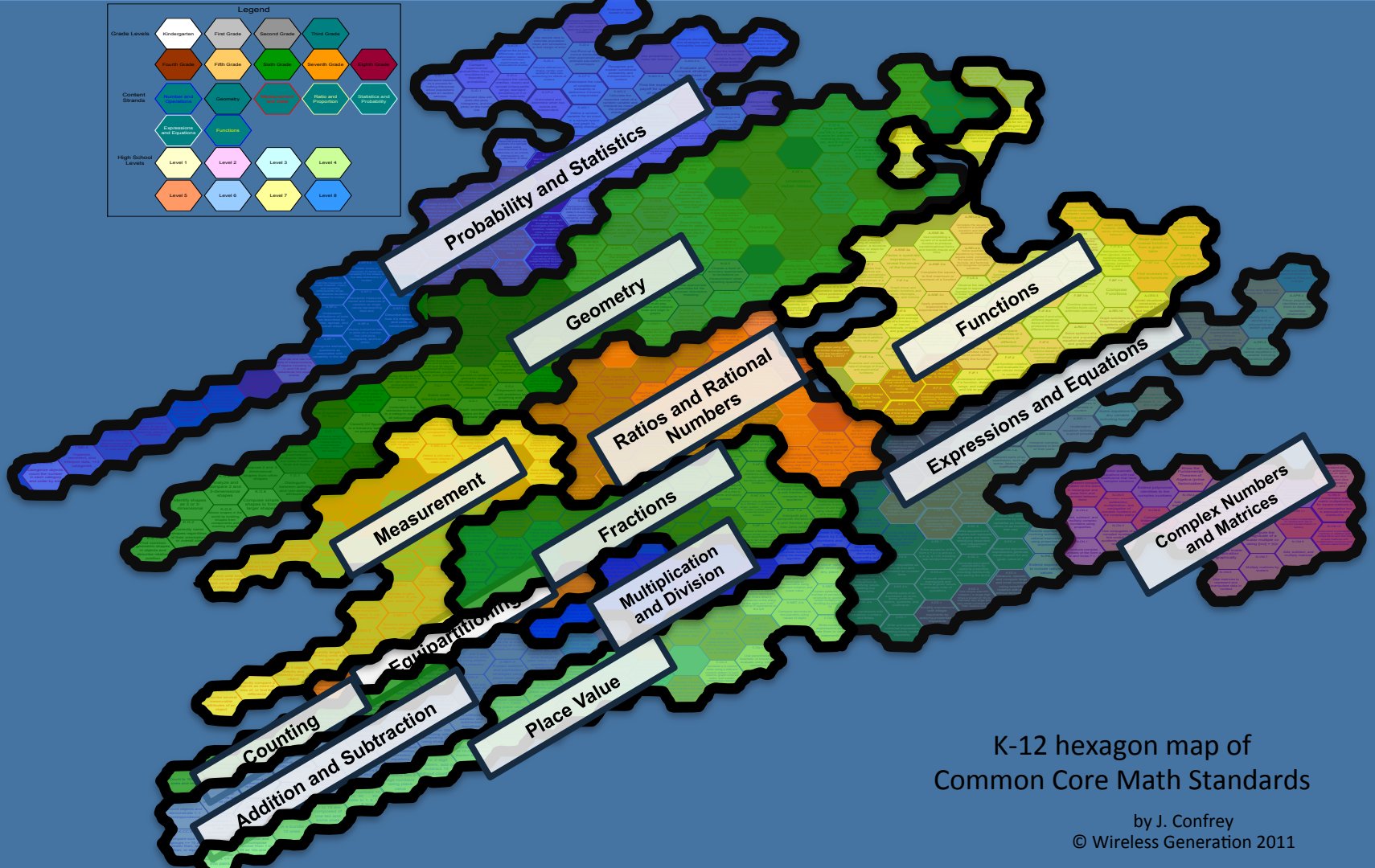
EQUIPARTITIONING:

Cognitive behaviors that have the goal of producing equal-sized groups (from collections) or pieces (from continuous wholes) as “fair shares” for each of a set of individuals.

Learning Trajectory Matrix: Equipartitioning

Equipartitioning Learning Trajectory Matrix (grades K-8) Task Classes → / Proficiency Levels	A	B	C	D	E	F	G	H	I	J	K	L	M
	Collections	2-split (Rect/Circle)	2^n split (Rect)	2^n split (Circle)	Even split (Rect)	Odd split (Rect)	Even split (Circle)	Odd split (Circle)	Arbitrary integer split	$p = n + 1$; $p = n-1$	p is odd, and $n = 2^i$	$p >> n$, p close to n	all p, all n (integers)
16	*Generalize*: *a* among $b = a/b$												
15	*Distributive property*, multiple wholes												
14	*Direct-, Inverse- and Co-variation*												
13	*Compositions* of splits, mult. wholes												
12	Equipartition *multiple wholes*												
11	Assert *Continuity principle*												
10	*Equality Property of Equipartitioning*												
9	Redistribution of shares (*quantitative*)												
8	Factor-based changes (*quantitative*)												
7	*Compositions* of splits; *factor-pairs*												
6	*Qualitative compensation*												
5	*Re-assemble*: *n* times as much												
4	*Name* a share w.r.t. the referent unit												
3	*Justify* the results of equipartitioning												
2	*Equipartition single wholes*												
1	*Equipartition Collections*												


Legend
Grade Levels
Kindergarten
First Grade
Second Grade
Third Grade
Fourth Grade
Fifth Grade
Sixth Grade
Seventh Grade
Eighth Grade
Content Strands
Number and Operations
Geometry
Measurement and Data
Ratio and Proportion
Statistics and Probability
Expressions and Equations
Functions
High School Levels
Level 1
Level 2
Level 3
Level 4
Level 5
Level 6
Level 7
Level 8
K-12 hexagon map of
Common Core Math Standards
by J. Confrey
© Wireless Generation 2011



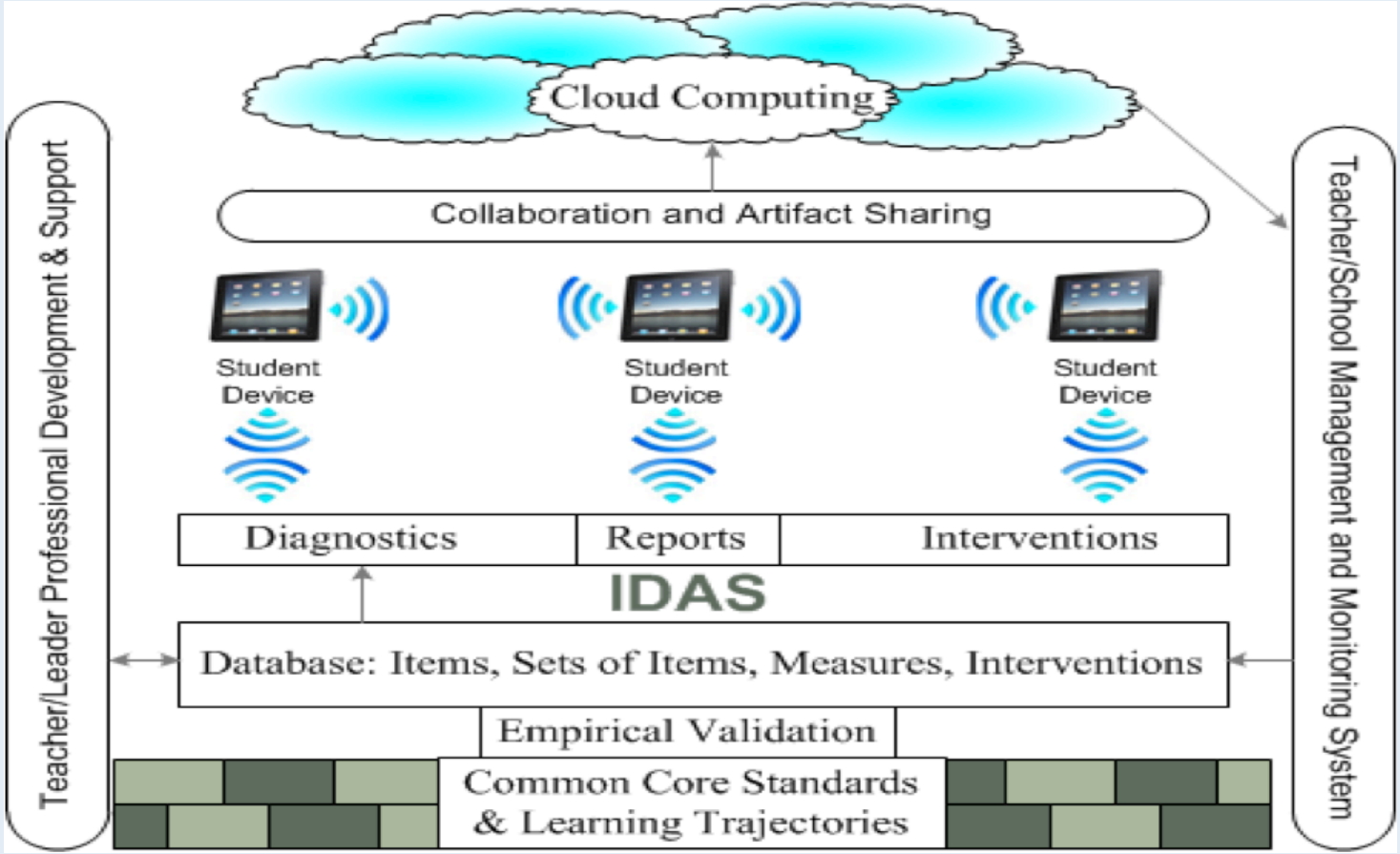
K-12 hexagon map of Common Core Math Standards

by J. Confrey

Goal 2--Design and Implement an Interactive Diagnostic Assessment System

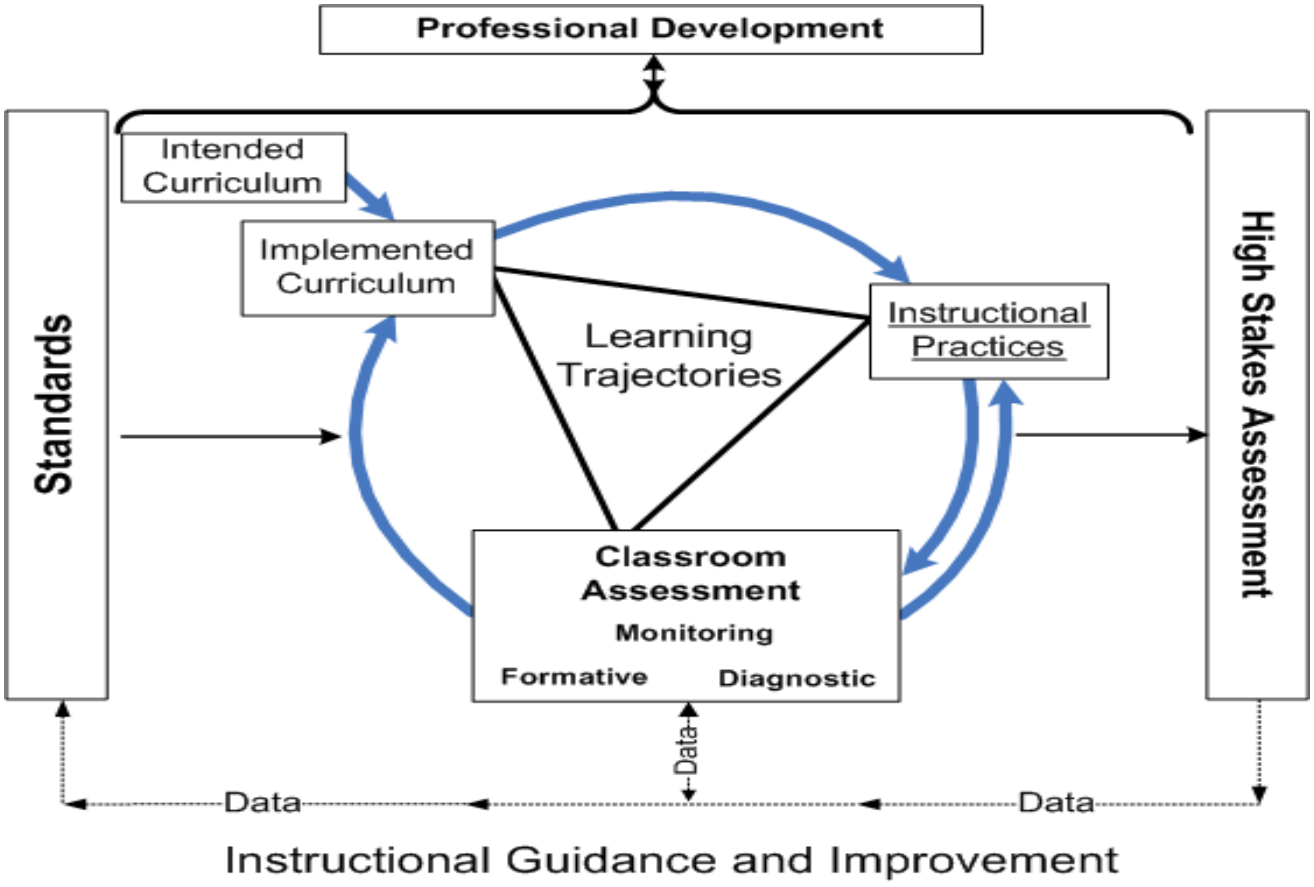
- Tied to the Common Core State Standards for Mathematics
- Anticipates the development of new summative assessments
- Gather data directly from dynamic virtual manipulatives, constructed responses, and written explanations and justifications
- Supports peer-to-peer (mentor) exchange of student work
- Creates personalized Learning Progress Profiles (LPPs)

Prototyping a Diagnostic Assessment System: LPPSync



Goal 3--Support engaged and interactive guided-classroom instruction

The Instructional Core



(Confrey and Maloney, 2010)

Packet 2 Diagnostics and Activities: Equipartitioning Single Wholes

Next Steps:

- A need for consistent and substantial funding for:
  - Research on Learning Trajectories
  - Child-friendly designs
  - Measurement and Scoring
  - Diagnostic Reporting and Analytics
  - Teacher Professional Development
- Sustained Research on Learning Trajectories
- Design for ongoing analytics and study of effective practices

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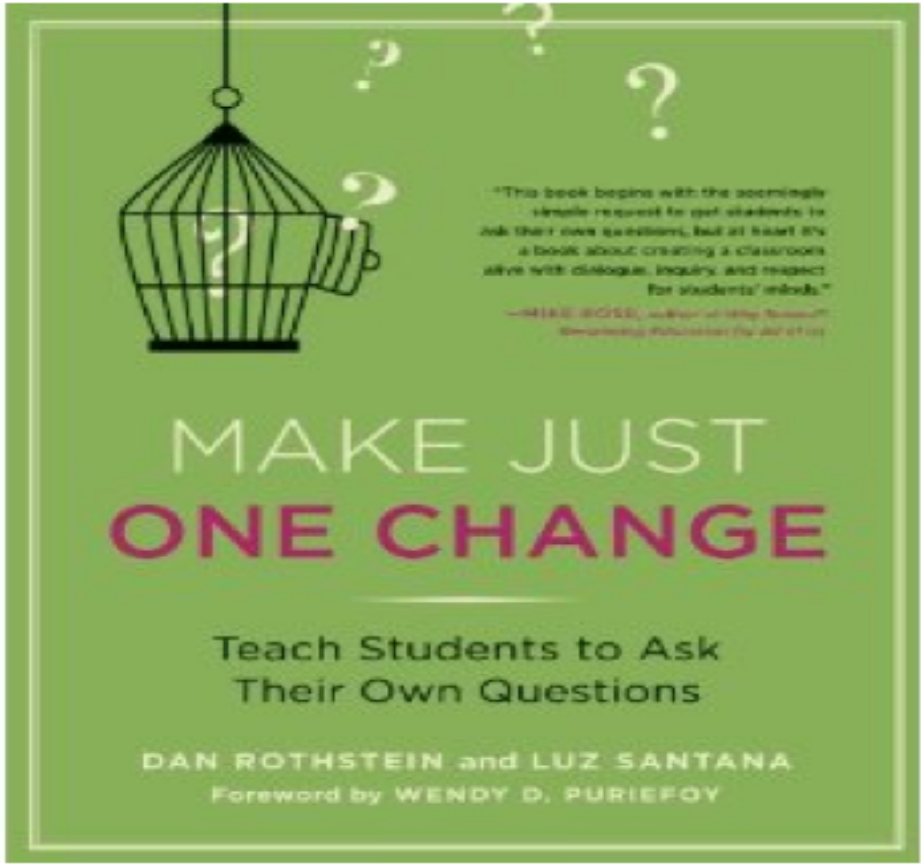
Bernie Dodge
Professor of Educational Technology
San Diego State University

San Diego State University

Project mGage

25 Student Teachers

City Heights, San Diego


MAKE JUST
ONE CHANGE
Teach Students to Ask
Their Own Questions
DAN ROTHSTEIN and LUZ SANTANA
Foreword by WENDY D. PURIEFOY

Four Projects

WHex

WonderPoints

CircuitBoard Games

ZigScript

WHex

WHo

WHat

WHere

WHen

WHy

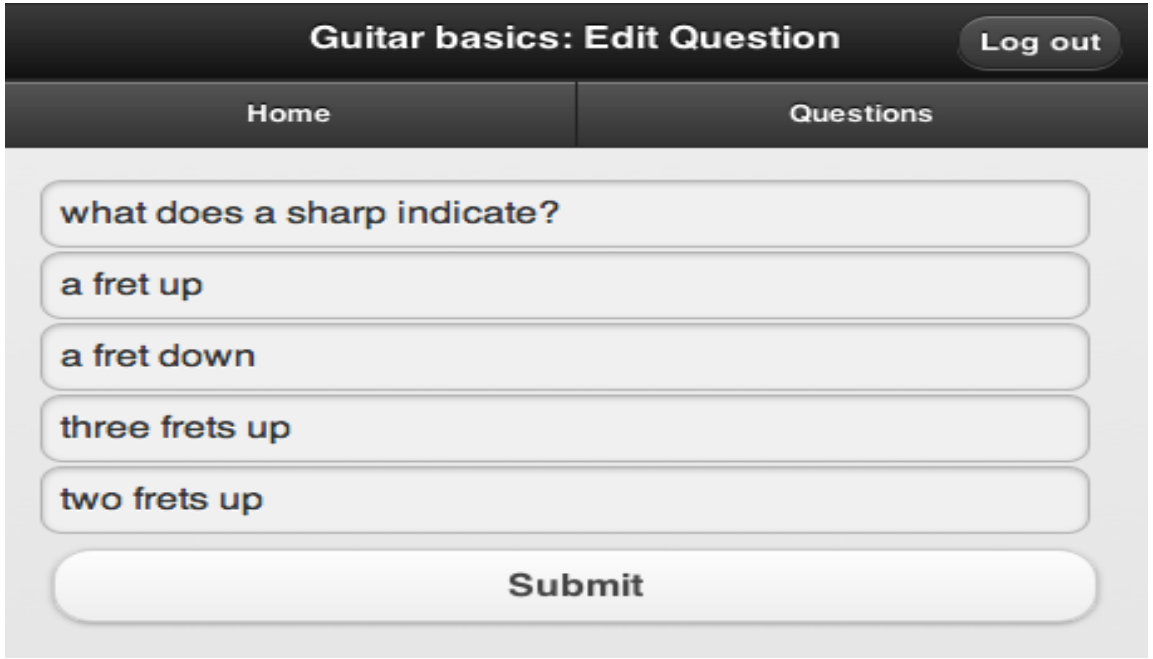
How

WHex

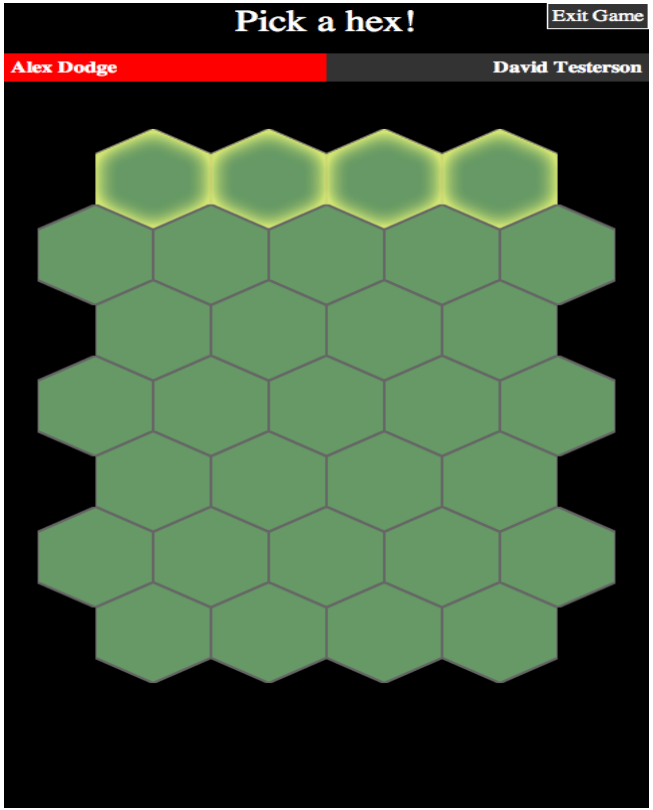
WHo
WHat
WHere
WHen
WHy
How

Students learn by creating questions from their textbook and other materials and then compete against each other in an online game.

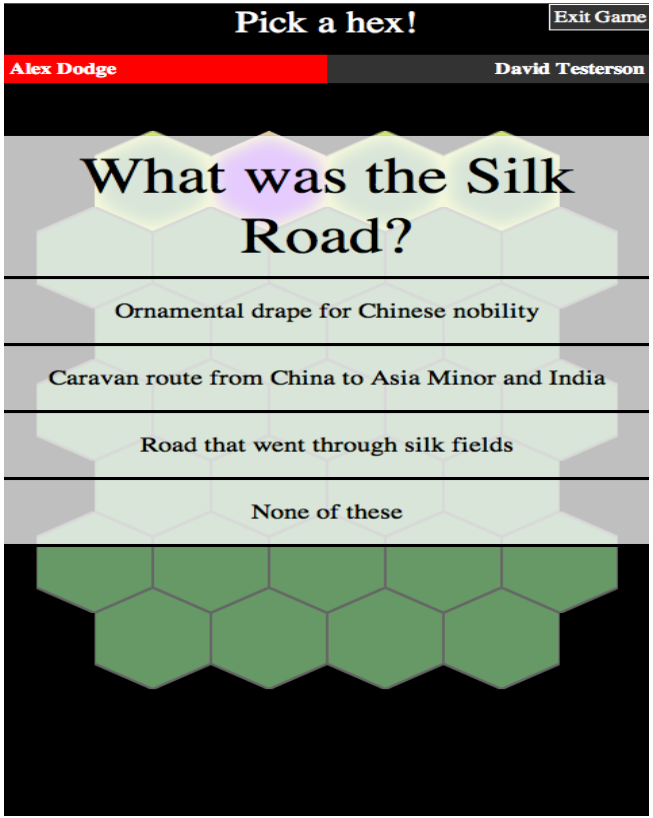
WHex


Guitar basics: Edit Question
Log out
Home
Questions
what does a sharp indicate?
a fret up
a fret down
three frets up
two frets up
Submit

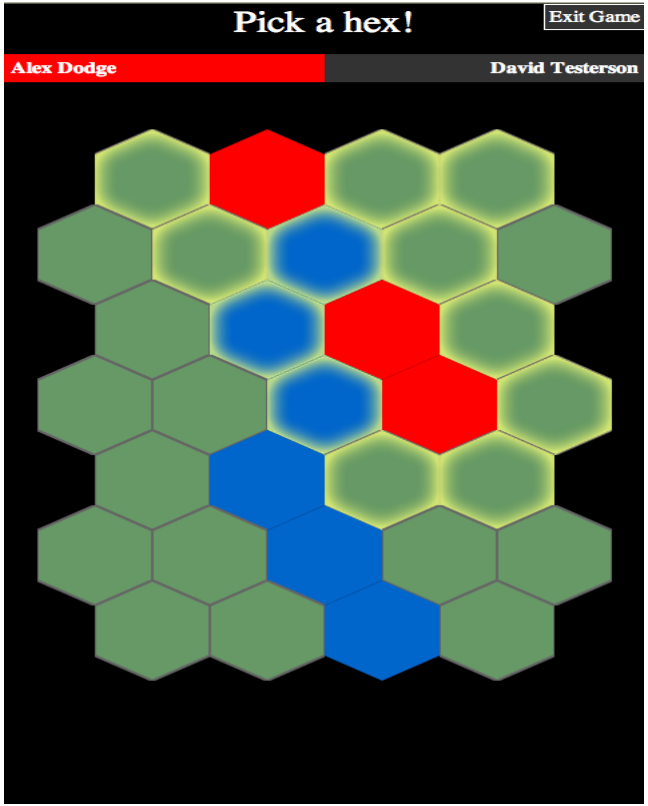
WHex



WHex


Pick a hex!
Exit Game
Alex Dodge
David Testerson
What was the Silk Road?
Ornamental drape for Chinese nobility
Caravan route from China to Asia Minor and India
Road that went through silk fields
None of these

WHex



WHex

WonderPoints

Students leave the classroom and use their smartphones to capture images they wonder about.

WonderPoints

They collectively create a map of geotagged images to inspire further discussion and inquiry.

WonderPoints

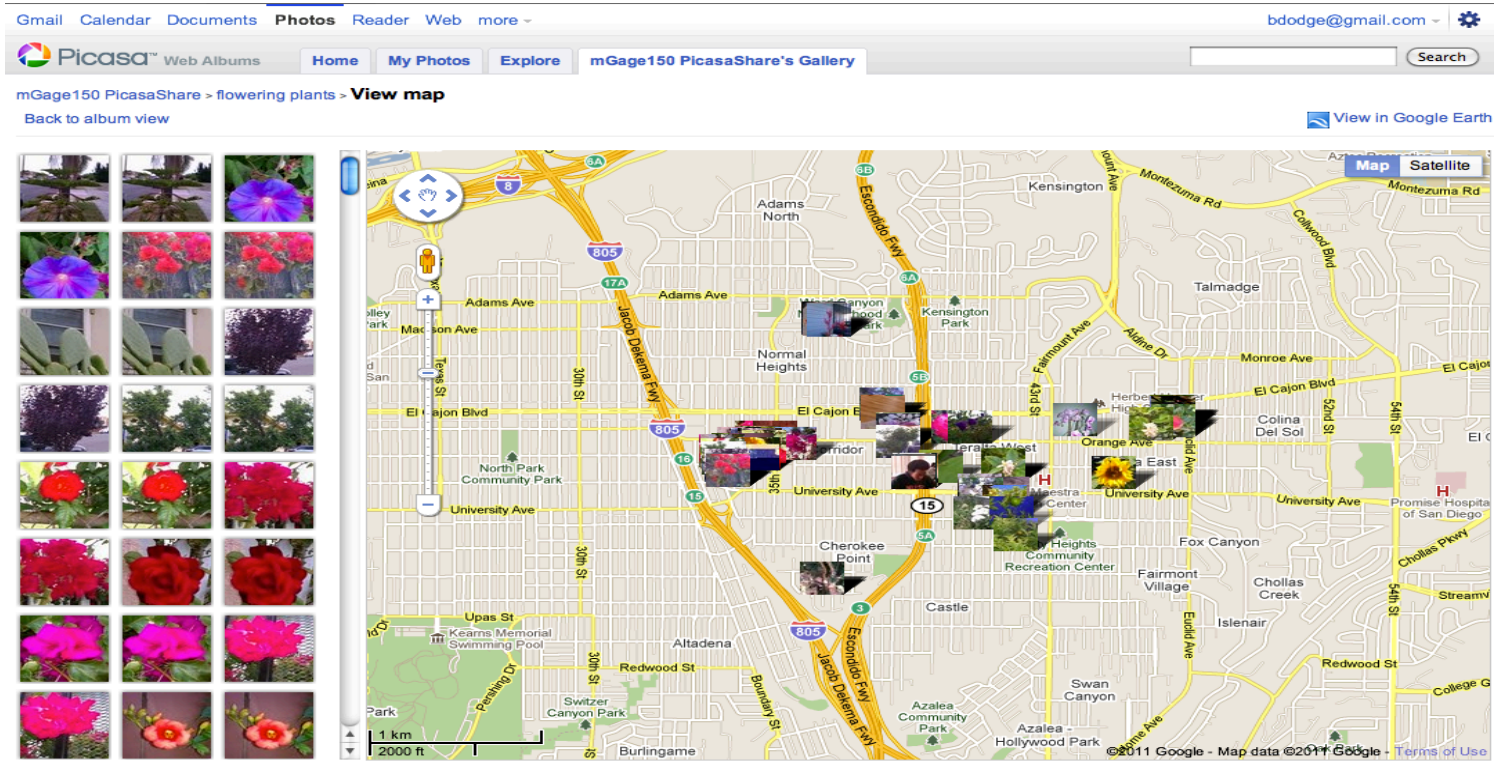
Smartphones as Tricorders

WonderPoints

Students log in,
take pictures, and
comment on them.

WonderPoints

Pictures are uploaded to a shared Google Pictures folder set up by the teacher.


Gmail Calendar Documents Photos Reader Web more
bdodge@gmail.com
Picasa Web Albums
Home
My Photos
Explore
mGage150 PicasaShare's Gallery
Search
mGage150 PicasaShare > flowering plants > View map
Back to album view
View in Google Earth
Map
Satellite
Adams North
Kensington
Talmadge
Normal Heights
Kensington Park
Adams Ave
El Cajon Blvd
University Ave
North Park Community Park
Cherokee Point
Fox Canyon
Fairmont Village
Chollas Creek
Castle
Islenair
Altadena
Kearns Memorial Swimming Pool
Switzer Canyon Park
Swan Canyon
Azalea Community Park
Azalea - Hollywood Park
Burlingame
Colina Del Sol
Orange Ave
Monroe Ave
Montezuma Rd
Redwood St
Upas St
1 km
2000 ft
©2011 Google - Map data ©2011 Google - Terms of Use

ZigScript

Smartphone-enhanced role play to engage kids in complex thinking.

ZigScript

CircuitBoard Games

Smartphone-enhanced board games in which students challenge their parents on what they're learning in school.

CircuitBoard Games

Four Projects

WHex

WonderPoints

CircuitBoard Games

ZigScript

mGage.net

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What Do We Know About Mobile Learning: Building Capacity for Success

Leslie Wilson
CEO
One-to-One Institute


Do one brave thing today... then run like hell!

Key Findings

Project RED
REVOLUTIONIZING EDUCATION

1. **Nine key implementation factors are linked most strongly to education success.**
2. **Properly implemented technology saves money.**
3. **1:1 schools employing key implementation factors outperform all schools and all 1:1 schools**
4. **The principal's ability to lead change is critical**
5. **Technology-transformed Intervention improves learning.**
6. **Online collaboration increases learning productivity and student engagement**
7. **Daily use of technology delivers the best return on investment (ROI).**

Keys to Success

Teachers' & administrators' professional growth

- District commitment to ongoing, sustained professional development opportunities for all
  - Turnkey/train the trainer models
  - Schedule
  - Build on prior skills & knowledge
- Migrate from the 'traditional teacher model'
  - Purveyor of information
- Classroom management
- Student Centered Classroom
  - Giving up 'control'
- Giving up textbooks
  - Using current and relevant digital resources

Keys to Success

- **Students' orientation, preparation**
  - Digital access to all resources
    - Formative assessments
  - Directing/managing their learning
    - Creating, collaborating digital projects
    - Work repositories
    - Time and pace management
  - Taking ownership of technology tools and resources
  - New expectations for self-direction and accountability

Keys to Success

- **Parents’/caregivers’ orientation, preparation**
  - The new classroom
    - Understanding the new look and feel
  - Sharing best practices
  - FAQs
  - Paperless environment
    - Digital communications
      - Website
      - Portal
        - » Report Cards\Progress Reporting
        - » Emergency contacts
        - » Schedules
        - » Posting information in portal and e-mail

The Community

- **Viral, Focused Messaging**
  - All stakeholders understand
  - Research based
  - Ongoing reports
    - The good, bad and ugly
  - FAQs
  - Involvement

Questions to Guide Implementation

- Who will lead – horizontal, vertical, connected?
  - Project manager
  - Sub committees
  - Committee member roles, responsibilities
- What are goals wrapped in the shared vision?
  - Driving device(s) functionalities
  - For student levels, grades, programs
- Lease or buy?
  - Platform
  - Applications

Must-Haves

- Plan for district-wide capacity, scale out, maintenance
- Ongoing, long-term and just-in-time training and professional growth experiences
- Continued work on curriculum with a focus on:
  - Aligning content areas outside the core with standards and benchmarks
  - Integration of technology
  - Personalized and collaborative instructional methods

Key Considerations

- Wireless, 3G, 4G infrastructure?
  - More than enough connectivity, all the time, for all users
  - Close monitoring of usage
- Sufficient licensing
- Commitment to ongoing professional development
- Partnerships
- Implementation strategy to support the curriculum

Keys to Capacity

- Leadership – all levels
  - Shared vision
- Short and long term plans including funding considerations
  - Infrastructure
  - Accommodations for growth
  - Sustainability
- Human capital-all stakeholders
  - Professional growth
  - Expected, planned, ongoing, embedded
- Expectations for innovation & risk taking

Questions for the Panelists

- What is the biggest barrier to the adoption of mobile learning?
- What is the biggest reward of adopting a mobile learning platform?
- What do you need from the other panelists in this session to make mobile learning successful?
- Questions from the audience?