Personalizing Learning with Next Generation Technologies

Beliefs
Every child needs and deserves a delightful and inspirational learning experience that is both challenging and fun.
The best use of technology is in support of great teaching to ignite new possibilities in learning.
Next Generation Learning Technologies can transform learning as we know it through dynamic and continuous adaptation and personalization.

What Inspires Learning?
When Raytheon Corporation asked 1,000 middle schoolers if they’d rather eat broccoli or do a math problem, the majority said broccoli.

This student is a natural learner.
How can we engineer digital lessons that enable her to realize her learning potential in ways that have never before been possible?

Intelligent Adaptive Learning
To Delight and Surprise

Results, not Philosophy
Only 35% of 8th grade students are math proficient.
Nation's Assessment of Educational Progress, 2011
Long-Term Negative Impact

Historic Inflection Point

- Long-Term Negative Impact
  - Of 100 middle school students, 93 want to go to college
  - Of those, 70 graduate from high school
  - Of the high school graduates, only 44% enroll in college
  - Of those enrolled in college, only 26% will successfully earn a college degree

- Historic Inflection Point
  - Parents demanding 21st Century skills
  - Students expect technology in learning
  - New Generation of adaptive instructional technologies are here

Blended Learning is Here to Stay

- Blended Learning is Here to Stay
  - “Online learning is sweeping across America. In the year 2000, roughly 45K K-12 students took an online course. In 2009, more than 3MM K12 students did.”

  - Christensen Institute

Big Investments to Support Scale

- Big Investments to Support Scale
  - ConnectED initiative will connect 99% of students to high-speed internet/Wi-Fi in 5 years
  - Over 35% of elementary teachers and 21% of Middle School teachers report regular use of digital games in their classrooms
  - Explosion in home schooling (800K kids in 1999 to 2MM now)

Dramatic Expansion of Access

- Dramatic Expansion of Access
  - 73% Use Smartphones
  - 66% Use Laptops
  - 61% Use Tablets
  - 48% Use Digital Readers

  - Project Tomorrow 2014

Let’s look at math class...

- Let’s look at math class...
  - Math teacher from student’s perspective
Let’s look at math class…

“One ten is the same thing as ten ones.”

This sounds crazy to kids. It’s not effective for learning.

Teacher explaining Place Value

Kid Snippets, “Math Class,” YouTube

Is this really the state-of-the-art?

Exercise 237:

$58 \times 55 =$ □

(Show your work)

Is this really the state-of-the-art?

Exercise 237:

$58 \times 55 =$ □

A: 319; B: 4278; C: 3190; D: 1130

It’s still ineffective on a computer

New Definitions of Success

“The illiterate of the 21st Century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.”

- Alvin Toffler

The Opportunity Before Us:

Intelligent Adaptive Learning

IAL is a next generation technology that learns the learner as the learner learns
Learning Requires Adaptnity
What incorrect answers would we expect on a problem like $26 + 67$?
- 83 Student does not regroup to the tens place
- 813 Student adds columns from left to right
- 2667 Student combines both addends
- 21 Student adds all as single digits
- 41 Student believes this is a subtraction problem
A master teacher would respond differently to these answers

…Technology should, too... And in real time at scale

Solve “58 x 55”
First, we would know what the student was capable of so we could ask challenging but solvable problems for that student
We scaffold as we challenge so they can explore strategies
Mastery is achieved when students demonstrate proficiency without scaffolding

Continuous, Dynamic Adaptation
What powers this new and dynamic approach to personalized learning?

Customized for each student
Formative Assessment
Activities (lessons)
Analytics
Pedagogy
Past Students
Intelligent Adaptive Learning
Future Students
3 Essential Elements Accelerate Learning

Rigorous Elementary Mathematics
- Aligned to Common Core State Standards, Texas TEKS, Ontario WNCP & Ontario World Mathematics
- Lessons Aligned to Process Standards and Common Co-Standards for Mathematics Practice

Intelligent Adaptive Learning™ Engine
- Millions of personalized learning paths
- Tailored to a student’s unique needs

Motivating Learning Environment
- Student Directed, Empowering, & Gaming Fundamentals, Rewards

Students continually receive appropriate feedback & reinforcement in every lesson
- Audio instructions
- Audio hints and sounds
- Written feedback
- Help button
- Ghosting
- Scaffolding
- Progress meter
- Hint button
- Gaming Elements

Age-Appropriate Self-Directed Learning

PreK-2 | 3-5 | 6+
---|---|---
Avatars | Avatars | Leveled Avatars
Story Theme (Missions) | Personalized Wallpaper and Music | Session Progress Transparency
Earn Tokens, Adventure Friends (Cards) | Earn Coins, Badges | Earn Keys to Unlock Lessons
Carnival Games | Math Mini-Games | Random Nanogames

Impact in Schools - Efficacy

Dunbar Elementary School
Glen Ellen, California
mSchools
New Orleans, LA
Christina School District
Delaware

Growth in Math Proficiency for Grade 3-5 Students
- Fall 2012
- Spring 2013
- Increase in Proficiency