Predicting Inventing the Future of Learning

Keith Krueger, CEO, CoSN
CoSN Mission

CoSN serves K-12 technology leaders who through their strategic use of technology, improve teaching and learning.

Core Value
The primary challenge is human, not technical

Audience
School system technology and education leaders

The CoSN Focus
Leadership and Policy
Technologies of 1992
>$900,000 worth of applications in a smartphone today

<table>
<thead>
<tr>
<th>Application</th>
<th>$ (2011)</th>
<th>Original Device Name</th>
<th>Year*</th>
<th>MSRP</th>
<th>2011’s $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Video conferencing</td>
<td>free</td>
<td>Compression Labs VC</td>
<td>1982</td>
<td>$250,000</td>
<td>$586,904</td>
</tr>
<tr>
<td>2 GPS</td>
<td>free</td>
<td>TI NAVSTAR</td>
<td>1982</td>
<td>$119,900</td>
<td>$279,366</td>
</tr>
<tr>
<td>3 Digital voice recorder</td>
<td>free</td>
<td>SONY PCM</td>
<td>1978</td>
<td>$2,500</td>
<td>$8,687</td>
</tr>
<tr>
<td>4 Digital watch</td>
<td>free</td>
<td>Seiko 35SQ Astron</td>
<td>1969</td>
<td>$1,250</td>
<td>$7,716</td>
</tr>
<tr>
<td>5 5 MPixel camera</td>
<td>free</td>
<td>Canon RC-701</td>
<td>1986</td>
<td>$3,000</td>
<td>$6,201</td>
</tr>
<tr>
<td>6 Medical library</td>
<td>free</td>
<td>e.g. CONSULTANT</td>
<td>1987</td>
<td>Up to $2,000</td>
<td>$3,988</td>
</tr>
<tr>
<td>7 Video player</td>
<td>free</td>
<td>Toshiba V-8000</td>
<td>1981</td>
<td>$1,245</td>
<td>$3,103</td>
</tr>
<tr>
<td>8 Video camera</td>
<td>free</td>
<td>RCA CC010</td>
<td>1981</td>
<td>$1,050</td>
<td>$2,617</td>
</tr>
<tr>
<td>9 Music player</td>
<td>free</td>
<td>Sony CDP-101 CD player</td>
<td>1982</td>
<td>$900</td>
<td>$2,113</td>
</tr>
<tr>
<td>10 Encyclopedia</td>
<td>free</td>
<td>Compton’s CD Encyclopedia</td>
<td>1989</td>
<td>$750</td>
<td>$1,370</td>
</tr>
<tr>
<td>11 Videogame console</td>
<td>free</td>
<td>Atari 2600</td>
<td>1977</td>
<td>$199</td>
<td>$744</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>free</strong></td>
<td></td>
<td></td>
<td><strong>$902,065</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Year of Launch
Predicting the future is fraught with peril…

1889: “Fooling around with alternating current (AC) is just a waste of time. Nobody will use it, ever.” Thomas Edison

1946: "Television won't be able to hold on to any market it captures after the first six months. People will soon get tired of staring at a plywood box every night." Darryl Zanuck, 20th Century Fox

1981: “Cellular phones will absolutely not replace local wire systems.” Marty Cooper, inventor

2007: “There’s no chance that the iPhone is going to get any significant market share.” Steve Ballmer, Microsoft CEO
Historical Concerns About “Technology” in Schools

“Students today can’t prepare bark to calculate their problems. They depend upon their slates, which are more expensive. What will they do when their slate is dropped and it breaks? They will be unable to write!”
Teachers Conference, 1703

“Students today depend upon paper too much. They don’t know how to write on slate without chalk dust all over themselves. They can’t clean a slate properly. What will they do when they run out of paper?”
Principal’s Association, 1815
### Historical Concerns About “Technology” in Schools

<table>
<thead>
<tr>
<th>Year</th>
<th>Quote</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td>“Students today depend too much upon ink. They don’t know how to use a pen knife to sharpen a pencil. Pen and ink will never replace the pencil.”</td>
<td>National Association of Teachers, 1907</td>
</tr>
<tr>
<td>1950</td>
<td>“Ballpoint pens will be the ruin of education in our country. Students use these devices and then throw them away. The American virtues of thrift and frugality are being discarded. Business and banks will never allow such expensive luxuries.”</td>
<td>Federal Teacher, 1950</td>
</tr>
</tbody>
</table>
We are coming into a period of EXPONENTIAL Change?

Quiz: how many exponential steps would it take to go around the world?
Making Sense of Exponential Change
by KnowledgeWorks

Step 1: 1 ft
Far too small to appear here at scale.

Step 10: 512 ft
Almost as tall as the Washington Monument.

Step 17: 65,536 ft
Approximate height of a proposed 12-mile-high space elevator.

Step 28: 126,139,200 ft
High enough to scale Mount Everest roughly 4,356 times.

Step 30: 1,073,741,824 ft
Far enough to circle the earth eight times. At scale, this is much too tall to fit on this screen.
Four Industrial Revolutions

1800s | 1900s | 1980s | Today

knowledgeworks.org
From an Agriculture Base to Industrial Base
From machines to factories, electrification and the production line
A shift from mechanical and analogue electronic technology to digital electronics - computers, digital cell phones, and the Internet
Technology becomes embedded within societies and even the human body. Includes robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, The Internet of Things (IoT), 3D printing and autonomous vehicles.
What will be more important in the future, the right skill set or mindset?

The better the question. The better the answer. The better the world works.
What is Innovation?

Image from HSBC ad
Driving K-12 Innovation

New CoSN series informs smart technology strategies for schools with teaching and learning at the center

cosn.org/k12innovation
THANK YOU SPONSORS!

GOLD
ClassLink
Google for Education

SILVER
aws
DELL EMC
kajeet

BRONZE
en@ Education Networks of America
catchion
Roadblocks that force schools to slow down, prepare themselves + make the leap
ACCELERATORS

Real-world megatrends that drive the needs + skills expected of learners + practitioners
The tools that grease the wheels for schools to surmount Hurdles + leverage Accelerators
100+ renowned EdTech experts collaborated virtually to identify broad issues, ranking on difficulty, implications, opportunities, and solutions for overcoming challenges.

cosn.org/k12innovation
Adopting Prohibitive Policies
Change Management
Changing Demographics
Clear Pathways to Postsecondary
Data Standards and Sharing
Determining the Strategic Value of Technology
Developing Non-Cognitive Skills
Digital Equity
Digital Fluency
Evolution of Teaching
Female Disengagement in Computer Science
Humanizing Online Learning
Inadequate Resources
Lack of Systemic Perspectives
Measuring the “Intangibles” of Learning
Non-Complementary Approaches to Multiple School Mandates

Ongoing Professional Development
Parent and Community Perceptions of EdTech
Pedagogy vs. Technology Gap
Preparing Students for (Digital) Lifelong Learning
Reinforcement of Poor Practices
Remaining Relevant
Scaling and Sustaining Innovation
Technology and the Future of Work
Technology Resistance from Teachers
Technology Training in Pre-service Teacher Education Programs
Thinking Outside the Box
Unbalanced Strategic Influence
2019 TOP HURDLES

Scaling + Sustaining Innovation

Digital Equity

The Gap Between Tech + Pedagogy*

Tech + the Future of Work*

Ongoing Professional Development
Turn to Person Next to You and Discuss

Which of the 2019 Top 5 Hurdles are you experiencing *most* in your own country? How is it impacting innovation efforts? Or identify some other key Hurdle you are focused on?

Scaling + Sustaining Innovation
Digital Equity
The Gap Between Tech + Pedagogy
Tech + the Future of Work
Ongoing Professional Development
Accelerators

cosn.org/k12innovation
Accelerators

Automation in Teaching
Building the Human Capacity of Leaders
Changing Attitudes Toward Degree Goals
Collaborative Learning
Computational Thinking
Data-Driven Practices
Design Thinking
Education-Industry Partnerships
Exemplary User Experiences
Expanding Educational Networks
Immersive Learning

Learner Autonomy
Learners as Creators
Multi- and Interdisciplinary Learning
OER Adoption
Reimagining Physical Spaces
Research-Practitioner Partnerships
Personalization
“Plus One” Technologies
School Choice
Social and Emotional Learning
Sustainable Development
The World as Habitual Learning Environment
2019 TOP ACCELERATORS

Learners as Creators*
Design Thinking*
Personalization
Building the Capacity of Human Leaders
Data-Driven Practices
TECH ENABLERS

cosn.org/k12innovation
Tech Enablers

3D Printing and Digital Fabrication
Analytics and Adaptive Technologies
Artificial Intelligence
Blended Learning
Blockchain
Broadband and Wireless Power
Cloud Infrastructure
Crowdsourcing Technologies
Data and Information Visualization
Digital Badges
Digital Environments
Digital Portfolios
Embedded Accessibility
Technologies
Extended Reality (VR, AR, MR)
Flexible Displays
Gamification (digital)
Haptic Interfaces
The Internet of Things
Location Intelligence
Mobile Devices
Open Hardware and Software
Real-Time Communication Tools
Robots and Drones
Social Media
Virtual Assistants
2019 TOP TECH ENABLERS

Mobile Devices
Blended Learning*
Cloud Infrastructure
Extended Reality
Analytics + Adaptive Technologies*
Turn to your Neighbor

Are there Accelerators or Tech Enablers you are particularly exploring, and if so, what are your major challenges around implementation?
Driving K-12 Innovation: 2019 Themes

**Hurdles**
- Scaling + Sustaining Innovation
- Digital Equity
- The Gap Between Technology + Pedagogy
- Technology + the Future of Work
- Ongoing Professional Development

**Accelerators**
- Learners as Creators
- Data-Driven Practices
- Personalization
- Design Thinking
- Building the Capacity of Human Leaders

**Tech Enablers**
- Mobile Devices
- Blended Learning
- Cloud Infrastructure
- Extended Reality (XR)
- Analytics + Adaptive Technologies

[cosn.org/k12innovation](cosn.org/k12innovation)
"I don't believe that predicting the future is really what we're about...our task isn't to predict it. It is to design it..."

Herbert A. Simon, October 19, 2000
Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.

Winston Churchill