

What Now?

Top Ten Emerging Technologies for Teaching and Learning



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RENAISSANCE INSTITUTE

Trusted Advisors in Educational Technology

Technology is causing
a renaissance in
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Experienced Practitioners in Technology
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Presentation at: www.teacherinfoseries.com

Our Core Beliefs

*

We believe in and support K-12.

*

We believe that teachers are the most important element in a child's education.

*

We believe that technology can play a vital role as a catalyst in supporting teachers, students, and staff.

*

We believe that intelligent and wise use of technology will modernize education at all levels.

The Status of K-12 Edtech

- Technology is changing all sectors of our life, including K-12.
- We've reached ubiquity; technology embedded in all aspects of K-12.
- 86% of schools now provide students with devices; up from 43% prior to pandemic.
- Over \$50 billion will be spent on edtech 2020-2021 academic year.

**Center for Democracy and Technology 9/21/21*

**Edtech Exchange March 2021*

The “Berning” Question

What technology holds the most promise to positively impact teaching and learning over the next 3-5 years?

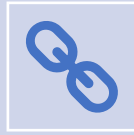
“I skate to where the puck is going to be, not where it has been.”

Hockey Star Wayne Gretsky

Components of a Modern K-12 Technology Plan

- A Framework for the Role of Technology
- Emerging technology to support your local vision
- Reliable network and systems infrastructure
- Modern cybersecurity framework
- Funding sources: local, state, federal
- Evaluation and feedback mechanisms

The Renaissance Framework: The Role of Technology



Connect the learner



Evaluate performance



Promote literacy



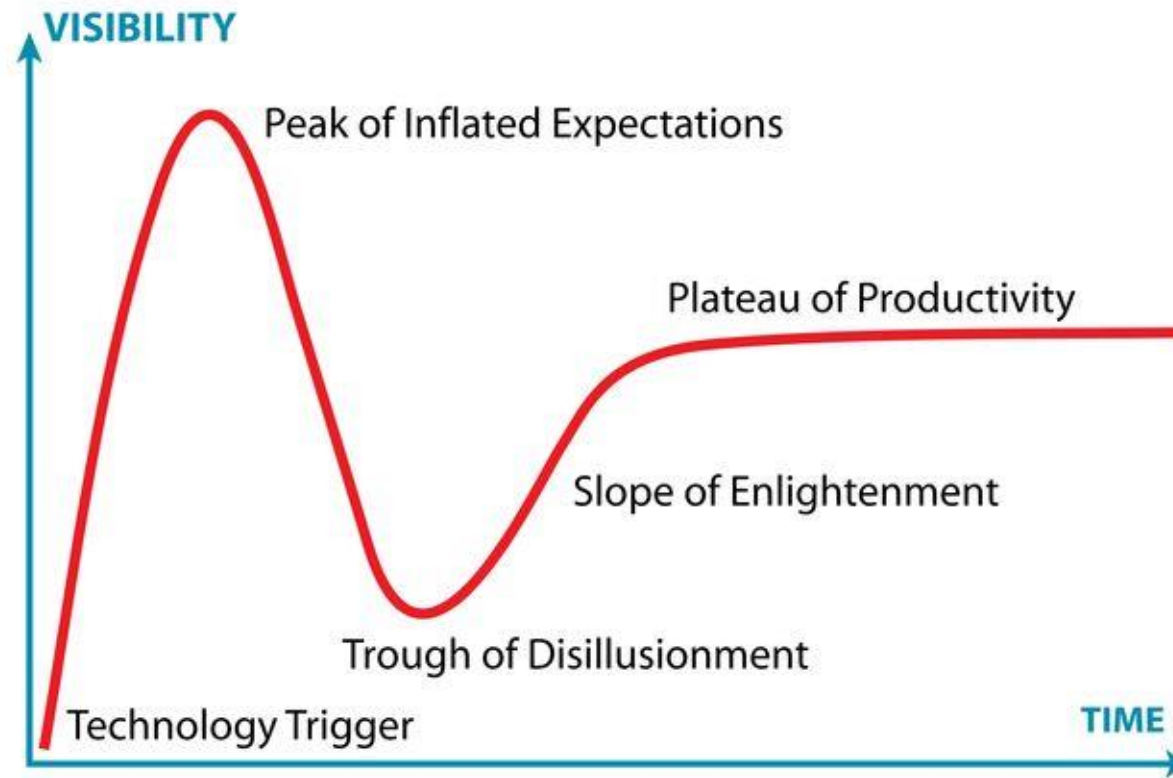
Level the playing field

NOT to Replace the Teacher



Skinner's Teaching Machine, 1954

The Hype Cycle from Gartner.com



Top Ten Emerging Technologies

*** Focus for today—Slope
and Plateau of Productivity

1. Mobile Technology ***
2. Cloud Computing***
3. Learning Management Systems (LMS)***
4. Content Ownership Technology
5. Social Media and Social Learning Platforms
6. Privacy and Cybersecurity Tools ***
7. Artificial Intelligence and Learning Analytics
8. Augmented and Virtual Reality
9. Maker Tools
10. Adaptive/Assistive Technology ***

Emerging Technology: Mobile Technology



- Pervasive access to untethered technology including laptops, smartphones, and tablets
- Mobile Learning (M-Learning) is changing how learners access and interpret information
- Online testing will continue to flourish
- Mobile Device Management is critical
- Covid 19 forced (district provided) 1:1
- 5G Services will drive new options for delivering content

The Impact of Mobile Technology

Mobile technology has created Bring-Your-Own-Device (BYOD), 1:1, flipped learning, mobile-learning, blended learning, personalized learning and many other initiatives.

Leverage mobile technology to connect your learners to content that is structured and localized to your needs through a Learning Management System that you control.

TIP: You must have a reliable network or wireless infrastructure prior to incorporating mobile devices.

Funding the Connected Learner

Federal Emergency Connectivity Fund: \$7.17 billion for 2021-2022

- For home connectivity---mobile devices and connectivity

Federal E-rate Fund: \$4.3 billion for 2021

- Funds Internet service and network electronics for K-12 schools and libraries

Texas Instructional Materials and Technology Allotment: \$ADA

Texas Operation Connectivity: \$200 million for 2020-2021

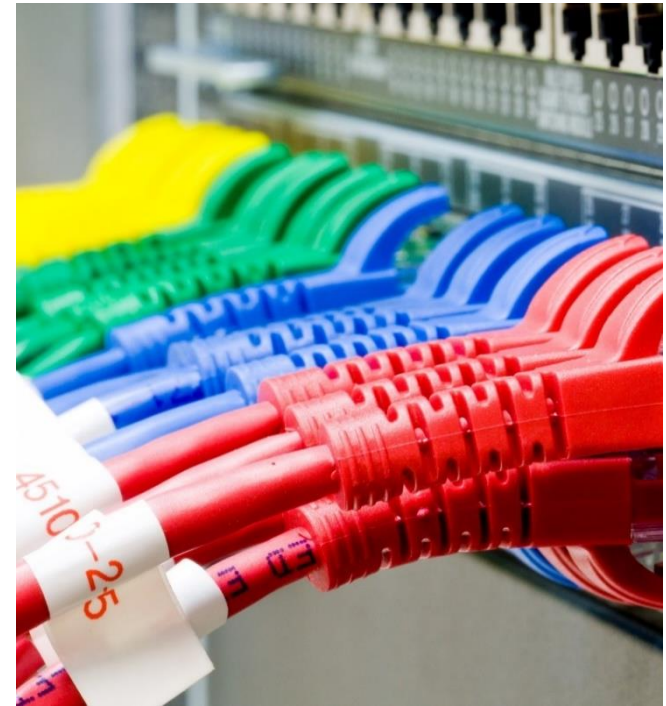
- Supports funding for K-12 mobile devices and connectivity

Texas Governor's Broadband Development Initiative: \$TBD

- Supporting broadband connectivity to all Texans

Emerging Technology: Cloud Computing

- The “Cloud” is a metaphor for the Internet.
- Simply means that the application is hosted on a computer on the Internet instead of in your network operations center.
- Companies that offer cloud computing include Amazon Web Services and Microsoft Azure.
- Drives “as-a-service” models
 - Software-as-a-Service (SaaS) allows us to access applications via a web browser.
 - Storage-as-a-Service allows us access storage space on the web.
 - Education-as-a-Service?



Emerging Technology: The Learning Management System (LMS)

- A software application to deliver content as well as the administration, documentation, tracking, and reporting of student learning.
- The backbone of a modern learning environment.
- Examples include Blackboard, Canvas, and Schoology.
- Current systems lack social-learning and other critical pedagogical components.



Emerging Technology : Content Ownership Technology

- Ownership rights are changing
 - Blockchain technology
 - Non-fungible tokens (nftbooks)
- Open Educational Resources
 - Freely accessible, open licensed teaching and learning materials
 - See www.oercommons.org



Emerging Technology: Social Media

The social media typically found in the classroom:

- Facebook (Meta)
- Twitter
- YouTube
- Instagram
- Snapchat
- LinkedIn
- Future: Web 3.0 (Metaverse)



Emerging Technology: Privacy and Cybersecurity Tools

- ✓ K-12 Schools are a target of malware, ransomware, phishing.
- ✓ An estimated 50% of K-12 schools have been a victim of ransomware.
- ✓ An estimated \$500/student and \$1000/faculty/admin lost, and personal identity stolen.
- ✓ Cybersecurity and privacy are an afterthought on most devices and software.

Cybersecurity Tools for K-12

Education and Awareness Programs

Vulnerability Management Software

Breach Prediction and Prevention Software

Breach Detection Software

Breach Recovery Strategies

Mobile Device Management (MDM) tools for in-school and remote

Cybersecurity Strategies

Cyber Security Program Establishment

Required Children's Internet Protection Act (CIPA)
Internet Safety Training for students

Required Texas HB 3834 User Awareness Training
for staff

Required Texas SB 820 Cybersecurity Policy and
Testing

Proper storage and access of school data

Proper disposal of technology

This is a new budget line item for K-12 schools

Cybersecurity Hygiene Score

Impossible travel

Anonymous actors:

- VPN
- Tor Browser

Failed logins

Operating system upgrades

Security Incident and Event Management (SIEM) logs

Virus/malware protection logs

Combined with regular meetings and conversations

Cybersecurity Hygiene Score

09/01 05:03 through 09/08 08:52	<ul style="list-style-type: none"> Cylance High Severity Detection ContentKeeper Security Categories Microsoft Windows Local Authentication Failure Microsoft Windows Windows Service Installed Microsoft Windows Windows Service Installed Kernel Device Driver ContentKeeper Questionable Categories Microsoft Windows Windows Service Installed Win32 Own Process Microsoft Windows Created Computer Account ContentKeeper Broken Website Categories 	<ul style="list-style-type: none"> 8 10 09/08 07:55 17.87 K 5 09/08 08:52 6.68 K 2 09/08 07:56 10 2 09/08 07:55 9 2 09/08 07:55 2 2 09/03 20:26 1 2 09/04 22:52 1 2 09/03 13:48 806 1 09/03 15:16 	<p>38 28 + 10</p>
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Emerging Technology: AI and Learning Analytics

- **Learning Analytics** is the science of the measurement of data about learners and the learning environment/system to visualize and optimize the complex conditions in a typical school system.
- **Predictive Analytics** is a type of learning analytics where we predict future outcomes from data today and determine why an outcome is likely, so that we can influence that outcome.



Emerging Technology : Augmented and Virtual Reality



- Engaging tools for the classroom.
- Available through a traditional desktop or head mounted display.
- Content can be touched and manipulated.
- The metaverse has potential for learning.

Emerging Technology : Maker Tools

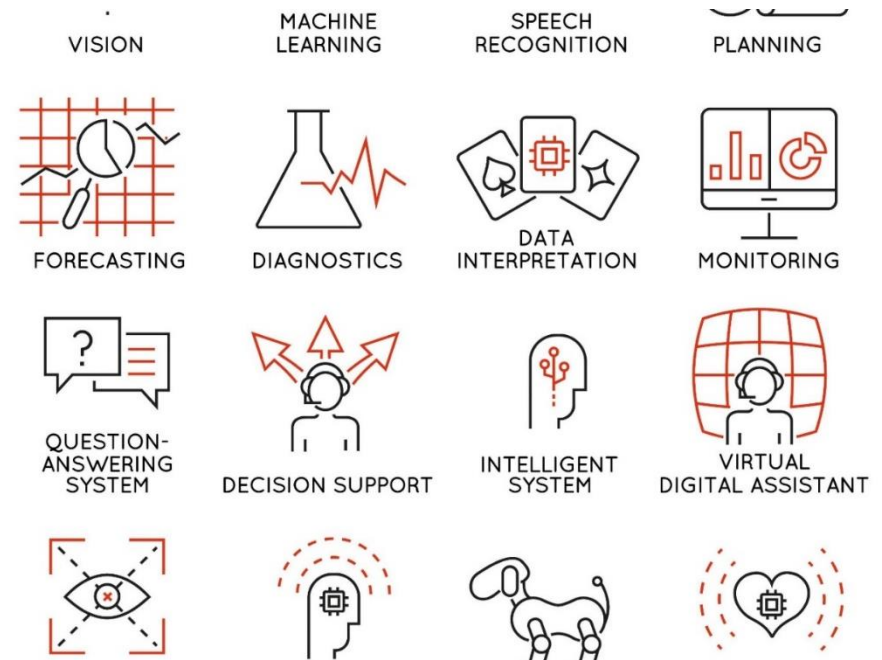
- Creating an environment where students can create, invent, and explore using modern technology tools
- Includes
 - Web design
 - 3D Printing
 - Robotics
 - Podcasting



Emerging Technology : Adaptive/Assistive Technology

Assistive technology is used to increase, maintain, or improve functional capabilities of individuals with disabilities-and everyone else.

- Natural User Interface: touch screen, gesture recognition technology.
- Context Awareness: identify location, nearby people and resources.
- Speech Recognition and Translation: machines identifying and translating spoken words.
- Voice Recognition: Identify a particular individual's voice.



The Future of School, Catalyzed by Technology

- Blended (Hybrid) in-person and online
- Flexible scheduling, grouping/pods
- Equity of access
- New funding and ownership models for content and technology
- New funding mechanisms for schools
- Competition for students
- Online testing
- New cybersecurity threats to students, staff, and parents
- New technology staffing models

How is Your Technology Program?

How do you know?

Strategies to evaluate your technology program.

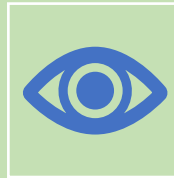
Evaluating Technology Programs



Key Performance Indicators

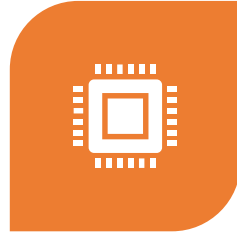


Surveys



Observation

K-12 Key Performance Indicators



UPTIME: PERCENTAGE
ACCESS TO CRITICAL
SYSTEMS



ACTIVITY: TECHNOLOGY
USE BY LOCATION, TIME,
AND TYPE OF CONTENT



CYBERSECURITY
HYGIENE



TROUBLE TICKET
ANALYSIS



CUSTOMER FEEDBACK



OBSERVATION

The Digital Review Process



- Vet all new technology initiatives and technology purchases through the lens of your district's goals.
- Ensure technology is compatible with your network infrastructure.
- Evaluate total cost of ownership:
 - Initial and ongoing costs
 - Training, support
- Never forget the teacher and the learner!

Technology Planning and Certification

- Next Cohort starts June 2022
- www.teacherinfo.com
- Contact Dr. Berning for details

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