Technology Integration in the Classroom
What Administrators Should Know

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Food for thought...

Have you been
paying attention?

- ▸ Click to play movie. If it doesn't play, visit link below.
- ▸ T4-Jordan School District, **Transforming Teaching Through Technology,** http://t4.jordan.k12.ut.us/t4/content/view/221/35/

Technology Integration Defined

▸ Technology integration – the incorporation of technology **resources** and technology-based practices into the daily routines, work, and management of schools (what comes next after making technology is available and accessible; a goal-in-process, not an end state) *Technology in Schools, Suggestions, Tools and Guidelines for Assessing Technology in Elementary and Secondary Education*

▸ "Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions—as accessible as all other classroom tools." *National Educational Technology Standards for Students, International Society for Technology in Education*

▸ "Technology integration is the process of teaching technology **and another curricular area simultaneously.** In addition, it is the process of using technology to enhance technology for learning*." EdTech Connect, 1999*

▸ "Leadership is the single most important factor affecting the successful integration of technology. This is true at the state level and at the school level. Schools which have made the most progress are those with energetic and committed leaders." *SouthEast and Islands Regional Technology in Education Consortium (Technology in Schools)*

Research: Using Technology to Improve Student Achievement

- A 2000 study revealed positive and consistent patterns when students were engage in technology-rich environments, including significant gains and achievement in all subject areas (Sivin-Kachala and Bialo, 2000)

- Schacter (1999) found that students with access to any of a number of technologies show positive gains in achievement on researcher constructed tests, standardized tests, and national tests.

- Using computers to teach low order thinking skills had a negative impact on academic achievement while using computers to solve simulations saw math scores increase significantly (Wenglinsky, 1998)

- It is not the computer use itself that has a positive or negative impact on achievement of students but the way in which the computers are used (Papanastasiou, Zemblyas, & Vrasidas, 2003)

- Computer technology can help support learning and is especially useful in developing the higher-order skills of critical thinking, analysis, and scientific inquiry "by engagin students in authentic, complex tasks within collaborative learning contexts" (Roschelle, Pea, Hoadley, Gordin & Means, 2000)

- eMINTS students scored consistently higher on the Missouri Assessment Program (MAP than non-eMINTS students, including eMINTS students classified as having special needs (Evaluation Team Policy Brief, 2002)

Research: Using Technology to Improve Student Achievement (cont.)

- The use of computers (desktops, hand-held devices, Internet) is more effective when:
  - there is a diversity of teaching strategies
  - there is teacher pre-training in the use of computers as a teaching and learning tool
  - there are multiple opportunities for learning (tutorials, drill and practice, simulations)
  - the student, not the teacher, is in "control" of learning
  - peer learning is optimized (working in pairs or groups vs. individually) (Hattie, 2009)
- When students use technology as a tool or support for communicating with others:
  - There is an increase in motivation (immediate results, enhances self-esteem)
  - Students acquire skills with a broad range of software and hardware tools
  - There is an increased inclination to work cooperatively and to provide peering tutoring (Office of Educational Research and Improvement, http://www2.ed.gov/pubs/EdReformStudies/EdTech/effectsstudents.html

National Educational Technology Standards (NETS-A) for Administrators

- **Visionary Leadership**: Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization.
- **Digital-Age Learning Culture**: Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.
- **Excellence in Professional Practice**: Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.
- **Systemic Improvement**: Educational Administrators provide digital-age leadership and management to continuously improve the organization through the effective use of information and technology resources.
- **Digital Citizenship**. Educational Administrators model and facilitate understanding of social, ethical, and legal issues and responsibilities related to an evolving digital culture.

CLICK ON LINK ABOVE FOR PERFORMANCE INDICATORS ASSOCIATED WITH EACH STANDARD.

National Educational Technology Standards (NETS-A) for:

TEACHERS

- **Facilitate and Inspire Student Learning and Creativity:** Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

- **Design and Develop Digital-Age Learning Experiences and Assessments :** Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

- **Model Digital-Age Work and Learning:** Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

- **Promote and Model Digital Citizenship and Responsibility:** Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

- **Engage in Professional Growth and Leadership:** Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

STUDENTS

- **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

- **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

- **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use information.

- **Critical Thinking, Problem Solving, and Decision Making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

- **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

- **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems, and operations.

CLICK ON LINKS ABOVE FOR PERFORMANCE INDICATORS ASSOCIATED WITH EACH STANDARD.
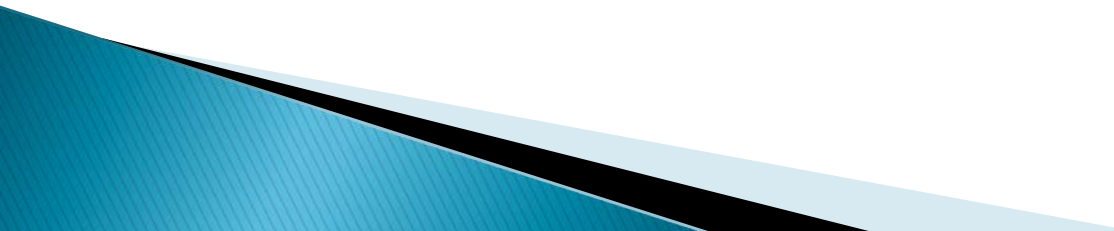
Meeting the 21ˢᵗ Century Challenge:

- NCLB requires states to demonstrate that "every child is technologically literate by the time the student finishes the eight grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability" (U.S. Department of Education, 2001).

- Information and Communication Technology (ICT) Literacy, a new common definition of what students need to know, reflects the need for students to develop learning skills that enable them to think critically, analyze information, communicate, collaborate, and problem-solve, and the essential role that technology plays in realizing these learning skills in today's knowledge-based society. Representative of the ICT literacy skills are the following six arenas critical to students' success in the workplace (Kay and Honey, 2005):

  ◦ Communicate Effectively: Students must have a range of skills to express themselves not only through paper and pencil, but also audio, video, animation, design software as well as a host of new environments (e-mail, Web sites, message boards, blogs, streaming media, etc.).

  ◦ Analyze and Interpret Data: Students must have the ability to crunch, compare, and choose among the glut of data now available Web-based and other electronic formats.

  ◦ Understand Computational Modeling: Students must posses an understanding of the power, limitations, and underlying assumptions of various data representation systems, such as computational models and simulations, which are increasingly driving a wide-range of disciplines.

  ◦ Manage and Prioritize Tasks: Students must be able to mange the multi-tasking, selection, and prioritizing across technology applications that allow them to move fluidly among teams, assignments and communities of practice.

  ◦ Engage in Problem Solving: Students must have an understanding of how to apply what they know and can do to new situations.

  ◦ Ensure Security and Safety: Students must know and use strategies to acknowledge, identify, and negotiate 21ˢᵗ century risks.

    (Kay and Honey, 2005)

Key questions for assessing the integration of technology in a school/district:

1. Are teachers proficient in the use of technology?
2. Are students proficient in the use of technology?
3. Are administrators and support staff proficient in the use of technology in support of school management?
4. Is technology integrated into the teaching/learning environment?
5. Are technology proficiencies and measures incorporated into teaching and learning standards?
6. Are technology proficiencies and measures incorporated into student assessment?
7. Is technology incorporated into administrative processes?
8. Is technology proficiency integrated into the evaluation of instructional and administrative staff?

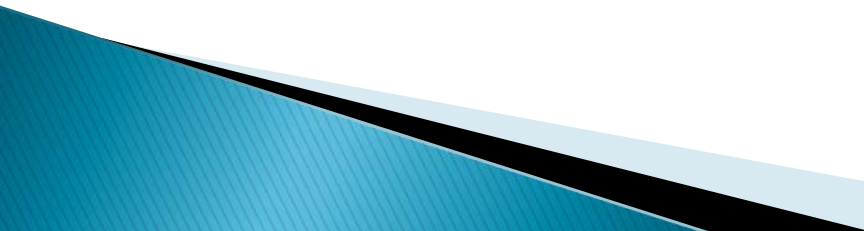CLICK ON LINK ABOVE FOR INDICATORS ASSOCIATED WITH EACH QUESTION.

Barriers to Integration

- Inadequate hardware/software – both need updating on a regular basis
- Difficulties in securing sufficient funding for purchasing new, updating, replacing
- Inadequate staff development (poor quality or lack of time for)
- Lack of commitment from school board and/or community
- Teachers' fears: resistance to change, feelings of inadequacy, role as expert threatened
- Difficulty in finding and using appropriate software for instruction
- Technology not easily accessible to teachers
- Inadequate technical support
- "Edutainment" software that doesn't meet learning goals and may lack educational value
- Lack of student technology skills
- Accountability pressures
- Some technology may add value while some may be a distraction
- Technology keeps changing

Keys to successful integration

- Quality support staff (technical support and media specialists) who are trained and available
- Use of technology is modeled from the top down (superintendent>principal>teacher> student)
- Quality, on-going professional development and inservice is offered to all faculty and staff
- Technology training should reach a wide variety of teacher skill levels: different training for the novice vs. the expert
- Technology is only used for work directly tied to the curriculum and never for games or rewards
- Placing computers for equitable access (location of computer labs, access to computers in classrooms, availability of mobile computer labs
- Technology supports the educational goals for students (clear set of goals, expectations, criteria are established)
- Acceptance of teacher's roles as facilitators or coaches rather than only lecturer
- Offer incentives for teachers to use technology: financial incentives, compensation for professional development, conferences, time, classroom-embedded mentoring/tutoring, job security, etc.
- Choosing appropriate software
- Obtaining and sustaining funding

eMINTS National Center

- http://www.emints.org/
- National Center is a non-profit, independent business unit of the University of Missouri
- In Missouri - collaborative education program sponsored by the University and DESE
- Professional development programs focusing on instructional strategies using technology
- Instructional model provides a research-based approach to organizing instruction and can be implemented in any subject area at any level
- Instructional model assumes inquiry-based learning with high quality lesson design in a classroom community that is powered by technology
- On-line Application
- Grant funding available

Web Terminology

- ▸ Wiki – type of collaborative software program that typically allows web pages to be created and collaboratively edited using a common web browser
- ▸ Blog – a shared on-line journal where people can post diary entries about their personal experiences and hobbies
- ▸ Learning management system – a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content (Blackboard, Angel, etc.)
- ▸ Podcast – a series of digital media files (either audio or video) that are released episodically and downloaded through web syndication.
- ▸ Global Positioning System (GPS): space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites
- ▸ Geographic information system (GIS) – a system that captures, stores, analyzes, manages, and presents data that are linked to location; the merging of cartography and database technology
- ▸ Webquest – an inquiry-based, on-line learning activity. During this activity students work in groups, dividing assignments among each other, so that everyone participates in a group-assigned role. The objective of the activity is to promote "transformative" learning outcomes, accomplished through the reading, analysis, and synthesis of Web-based information.
- ▸ Electronic portfolio (e-portfolio) – a collection of electronic evidence assembled and managed by a user, usually on the Web. Such electronic evidence may include inputted text, electronic files, images, multimedia, blog entries, and hyperlinks.

All definitions from wikipedia.com.

Web 2.0 defined

- The term **"Web 2.0"** is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centered design,[1] and collaboration on the World Wide Web.
- Examples of Web 2.0 include web-based communities, hosted services, web applications, social-networking sites, video-sharing sites, wikis, blogs
- A Web 2.0 site allows its users to interact with each other as contributors to the website's content, in contrast to non-interactive websites where users are limited to the passive viewing of information that is provided to them.

Wikipedia, http://en.wikipedia.org/wiki/Web_2.0, retrieved 4/26/10

Web 2.0 Examples

(just a small sampling)

- Blog: edublogs – free blog-hosting site for educators and students of all ages
- Wiki: Wikispaces – create a public, online wiki for free; great for class collaboration
- Database: Zoho Creator – an online database application that can be used for surveys, inventories, data collection, and much more
- Podcast: Gabcast – easy-to-use podcast creation and hosting site; even use your cellphone to record the podcast
- Google Reader
- An easy-to-use aggregator which is part of the Google suite of apps
- Drop.io – Free file-sharing and collaboration in real-time. Share, collaborate, and present music, videos, documents, audio, and add them to a private drop, online through email, web, phone, fax, and more.
- MindMeister – Another easy-to-use online, collaborative concept-mapping tool.
- skrbl: – A collaborative, online whiteboard
- TinyChat – Create a chat-room on-the-fly and share the URL with others (no email address needed). Download the completed chat as an RTF file.
- Twiddla – Twiddla is a free, no-setup, Web-based meeting space. You can mark up screenshots of Websites, graphics, and photos, or start brainstorming on a blank canvas. It also includes voice and text chat.
- Wallwisher – An intuitive site that allows multiple users to simultaneously post to a "wall" using little notes and a limit on the number of characters. No registration is needed, just the URL of the wall, and it is a great tool to start or end a lesson or professional development session.
- Writeboard
- A online collaborative file sharing and tool-- similar to a wiki in that you can roll-back to an earlier revision.
- Flickr – a social networking site for photographs; a great source of material for students to access
- Video Hosting: JayCut – not just a video-hosting site, Jaycut allows you to edit your upleaded video and store it online

Other Web educational tools

(just another small sampling)

- Assign-A-Day – a free, online calendaring site that can be used to post school, activity, or class calendars
- Aviary – a powerful set of online tools for image and audio editing
- Exercises, Quizzes, Tests – hundreds of links to online exercises, quizzes, and test makers as well as as well as a subject-arranged list of links to assessment tools
- Game-O-Matic – a suite of wizards to create simple Web-based activities for language learning and practice
- Jing – this easy-to-use, cross-platform screen-casting program can be used for creating tutorials, screenshots, and much more
- Puzzlemaker – create word searches, cryptograms, math squares, and other types of puzzles to use with your lessons
- QuizCenter – this site allows you create and correct online quizzes without requiring any knowledge of HTML and automatically posts them on a server so they may be used by students
- Exercises, Quizzes, Tests – just what it says!
- Flashcard Exchange – "world's largest flashcard library" (self-proclaimed)
- RubiStar – a free tool to help teachers create quality rubrics
- BibBuilder 1.3 – tool to help teachers/students create accurate bibliography
- EduTecher – a list of links, mostly Web 2.0 and online activities, for educators and students
- Kathy Schrock's Guide for Educators – list of sites useful for enhancing curriculum and professional growth
- Best Webquests – webquests: inquiry-based, on-line learning activity where students work in groups, dividing assignments among each other, so that everyone participates in a group-assigned role
- Virtual Museum – a distributed directory of on-line museums
- Math: Virtual Manipulatives – a collection of interactive math manipulative sites

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Suggested Reading

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- The Ethics Web: Ethics on the Net, http://www.tnellen.com/cybereng/ethics/

- Edutopia: The George Lucas Educational Foundation: What works in Education. http://www.edutopia.org/

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