

Educational Technology: Can It Be Equitable?

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MARTEC Invitational Conference ♦ May 15-16, 2002



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NCLB Educational Technology Goals

- improve student academic achievement through the use of technology in elementary schools and secondary schools;
- assist students to become technologically literate by the time they finish the eighth grade; and
- ensure that teachers are able to integrate technology into the curriculum to improve student achievement.

Source: *The Facts: 21st Century Technology*, NCLB, www.nclb.gov/start/facts/21centtech.html

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Focus on the Classroom

- The Challenges
- The Opportunities
- The Strategies

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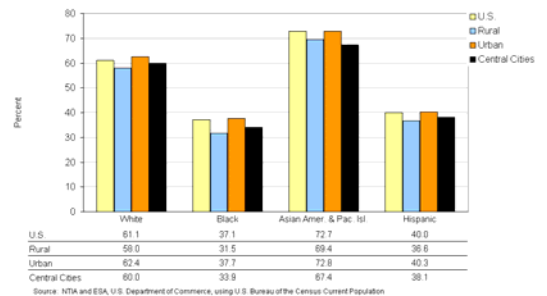
The Challenge

- Unequal Access by Income
- Unequal Access by Race and Ethnicity
- Unequal Access by Location
- Unequal Participation by Gender

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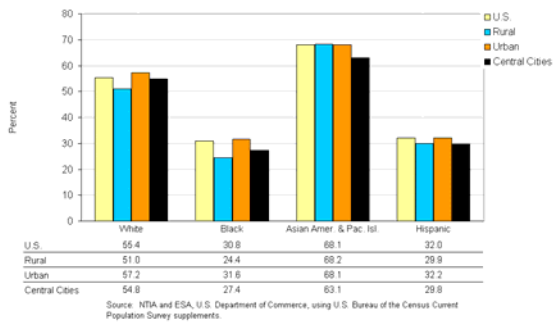
Percent of U.S. Households with a Computer By Race/Hispanic Origin,
By U.S., Rural, Urban, and Central Cities, 2001



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Percent of U.S. Households with Internet Access, By Race/Hispanic Origin, By U.S., Rural, Urban, and Central Cities, 2001



School Computer Access

- In schools with high concentrations of poverty, only 39% of instructional rooms had Internet access compared with 62-74% for instructional rooms in schools with lower concentrations of poverty.
- The nation's poorest schools are least likely to report use of the Internet by administrators, teachers and students. Only half of the nation's poorest schools report that students use the Internet at all.

Source: *Young Americans and the Digital Future Campaign*, <http://www.childrepartnership.org/youngamericans/factsheet.html>

Stats for Women and Girls

- 17 percent of the Computer Science "AP" test takers
- Less than 10% of the higher level Computer Science "AB" test takers
- Roughly 20 percent of IT professionals
- Receive less than 28 percent of the computer science bachelor's degrees, down from a high of 37 percent in 1984.
- 9 percent of the recipients of engineering-related bachelor's degrees.

Source: *Tech-Savvy: Educating Girls in the New Computer Age*, AAUW (2000)

Why worry?

- By the mid-2050's, white non-Hispanic Americans will be in the minority
- 24.8% of the population live in rural areas (1990 census data)
- Women are nine times as likely as men to be single parents
- ¾ of teachers are women



Source: Walt Kelly, 1971

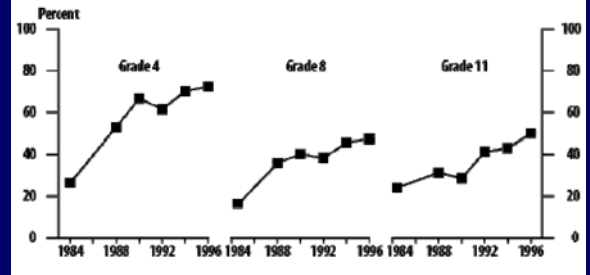
The Opportunities

Classrooms & Schools online

Mid-Atlantic Region's Progress Towards the Four National Goals:

Indicator:	DC	DE	MD	NJ	PA	Average
Students per instructional computer:	5.4+	5.3+	6.6-	5.7+	5.5+	5.7
Percentage of classrooms with at least one multimedia computer connected to the Internet:	70%+	81%+	62%	65%+	60%	68.8%
Schools with Internet Access:	85%	98%+	NR	NR	NR	92%
Percentage of schools with at least 50% of teachers with school based email addresses:	NR	NR	55%	90%+	57%	67.3%

Source: Progress Report on Educational Technology - State by State Profiles, December 2000, U.S. Department of Education, Office of Educational Technology



Percentage of students who reported using a computer at school at least once a week, by grade.

Source: *The Facts: 21st Century Technology*, NCLB, www.nclb.gov/start/facts/21centtech.html

Access by Students

- There are now more children 12 and under online (13.2 million) than those 13-18 (12.5 million).
- Use for homework or school assignments
 - 66% of online teenagers
 - 51% of online kids 12 and under

Source: *The Facts: 21st Century Technology*, NCLB, www.nclb.gov/start/facts/21centtech.html

Attitudes

- Of online U.S. parents, 75% believe that the Internet is a positive learning tool.

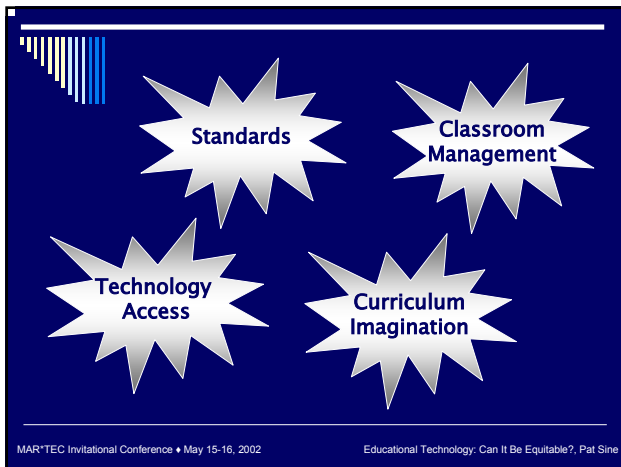
Source: Turow, Joseph, *The Internet and the Family*, Annenberg Public Policy Center, University of Pennsylvania, May 4, 1999.

The Strategies

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Why Standards?

- Standards provide guideposts for academic achievement, clearly telling teachers, students, and parents where they are going.
- The Challenge: To establish clear expectations of what students should know and be able to do for schools, teachers, and students.
- The Solution: Require each state to establish its own standards in the core content areas of reading, math, and science.

Source: Closing the Achievement Gap in America's Public Schools, NCLB, <http://www.nclb.gov/next/closing/closing-the-gap.pdf>

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NETS for Students

1. Basic operations and concepts
2. Social, ethical, and human issues
3. Technology productivity tools
4. Technology communications tools
5. Technology research tools
6. Technology problem-solving and decision-making tools

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NETS for Teachers

- I. Technology Operations and Concepts
- II. Planning and Designing Learning Environments and Experiences
- III. Teaching, Learning, and Curriculum
- IV. Assessment and Evaluation
- V. Productivity and Professional Practice
- VI. Social, Ethical, Legal, and Human Issues

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NETS for Administrators

Technology Standards for School Administrators (TSSA)

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NETS for Administrators

- I. Leadership and Vision
- II. Learning and Teaching
- III. Productivity and Professional Practice
- IV. Support, Management, and Operations
- V. Assessment and Evaluation
- VI. Social, Legal, and Ethical Issues

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Problems with Standards

- Reasonably skilled, well-intentioned teachers are stymied in trying to create or implement lessons that incorporate technology up to the performance indicators described in [NETS for Students](#) and that help students meet the Delaware and national standards.

Computer Skills Growth Chart

- What It's Not
 - A computer skills scope and sequence
 - A computer curriculum
 - Another set of standards
 - A set of performance indicators
- What it is
 - A measuring standard
 - A "quick check" for lesson planning
 - A way to alleviate teacher fear
 - An enabler

Computer Skills Growth Chart

- List of skills for planning for curriculum integration for students in K-12
 - E-mail & Internet
 - Network & Computing Skills
 - Word Processing
 - Graphics & Presentation
 - Spreadsheets & Databases
- By including these skills across the curriculum, students should be able to meet or exceed the NETS for Students through projects that utilize technology
- www.dcet.k12.de.us/instructional/skills/index.html

Classroom Management

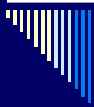
Problem

- In 1999, teachers reported feelings on using computers and the Internet for classroom instruction.
 - 10 percent of teachers reported feeling "very well prepared"
 - 23 percent reported feeling "well prepared" to use computers

Source: "Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology," <http://nces.ed.gov/pubsearch/pubsearch.asp?pubid=2000102>



Source: http://www.olympics.org/uk/sports/programme/disciplines_uk.asp?DiscCode=CU



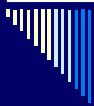
ITLT project

- Instructional Technology Lead Teachers
- One or two per school
- Treated as professionals
 - Receive pay or released time plus a laptop computer
- Receive JIT support through listservs



ITLT project

- Focus on whatever is keeping teachers in their school from using technology
- Serve as “eyes and ears” for district level support



ITLT project

- Report Monthly
 - What did you do this month?
 - What do you have planned for next month?
 - What help do you need?

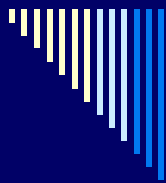


ITLT project

- Brandywine School District, Delaware
www.udel.edu/sine/brandywine
- Avon Grove School District, PA
www.udel.edu/sine/avongrove

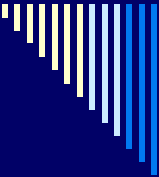


Curriculum Imagination



90% of the jobs today's kindergartners will be doing when they reach adulthood do not even exist today.

Source: <http://www.academic.org/work.html>

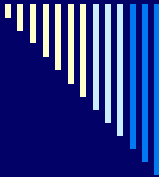


Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible.

NETS for Students: Connecting Curriculum and Technology, ISTE, 2000

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Integrating into the Classroom?

or

Integrating into the Curriculum?

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Challenges

- Most of the current emphasis of NCLB is on reading and math
- Educational technology applications for these are often limited to testing, record keeping or drills

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Challenges

- Examples of educational technology applications are often trivial, not representing quality technology integration
- Online curriculum resources are written in ways that make it difficult to implement the lessons or units in the classroom

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Challenges

- Technology is seen as separate from other areas because of
 - Specialization
 - Scheduling needs
 - Fear of classroom teacher
 - Response to pressure for enough "computer time" for students

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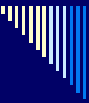


Challenges

- The best applications of technology are the most difficult to incorporate into today's schools with emphasis on measurable progress in the core curriculum areas
- Starting May 13, "The Constructivist Software Struggle"
 - David Benoit, Dr. Anne H. McCormick, Dr. Seymour Papert and Dr. Alexander Repenning
 - Institute for the Advancement of Emerging Technologies in Education (IAETE) at AEL
 - www.iaete.org/soapbox

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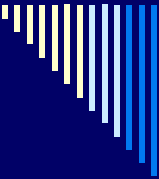
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Educational Technology: Can It Be Equitable?



Educational Technology: Can We Make it Equitable?



Sometimes I've believed
as many as six
impossible things before
breakfast.

Lewis Carroll



*This presentation and links
to supporting information
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www.udel.edu/sine/equity*