


## *Education and the Digital Divide*

IS NCLB THE WAY ACROSS?

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### *No Child Left Behind Act of 2001:* Reauthorization of the Elementary and Secondary Education Act

- On January 8, 2002, President Bush signed into law the *No Child Left Behind Act of 2001*
- The Act is the most sweeping reform of the Elementary and Secondary Education Act (ESEA) since ESEA was enacted in 1965
- It redefines the federal role in K-12 education.

*Meant to help close the achievement gap between disadvantaged and minority students and their peers*


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### *NCLB is based on four basic principles:*

1. Stronger accountability for results
2. Increased flexibility and local control
3. Expanded options for parents
4. Emphasis on teaching methods that have been proven to work

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### *NCLB & the Digital Divide*

<p><i>In terms of the issues:</i></p> <ul style="list-style-type: none"> <li>• Stronger accountability for results...</li> <li>• Increased flexibility and local control...</li> <li>• Expanded options for parents...</li> <li>• Emphasis on teaching methods that have been proven to work...</li> </ul>	<p><i>In terms of solutions:</i></p> <ul style="list-style-type: none"> <li>• Are we closing the gap?</li> <li>• What local resources are available?</li> <li>• What are the local options?</li> <li>• Nothing has worked at the national level...</li> </ul>
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*If the answers to these questions are no, none, few or zero... Then we can invoke the legislation for action on the program.*

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## *The Digital Divide v. e-Learning*

1. The expectation that we could connect every child, classroom, school and library led to the unwise creation of a national digital divide
2. The concept of an information superhighway was technically unfeasible (e.g., Internet 2 is not inclusive)
3. All subsequent plans based on an invalid technology strategy and flawed technology vision only served to aggravate our education problems at the national level

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## *e-Learning is Real and Feasible*

1. We now have a real opportunity for achieving equity access to educational technology and educational quality
2. We can achieve **e-Quality** through **e-Learning**, a very different technology strategy and a realistic national goal
3. We are able achieve e-Quality within the principles of NCLB

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## *Remarks by Secretary Paige* **No Child Left Behind Forum on Learning** Denver, CO, July 12, 2002

- e-Learning promotes local control by expanding opportunities even in rural and urban areas with limited resources to tap a vast reservoir of knowledge and expertise online
- Schools can increase their repertoire of courses for students, provide professional development for teachers or share their talented staff with other districts
- e-Learning increases flexibility for schools and for students so even a living room can be a classroom.
- A classroom can be an archeological dig
- The motto of the Florida Virtual School says it all:  
*"Anytime, any place, any path, any pace"*
- e-Learning promotes individual instruction to meet the needs of each student
- e-Learning empowers moms and dads to make choices that will help their sons and daughters get the best education possible

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## *What is e-Learning?*

*e-Learning is the application of e-business technology to education and learning. It is currently a web-enabled enterprise application, including the entire spectrum from back-end systems to front-end linkages such as learning delivery systems, learning management, and the underlying infrastructure, including network infrastructure, middleware, storage, servers and client systems. e-Learning requires a successful evolution of learning objects takes place as part of the ongoing evolution of IT.*

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### *e-Learning as an IT Industry*

- e-learning market is composed of services, infrastructure and content development
- Market driver is life-long learning and the knowledge economy
- Growing strongly and attracting strong VC and government investments
- Lack of open standards for interoperability and for mixing and sharing content
- Highly fragmented - over 100 players

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### *e-Learning as a Technology*

- Text, graphics, video, interactive content packages will emerge as XML-annotated objects, *composable* screens, sessions, even entire courses
- Meta-data techniques will define nature, purpose, authorship, copyright... etc.
- Learning Objects will be separated from learning infrastructures
- Specifications for how to package, install, discover, and retrieve from repositories will evolve in automatic processes
- Group of related standards are emerging: IMS, SCORM, IEEE LOM, ISO...

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### *IT Market Defined by e-Learning Standards?*

- According to industry research, customers, e.g. schools, want to be able to buy fine-grained content from multiple publishers, so that teachers can deliver personalized classes
- Publishers have historically adopted proprietary standards for delivering coarse-grained, rigidly structured content and they will need to adapt to the market requirements of the e-Learning industry, which are different from traditional educational markets
- Publishers strongly desire standards in this industry but lack conviction that current processes will yield useful results in short term is holding back such standards development
- e-Learning not currently defined by publishers?
- How is e-learning technology defined? Who defines it?

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### *IT Market Implications*

- **Globalization:** Imports/exports processes should be largely simplified through e-commerce. This will impact offshore outsourcing and the e-learning industry
- **Economy:** As governments move beyond regulations, they will become true IT business facilitators, thus e-learning facilitators
- **Society:** IT role in our daily lives will be transformed and governance redefined through e-communities

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### *IT Technology Implications for e-Learning*

- Technology, Grid Computing and related distributed computing topics will be key in sharing the tremendous amount of data generated by a knowledge society and will affect e-learning more than other industries
- Middleware and hardware: (storage and infrastructure) are key components of an e-learning strategy
- Software for content management and learning objects will see high growth

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### *IT Technology Implications (cont.)*

- **Alliances:** Business partners will play a key role in the reengineering of IT processes and this may change the implementation landscape
- **Paradigms:** Widespread adoption of mobile and wearable technology and the plurality of channels will create opportunities for new e-learning models
- **Geographies:** Some countries have been delayed in their adoption of IT because of tradition or cost, but will enter the field changing the dynamics of the IT industry

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### *IT Technology Implications (cont.)*

- Outsourcing service integration will continue to grow and affect our national needs for education and training
- Security after September 11 produced a shift on budgets towards more security, which will involve the future of all websites
- Privacy issues are also rising with the recent concern for individual liberties in a climate of heightened security
- New wireless applications are being developed to facilitate communications between different forces and emergency services as well as diffusion of information

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### *e-Learning Standards v. Education Standards*

*The emergence of an open-standards based economy for the creation, distribution, composition, and delivery of Learning Objects supporting Digital Rights Management would turn this industry into the future of IT-based education, and that might be the best hope for the participation of schools in the IT-enhanced future described earlier.*

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### ***ILIT: National Academy of Sciences Technology Reflections***

*On an extended time scale, the rate of growth of Information Technology (IT) power, performance and corresponding improvement in price is today about 60% from 20% in the early 20<sup>th</sup> century. The fundamental technologies that have changed the world are extremely dense storage, enormous bandwidth and faster and smaller transistors. And, while we expect substantial technical and physical barriers to progress in these areas, history has shown that we always find new technologies to go beyond those that are reaching their natural limitations.*



### ***IT Relevance to Education***

*IT is already as relevant to education as life is. Our classrooms will exist in the IT-enhanced world of the future, unless we force our classrooms to remain in the past. Socially, future generations of students will not remain in the past, and this will create social and intellectual problems for which we may not have any solutions. Simply put, the problem for education is: how will people learn to live with these technologies, if we don't find way for people to learn with these technologies?*



### ***Legislation Relevance to IT***

- Web technologies developed over the last decade through an unprecedented burst of entrepreneurial energy and global cooperation
- Competitive tension and global cooperative standards that ensued created an IT climate irrelevant to education and learning
- Web-standard technologies are a by-product of business and only provide by-product benefits to education, fragile benefits at that
- Second decade Web demonstrated that patents are a factor in the ongoing evolution of the Web infrastructure
- Schools, education and learning stand to be left out of the ultimate phase of WEB-based IT, this important because of the inseparable involvement of the Web with telecommunications

*It is unclear what will happen without effective and profoundly knowledgeable policies.*



### ***Future Technology Trends***

- Hardware, software and services will be integrated into scalable infrastructures
- Modular technologies will be optimized to service those infrastructures
- Core business drivers for IT evolution will be in the areas of buy and supply, sell and support
- Most IT development will be outsourced and offshore outsourcing in itself will be a strategic business driver
- Global services, life sciences and knowledge management will become the major IT growth areas.
- IT project drivers will be business bottom line
- There will be a massive shift in IT skills dynamics



### *Needed Core Principles for IT Policies*

- We cannot allow politics to chart the future of our schools
  - We must explicitly define IT policy requirements for our schools
- We must not allow schools to be second to industry in the IT future of the US.
  - We must define e-learning technology standards

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### *Are our schools in a position of power?*

- How do we enforce these guiding principles in a nation that is guided by a notable free enterprise system that is the envy of the world?
- How do we enforce these guiding principles in the midst of a global economy where our schools stand to challenge no one in the world?

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### *Are our schools in a position of leadership?*

- We must maintain a strong international image, both through industry and government, which is today impacted by our poor education image
- Our international leadership comes from our strength as a nation and our industry success
- We must continue the **IT transformation** will keep us at the forefront of e-Learning worldwide
- We will always be a **superior in e-learning**

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### *National e-Learning Strategy*

- **Position e-learning as THE framework for education transformation**
- **Exploit the opportunity to acquire e-learning from the private sector or government initiatives**
- **Cross leverage an e-learning strategy with an IT roadmap**
- **Position e-learning as our foremost national priority**

*education is our national defense*

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