“The greatest use of life is to spend it for something that will outlast it”

William James, 19th century

Education and the Challenges Ahead

Woody Sessoms
Vice-President
Agenda

Changing world environment:
- U.S. results (vs other countries, between States)
- Macroeconomic needs
- Children’s expectations

What Cisco is doing about it:
- Networking Academies
- Mississippi/Louisiana Education Initiatives
- Gender equity
- Partnership for 21st Century Skills
U.S. Trailing and Falling Further Behind

Ranking of G8 countries:
10th grade math & problem solving

<table>
<thead>
<tr>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Canada</td>
<td>France</td>
<td>Germany</td>
<td>UK</td>
<td>Russia</td>
<td>USA</td>
<td>Italy</td>
</tr>
</tbody>
</table>

OECD Ranking

<table>
<thead>
<tr>
<th>Science</th>
<th>Reading</th>
<th>Math</th>
<th>Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>1st</td>
<td>1st</td>
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<tr>
<td>5th</td>
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<tr>
<td>30th</td>
<td>30th</td>
<td>30th</td>
<td>30th</td>
</tr>
</tbody>
</table>

Source: PISA, 2000, 2003
Relative Achievement Drops Rapidly from 4th to 12th Grade Compared to Peers

- Focus on K–8 reading and math not paying off by graduation
- Only students in Lithuania, Cyprus, and South Africa rank worse by 12th grade
- No improvement overall or have slipped since 1995

### Perception vs Reality

#### "I get good marks in mathematics."

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage Agreeing or Strongly Agreeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>72</td>
</tr>
<tr>
<td>Australia</td>
<td>65</td>
</tr>
<tr>
<td>Canada</td>
<td>63</td>
</tr>
<tr>
<td>Ireland</td>
<td>60</td>
</tr>
<tr>
<td>Germany</td>
<td>59</td>
</tr>
<tr>
<td>France</td>
<td>48</td>
</tr>
<tr>
<td>Spain</td>
<td>47</td>
</tr>
<tr>
<td>Korea</td>
<td>36</td>
</tr>
<tr>
<td>Japan</td>
<td>28</td>
</tr>
</tbody>
</table>

#### Mathematics Literacy

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>542</td>
</tr>
<tr>
<td>Japan</td>
<td>534</td>
</tr>
<tr>
<td>Canada</td>
<td>532</td>
</tr>
<tr>
<td>Australia</td>
<td>524</td>
</tr>
<tr>
<td>France</td>
<td>511</td>
</tr>
<tr>
<td>Germany</td>
<td>503</td>
</tr>
<tr>
<td>Ireland</td>
<td>503</td>
</tr>
<tr>
<td>Spain</td>
<td>485</td>
</tr>
<tr>
<td>United States</td>
<td>483</td>
</tr>
</tbody>
</table>

Note: Scores were reported for 39 countries in PISA 2003. The above figures depict the United States, which ranked 27th in math, and a sample of eight countries with average mathematics literacy scores higher than those of the United States.

Source: Organization for Economic Co-operation and Development (OECD), "Learning for Tomorrow's World—First Results from PISA 2003"
PISA Scores vs. Education Investment

Source: NCES, September 2004
Urban Divide: Relative Performance by State

- Five most populous states have 40% of all students and largest urban populations.
- Gap between top and bottom is the highest of any OECD country.

Average State NAEP Scores, Reading and Mathematics, Grades 4 and 8, 1990-2003

Sources: Cisco, January 2005; Rand Corp., December 2004; NAEP, 2003
Urban Divide: Texas Closing the Gap

- Best education equality
- Model focuses on teachers
  Autonomy
  Accountability
  Individualized attention
- Safe environments
- Statewide standards model
- California trails nation

Estimated Average NAEP Scores for Students from Similar Families Across States

Sources: Cisco IBSG, January 2005; Rand Corp., December 2004; NAEP, 2004
The Urban Divide

- 2,000 drop outs every day in largest 32 urban cities
- Less than 10% go to college, 90% need remediation
- Dropouts associated with crime, substance abuse, early unprotected sex
- Gap between best and worst students is largest of any OECD country
- African Americans and Hispanics are most likely to perform poorly

Source: Carnegie Challenge, the Urban High School’s Challenge: Ensuring literacy for Every Child, 2002
# The Teacher–Student Divide: A Broken Foundation

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools connected by broadband</td>
<td>94%</td>
</tr>
<tr>
<td>Instructional rooms connected</td>
<td>92%</td>
</tr>
<tr>
<td>After hours access for students</td>
<td>53%</td>
</tr>
<tr>
<td>Teachers with a computer</td>
<td>49%</td>
</tr>
<tr>
<td>On-site support</td>
<td>38%</td>
</tr>
<tr>
<td>Teacher training</td>
<td>25%</td>
</tr>
<tr>
<td>Teachers with laptops</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: NCES, FRSS Study, June 2003
Failure to Raise Student Achievement Results In Huge Opportunity Cost

• $2.5T lost economic output 1990–2002

• The U.S. has lost ground to top performers since Accountability Movement

• Lost opportunity would pay cost of K–12 education

• Closing the gap over 12 years would add 1% to annual GDP or $980B

Sources: Cisco IBSG, calculations using Congressional Budget Office data on potential GDP, January 2005; Eric Hanushek, Lost Opportunity, 2003
“Imagination is more important than Knowledge” – Albert Einstein
China Has Awoken

• China goal: 5–10x more engineers
  Country plans to drive IT and jobs 4x
• US: 1 lawyer/274 people; China 1 per 12,745
• China: teacher is most respected socially
• China… Jiangsu province (Shanghai)
  Population 75M
  College students… 25% in math/ science/IT
• Engineer: China $48K… U.S. $252K…
• High tech… ½ U.S. GDP growth

“When China awakens, it will shake the world.”

Napoleon Bonaparte
Creative Skills Comparison
Analytical Skills Comparison

US

Europe/Asia
“Successful Intelligence” —per Sternberg

…”in the real world, analytical intelligence is no longer enough. It is not that it no longer matters, but it certainly matters less…”

Robert Sternberg, Yale University
Evolution of Perceptual Modes During Formative Years

20’s – 40’s  
Auditory

50’s – 70’s  
Auditory
Visual

80’s – 00’s  
Auditory
Visual
Kinesthetic
Collaborative

For today’s generation of Learners, the Computer is an Environment, not just a Tool!
Ancient Wisdom

Confucius (551-479BC):
“"I hear and I forget, I see and I understand, I do and I remember""

Aristotle (384-322BC):
“The proof that one knows something is that they can teach it”
Ancient Wisdom Confirmed by Psychologists

Technology:
- Connects
- Personalizes
- Deepens

Retention Rates

- Reading: 10%
- Seeing: 20%
- Hearing: 30%
- Seeing & hearing: 50%
- Collaboration: 70%
- Doing: 80%

Source: M. Chi, M. Bassok, M. Lewis, P. Reimann, & R. Glasser,
### Performance Outcomes
- Increased Registration
- Better Retention
- Improved Results

#### Learning Outcomes
- Absorption
- Time to competency
- Penetration/audience

### Vision: Where Is Learning Going?

- **Content-Centric**
  - Dispersed Content
  - Catalogs
  - Generic Audience

- **Module-Centric**
  - Chunking of Content
  - Dynamic Processes

- **Portal-Centric**
  - Audience-Specific Content
  - Competencies and Roadmaps

- **Performance-Centric**
  - Dynamic Role-Based Content Updating
  - Learning Assessment

- **Learner-Centric**
  - Unlimited Content Sourcing
  - Dynamic Prescription

#### Establishing the Foundation

#### Creating Learner Accountability for Results
Connected Learning

Play Video
Education Is the Basis of Cisco’s Genes…

1984: Stanford U. professors Bosack & Lerner start Cisco

“Education and the Internet are the two great equalizers in life…”

First logo

First router

John Morgridge
Cisco CoB

John Chambers
Cisco CEO

“Changing the way we Work, Play, Live and Learn”
Networking Academies History

- Schools lacked resources to manage networks
- Created as solution for connecting schools
- Launched in October 1997
  
  64 Academies, 7 states
Cisco Networking Academy Program

• A dynamic, philanthropic educational program that teaches students relevant technology skills

• Academy impact since 1997:

<table>
<thead>
<tr>
<th>COUNTRIES WORLDWIDE</th>
<th>INSTRUCTORS WORLDWIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 +</td>
<td>30,000 +</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STUDENTS WORLDWIDE</th>
<th>TOTAL EXAMS TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6 million +</td>
<td>40 million +</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACADEMIES WORLDWIDE</th>
<th>LANGUAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 +</td>
<td>9</td>
</tr>
</tbody>
</table>
## Florida State Profile

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Academies</td>
<td>16</td>
</tr>
<tr>
<td>Local Academies</td>
<td>104</td>
</tr>
<tr>
<td>CATCs (Cisco Area Training Centers)</td>
<td>3</td>
</tr>
<tr>
<td>Number of Students Participating</td>
<td>1,927</td>
</tr>
<tr>
<td>Number of CCNA 4 Graduates:</td>
<td>5,547</td>
</tr>
</tbody>
</table>

**Ranked 6th in the Country**

Florida was chosen as a national pilot to **Educate** and **Empower** young women in the state of Florida to **Explore** careers in IT.

Cisco has partnered with the Florida Community College System and Department of Education to help create a pipeline for young women.
Many Pathways and Exit Points

CAREERS

Enterprise Networking

Small and Medium Business Networking

Network Installer
Basic IT Support
System Admin

UNIVERSITY

COLLEGE

HIGH SCHOOL

FUNDAMENTALS
HP ITE I
HP ITE II
Panduit NIE
Java
UNIX

CCNA
Basics
Routing
Switching
WANs

CCNP
Advanced Routing
Remote Access
Multilayer
Switching
Troubleshooting

Security
IP Tel
Wireless

Enterprise Networking

Small and Medium Business Networking

Network Installer
Basic IT Support
System Admin
# Hurricane Katrina: 21st Century Community

<table>
<thead>
<tr>
<th>Guiding Principles</th>
<th>Cisco Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provide Community Leadership</strong></td>
<td>Contribute $40M + 5-10 “Community Fellows”</td>
</tr>
<tr>
<td><strong>Do the Right Thing</strong></td>
<td>Provide Baseline converged technology not eligible for E-Rate “Adopt” impacted schools &amp; communities</td>
</tr>
<tr>
<td><strong>Leverage our Process/Expertise</strong></td>
<td>Lead a coalition of public, private, and non-profit organizations based on Cisco Networking Academy, Jordan Education Initiative and IBSG experiences</td>
</tr>
<tr>
<td><strong>Make It Better than Before</strong></td>
<td>Partner to create a holistic approach to establishing a sustainable 21st century community</td>
</tr>
<tr>
<td><strong>Build an Example</strong></td>
<td>Create a 21st century school model and showcase</td>
</tr>
</tbody>
</table>
What Is a “21st Century School”? 

**Academic Excellence:**
- Quality curriculum
- On-going teacher training
- Development and resources for teachers
- Integrated parent involvement
- On-line and secure assessments and accreditation

**Administrative Efficiency:**
- Communications and messaging
- Safety and security
- Integrated student management and tracking
- Digital Library
- All departments automated: cafeteria, bussing, nursing, etc
- Broadband wireless access everywhere
Gender Initiative in Technology

- **Educate** young women on careers in IT
- **Explore** opportunities to participate in the Cisco Networking Academy Program
- **Empower** girls to succeed and continue their education in engineering and computer science
- **Create** a pipeline of females entering the IT workforce
- **Measure** the impact of this project
## Girls and Women in IT 8–20 Years Old

### Focus Areas FY06

**In Place**
- Gender module
- Videos – Cool Engineers @ Cisco
- Penny & Peter Packet

**Website - Academy**
- Success stories
- Career mapping

**Girls in IT event toolkit**
- > 20 Girls in IT events

**Partnerships:** NCWIT, ITU, USAID, UNPD, UNIFEM, CWIT, IMOW, etc.

### WAN

**What a Difference a Year Makes!**

**FY05**
- 10 events
- 941 Students
- 68 Cisco Volunteers

**FY06**
- 140 events
- 4,700 students
- 300 Cisco Volunteers

### Tech Pipeline Pilot

**Making News...!**

**Partnership with NCWIT**
- Launched US Campaign

**Results:**
- Website launched Nov. 238,438 hits in January
- E-mail letter- 30,000+
- Press coverage 50+ hits
- 12 articles in tier 1 & 2 pubs
- Attracting IT women

[www.ncwit.org/cisco](http://www.ncwit.org/cisco)
### The 21st Century Skills Movement

<table>
<thead>
<tr>
<th></th>
<th>20th Century</th>
<th>21st Century</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Jobs:</strong></td>
<td>1 – 2 Jobs</td>
<td>10 – 15 Jobs</td>
</tr>
<tr>
<td><strong>Job Requirement:</strong></td>
<td>Mastery of One Field</td>
<td>Flexibility And Adaptability</td>
</tr>
<tr>
<td><strong>Teaching Model:</strong></td>
<td>Subject Matter Mastery</td>
<td>Integration of 21st Century Skills into Subject Matter Mastery</td>
</tr>
<tr>
<td><strong>Assessment Model:</strong></td>
<td>Subject Matter Mastery</td>
<td>Integration of 21st Century Skills into Subject Matter Mastery</td>
</tr>
</tbody>
</table>
Cisco Is a Founding Member of the Partnership for 21st Century Skills
The Partnership for 21st Century Skills brings together business, education and government leaders to define a powerful vision for 21st century education to ensure every child’s success as citizens and workers in the 21st century.

First State Partners:
- North Carolina
- West Virginia
21st Century Skills—
Above and Beyond the Basics

Core Subjects, +

Learning Skills

Information & Media Literacy
Communication
Critical Thinking
Systems Thinking
Problem Solving
Creativity & Intellectual Curiosity
Interpersonal & Collaborative
Self-Directed Learning
Accountability & Adaptability
Social Responsibility

ICT Literacy
Learning Skills + 21st Century Tools

21st Century Content
Global Awareness
Civic Engagement
Business, Financial & Economic Literacy
Market Transitions...Companies / States
Opportunity for Competitive Advantage

- Economic
- Business / Education Models
- Process Standardization
- Technology
  - Data, Voice, Video
- Industry Consolidation
- Customers “Added Value”

Jobs go to...
Best educated workforce, strong infrastructure, innovation, supportive government

By time obvious... Too late”
“The Internet is changing the way we...