Transforming Education for a World of Opportunity

“Learning without thought is labor lost; thought without learning is perilous.” - Confucius

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Transforming Education with 21st Century Learning Conference, Oct 29, 2010, Taipei, Taiwan
Systemic Education Transformation: a Socio-Economic Requirement

- In need of a systemic transformation approach: Change the system!

- Country Value
  - Increased competitiveness & economic development
  - Highly skilled citizens ready for the 21st century workplace
  - Improved social cohesion

* eg UNESCO, World Bank, OECD
“We cannot afford 21st century students being taught using 20th century methods in 19th century classrooms. According to a recent World Bank survey on Information and Communication for Development, policymakers found that connecting schools to ICT constitutes one of the top e-strategies to help promote economic growth and reduce poverty. The latest developments in interactive computer technologies and student centered teaching and learning practices help transform our schools and empower our students to keep up with the global knowledge economy. “

- Martina Roth, Director Global Education Strategy, Intel Corporation
A Story...
• N35.157919 Latitude, &
• W-106.54635 Longitude

• ~ 1524 meters above sea level
• ~ 6 kn NW

* The facts are important, but sometimes incomplete for critical thinking & problem solving.
“It is not the facts that are of chief importance, but the light thrown upon them, the meaning in which they are dressed, the conclusions which are drawn from them, and the judgements delivered upon them.”

– Mark Twain
Think about early primary or Pre-School classrooms...
Now think about a secondary classroom...
Learning Paradigm Shift

- Instructor Centric
- Student Centric

Students, Experts, Internet, Other Schools and Organizations, Library, Company Learning Communities, Class, Portal, Internet, Experts

Instructor, Student, Student, Student
Previous Findings

End of Training Benchmarks

A high percentage of teacher respondents indicate the training:
1. focused on integration of technology into their curriculum.
2. provided teaching strategies to apply with their students.
3. training illustrated effective uses of technology with students.

A high percentage of teacher respondents indicate they are prepared to:
1. implement teachings that emphasize independent work by students.
2. integrate educational technology into the grade or subject they teach.
3. support their students in using technology in their schoolwork.

Impact Benchmarks

1. A significant majority of teachers reported an increase use of technology for lesson planning and prep
2. A majority of teacher respondents indicate increased use of technology activities with their students
3. A majority of teachers use the unit/lesson they developed in training back in their schools
4. A simple majority of teachers increase use of project-based approaches in their teaching
"I must confess that I have fallen in love with the Intel Teach curriculum. As the days passed, I gained more skills and discovered more possibilities that the curriculum can offer to me. In turn, my students benefited much as I implemented what I have learned in Intel Teach."

- Candelario Garo, Philippines Professor

- Intel Teach is recognized as a main training component of the govt’s major ICT projects; >74,000 teachers trained

- Promotes the development of learning communities that foster reforms in micro to mid-level to macro levels

- Strong private sector and government collaboration resulting in
  - Classroom innovations: 97% MT unit plan implementation rate in SY05-06
  - Institutional innovations: 41 top teacher education institutes integrating Intel Teach in curriculum
Local story : Pakistan

“Yes it has made my teaching simpler and effective. Students’ responses are better and they want to learn the new technology – it attracts everybody”.

- Teacher, Pakistan

- Intel Teach Program was launched in 2002 with the Ministry of Education
- Trained 80,000 teachers to date across the Country
- First year evaluation activities included surveys, interviews & focus groups. Time, infrastructure & access were key challenges.
- However, 55% of the teachers identified the difficulty in Scheduling Time at the Computer Lab as a primary barrier.
- Punjab : Passed out a Policy for all CPP (Community Private Party Labs Owners – 102 of them) to allow access to all teachers and students in support of the Intel Teach to the Future Program.
Recent Findings - The Intel® Teach Essentials Course and changing teacher practice in India, Turkey, and Chile

- **Supporting change at the school-level.** What are the factors that facilitate teachers’ ability to follow up on the training with their students?
  1. Pedagogical Objectives and Goals
  2. Leadership
  3. Professional Development and Ongoing Support
  4. Experimentation, Adaptation, and Critical Reflection
  5. Time
  6. ICT Infrastructure
  7. Financing and Sustainability
Recent Findings – (Cont’d) The Intel® Teach Essentials Course and changing teacher practice in India, Turkey, and Chile

- **Changes in the learning environment.** Within each context, how are teachers able to follow
  1. Changes in Teachers’ Knowledge, Beliefs, and Attitudes
  2. Changes in How Students Engage with Content
  3. Changes in Relationships among Teachers, Students, and Parents
  4. Changes in the Use of ICT Tools to Promote Students’ Learning
Intel’s Model for Education Transformation

- Policy
- Research & Evaluation
- Curriculum & Assessment
- Information Communications Technology
- Professional Development

Education Transformation
Policy

Policies aligned to education goals for student success ensure a systemic education transformation.
Policy Impact

• Difficulty in maintaining many large-scale policy reform initiatives:
  – Lack of understanding of schools as complex organizations and sociocultural entities.

• Sustaining policy-based initiatives:
  – Must be designed and understood at the classroom level
  – and secondarily at the School level.
Curriculum & Assessment

Students gain critical 21st century skills through:

• Strong curriculum standards

• Robust assessment approaches

• New digital media tools, content and resources
Curriculum Standards and Assessment

10 Attributes of a 21st Century Learning Environment

1. Student centered systems
2. Clear standards and objectives
3. Robust formative and summative assessment systems
4. Continuous feedback improving students’ learning
5. Support for 21st century skills
6. Inquiry-based learning approaches
7. Personalized learning
8. Digital media curriculum resources
9. Advanced open-ended learning tools
10. Online Managed Learning and Assessment Systems
# Student Learning Assessments

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example</th>
<th>Intel’s Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benchmarking</strong></td>
<td>Tests a population “sample” to help policy makers understand how their students score against other populations of students.</td>
<td>PISA, TIMSS, NAEP other</td>
<td>ATC21S- Provide research on the measurement of 21st Century Skills</td>
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<td></td>
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<td></td>
<td>NAEP - Technology &amp; engineering literacy at 8th grade level</td>
</tr>
<tr>
<td><strong>“High Stakes” Summative</strong></td>
<td>Provides students’ scores for entrance / exit / school options.</td>
<td>National High School Exams; SAT, other</td>
<td>Opportunity for research from ATC21S to support integration of learning into these exams</td>
</tr>
<tr>
<td><strong>Classroom Summative</strong></td>
<td>Feedback given at the end of a unit to grade mastery of concepts and processes.</td>
<td>Performance Rubrics; Tests, End of Year Subject Exams</td>
<td>Intel Teach (Essentials; TEO, Teaching with Technology, TAO and Elements) help teachers’ capacity/ skills in measurement of student learning and skills development</td>
</tr>
<tr>
<td><strong>Classroom Formative</strong></td>
<td>Feedback from learning activities used to adapt teaching approaches and meet the learner’s needs. Helps students take responsibility of their own learning.</td>
<td>Observation, Checklists, Learning Logs, Self- assessments; Peer input; other</td>
<td>Intel Teach (Essentials; TEO, Teaching with Technology and Elements) help teachers understand and use formative assessment approaches</td>
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<tr>
<td></td>
<td></td>
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<td>ATC21S- supports research in this arena</td>
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Assessments of 21st Century Skills:

Summative:
• Provides concluding information on student’s mastery of content, knowledge or skills.
• Allows students to construct responses to open ended items.
• Incorporates adaptability to novel situations.
• Is largely performance-based.
• Measures collaboration.

Formative:
• Provides information needed to adjust teaching and learning while they are happening.
• Informs both teachers and learners on progress.
• Makes students thinking visible.
Assessment and Teaching of 21st Century Skills

A multi-stakeholder collaboration to help transform the teaching, learning and measurement of skills needed by citizens and workers in the 21st century.

Mobilizing international educational, political and business communities is a key aspect of the project to make the transformation of educational assessment and, hence, instructional practice a global priority.

www.atc21s.org
Professional Development

Provide teachers with the right tools and training to support a student centric learning environment.
New Teaching Methods are Required in a Knowledge Economy

• Projects Based Learning
• Personalized
• Relevant Questions
• Engaging Learning
• Multiple Experts
• Collaborative Grouping
• Assessment across the instructional cycle
• Ensures students meet the standards
## Technology Supports New Teaching Methods

<table>
<thead>
<tr>
<th>Approach</th>
<th>ICT Assists</th>
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<tbody>
<tr>
<td>Projects</td>
<td>Supports students in completing real world projects</td>
</tr>
<tr>
<td>Personalized</td>
<td>Provides student choice, differentiation</td>
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<tr>
<td>Expert Access</td>
<td>Connects to expertise beyond the school</td>
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<tr>
<td>Collaborative</td>
<td>Capacity for anytime interaction</td>
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<tr>
<td>Assessment</td>
<td>Longitudinal data and informing instruction</td>
</tr>
<tr>
<td>Standards attainment</td>
<td>Meaningful engagement helps kids learn</td>
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Individually Sharing Content In Virtual Communities

Be the CEO of your own personal brand.....
Research and Evaluation

Continuous improvement of education reform for sustainable education transformation.
How do we make learning as relevant, rigorous and meaningful inside of schools as outside?

*The digital natives are getting restless*
Our Challenge...

Chilean Miner Rescue

Creativity, Critical Thinking, Problem Solving
Thank You!

Questions?
Back Up
Where to Find the Resources

- **Intel Corporate Affairs & Education**: http://www.intel.com/education/
- **Strategy & Research Library**: engage.intel.com/index.jspa
- **SRA Research & Policy Community**: http://engage.intel.com/community/leadershiplearning
- **Evaluator Community**: http://engage.intel.com/index.jspa
- **EMPG Content and Collateral**
  - www.intellearningseries.com/alliance
- **SMCR // World Ahead: Education**: smcr.intel.com
Intel Education Transformation Toolkit now available

Making an Impact with Free Teaching Resources

Free Tools and Resources from Intel® Education

Intel offers free, easily integrated tools and teaching resources to support collaborative student-centered learning. Our online thinking tools provide active learning places where students can engage in robust discussions, analyze complex information, pursue investigations, and solve problems. You'll also find teaching resources such as exemplary lesson plans, assessment strategies, and technology-enriched project ideas for all K-12 subjects. Developed by educators, these free tools and resources support 21st century learning, with project-based approaches in the classroom.
Recommendations:
Standards, Content and Assessment must be well defined, aligned and integrated to ensure education transformation.

Summary

- **Standards**: Specify 21st Century skills and content knowledge in measurable terms.
- **Assessment**: Identify and address methodological and technological barriers to ICT-based assessment thru R&D.
- **Content**: Recommend ICT-enabled, classroom-based learning environments and formative assessments to support development of 21st Century skills.
Intel Investment in Assessment

Please see backup slides for more details.
Assessment and Teaching of 21st Century Skills

WHO
- University run
- Company sponsored

WHAT
- Methods to assess schools’ teaching of 21st Century Skills
- Recommendation on updating assessment tools (ie PISA & TIMSS)

WHERE
Pilot Countries
- Australia
- Portugal
- Finland
- Singapore
- United Kingdom
- United States of America

WHEN
- 3 year project
- PISA Pilot
- countries using new methods by 2014

WHY
- Improve education and innovation
- Positively impact the global economy

- Improve education and innovation
- Positively impact the global economy
Improving 21\textsuperscript{st} Century Skills Matters:

Prepare students for today & tomorrow’s jobs!

**Ways of Thinking**
- Creativity & innovation
- Critical thinking, problem solving, decision making
- Learning to learn, metacognition (knowledge about cognitive processes)

**Tools for Working**
- Information literacy
- Information and Communications Technology (ICT) literacy

**Ways of Working**
- Communication
- Collaboration (teamwork)

**Living in the World**
- Citizenship – local and global
- Life and career
- Personal & social responsibility – cultural awareness & competence

* This framework was developed within the research project
Enabling Assessment Reform with Intel Teach

- Teacher professional development is required to support changes in classroom assessment practice
- Intel Teach program has teachers start their planning with assessment in mind (Use the ASCD Backward Design)
- Essentials; TEO; Teaching Thinking w/ Technology; & Elements all use the Assessing Projects tool in their trainings (TAO to adopt 2H 2010)

Intel Teach Courses have a strong emphasis on assessment

* Association for Supervision and Curriculum Development