ITL research

Innovative Teaching and Learning

# INNOVATIVE TEACHING AND LEARNING RESEARCH

## 2011 Findings and Implications

SRI International

Microsoft Partners in Learning

# FOREWORD

# FOREWORD FROM MICROSOFT PARTNERS IN LEARNING, GLOBAL SPONSOR OF ITL RESEARCH

Throughout history, changes in the shape and process of education have often followed fundamental changes in the structure of economies. Major economic changes tend to be a source of disruption and realignment of societies. As we more fully come into a globalized, knowledge based economy, we are seeing clear signs of increased economic and social inequality, and perhaps more importantly, of deep divides in how youth all over the world perceive their future opportunities. The recent outbreak of riots in London may be just the beginning.

At the same time, other foundations upon which our societies have long depended are changing. For example, in the last half century, women have entered formal labor markets in large numbers changing dynamics at home and in the workplace. Information and communication technologies are becoming ubiquitous in ways that allow work, learning and life to be radically redesigned, un-tethered from physical localities. We consider these changes as progress indeed, but change of any nature brings tension.

Schools and education systems have increasingly become the nexus of these broader social and economic tensions. The question of how educational ecosystems, and the very life streams of teaching and learning, can renew themselves to adjust to these emerging dynamics, could not be more important. This question of educational renewal is at the heart of the Innovative Teaching and Learning Research inquiry.

Microsoft is the global sponsor of ITL Research, in partnership with sponsors from the participating countries. Our collective goal has been to develop a rich body of evidence that can contribute insights to the global conversation on the challenge of education renewal. Education systems will dramatically change over coming decades. Of that there can be no doubt. Whether or not they can change quickly and effectively enough to avert major social and economic disruptions during those decades – that is the issue. The ITL Research findings shed light on the conditions that support education renewal in ways that help students develop the skills they will need to thrive in life and work in our emerging world.

We would like to acknowledge and thank our partners in this endeavor, particularly the research team from SRI International, the research and policy partners from each participating country, and the global advisors to the project (all listed below). This project and its value would not have been possible without this truly global collaboration. Our deepest thanks, however, go to the students, teachers and school leaders who participated in this project. Each of the schools in the ITL sample gave their time, thought and commitment to this endeavor, and whatever learning comes from ITL Research springs from their participation. Amid the overwhelming demands and complexities of schools and teachers' daily lives, these contributions speak once more of educators' deep commitment to learning.

James Bernard, Worldwide Director,
Microsoft Partners in Learning

Maria Langworthy, Global Director, ITL Research

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## ITL RESEARCH 2011 POLICY PARTNERS

| Country | Organization | Individuals |
|---|---|---|
| Finland | National Board of Education | • Kristiina Kumpulainen (PhD), Director, Information and Evaluation Services<br>• Kaisa Vähähyyppä, Councilor of Education, Head of Unit |
| Indonesia | Ministry of National Education (MONE)<br>Province of Yogyakarta | • Fasli Jalal, Vice Minister of National Education<br>• Suwasih Madya, Head, Education Services of the Province of Yogyakarta |
| Russia | • Russian Academy of Education and World Bank projects representative (National Training Foundation)<br>• The Academy for teachers training and professional retraining for educators (APKiPPRO) | • Mr. Uvarov, Leading expert and researcher, Computer Center, Russian Academy of Sciences<br>• Ms. Gorbunova, Vice-rector |
| Senegal | Ministry of Education (National), Senegal | Mr. Ibrahima NDOUR, Director of Secondary Schools |
| England | The Schools Network | Mr. Chris Montacute, Strategic Director |
| Mexico | Ministry of Education (Federal) | Lic. Margarita Arruti, Coordinación Nacional HDT, DGME, SEB, Directora Operativa HDT |
| Australia | New South Wales Department of Education and Training | Max Smith, Senior Manager, Student Engagement and Program Evaluation |

## ITL RESEARCH 2011 RESEARCH PARTNERS

| | | |
|---|---|---|
| Global | SRI International | • Linda Shear<br>• Barbara Means |
| Finland | Agora Center / Institute for Educational Research<br>University of Jyväskylä | • Marja Kankaanranta<br>• Juho-Matti Norrena |
| Indonesia | Centre for Strategic and International Studies | • Medelina K. Hendytio<br>• Vidhyandika D. Perkasa<br>• Deni Friawan<br>• Teguh Yudo Wicaksono |
| Russia | Institute of New Technologies | • Alexei L. Semenov<br>• Olga B. Loginova<br>• Vadim V. Kroutov |
| Senegal | Association of Teachers and Researchers of ICT in Education and Training | • Abdourahmane Mbengue<br>• Cheikh Tidiane Sall<br>• Cheikh Mbacke Cisse |
| England | London Knowledge Lab | • Neil Selwyn<br>• Carey Jewitt<br>• John Potter<br>• Carlo Perrotta |
| Mexico | Proyecto Educativo SC | • Lucía Fernanda Remes<br>• Bernardo Naranjo |
| Australia | University of Newcastle, SORTI | • Sid Bourke<br>• Kathryn Holmes<br>• Kylie Shaw<br>• Greg Preston |

# ITL RESEARCH GLOBAL ADVISORS

| Organization | Individuals |
|---|---|
| OECD | • Dirk Van Damme |
| UNESCO | • Francesc Pedro<br>• Tarek Shawki |
| European School Net | • Patricia Wastiau |
| IEA | • Dr Seamus Hegarty |
| ISTE | • Lynn Nolan<br>• Leslie Connery |
| University of Southern California, Rossier School of Education | • David Dwyer |
| Kozmalone Consulting | • Robert Kozma |
| ACER | • Hamish Coates<br>• Geoff Scott |
| Ontario Institute for Studies in Education, University of Toronto | • Michael Fullan |
| South African Qualifications Authority | • Paul West |
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| Yankahlink Advisors, Ghana | • Erik Yankah |
| St. Andrew's Junior College, Singapore | • Bee Yann Lee |
| Commonwealth Council for Educational Administration & Management | • Jenny Lewis |
| Centre for Information Technology in Education (CITE), University of Hong Kong | • Nancy Law |
| MIT Center for Civic Media | • Leo Burd |
| Microsoft | • Greg Butler<br>• Kati Tuurala<br>• Michael McMann |

# ITL Research Findings 2011

# ITL RESEARCH 2011 FINDINGS: EVOLVING EDUCATIONAL ECOSYSTEMS

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Linda Shear, Larry Gallagher, and Deepa Patel, SRI International

**Project Sponsor**

- James Bernard, Director, Microsoft Partners in Learning

**Program Director**

- Maria Langworthy, Langworthy Research

**Contributing Research Partners**

- University of Newcastle, Australia
- University of Jyväskylä, Finland
- Centre for Strategic and International Studies, Indonesia
- Proyecto Educativo SC, Mexico
- Institute of New Technologies, Russia
- Association of Teachers and Researchers of ICT in Education and Training, Senegal
- London Knowledge Lab, England

**Contributing Members of the SRI Research Team**

- Kea Anderson
- Gucci Trinidad
- Akiko Lipton
- Barbara Means
- Gloria Miller
- Corrine Singleton

# I. INTRODUCTION

**Innovation is flourishing in the world around us**. We see it regularly in rapid technological advancements and in the growth of knowledge-based economies around the world. In comparison, educational systems are often described as notoriously slow to innovate. While in some countries blackboards and chalk have been replaced by laptops and data projectors, the majority of students are still in their traditional roles of information consumers rather than problem-solvers, innovators, and producers. And while examples of more innovative learning environments can be found around the world, too often they are available only in isolated pockets rather than to all students.

**Education today thus faces several critical gaps:**

- Between the world that young people experience outside the classroom and the world within
- Between the skills that students learn in school and those they will need later in life
- Between those who have access to high-quality education and tools and those who do not

It is increasingly an accepted truth that education systems must evolve to meet the needs of the students and societies they serve, changing their mission from knowledge transmission to preparation for future learning.

On an average day in 2011, more people used Twitter than the populations of Kenya and Greece combined. [1]

$7 million (USD) in donations from around the world were made via mobile phones within 36 hours of the earthquake in Haiti. [2]


[1]Twitter use: Bilton, N. "Twitter Reaches 100 Million Active Users." New York Times. 8 Sept. 2011.

[2]Mobile donations in Haiti: Choney, S. "Mobile giving to help Haiti exceeds $30 million: Pew study finds that 14 percent of donations made by text message."Msnbc. 21 Jan. 2010.

By “ecosystems,” we mean the interacting and dynamic spheres of influence that shape teaching practice and student outcomes at multiple levels of the education system .[1]ITL Research builds on important multinational studies of educational effectiveness and innovation that closely examine, for example, the characteristics of high-performing school systems (e.g., Mourshed, Chijioke, & Barber, 2010), or the role of ICT in classrooms (e.g., Law, Pelgrum, & Plomp, 2008). ITL Research seeks to offer an integrated perspective across these levels, from policy to teaching practice to students.

This report describes results from the second year (2010-11) of ITL Research. This study of teaching and learning ecosystems was carried out in seven countries: Australia, England, Finland, Indonesia, Mexico, Russia, and Senegal. This work builds on the pilot year of the project, in which instruments and methods were developed and tested in four countries[2] (see Shear, Novais, & Moorthy (2010) for pilot year results). Recommendations offered in this report will serve as the basis for the continued evolution of the program, as its focus shifts in the coming years from research on teaching practices to support for improving teaching practices.

### Key Findings from ITL Research in 2011

- Innovative teaching supports students’ development of the skills that will help them thrive in future life and work.
- However, students’ opportunities to develop these skills are typically scarce and uneven, both within and across the sample of schools in the study (across all countries).
- While ICT use in teaching is becoming more common, ICT use by students in their learning is still an exception in many of these schools.
- Innovative teaching practices are more likely to flourish when particular supportive conditions are in place. These conditions include:
  - Teacher collaboration that focuses on peer support and the sharing of teaching practices
  - Professional development that involves the active and direct engagement of teachers, particularly in practicing and researching new teaching methods
  - A school culture that offers a common vision of innovation as well as consistent support that encourages new types of teaching
- While we saw examples of innovative teaching practices in the classes we visited, a coherent and integrated set of conditions to support the adoption of innovative teaching was lacking in most of the schools and all of the systems in our sample.

[1]Zhao and Frank (2003) have similarly used an ecological metaphor to “provide an organic, dynamic and complex response to the organic, dynamic, and complex phenomenon” (p. 810) of adding the “exotic species” of educational innovations to the ecosystems of schools.
[2]Pilot countries were Finland, Indonesia, Russia, and Senegal.

# II. ABOUT ITL RESEARCH

### Who?

ITL Research is the product of a multinational research collaboration, with a design that is both global and local in scope. ITL's research network is led by SRI International, the organization responsible for research design, coordination, and global analysis. In each participating country, a leading research organization adapts common designs to local contexts and conducts local data collection, analysis, and reporting. The program is sponsored by Microsoft Partners in Learning in partnership with a governmental agency or policy organization in each country; in some countries these partners also fund the research. ITL Research is globally coordinated by Langworthy Research and benefits from the support of an advisory team of international experts.[1]

[1]See http://www.itlresearch.com for a full list of partners and sponsors.

### What?

**ITL Research focuses on teaching practices that have been shown to have strong relationships with 21st century learning outcomes**, with a model that draws extensively from leading global research and frameworks (e.g., Law et al., 2008; OECD, 2006; UNESCO, 2008; Partnership for 21st Century Skills, 2004; Government of South Australia, 2008; ISTE, 2007, 2008). As shown in Figure 1, "innovative teaching" in this research refers to three categories of practices:

- Student-centered pedagogies that promote personalized and powerful learning for students;
- Extending learning beyond the classroom in ways most relevant to knowledge-building and problem-solving in today's world; and
- ICT integration into pedagogy in ways that support learning goals. It is important to note that ICT use is not a goal in itself, but a tool to broaden and deepen learning opportunities.

Figure 1 also shows the specific elements that comprise "students' 21st century skills" in the ITL model.

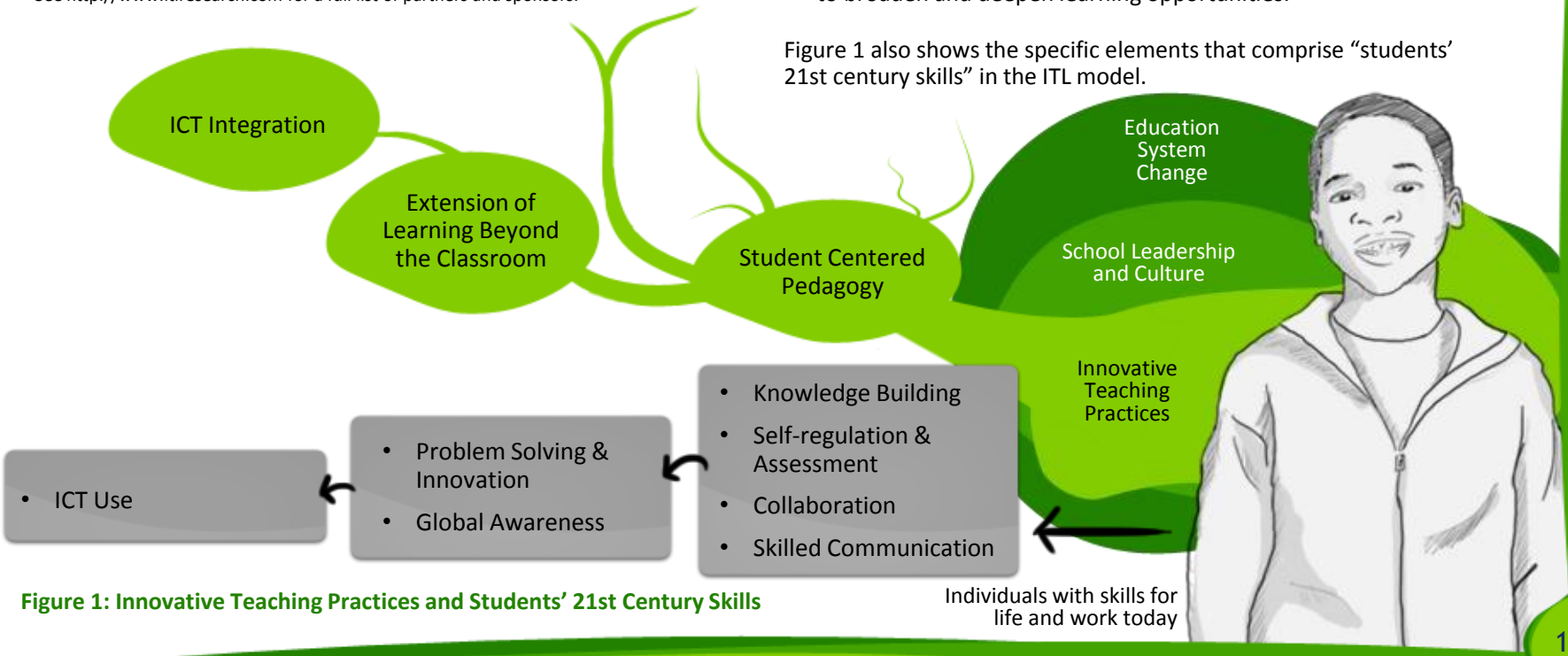



**Figure 1: Innovative Teaching Practices and Students' 21st Century Skills**

# HOW?

**One of the contributions of the ITL Research program is the range of methods it uses to define and investigate the elements of innovative teaching and learning**. [1] Table 1 in the Appendix shows the variety of data we collect, with sample sizes for 2011 across seven countries. Primary methods include:

**Teacher and school leader surveys** were administered at approximately 24 schools in each country, typically among teachers of students between the ages of 11 and 14. Groups of schools were nominated to be a balance of 1) schools where teaching practices were deemed innovative relative to other schools in the country, and 2) schools that served similar students but offered teaching deemed more typical of what those students might likely experience. The "innovative teaching practices score" referenced in this report is a measure created from teachers' reports of the frequency at which they incorporate a range of teaching practices into their teaching. [2]

**Site visits** offer a richer and more objective look at teaching and learning *in situ*. For site visits, researchers in each country selected either three or six schools[3] from the "innovative" sample of survey schools, and selected specific teachers to interview and observe with the intent of seeing relatively innovative practices. Researchers also interviewed school leaders and conducted focus groups with students.

**The analysis of learning activities and student work** is a unique element of this research that provides a specific and objective lens on classroom practice without disturbing the process of teaching and learning. A learning activity is an assignment that teachers ask students to complete as part of their studies; student work samples are products such as essays, presentation materials, worksheets or websites that students create as they complete the learning activity.

Researchers in each country collected samples of learning activities and student work from eight humanities or science teachers in each of six schools, and recruited and trained a separate group of experienced teachers to code the samples according to common rubrics[4] that define specific dimensions of 21st century skills. The resulting codes offer a measure of the extent to which teachers give students opportunities to build 21st century skills, and the extent to which student work actually demonstrates those skills.

Taken together, these methods span levels of the system, and offer a unique blend of self-report and objective measures, contextual understanding, and a deep dive into teaching and learning. All instruments are available to the public at http://www.itlresearch.com, where you can also find a technical supplement that describes project methods in detail (Gallagher, Shear, & Miller, 2011).

[1] For details of the Phase 1 ITL Research program design see Shear, Novais, Means & Gallagher (2010).
[2] Teacher-level measures of innovative teaching practices are standardized within country and weighted by country for cross-country analyses. Teacher and school leader surveys are available at http://www.itlresearch.com.
[3] Designs varied according to whether or not each country had participated in the pilot year of the study.
[4] The definitions and rubrics that operationalize the concepts of 21st century teaching and learning were developed by SRI International, building on a strong tradition of prior research (Bryk, Nagaoka, &Newmann (2000); Matsumura & Pascal (2003); Mitchell, Shkolnik, Song, Uekawa, Murphy, Garet, & Means (2005); Shear, Means, Gorges, Toyama, Gallagher, Estrella & Lundh (2009)).

## III. WHAT DOES INNOVATIVE TEACHING LOOK LIKE?

In Indonesia, students experienced economic theory in action at an outdoor market where they researched the relationship between supply and demand.

"*It doesn't have to be bells and whistles all the time; it's about opening up possibilities*." – teacher in England

In Finland, students travelled virtually to 3 countries of their choice to research climate, vegetation, and culture. Using this information they produced a travelogue to document their travels.

In Senegal, a geography teacher presented students with Jaques Attali's provocative statement, "Magic is those who leave," as a launching point for students to research and debate the impact of emigration on Africa's economy.

## INVESTIGATION OF CARBONATED BEVERAGES IN RUSSIA

**A science teacher in Russia guided her students through an investigation of carbonated drinks using the format of the popular Russian television show**, "Test Purchase," to introduce different methods to study the composition of substances. The teacher divided the class into three groups: "public jury"; "expert-biologists"; and "expert-chemists." Within each of these groups, students worked in pairs to draw conclusions about the chemical composition of carbonated drinks using methods tailored to their roles. After each group completed its investigation, the students compiled their analyses as a class and drew conclusions about carbonated drinks (i.e., all of the tested carbonated drinks are harmful to health).


This teacher crafted a lesson that engaged her students in learning while giving them opportunities to collaborate with their peers, build new knowledge, and participate in real-world problem-solving.

## PERSONALIZED LEARNING IN ENGLAND

Personalized learning was a common theme in the ITL study schools in England. At some schools, students meet one-on-one with tutors to discuss their learning, a support which one teacher found to be "nothing short of revolutionary." During class teachers use dynamic questioning strategies to adjust for students' current understandings.

Schools are also making learning more student-centered through the use of personalized learning plans that help students articulate their goals and aspirations and often provide opportunity for teachers to give feedback over time. Formats to support and share these plans include integration into the school's Virtual Learning Environment, which gives students and their parents remote access to information about student progress, and Passport to Independence (P2i), a digital booklet that allows students to reflect on their learning progression. Regardless of the mode, personalization occurs at all levels within a school and provides supports to help students take ownership of their learning.

## CRITICAL ANALYSIS OF MASS MEDIA STEREOTYPES IN MEXICO

In a Mexican civics and ethics course, students explored social stereotypes found in mass media and how they influence students' self-images. Students first read a short story (on an educational website developed by the Dove Foundation) about two girls discussing media stereotypes. After reading the story, students worked in teams to develop blog postings about social stereotypes and the ways in which they impact students' self-images, including videos about self-image that the students produced.

The use of ICT in this civics and ethics lesson, through blog posts and video production, offered students a mechanism for integrating the knowledge they were building in a personally relevant context as well as a means for personal expression of the result.

## SIMULATED FROG DISSECTION IN AUSTRALIA

A science teacher in Australia prepared a multi-part lesson to engage her students in learning the important features of the digestive system. Students used an online simulation of a frog dissection to explore the features of the digestive tract and prepare to physically dissect a rat. Once the students became familiar with the dissection process, the teacher assigned each pair a different aspect of the digestive system that they were to learn in sufficient depth to be able to teach it to their classmates. In the end, all the pairs' research was compiled, resulting in a more comprehensive understanding of the digestive system.

The structure of this lesson shifted the responsibility of learning to students. Students collaborated to build knowledge and problem-solve, while ICT use enabled them to explore a process in a richer way than a textbook could offer.

# IV. THE STUDENT EXPERIENCE

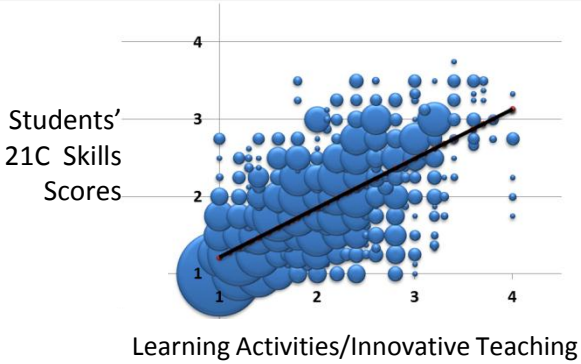
We begin with the innermost layer of the ecosystem that most directly shapes the evolution of students' skills: the classroom. **Does innovative teaching make a difference for students?**

The teachers and school leaders we spoke with believe that it does. Teachers who had begun to embed elements of student-centered, collaborative approaches into their pedagogies described a host of observed student outcomes consistent with the 21st century skills that education and business leaders seek: across participating countries, the most commonly cited were collaboration, problem-solving, critical thinking, independence, creativity, resourcefulness, and ICT skills.

**ITL Research measures the relationship between innovative teaching and student skills directly** by analyzing samples of assigned learning activities (looking for evidence of students' opportunities to build 21st century skills) and the actual work that students completed (looking for evidence that those skills were being used). The findings are clear: **The characteristics of an assigned learning activity strongly predict the skills demonstrated in student work**. We found a strong association between learning activity scores and corresponding student work scores (Figure 2; r = .68). This suggests that students are much more likely to build and exhibit 21st century skills if the learning activities in which they engage as part of a class ask them to demonstrate those skills.

"*What I'm especially proud of is that new ideas are starting to be developed from students*." – teacher in Finland

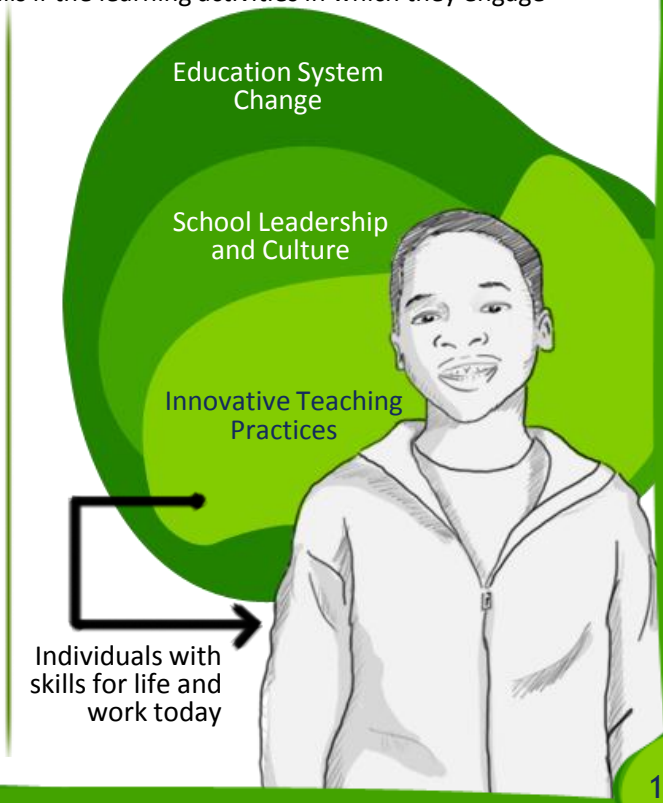
"*With ICT, students have increased their capacity and knowledge to compete with foreign students. ICT has given students the chance to express their talent and creativity*." – teacher in Indonesia




Notes:
a. For a given learning activity, this chart plots the learning activity's score (collapsed across dimensions) to the mean score for its corresponding pieces of student work. A larger bubble represents a higher concentration of data points.
b. LA and SW score points can range from 1-4.
c. Source: ITL LASW data, 2011

Based on Analysis by SRI International

**Figure 2: Learning Activity Scores Predict Student Work Scores**

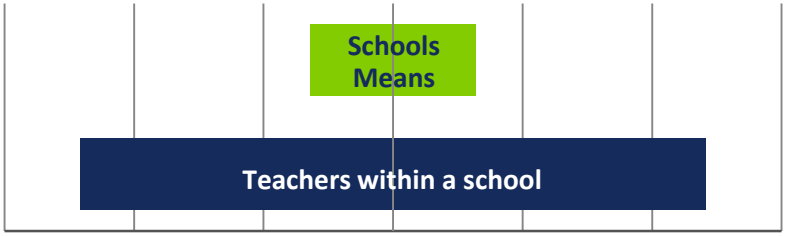


**Related findings:**

- **Within a single class**, 86% of the variance across student work scores is explained by the associated learning activity: in other words, evidence of 21st century skills in the work that a student does is driven more by differences in learning activities than by differences in students.
- **Across the sample**, 75% of student work scored at or below the corresponding score for the learning activity on analogous dimensions.[1] This implies a ceiling effect: while students are likely to reach up to the level demanded by the learning activity, they are unlikely to go beyond it.

## PATTERNS OF VARIATION IN TEACHING

**In most places, it is striking that innovation is a teacher-level phenomenon**, with strong variation across classrooms even within schools that are seen as relatively innovative within their national contexts. Survey analysis shows that the range of innovative teaching scores for individual teachers within a typical school in the sample is much broader than the range of school-average innovative teaching scores (Figure 3): in other words, most of the variation in teaching practice lies between teachers within a school, not between schools.




Based on analysis by SRI International

**Figure 3: Teaching Practices Vary Within Schools More than Across Schools**

**Unfortunately, activities that ask for strong demonstration of 21st century skills are still the exception rather than the rule in the classes we sampled, despite the fact that we deliberately sought out relatively innovative teachers from relatively innovative schools to participate in this research.** On any given dimension (collaboration or real-world problem-solving, for example), where a strong score is "4," the mean score for all learning activities we collected was a "2" or below, indicating that most learning activities ask for weak demonstration of the skill. For example, students discuss their work in pairs but do not share responsibility for the work as real collaboration would demand, or the learning activity requires some knowledge-building but students spend most of their time simply repeating information. On three dimensions,[2] more than half of activities scored a "1," the lowest possible score.

Nevertheless, examples do exist of innovative learning experiences that give students the opportunity to build and demonstrate important skills for their future. The remainder of this section looks at patterns of the innovative teaching that students experience, and patterns of ICT access and use that support this type of teaching.

Notes:
a. On this chart, the lengths of the bars represent the standard deviations of innovative teaching scores within schools (scores for individual teachers) and between schools (school-mean scores).
b. Source: ITL Teacher Survey, 2011

[1] This result includes analysis of scores on three dimensions – knowledge-building, use of ICT for learning, and real-world problem-solving and innovation – that were measured for both learning activities and student work.

[1] Collaboration, real-world problem-solving and innovation, and use of ICT for learning

**Other patterns**
In most countries, innovative teaching tends to vary by student achievement level, with more innovative pedagogies typically available to students who perform at or above grade level: less advanced peers typically experience less innovative teaching; [1] and by academic discipline, with mathematics teaching typically the least innovative among subject areas.[2]

## PATTERNS OF ICT USE

**As with pedagogical choices, ICT use varied widely among teachers.** In settings where there was a strong history of ICT use, we met teachers who saw ICT as an essential part of their everyday practice, something they would now have difficulty living without. In contrast, many teachers who were newer to using ICT did so less frequently: it had not yet taken an important place in their teaching practice.

> *"At first I thought that technology is not needed here with small children, but now when the data projector is broken, I feel I am in trouble."* – teacher
> *"Math is not dependent on ICT. I sometimes feel that it is more appropriate for me to just use the blackboard; it fits better."* - teacher

**In classrooms observed in this study, the most common use of ICT was for teachers to present information**, often using computers with projection devices or electronic whiteboards. Teachers reported that ICT allowed them to make their lessons more engaging and to make difficult content more accessible for students. The students themselves, however, were most often in the role of receiving information.

> *"We can't use ICT in our own classroom."* – student

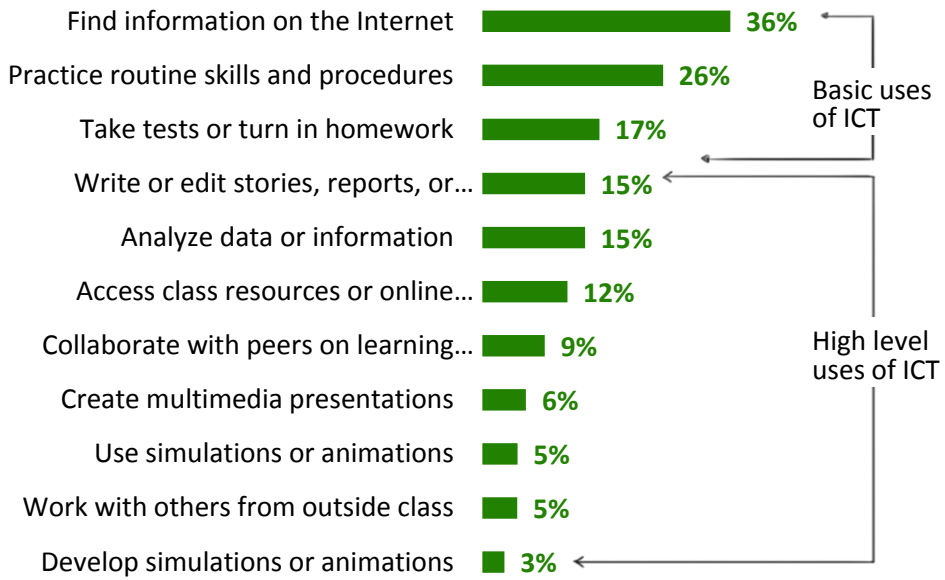
**When students did use ICT, it sometimes afforded learning opportunities they wouldn't otherwise be likely to have.** For example, students analyzed a character from a novel by creating a page for him or her in a Facebook-like application; used ICT at home to collaborate more fully with classmates on homework projects; or accessed topical resources that were not available in print formats.

**But more commonly, students' use of ICT in school could be described as basic**: in the classes we observed, the majority of students used ICT to find information on the Internet, practice routine skills, or take tests (Figure 4). It was unusual in these classes to see students using ICT in classes that also featured student-centered pedagogies to a large degree.

> *"The teacher's presentation is too summarized; after class I connect to the Internet to gather more complete information. ICT allows us to better understand our lessons."* – student in Senegal
> *"Technology has made us small detectives. Students have videoed and made news."* – teacher in Finland

**[1]**The opposite trend was observed in England, where teachers of disadvantaged students described a greater willingness to try new approaches in the classroom in hopes of engaging their students in learning.

**[2]** Source: teacher surveys; $p < .05$.




Based on Analysis by SRI International

**Figure 4: Student uses of ICT**

Notes:
a. This chart shows the percentage of teachers who reported these uses of ICT by their students at least weekly.
b. Source: ITL Teacher Survey, 2011

Overall, it is clear that some students have access to innovative teaching and use ICT to support their learning. **But these opportunities are not yet widespread in most of the countries represented in this research, and when they do occur they often represent isolated practices rather than an integrated experience that blends innovative pedagogies with innovative uses of ICT to support new learning opportunities.** The next section explores what it takes to increase the odds that students will experience learning environments that prepare them for their future.

# IV. SUPPORTS FOR INNOVATIVE TEACHING

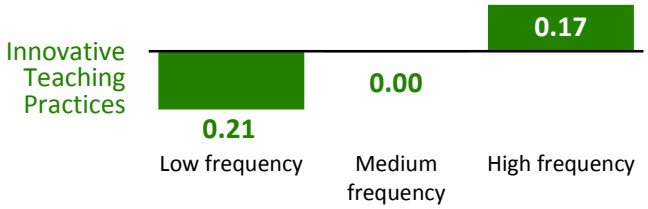
***If innovative teaching is not yet commonplace, under what climates and conditions does it flourish?*** For a host of reasons, ecosystems (be they educational or biological) have strikingly different features in different places. Accordingly, we might expect different approaches and conditions to be driving factors in the different parts of the world represented in this research. We report here on factors that emerge as salient across countries, drawing from both survey data and qualitative reports. [1]

**Innovative teaching happens more in environments where teachers collaborate.** In schools where teachers report more frequent collaboration with one another on teaching practices, innovative teaching scores tend to be higher (Figure 5). Teachers told us that collaboration can be an important mechanism for sharing teaching practices and for mutual support toward improving them.

**Collaboration relies on a supportive culture, alignment of incentives, and times built into teachers' schedules during which collaboration can take place**. We heard about regular, focused teacher time built into teachers' schedules that supported meaningful collaboration both within and across schools. These structures are necessary but not sufficient: collaboration requires a supportive culture in order to thrive, as well as a common focus on teaching improvement that allows collaborative time to be used in specific and productive ways. Where these attributes are not yet in place, sharing of practices is not always productive and can even be seen as a personal threat.

> *"In our community, we have built the system to support an individual teacher. No one is left alone with his or her class."* – school leader in one school
>
> *"We don't work together because we fear our colleagues to know how we work."* – teacher in a different school

[1] The survey results reported in this section generally meet two conditions: the relationship was significant in the combined dataset; and it was significant in at least three specific countries, with most other countries showing similar trends. In qualitative analysis we looked for trends that were reported explicitly in multiple countries and were generally consistent with data from other countries.

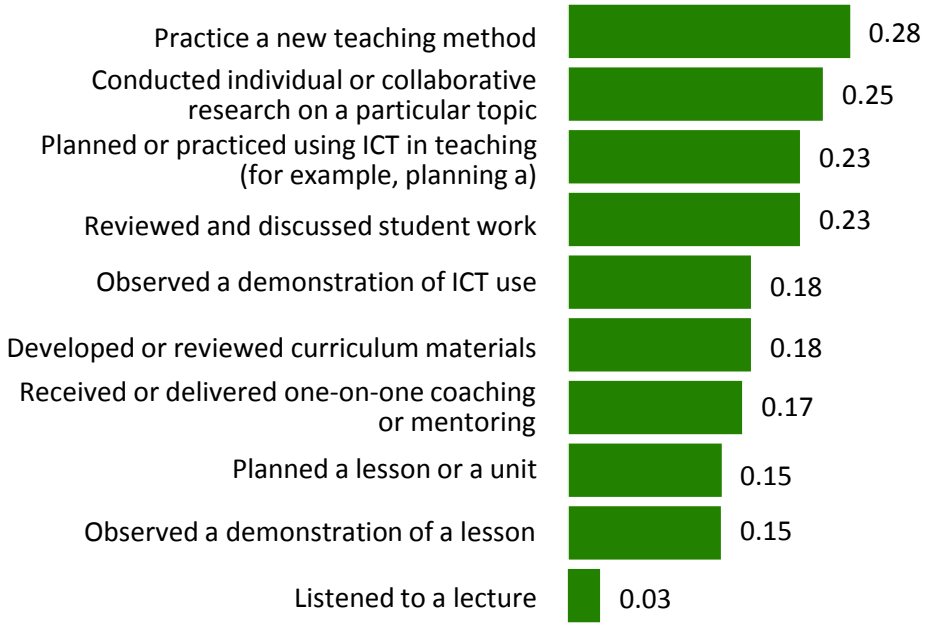



Based on Analysis by SRI International

**Figure 5: More Frequent Collaboration About Teaching Predicts Higher Innovative Teaching**

NOTES:
a. This chart groups teachers according to the frequency of collaboration reported across teachers at their school, and displays relative mean innovative teaching scores (expressed as standard deviations) for each group.
b. Source: ITL Teacher Survey, 2011
c. P < .05

**Innovative teaching happens more in environments where teachers have access to strong programs of professional development.** In professional development, both intensity and design make a difference. Survey data show that innovative teaching practices tend to be reported more frequently by teachers whose recent professional development has been longer term [1] and included more hand-on activities, such as practicing teaching methods and conducting research rather than observing demonstrations and listening to lectures (Figure 6).




Notes:
a. This chart describes teacher reports of the professional development activity in which they participated recently that had the highest total hours. The chart shows the differences in innovative teaching scores between teachers whose professional development program did or did not have each of these characteristics. Differences are reported in standard deviations within country.
b. Source: ITL Teacher Survey, 2011
c. P < .05

Based on analysis by SRI International

**Figure 6: More Active PD Predicts Higher Innovative Teaching**

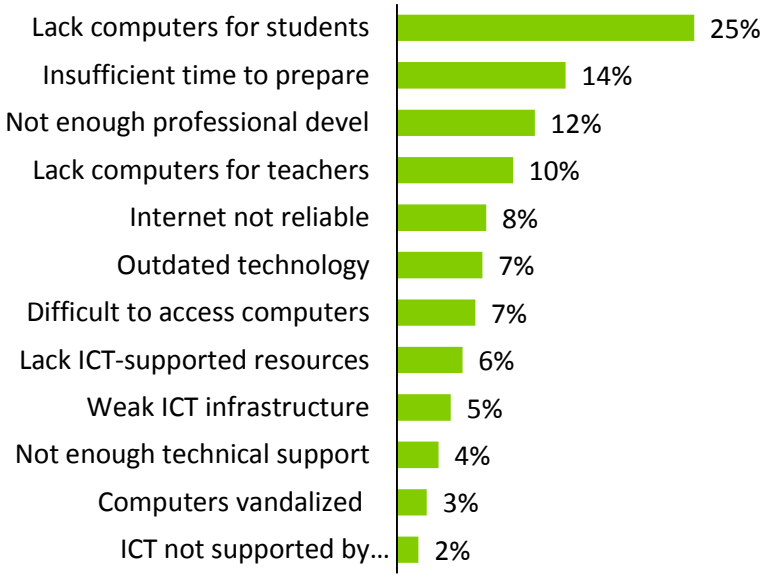
*"Professional learning tends to be ad hoc, depending on what we are exposed to... A lot happens because you just stumble upon it."* – teacher in England

**In interviews, many teachers felt they did not have sufficient access to professional development that offered coherent support for the skills they need.** Commonly cited needs included practical professional development that:

1) helps teachers learn how to integrate innovative practices into their teaching;
2) goes beyond the technical aspects of ICT to offer explicit guidance on its pedagogical purposes and uses; and
3) aligns with teacher needs (driven bottom-up rather than top-down).

**[1]** Teacher reports of the total number of professional development hours they experienced over the last 2 years associate significantly with their innovative teaching scores, $p < .05$.

**Innovative teaching that leverages ICT happens more where students have access in their classrooms.** ITL survey data suggest that ICT integration is an important enabler to innovative teaching. To support integration, students' access classrooms is an important factor. Survey data show that student access to computers in the classroom is more strongly associated with ICT integration than is teacher access, and both are stronger predictors than access in public areas such as computer labs or libraries. When we asked teachers about the biggest barriers to using ICT in their teaching, the lack of student access in classrooms was the runaway leader (Figure 7).




Percent teachers citing most significant barrier
Based on analysis by SRI International

**Figure 7: Teacher-reported Barriers to ICT Integration**

Notes:
a. This chart shows percentages of teachers who reported that each of these factors is the "most significant barrier" to using ICT in their teaching.
b. Source: ITL teacher survey, 2011

In general, ICT access (both to computers and to reliable networks) varied widely across the sample: Average access to ICT at the schools in our sample ranged from 54 computers per 100 students in England to 2 computers per 100 students in Senegal, where frequent power outages required ICT-using teachers always to have a "Plan B." Other research has shown that even where access in schools is relatively high, students are not always allowed to use the technology more than one or two hours per week (OECD, 2009).

**Where access was lacking, this issue served as a strong deterrent to ICT integration into teaching and learning.** Many students and teachers described students' frequent uses of ICT outside rather than inside the classroom to supplement an ICT shortage at school. But in many places without ICT access in school, ICT integration relies on individual creativity and resources. In some settings, teachers bring their own laptops to school, students bring their own smart phones and digital cameras, and assignments are completed in cyber-cafés outside of school hours. In less privileged environments where such personal resources are lacking, relying on access outside of school can lead to wider inequality.

**Innovative teaching happens more in schools with a school-wide culture that supports innovation.** The elements described above represent issues that, when viewed in isolation, significantly correlate with innovative teaching. But the local ecosystem within which teaching takes place serves as a web of influences that may or may not provide coherent support for the continuous evolution of teaching practices. While schools that fit this picture of coherent support were decidedly in the minority in this study, their model is instructive.

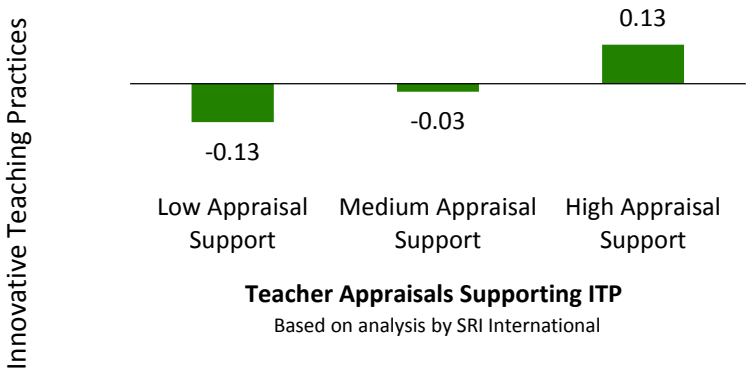
- **Reports from all countries recognize school leadership as a key factor for implementing school-level innovation.** This support can come in the form of encouragement, time and material resources, and professional development, all aligned to a clear and consistent vision.
- **Teacher incentive structures and appraisals must also be aligned.** In survey results, teachers in schools where appraisals emphasize new teaching practices reported significantly higher levels of innovative teaching (Figure 8). In addition, when incentives do not support participation in school-wide activities, developing a school-wide culture of innovation can be more difficult: in some countries participation in collaborative activities was low because some teachers chose to use the designated time instead for paid activities such as private tutoring.

> "*From the very beginning the staff was told that [an ICT-based system] is for those who want it, who are interested, who believe it is necessary and important… And when they tried and talked to somebody else on the topic, the others decided to try too – it was like a chain reaction. Now, we created such an atmosphere where people avidly absorb what is going on in their colleagues' work and eagerly learn."* – school leader in Russia
>
> *"[In this school,] it is just awkward not to use innovations*." – teacher in Russia
>
> "*In this school there is no involvement [with other teachers], there is no reflection, because there is no school project.*" – teacher in Mexico

- **Opt-in models—the ability for teachers to choose to begin to explore innovative practices when they are ready—were common among schools with supportive cultures.** Some of these schools also leveraged teacher champions—teachers who were relatively advanced on the innovation curve who could demonstrate the value of new practices and encourage their use. Models such as these create deliberate mechanisms for practices to spread organically among teachers rather than being dictated top-down.

In summary, this research found that within-school environments that nurture innovative practices include particular elements such as effectively-designed collaboration and professional development opportunities. More importantly, innovative practices appear more likely to evolve when school environments provide coherent support across these elements, offering consistent focus and encouragement toward practice improvement. Despite the fact that our samples in each country were deliberately inclusive of highly innovative schools, environments such as these were few among the schools we visited.

### Figure 8: Aligned Appraisal Practices Predict Innovative Teaching




Notes:
a. This chart groups teachers according to the degree to which teachers at their school agreed with the statement, "Teacher appraisals emphasize new teaching practices," and displays relative mean innovative teaching scores (expressed in standard deviations) for each group.
b. Source: ITL Teacher survey 2011
c. $p < .05$

# V. THE NATIONAL EDUCATION SYSTEM

Beyond the environment of the individual school, the broader national context is an essential layer of the educational ecosystem. Even the most autonomous schools still operate within a context of educational structures and values that strongly shape learning goals and often teaching methods. These influences may operate in concert or at odds with the goals of innovation.

**National policy documents that support the use of innovative teaching and learning exist in all countries in the study**, and most countries reported some national-level program support for innovative teaching and learning. In some cases this extends to recently rewritten curriculum guidelines that include a focus on ICT and/or students' 21st century skills.[1] For example, guidelines for innovative teaching are included in national teacher standards in Indonesia, Ministry publications in Finland, and in elements of the national curriculum in Russia, Senegal, and Mexico.

**However, mechanisms that bridge policy and practice are not sufficiently known or in place**. Researchers in each country reported a disconnect between the vision expressed in policy documents and what happens in classrooms. Teachers lacked sufficient guidance to understand and especially to implement the policy in their everyday teaching. For example, teachers we interviewed in Indonesia reported that whereas a new policy requires them to adopt an interdisciplinary approach, they have not been offered the training that would help them acquire the additional content knowledge necessary to become effective interdisciplinary teachers.

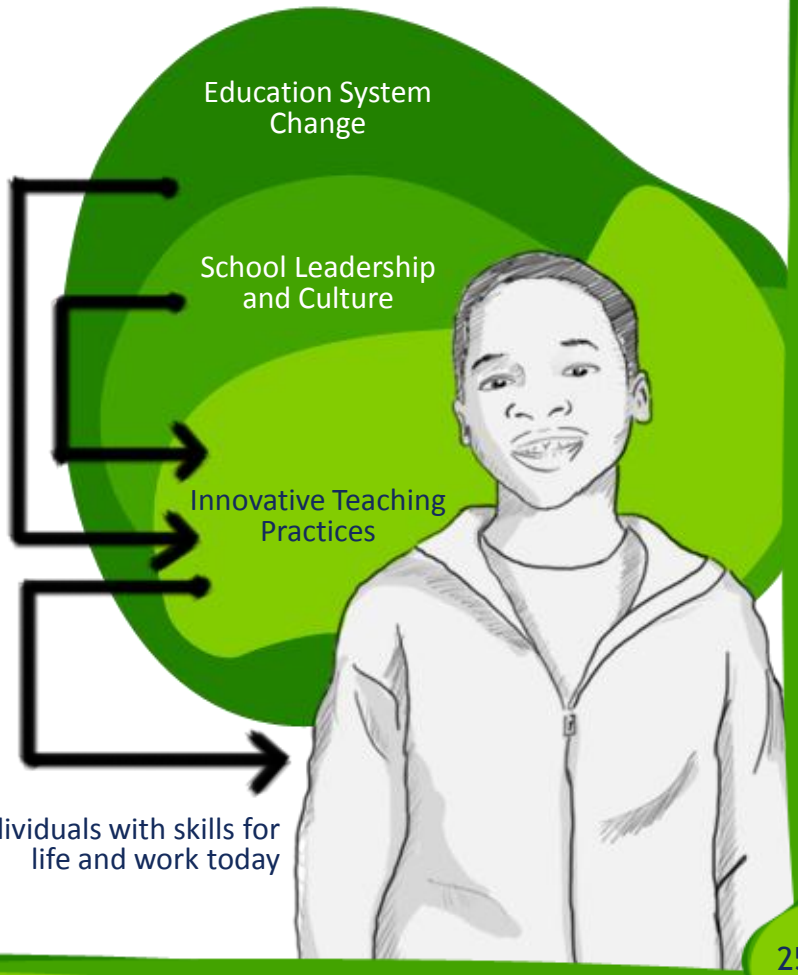
**Teachers and school leaders from all six countries that practice extensive national student testing [2] reported strong tensions between goals for innovation and experiences of accountability based on student scores on traditional subject-matter tests**. Assessment practices have not kept pace with innovation, resulting in challenges for schools and teachers to integrate the two contrary visions.

[1] One country in the study has recently experienced a change to an administration with more traditional educational priorities, serving as an exception to this supportive trend and illustrating the challenge of leadership change to long term program support.

[2]Finland is the exception to this practice, with limited national testing for students in compulsory grades (through approximately age 15).

"*Innovative practices are a necessity, but the primary concern has to be concrete outcomes, as measured by the results in national exams*." – school leader in Senegal

"*My success is judged by examiners, by Ofsted, by parental choice… and what parents want, what children want is not necessarily what I would judge as innovation. So I am constantly juggling with that tension (…) I can't do something interesting and let results slip. You just do not have that freedom*." – teacher in England



# SUMMARY AND FUTURES

**By design**, ITL works with a diverse sample of countries and schools, both in contexts where we might expect to see mature examples of educational innovation and in contexts where these practices are just beginning to be explored. While the experiences of teachers and students vary dramatically in these different settings, several common themes emerge.

- In most places we visited, it is striking that **teachers within the same school vary considerably in their levels of innovative teaching**. The theme of partial integration of innovation was also observed at the classroom level: while researchers saw many examples of specific practices that were innovative within a given national context (such as students working in teams or developing presentations based on current social issues they had researched on the Internet), descriptions of learning activities that incorporated a coherent set of innovative practices were quite rare, and the 21st century skill-building opportunities offered by the typical learning activity remains low.

- **The use of ICT in learning also varied widely within schools**. We saw this variation both in depth of integration into the everyday practices of individual teachers, and in the ways that teachers chose to use ICT in their classrooms. Overall, ICT use in teaching is becoming more widespread; opportunities for students to use ICT in their learning are at an earlier stage.

- This research identifies a number of **specific supports that predict innovative teaching across countries**. These include collaboration among teachers at the school tied explicitly to topics of teaching and learning; teacher appraisal practices aligned with innovative teaching; and coherent, ongoing programs of professional development that offer active opportunities to explore and integrate—not just learn about—new approaches to teaching.

- Among the schools we visited were several that have succeeded in developing an **overall culture of innovation**. These schools offer a coherent and integrated system to support teacher exploration of new practices: common elements include clear and common vision of innovation, consistent encouragement, time and material resources, and professional development that are all aligned to promote continuous evolution of teaching practices. Within these innovative environments, **schools more commonly offer support and encouragement for teacher professional growth than have top-down requirements**. Several school leaders described opt-in strategies, as well as lead teachers or other champions who were active in coordinating and seeding changes and acting as role models for teachers who are earlier on the adoption curve.

- At the national level, while all countries espoused innovative goals and reflected these in standards and other policy documents to some degree, **our sample of countries did not include an example of coherent national, systemic support of innovation**. Most lacked sufficient programmatic supports that link policy to practice, and traditional student testing in most countries assures that schools, teachers, and students are still judged on the vision of schooling as a mechanism for transmitting knowledge. Until this system-level coherence is established, innovation is likely to continue its path of fragmented and piecemeal adoption.

While examples of innovative opportunities for teaching and learning are evident in many places, true "innovation" will not be achieved until these opportunities are woven into the fabric of the education system and become an everyday element of classroom practice, available to a wide range of students. In most places we visited, this stage has not yet been reached. But there is reason to be hopeful.

- **While innovation is not yet commonplace in most settings, seeds are being sown**. In each country, some of the teachers we observed were introducing practices that were novel in the context of their educational systems, whether that be pushing an advanced system forward or taking initial steps toward experimentation with new practices. This variation offers the promise of continued evolution, particularly when the right conditions are present.

- **We know a lot about the types of school climates that nurture innovation.** This research suggests several important components:
  - Opportunities for collaboration that provide focused peer support for exploring and integrating new teaching practices within cultures that are supportive of sharing;
  - Professional development that offers sustained, hands-on opportunities to engage and reflect on pedagogical practices that help students develop the skills they will need for life and work;
  - A coherent system of supports and incentives that both allow and inspire teachers to continue to grow in innovative directions.
- **Alignment is a requirement at the system level as well**. It is notable that the countries in our sample occupy a range of places on the scale of system performance as described by Mourshed and colleagues (2010). Some of these countries are known for their educational systems that are aligned toward strong and equitable student performance. Yet none of the countries in our sample have systems that are fully aligned toward innovation. It is important that stated goals are propagated through the system in the form of bridges to practice: professional development programs, aligned curriculum and resource materials, and assessments that all offer a balanced focus on the development of students' capacities for success in the 21st century.

- **ICT can provide strong support for innovation if it too is aligned.** Too often all levels of the system, from governments to schools to teachers, begin with the goal of ICT use for its own sake, rather than keeping the focus firmly on students and learning. A more compelling goal is driven by a vision of the ways in which emerging ICT tools can make possible new, more powerful learning opportunities for students. Supports aligned around this vision would begin to answer the needs that we heard most frequently from teachers: ICT access for students, professional development focused on pedagogical applications, and rich digital learning models and materials that help teachers make powerful learning opportunities a reality in the classroom.

This combination of knowledge and tools offers hope that educational systems can become increasingly fertile environments within which new teaching practices can take root. To further support this vision, in 2012 ITL Research will embark on a new program of professional learning and collaboration called LEAP21.[1] This program leverages the research-based tools developed in Phase I for the analysis of learning activities and student work. LEAP21 brings together groups of teachers and offers a detailed set of definitions and strategies that act as a lens for the collective analysis of 21st century learning opportunities. In early trials, this program has been shown to be a powerful tool in the hands of groups of teachers to help them reflect on and strengthen the learning opportunities they offer to students (Leahy and Butler, 2011).

[1] Learning Educators, Advancing Pedagogy for the 21st Century

**LEAP21 is designed to support the above vision of a fertile environment for change in these ways:**

- Its professional development component offers an explicit bridge between the theory of 21st century teaching and learning and its specific instantiation in practice
- It provides a framework for ongoing teacher collaboration that centers firmly on the continuous improvement of teaching and learning, and builds a shared language through which to have those discussions
- It supports local champions and school leaders as they work to integrate this collaborative process into the culture of the school
- It presents a view of ICT that is focused on the depth with which it supports new knowledge building opportunities for students.

In several participating countries, discussions are in progress on ways to integrate LEAP21 into nationally-offered education programs and goals for education. LEAP21 will be introduced to teachers and schools in at least six countries in 2012 through the ITL program. For more information or to join us, please visit **http://www.itlresearch.com** or send an email to **inquiry@itlresearch.com.**

Many posit that "evolution" is the enemy of "revolution," and that the latter is what is needed to bring educational systems into the 21st century. This report suggests instead that ecosystems are a productive metaphor for the constellations of integrated supports needed for powerful teaching practices to grow and proliferate within and across schools. In turn, this proliferation will help a much higher proportion of young people to build the skills they will need to thrive in their future life and work. When "innovation" takes place to this degree, it will be nothing short of revolutionary.

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# APPENDIX: SAMPLE DESCRIPTION

Findings in this report are based on **multiple types of data** that were collected in each participating country to offer a range of perspectives on teaching, learning, and the systems that shape teaching and learning in each of seven countries.

Table 1 describes the sampling guidelines, and the actual 2011 sample, for each method used in each of participating country.[1] In each country, the sample was designed by a committee that included research partners and other senior education officials familiar with individual schools in the region. The nomination process identified 12 schools that feature relatively "innovative" instruction according to ITL Research definitions; this is the "innovative" sample described below. Committees also selected a set of schools that are more typical of the teaching and learning environments experienced by the same student populations (the "comparison" sample). Teacher and school leader surveys were administered at all nominated schools, with replacement for nominated schools that declined participation. Site visits and learning activity/student work collection were performed at schools selected from the "innovative" sample. Incentives for participation in all research activities were defined as appropriate within each country.

**It is important to recognize that:**

- Samples are not nationally representative; instead, they seek to encompass a range of school characteristics, including oversampling for schools with relatively innovative instruction.
- While survey data come from the full range of schools, qualitative data and classroom based research (classroom observations, learning activities and student work) were sampled with intent to identify examples of innovative teaching within the country.

[1]England, Finland, Indonesia, Mexico, Russia, and Senegal are included in all datasets; due to differing timing of the school year, Australia is included in surveys and classroom observations only.

**Table 1: 2011 Sample Sizes by Data Collection Activity**

| Methods | 7-Country Sample | Per-Country Guidelines |
|---|---|---|
| **Survey Schools** | **159** | **24 schools, representing 3-4 selected geographical regions in each country, balanced between "innovative" and "comparison" samples** |
| Teacher surveys | 4,038 | 650 teachers of 11-14-year-olds |
| School leader surveys | 159 | 1 survey per school |
| **Site Visit Schools** | **24** | **3-6, from "innovative" sample** |
| Teacher interviews<br>Teacher observations | 86<br>81 | 4 per school<br>4 per school (interviewed teachers) |
| School leader interviews | 18 | 1 per school |
| Student focus groups | 33 | 1-2 per school |
| **Learning Activity/ Student Work Schools** | **29** | **6, from "innovative" sample (inclusive of site visit schools)** |
| Learning activities | 967 | 6 activities from each of 8 teachers of humanities and sciences per school. Activities were selected by teachers as those that provided the strongest learning opportunities for students. |
| Student work samples | 3,367 | 6 pieces of student work, drawn at random, for each of 4 submitted activities per teacher |

For more detailed technical information about ITL Research methods, please see the separate ITL Research Technical Supplement (Gallagher et al., 2011)


# WHOLE SYSTEM REFORM FOR INNOVATIVE TEACHING AND LEARNING

Michael Fullan
October 2011

# WHOLE SYSTEM REFORM FOR INNOVATIVE TEACHING AND LEARNING

Michael Fullan

Once in a while there is a convergence of independent but relatable forces that come together and create synergetic breakthroughs in societal learning. We are at the early stages of a potentially powerful confluence of factors that could transform education. Change that works that has an elegant quality to it—something that is ingeniously simple and profound. The three forces that currently offer us this possibility are: recent knowledge about 'whole system reform', insights on powerful pedagogical practices, and digital innovations with enormous potential. The new breakthroughs on which my colleagues and I are currently working integrate 'technology, pedagogy, and change knowledge' (knowledge about supporting implementation, and about system conditions necessary for widespread reform).

In this paper I examine the new research findings arising from the Innovative Teaching and Learning Research project sponsored internationally by Microsoft Partners in Learning. This study was based on data from seven countries: Australia, England, Finland, Indonesia, Mexico, Russia, and Senegal.

This latest ITL research is the clearest conceptual and empirical example that I have seen of how technology and pedagogy can be effectively integrated, although it too shows that we have a long way to go. ITL Research brings new clarity to reform work that is in early stages in many places, and this clarity can enable an increasingly accelerated pace for subsequent breakthroughs. The path is becoming clearer with dramatically greater potential for going to the next stage of transformation.

This paper is organized into four sections. First I review what I have recently called the 'wrong' and 'right' drivers for whole system reform. There are four sets of drivers. Second, I examine the key findings from ITL Research (Shear, Gallagher, & Patel (2011).

## WRONG DRIVERS FOR WHOLE SYSTEM REFORM

Third I take up Ontario as a good example of whole system reform, although it falls short in terms of "innovative teaching". Finally I consider the main implications for the future spread and development of innovative teaching and learning on a large-scale.

Thanks to the growing presence and precision of OECD's PISA program which assesses the performance of 15 year olds in some 65 countries in literacy, math and science there is a growing interest among politicians in joining the race to the top. This is good news and bad news. I will end up saying in this paper that deep whole system reform does not have to be overwhelming and may indeed get easier but in the short run politicians still have the tendency to rely on certain silver bullets. I call these 'wrong drivers' (Fullan, 2011). A driver is a major policy and set of associated strategies that promises to achieve successful whole system reform. Wrong drivers fail to deliver while right drivers do have the intended impact. Later in this paper I will show how the recent ITL findings confirm what some of the right drivers might be for promoting 21st century skills and their link to technology, although these findings also show that the right conditions are poorly established on any scale in practice.

Let me state the criteria that a right driver must meet in order have deep impact on students and teachers. Does the driver sooner or later: i) foster intrinsic motivation of teachers, and of students; ii) engage them in continuous improvement of teaching and learning; iii) inspire collective or team work; and iv) affect 'all' teachers and schools—100%?

The four 'wrong drivers' I identified, using the U.S. and Australia as case examples are (the corresponding right drivers are in parentheses):

1. External, punitive accountability (vs. capacity building)
2. Individual (vs. group) solutions
3. Technology (vs. pedagogy)
4. Piecemeal (vs. systemic) policies

It is not that the wrong drivers have no place in the set of strategies, but rather they are miscast as lead drivers. They simply fail to engage the masses in the kind of reform that would be comprehensive and deep.

While these are clearly the wrong drivers for moving forward I can't say that whole system reform has produced the depth we need for the future. For the latter to happen we need to integrate high yield pedagogical practices with widespread technology access and the digital content to bring learning to life (for both students and teachers).

As we turn to examine the ITL Research findings we will see that they are consistent with the so-called 'right drivers' in action. Furthermore the findings are clear enough that they allow us to point to next steps.

# INNOVATIVE TEACHING AND LEARNING

**The criteria I hold for going to the next phase of development - a qualitatively different level of performance—include powerful pedagogy that is: engaging, precise, high yield, and higher order. This new pedagogy would capture the intrinsic motivation of learners individually and collaboratively and is at the heart of the ITL Research investigation**.

At this stage in the learning journeys of most educational systems there are two big barriers—one generic and one specific to higher order learning. The generic barrier is the fact that 'instruction' goes missing or at least seriously underdeveloped in the improvement agenda. Think of a three-legged stool: standards, assessment, and curriculum/instruction. It is almost always the case that the black box of instruction is the most neglected of the three (consider for example all the current fanfare in the US around common core state standards and the corresponding two assessment consortia within which instruction is a distant third cousin).

At the specific level current pedagogies do not meet the four criteria stated above. Stated negatively, education experiences for most students are boring (low engagement), imprecise (unclear learning goals), unrewarding for the effort (low yield), and biased toward low-level skills (lower order skills). This is where the picture of learning painted by the ITL Research findings comes in.

The results of ITL Research are described in detail elsewhere (Shear et al., 2011) so I will discuss them selectively. Here are the findings in a nutshell:

**1.** The findings are cast (very appropriately) as part of an ecosystem of change with 'student skills for life and work today' at the center. This core is supported (or not) by three sets of factors: Innovative Teaching Practices (ITL), School Leadership and Culture, and Education System Supports.

**2.** "Innovative Teaching Practices" in this model have three elements: student centered pedagogies ( including knowledge building, self –regulation and assessment, collaboration, and skilled communication); extending learning beyond the classroom (including problem solving and real world innovation); and ICT use (in the service of specific and concrete learning goals).

**3.** Innovative teaching practices were more likely to be seen in schools where teachers collaborate in a focused way on the particular instructional practices linked explicitly to 21st century skills. (This has implications for professional development, as will be seen below).

**4.** Innovative teaching was more frequent when teachers engaged in "professional development activities that involve the active and direct engagement of teachers" such as teachers conducting research or directly practicing new methods.

**5.** School leadership with vision and focus on supporting the development of innovative teaching and learning was found to be a key condition for implementation. Inclusion of innovative teaching in teacher appraisals was also a positive factor.

**6.** System focus and support (the largest element in the ecosystem model) was not only found to be missing but worked at cross purposes when narrow testing regimens conflicted with broader 21st century skills.

**7.** The above factors, save for item 6, support innovative teaching that in turn was found to be linked to the following student learning outcomes: knowledge building, use of ICT, problem solving and innovation, and skilled communication (collaboration could have been an outcome but there was not enough evidence to assess it through the methods used ). The key is that when students experience these innovative teaching practices, they are more likely to develop and demonstrate the skills needed for life and work today.

There are more detailed findings which I take up below that are helpful in identifying policy and practice implications from the research, i.e. implications for further developing the ecosystem conditions that support the adoption of innovative teaching and learning. It is helpful to use the four 'right drivers' to reinforce and elaborate on the ITL Research findings.

The first right driver involves focusing on capacity building and avoiding punitive accountability systems. We don't have a full description of the role of the accountability systems in the seven countries. We do see that narrow testing requirements undercut the use of ICT and more innovative teaching practices. And teacher appraisal systems that emphasized innovative teaching were a positive factor (in my language likely linked to growth rather than punishment based).

The second driver – team vs. individual strategies—is revealing. On the one hand it was found that collaboration among teachers fosters greater innovative teaching; on the other hand, and most revealing, was the very clear finding that innovative teaching in reality is "a teacher-level phenomenon" rather than a school level adoption. This means at least two things. One that the spread of innovative teaching within let alone across schools is currently limited by low levels of teacher collaboration, and two the quality of innovative teaching will be uneven. In other words well-developed team work improves the quality of practices as teachers work and learn form each other. Another reflection of the absence of coordinated teamwork was the finding that there were not many examples of the integrated use of innovative practices (which I would maintain requires teachers as a group working together over time).

Still staying with right driver number two, ITL Research found that the work of leaders was crucial. School principals who fostered teamwork and supported teachers focusing on innovative teaching made a positive difference. Here again we see underdevelopment. There were a scattering of innovative classrooms but not a clustering of innovative schools. The latter among other things would require school leadership supporting innovative teaching on a wider scale. Another crucial aspect of this driver so to speak is the finding from one country that "highly innovative teachers" who served as lead teachers were seen as invaluable. One suspects that such teachers were not systematically utilized in most of the systems studied.

When we turn to the third driver— **pedagogy needs to drive technology** —we see the nuance of how to interpret drivers vs. non drivers. Above all ITL Research shows by definition that when pedagogy (Innovative Teaching Practices) is clearly the focus a lot of other things fall into place including strong use of ICT, and improving the learning of 21st century skills on the part of students. We also see evidence that relegating a 'non-driver' to a secondary supportive role does not mean that it is not important. Lack of access to ICT was a barrier. Thus the continual investment to achieve ubiquitous ICT for both teachers and students is essential. I am not too fussed about this because the spread of ICT does have a seductive life of its own. The more serious problem is the underutilization of ICT, especially ICT that all students can use outside of school, not just the students who are already better off.

Finally, right driver number four is missing in action. The blunt ITL Research finding: "our sample did not include an example of coherent national systemic support toward innovation." What we have then is piecemeal and fragmented rather than systemic policies and strategies. More about this in the conclusion.

In sum, the pedagogical practices identified in ITL are congruent with the high-yield practices that John Hattie (2009, and in press) found in his mammoth meta studies of over 800 reviews. He found that the top (most effective) teaching practices included:

| | | | | |
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| **Reciprocal teaching (teachers enabling students to learn and use self-learning)** | **Feedback (specific response to student work)** | **Teaching students self-verbalization or self/questioning** | **Meta-cognition strategies (awareness and knowledge of one's own thinking)** | **Problem-solving teaching** |

Hattie concludes that "these top methods rely on the influence of peers, feedback, transparent learning intentions and success criteria... using various strategies, attending to both surface and deep knowing.". All of this is deeply congruent with the ITL Research findings which discovered that "teachers who use student centered pedagogies that develop 21st century skills tend to use ICT more frequently" in their teaching.

**To conclude, ITL Research is decidedly on the right track. It unveils the nature of how deep and powerful pedagogies and supportive ecosystems work together to produce the 21st century learning outcomes that up to the present time have been an elusive pipedream.** Before identifying the main implications of the ITL research I want to take up more fully what I mean by whole system reform.

# WHOLE SYSTEM REFORM

A few of us in Ontario, Canada over the past 8 years have had the opportunity to engage in what we call 'whole system reform' which we define as raising the bar and closing the gap for all students in every school, and in every district and at all levels in the public school system. In Ontario's case (there is no Federal education agency in Canada) this means 2 million students, 130,000 educators, 5,000 schools in 72 districts. Ontario has a highly diverse population of over 12 million people including a steady stream of recent immigrants.

Drawing on the experience in England in 1997-2001 (but not imitating it) we designed a whole system reform strategy for Ontario that at the time, (2003) had just passed through five years of stagnated school and student performance, and bitter relations between the government and the teaching profession. The key drivers of the reform were first and foremost the Premier (equivalent of the governor) of the province, Dalton McGuinty, the Minister of Education, Gerard Kennedy (for the first few years), Ben Levin, Deputy Minister (equivalent of the state superintendent), the head of the first Literacy and Numeracy Secretariat, Avis Glaze and myself as Special Adviser to the premier. McGuinty got re-elected for a third 4 year term in October, 2011 which gives us the opportunity to go deeper into system reform.

We combined an assertive and ambitious agenda from the centre with a respectful two-way partnership with the sector in order to accelerate whole system improvement. I have written about this before and will not repeat the detail here (Fullan, 2010). Our priorities were to improve literacy and numeracy (deeply defined), close the gap for all disadvantaged students, and increase the public confidence in the public school system. We recently added a fourth priority—full day kindergarten for all 4 and 5 year olds (currently about one-third implemented). Our strategy in a nutshell is 'capacity building with a focus on results'. We have been careful to combine relatively non-judgmental attitudes in the early stages with transparency of results and practice. Short accounts of this strategy have been written recently by Ben Levin (2012), and Minister Kennedy (2011).

Levin for example lists 8 factors that comprised our strategy:

- A small number of ambitious goals.
- A positive stance on improving all schools.
- Emphasis on capacity building with a focus on results.
- Multi-level engagement with strong leadership.
- Effective use of research and data.
- A focus on key strategies (e.g. improving instruction) while managing other issues.
- Effective use of resources.
- Development of an infrastructure to a) focus on implementation of the task, and b) lead and support the change process.

Gerard Kennedy's list is similar (which is the point here):

- Establish a strong sense of vision.
- Take calculated risks (ambitious public goals)
- Embed capacity for implementation.
- Partnership based on respect.
- Culture shift to one that values results and is enterprising.

The results are impressive (but not deep enough as I will argue later). Literacy and numeracy, deeply defined, have increased by 15% over the 4,000 elementary schools; there are dramatically fewer schools with high percentages of low performers; high school graduation rates rose from 68 to 81% and are still increasing; morale and ownership by educators is strong; and
the public's satisfaction of its schools' performance is high.

Ontario's success and the reasons therein have been documented by external researchers including McKinsey and Company (Mourshed et al, 2010), and the National Centre on Education and the Economy (Tucker, 2011). It is not so much that we invented the best ideas. We borrowed from around the world. Other high performing countries such as Finland and Singapore over longer periods of time have built similar successful systems. The main point is that whole system reform can be accomplished in reasonably short periods of time. We started to get good results and growing ownership within two years.

Despite the promising results in Ontario I would venture to say that it does not measure up to some aspects of innovative teaching and learning as we have been describing it in this paper. We do not have a strong focus on innovative teaching, deep technology use for learning and the associated higher order skills. In an interesting way we are stronger on most of the ecosystem factors: collaborative cultures, school and district leadership, professional learning, focus on transparent practice and results, and coherent policies and strategies at the system level. Our job now is to employ these strengths in the development of innovative teaching and higher order student learning outcomes.

# IMPLICATIONS

**First, the promise.** It seems to be a good bet that ICT can be mobilized in the service of the four pedagogical criteria I offered earlier, namely learning that is: engaging, precise, high-yield and higher order. We ourselves are working on this very goal in a major initiative that we call, ML/Madcap which attempts to enliven the curriculum through engaging digital experiences (Fullan, Devine et al, 2011). The idea is to integrate technology, pedagogy and change knowledge. This is consistent with the ITL Research model and findings, and we believe that it will make learning more productive, and enjoyable.

The big question is how to generate widespread adoption of innovative teaching and learning approaches. I would decidedly not call this 'going to scale'. Instead we need to create the conditions for the kind of ecosystem portrayed in ITL Research to flourish. We know most of the key ingredients. We will need top-down assertiveness about the focus of learning (on 21st century skills combined with numeracy and literacy) along with the fostering of bottom up conditions that will enable innovative teaching and learning to spread and take hold.

Following our whole system reform knowledge and the findings of ITL Research the main elements should include:

**1. A declared focus on concrete (what we call precision), describable innovative teaching practices.** After some initial discussion of the potential value of innovative teaching and learning there needs to be a move to action. Access to such practices through brief digital films would help. The use of the Partners in Learning School Research tool would be valuable (an online tool that allows a school to deploy the ITL Research teacher and school leader surveys, **www.pilsr.com**), as well as the teacher professional development program currently being developed by ITL Research in which teachers collaboratively examine how they design their own learning activities and students' resulting work. But remember tool kits are only as good as the mindsets using it.

**2.** The goals on item 1 should be pursued using the strategies that we know are critical for deep and widespread implementation: **developing collaborative, focused cultures at the school level; a new role for the principal as lead learner and supporter; the identification of lead teachers to play a supportive and collaborative role among peers.** This suggestion fits squarely with the McKinsey finding that as teacher capacity develops it is peers who are the main sources of innovations (Mourshed, 2010).

**3.** Although I could have made this recommendation as part of item 2, I want to state it separately here for emphasis. **Above all use *collective capacity'* as the foundation of innovative teaching and learning work.** ITL Research found a lot of pockets of innovative classrooms, even in the schools that were deliberately selected as 'innovative'. ITL Researchers did not find much evidence of school-wide let alone district-wide or system-wide innovation. Therefore the new strategies must be based on strategies for teachers to learn from each other within schools, and across schools. There is a role for the 'line-authority'—principals, district or regional authorities in leading collective capacity building. In Ontario we make strong use of such a strategy without being prescriptive.

## IMPLICATIONS

**4.** Finally in light of the ITL Research finding that none of the seven countries had coherent national systemic support toward innovations, we need to take a page from the Ontario story (but applied to innovative teaching and learning**). Have a small number of ambitious goals, and develop a corresponding set of coherent, integrated actions to pursue the goals** (Levin's 8 factors is a good checklist in this regard).

In short, we are in a position to discover learning methods and experiences that are deeply engaging, and that I am going to say easier to accomplish because of the potential power of ICT. We can create the conditions and strategies for these innovations to be adopted and sustained system-wide. For a change connoisseur such as me nirvana is making substantial change of this nature *easier.* Ultimately, what matters most -- and what we are all working towards -- is that students learn what they will need to thrive in our world, and that they experience learning environments where each of them can blossom to enrich our cultures and societies.

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