Intel® Teach

Jumpstarting 21st Century Learning

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Executive Summary

"Higher-performing nations tend to have high standards for learning, have effective professional development to assist teachers in moving students towards meeting those standards, and have structures in place to attract the most effective teachers who are skilled in a highly individualized approach to teaching and learning."

- A. Schleicher & E. Hanushek[2]

Innovation fuels today's global economy. The ecomonic viability of each nation depends on citizens who have the drive, attitude, and capacity to bring creative, viable ideas to life.[1] Today, a nation's most important natural resource is the intellectual capacity of its citizenry—a natural resource that can be developed over time through education. Increasingly, as nations across the globe strive for economic competitiveness and a higher quality of life, they are redesigning their education systems to develop that intellectual capacity. The stakes are high. Fortunately, research is providing clear direction. Researchers have established a definitive causal link between a school system's engagement of K12 students in higher order thinking and complex problem solving with higher economic viability. [2, 3]

Thus, it is imperative that educators' practices shift toward deeper engagement of students in relevant, intellectually stimulating challenges. Intel's premier professional development program, Intel® Teach, is inspiring teachers to redesign their classrooms to meet this challenge. Intel Teach focuses on classroom practices that advance K12 students' critical thinking, problem solving, and collaboration skills using today's technologies. These are the key 21st century skills required for students to thrive in the innovative, networked society in which they live. [4]

Through a decade of proven results, Intel Teach has positively impacted K12 classrooms worldwide. Intel works globally with ministries and state departments of education to adapt this program to support the individual educational goals of each country. Intel Teach has reached over 10 million educators in 10 years in 70 countries around the world. Evaluations commissioned by Intel through objective third parties are reporting positive results.[5] According to participant surveys in 13 countries, 93.9% of the teachers who take the Intel Teach Essentials course realign their teaching to focus more on problem solving, critical thinking, and collaboration through technology. As a result of Intel Teach, over 300,000 students in these 13 countries:

• Are engaged in more project based learning; and

• Use more technology in new, innovative ways.

Given the critical role that sustained professional learning plays in developing teachers as change agents for education reform agendas, policy leaders are increasingly investing in professional development. Around the world, education leaders are turning to Intel Teach to change the way teachers teach and students learn. All governments face the same challenge: to provide their citizens with the opportunity to succeed in the global economy. Increasingly, that success is linked to the quality of education.
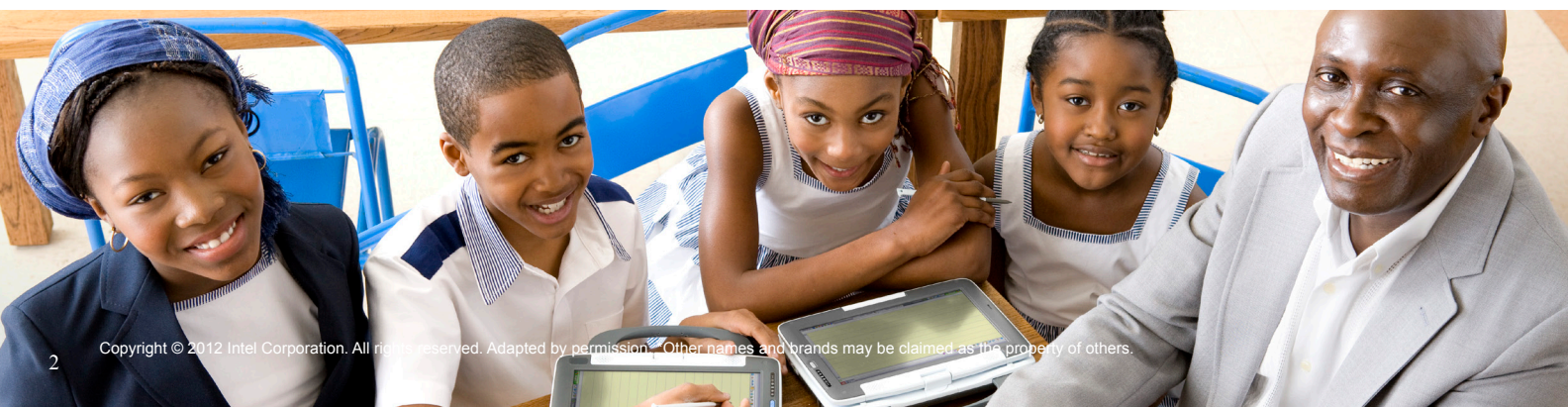
Intel® Teach: The Program

Teachers are the professionals who breathe life into their school district's vision for 21st century learning. Research confirms that the quality of the teacher is the single largest influence on student achievement.[6] The success of any change in a school or district depends on the effectiveness of the teachers in redesigning curriculum, instruction, and assessment. Intel designed its Intel® Teach program with this in mind.

Intel Teach Goals for Participating Teachers:

- Integrate technology into the teachers' lessons.

- Promote problem solving, critical thinking, and collaboration among the teachers' students.

Intel Teach was designed to scale globally. This series of high-quality professional development experiences is grounded in sound research and 21st century learning, yet customized to meet the needs of individual states, nations, and education systems. Intel continually reviews emerging research on how students best learn and updates its courses accordingly. Three key research findings define the Intel Teach series:

The research says…

…sustained, targeted professional development of 30-100 hours over a period of six months to a year can yield significant improvements in achievement for the average student (i.e., gains of 21 percentile improvements). [7]

Intel Teach…

…offers a series of professional development courses with longer (32+ hours) and shorter (approximately 20 hours) options, delivered face-to-face or online, supported by an online community of practice. The offering of multiple Intel Teach courses in a series results in most participants exceeding the threshold that research says is required to yield significant results in student achievement.

The research says…

…teachers learn best when their professional development provides five key opportunities: 1) content focus, 2) follow-up, 3) active learning, 4) feedback, and 5) collaborative examination of student work.[8]

Intel Teach…

…is designed to include all five opportunities for teachers. The offerings are customized region-by-region to include relevant, localized content that speaks to the interests, needs, and teaching assignments of the participants, all within a framework that embodies these five opportunities.

The research says…

…there are generally three outcomes for professional development that happen in the following order: 1) changes in teachers' beliefs and attitudes, 2) changes in teachers' classroom practices, and 3) changes in student learning outcomes.[9] Reaching the last two stages requires continued support from school leaders, as teachers begin to translate the shift in practice.

Intel Teach…

…is designed to effect changes in teachers' attitudes and beliefs about redesigning lessons to optimize student learning, based on research. This is tied to lesson design, which ultimately results in changes in their classroom practices, with the intent of improving student learning and outcomes. Intel often partners with the local education ministries in bringing these professional opportunities into the region. This serves to advance systemic support for the teachers, and provides a platform for common teacher experiences.

A decade ago, Intel embarked on a long-term strategy, committing to the research, development, and continuous improvement of a series of professional development courses that nations and states worldwide could count on as relevant, current, and grounded in the latest research. Their partnership with regional and local entities, in support of local customization, is critical — representing the best of class worldwide, while adaptable to fit local environments. Once the core professional development courses were established, Intel has continued to refine, revise, and expand these courses and offerings.

Today Intel® Teach comprises a series of professional development courses. While most of the courses are designed to build the capacity of teachers to use technology effectively to advance their students' learning, others are designed specifically to develop the skills of leaders and Information Communication Technology (ICT) teachers.

| Audience	Course Title	Focus
Classroom Teachers	Intel Teach Getting Started	Learn to use classroom software productivity tools effectively to promote student-centered learning.
	Intel Teach Essentials	Integrate technology into classroom curricula and promote student-centered learning (face-to-face course).
	Intel Teach Essentials Online	Integrate technology into classroom curricula and promote student-centered learning (online course).
	Intel Teach Thinking with Technology	Promote students' higher-order thinking using online thinking tools.
	Intel Teach Advanced Online	Build communities to advance integration of technology and 21st century skills.
School Leaders	Intel Teach Leadership Forum	Promote, support, and implement effective technology integration in schools through an interactive, face-to-face forum on leadership.
ICT Teachers	Intel Teach Skills for Success	Advance digital literacy, problem solving, critical thinking, and collaboration skills with students.

Evidence of Impact: 10 million in 10 years

Over the last decade Intel has commissioned objective, third party evaluations of Intel Teach to assess the degree to which the goals of the program are being attained. The goals for Intel Teach are to integrate technology into teachers' lessons, and to promote problem solving, critical thinking, and collaboration among students in those integrated classrooms. The evaluations looked for evidence that the teachers' participation in the professional development courses was reaching those goals. They used four key indicators (see text box below) as evidence of the impact of the Intel Teach program on the teachers' practices.

One of the most recent evaluation studies looked specifically at the Intel Teach Essentials course from the program offerings. Teachers in that course personalized what they had learned earlier in the Intel Teach courses to develop a unit of study to use with their students back in their classrooms. The unit involved engaging students in projects that require problem solving, critical thinking, and collaboration.

Intel® Teach Program's Indicators of Impact			
Indicator 1	Indicator 2	Indicator 3	Indicator 4
Implementation of all or part of the unit plan designed in the training	Increased use of technology for lesson planning and preparation	Use of technology in new ways with students	Increased use of project-based learning activities with students

The evaluation of the Essentials course was based on surveys from 13 countries. Survey participants indicated that 93.9% of the teachers who took the Intel® Teach Essentials course reported meeting at least one of the program success indicators. In summary:

- 93.9% of the teachers who took the Intel Teach Essentials course realigned their teaching to focus more on problem solving, critical thinking, or collaboration, through technology.
- 80.7% of the teachers reported using technology in new ways with students upon completion of the course.
- 75.3% of participants reported they used all or part of the unit plan they designed in the course.
- 63.7% of participants reported an increase in the use of technology for planning and administration since participating in the course.
- 53.1% of the teachers reported increased use of project-based learning with students upon completion of the course.
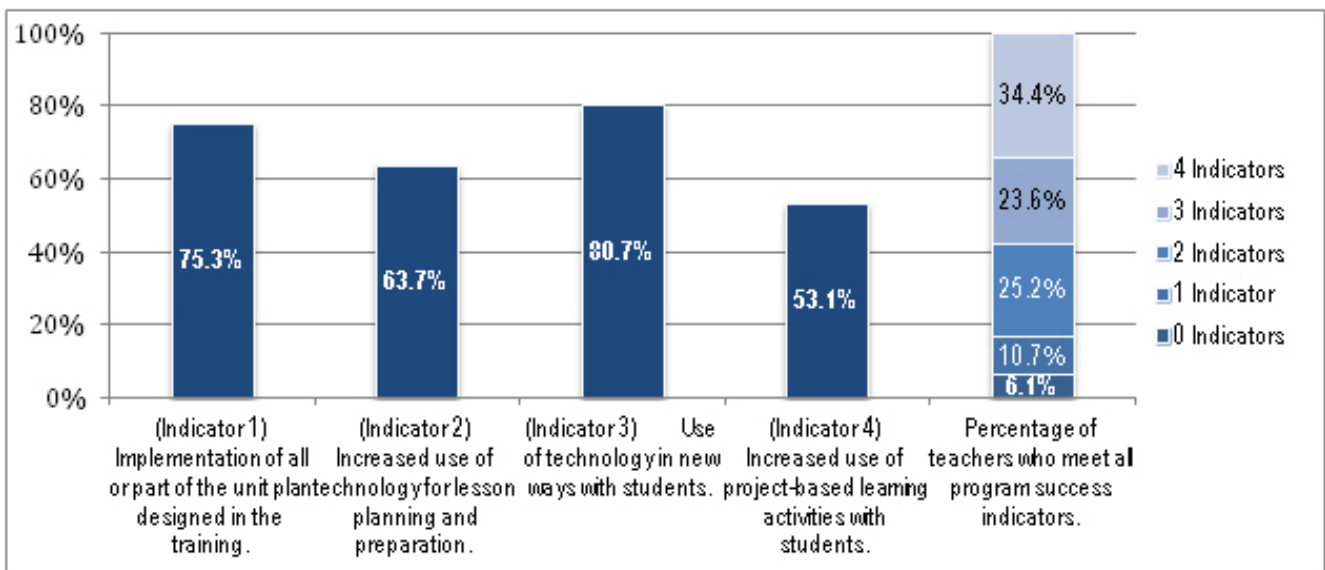
One of the elements that differentiates the Intel® Teach courses is the focus on relevancy and authenticity of learning. Woven into the design of the Intel professional development is project-based learning, which uses contemporary technologies and brings relevancy to learning. As the surveys reported above indicate, 93.9% of the teachers who took the Intel Teach Essentials course in the 13 countries involved in the evaluation study realigned their teaching to focus more on problem solving, critical thinking, collaboration, or technology. In many cases, that meant redesigning classroom units. Consider, for example, the sharp contrast between the conventional and inquiry units of study described below. While both units address specific standards related to student research, only the inquiry unit is aligned to the Intel Teach principles.

Conventional Unit of Study	Inquiry Unit of Study
Mr. Alberta, a sixth grade teacher, models how students are to conduct Internet searches on various topics. He demonstrates good searching techniques using search engines such as Google, as well as searches within informational databases. He has the students practice good searching techniques guided by a worksheet of short topical assignments. The students work in pairs to conduct the searches, summarize the information they find, and cite their sources. Since his students are also beginning a unit on European history, he assigns a country to each team asking them to: • *Research their assigned European country by completing a template with topical research questions (e.g., language spoken, type of government, flag, etc.), documenting their findings, and citing their sources; and* • *Develop a 3-minute oral presentation with visuals that represents a summary of their findings.* Once the research is complete, students hand in the completed template and present their 3-minute oral report. Their grade for the template is based on the accuracy and comprehensiveness of their answers and the appropriateness and quality of their citations. Their grade for the oral report is based on the content (elements selected to represent the country, context, comprehensiveness, and accuracy), and presentation (visual elements, visual design, oral reporting, handling of questions and answers, etc.). The students first see the scoring criteria when they receive their grades for the unit.	Ms. March, a sixth grade teacher, has participated in a series of *Intel® Teach* courses. Based on those experiences, she is designing a unit of study to address the *Research to Build and Present Knowledge* standards from the U.S. Common Core. She develops good searching techniques and research literacy in her students through modeling and interactive online sessions using the Digital Investigator Resources on the 21st Century Information site (http://21cif.com) from the Illinois Mathematics and Science Academy. She has students practice their skills through simple searches integrated into the other lessons she teaches in social studies, science, and mathematics. Once her students have become fairly proficient with basic research skills, she deems them ready for more complex challenges. One of the first she introduces to her students is related to a new unit on modern European history. The assignment is to: • *Choose two European cities (or locales) that interest you. Develop your own personal livability index to determine in which city you would prefer to live. Describe the criteria in your livability index, provide evidence supporting your preferences, and cite your sources. Delve into the history of the two cities/locales, and find an era when your preferences might be different. Explain.* • *Develop a final product, stating and supporting your positions on your European cities/locales. Post the product on the class website for public review.* Students work in cooperative pairs, and meet periodically with students who chose the same city or locale, to discuss sources, findings, and insights. A rubric is provided on the standards to be reached in English Language Arts, social studies, and visual/oral presentations. Ms. Marsh stages her students for success by establishing milestones and a timeline: 1) choice of two cities, 2) determination of livability index, 3) locating and vetting sources, 4) collecting data, 5) summarizing resultant information and determining the students' preferential city/locale, and 6) scripting, developing, and posting the final products in a public venue. Each product is peer-reviewed by three other teams, and then reviewed by the teacher for a final grade. She extends this lesson by asking her students to continue to research their preferred city/locale in other venues. For example, when discussing a current news event, the teacher might ask each student to research the news story based on news outlets from their preferred European city/locale. By doing so, she helps the students develop the habit of using their online research skills to satisfy their curiosity and to inform and expand their thinking on a daily basis.

Both the conventional and the inquiry lessons address the U.S. English Language Arts standard in grade 6 on Research to Build and Present Knowledge. But notice the differences in the level of interactivity of students as the two teachers develop students' online research skills, and the differences in the assignments and frequency of practice as the students further develop their skills.

The conventional example approaches the unit as a topical research exercise in which students learn to conduct searches to find information based on a formulaic template.

In contrast, the inquiry lesson presents an open-ended question relevant to the student that offers them choices and requires higher order thinking. This type of inquiry lesson provides learning experiences that will be remembered and transferred to future situations. The assessment processes noted in the inquiry

lesson include the use of rubrics, performance-based assessment of the student projects, student self-assessment, and peer assessment, all of which are addressed in Intel's professional development courses.[10] The Intel® Teach courses prepare teachers to bring relevancy to learning, which in turn enables them to provide a venue for high student engagement and deep, authentic learning in their classrooms.

Teachers Speak Out About the Impact on their Classrooms			
Jordan	United States/Australia	South Africa	Turkey
"When I posed an essential question to the class, students understood it differently. Some took it from the ethical point of view, others from the biological point of view, and others from the religious point of view. The essential question guided students' thinking and created lots of discussion among them...triggering other questions in the students' minds and made them more interested in the subject."[11] - Dr. Majdi Al-Mashaleh, Master Teacher, Jordan	"I think they [students] have discovered that we are all connected. It's not so different between here and Australia or China or India. We are all just people who want to make a difference on this planet."[12] - Dyane Smokorowski, Teacher, United States	"The Intel Teach program has revolutionized the way we can use the computers that were donated to us. It has revolutionized the way we teach."[13] - Mercy Ntlemo Teacher, South Africa	"Integration of technology helped a lot in getting the attention of students and in motivating them to discover things on their own."[14] - Myline Villaflores, Teacher, Philippines

More than ever before, a good education matters now. Today's student lives in a vastly different world from prior decades, a world unprecedented in its complexity, rate of change, social networking, and democratization of power. To navigate successfully, students will need to be independent, critical and creative thinkers, confident in their ability to adapt, solve problems, communicate, and work collaboratively in teams. This calls for learning experiences that are different from that of yesterday. Intel Teach paves the way for such education reforms.

To learn how Intel Teach can benefit your students and teachers, visit: www.intel.com/education/teach

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