

Intel Teach for the Future*: Meeting the Challenge of No Child Left Behind

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Introduction

The No Child Left Behind Act of 2001 ("NCLB")¹ presents a rigorous plan for education reform, challenging the nation's schools to increase student achievement and teacher quality. Central to that call for accountability is the requirement that schools take greater care in the selection of curricular and professional development programs and materials to ensure that they are of high quality, based on scientifically-based research and subject to exacting evaluation.² That mandate extends to professional development programs aimed at the integration of technology into the curriculum. NCLB places an increased emphasis on the integration of technology into standards-based curricula and mandates that 25% of technology funds be devoted to high quality professional development in technology.³ In addition, NCLB requires that technology professional development be "ongoing, sustained.... intensive [and] high quality..." and based on relevant research.⁴ Thus, a comprehensive high quality professional development program in technology is a key component of a successful district level NCLB strategy.

Intel Teach for the Future

Intel Teach for the Future is a professional development program aimed at training teachers to integrate technology into a standards- and project-based curriculum. Developed by the Intel Corporation and the Institute for Computer Technology, the program employs a train the trainer model, through which Master Teachers receive training before then training and supporting their peers within their school districts. Since its inception in 2000, Intel Teach to the Future has trained more than 110,000 in-service teachers in 46 states.

EDC's Center for Children and Technology (CCT) has conducted an external evaluation of Intel Teach to the Future since the program's launch. Established in 1981, CCT has been at the forefront of educational technology research, conducting a wide range of basic and applied research to understand how technology can best support teaching and learning. CCT is part of Education Development Center, Inc. (EDC) a leading non-profit research and development organization that investigates and supports learning and human development around the world.

¹ Public Law 107-110.

² Elementary and Secondary Education Act ("ESEA"), Section 1119(a)(1) and (3); "Improving Teacher Quality: Non-Regulatory Guidance, Revised Draft," Section D-1. Department of Education, September 12, 2003.

³ ESEA, Section 2416 (a)(1); "Guidance on the Enhancing Education Through Technology (Ed Tech) Program," Sections E-11, H-1. Department of Education, March 11, 2002.

⁴ ESEA, Section 9101(37).

Broadly stated, the CCT evaluation found that Intel Teach to the Future is a rigorous research-based program that incorporates the best practices in the professional development field. They further found that the program is closely aligned with NCLB's exacting criteria for high quality professional development and with the goals and objectives of NCLB's technology programs. Finally, the CCT evaluators have concluded that Intel Teach to the Future is an effective professional development experience that has enabled a large majority of participating teachers to integrate technology into classroom teaching in ways that support high-quality instruction and improve the overall learning environment.⁵

Focusing on the integration of technology into curriculum

Intel Teach to the Future is designed to meet the technology goals of NCLB by ensuring that teachers are equipped to integrate technology into a standards-based curriculum in order to improve teaching and student achievement.⁶ Throughout its intensive, 40-hour program, Intel Teach to the Future seeks to train teachers to incorporate technology use into student centered project-based learning. Substantial research shows that technology, when linked with effective instruction, can be a powerful tool to support student achievement.⁷ Technology can help students collect, analyze, reflect on and communicate information and ideas while exposing them to a broader universe of resources. Moreover, technology can help students manage and analyze complex information – a critical skill for success in a challenging standards-based curriculum.⁸ Maximizing successful student use of technology requires supporting teachers with professional development that links learning about technology with learning effective instructional practices.⁹

Emphasizing effective instruction

Intel Teach to the Future places “learning about technology” in the context of learning effective instructional strategies. As NCLB makes clear, quality professional development must “advance teacher understanding of effective instructional strategies.”¹⁰ Teachers participating in Intel Teach to the Future learn the pedagogy that supports effective integration of technology into the classroom and then learn how to develop materials and teaching strategies that translate those principles into effective learning opportunities. Each participant in the program draws on his or her own existing curriculum to develop a technology-rich unit plan over the course of the training. This process allows participants to act immediately on what they are learning, and to work in a collaborative manner with other teachers to refine their plan and solve instructional and technical problems as they arise.

⁵ Culp, et al, 2001; Martin, et al, 2002. For more information about CCT and the evaluation of Intel Teach to the Future, visit <http://www.edc.org/cct>.

⁶ ESEA, Section 2413 (b)(1)(2) and (7).

⁷ Cognition and Technology Group at Vanderbilt, 1996; National Research Council, 2000; President's Committee of Advisors on Science and Technology, 1997; Sandholtz, Ringstaff & Dwyer, 1997

⁸ Dede, 1998; Koedinger, Anderson, Hadley & Mark, 1997; Means, Penuel & Padilla, 2001; Pea, 1997; Roschelle, et al, 2001.

⁹ Light, McDermott, Honey, 2002; Sandholtz, Ringstaff & Dwyer, 1990; Scardamalia and Bereiter, 1996.

¹⁰ ESEA, Section 9101 (34)(A)(vii).

Intel Teach to the Future is based on substantial research that demonstrates that the quality of instruction plays a central role in determining how well students learn.¹¹ Additional research suggests that teachers use new resources and strategies when they are introduced in ways that make direct connections to teachers' existing needs and interests. Effective professional development gives teachers the skills and knowledge they need to provide effective instruction; the opportunity to find direct links between their existing needs and priorities and the new ideas and resources being presented; and confidence that they know how to act on what they've learned.¹²

Ensuring teachers can take what they learn back to their classrooms

Intel Teach to the Future draws on extensive best practices in professional development in order to achieve its ambitious goals. Teachers in the program are called on to define and create parts of the training experience so that it will meet their local needs and make the core concepts immediately useful and relevant to their classroom teaching. The emphasis on the teacher's own classroom is the center of the Intel Teach to the Future experience, and mirrors research recommendations that call for strong, clear connections between teachers' particular classroom experiences and the concepts addressed in professional development settings.¹³ Specifically, in this program teachers are expected to bring an existing curriculum unit to the training to use as the basis for designing a technology rich unit and all supporting materials. Important topics, such as the challenges of classroom management raised by the integration of technology into student-centered activities, are considered in the context of real world curriculum development. NCLB specifically identifies classroom management skills as an essential component of quality professional development.¹⁴

Aligning with standards

Intel Teach to the Future is fully aligned with the ISTE National Education Technology Standards (NETS) for teachers, a comprehensive set of performance-based standards reflecting fundamental concepts and skills for using technology to support teaching and learning. ISTE NETS have been adopted, or adapted for use, in 32 states.¹⁵ This alignment contributes to the program meeting NCLB's exacting criteria for professional development, which requires that such programs be aligned with state standards and assessments.

NCLB mandates the alignment of standards, curriculum and assessment so that students are able to meet challenging state content and achievement standards.¹⁶ Intel Teach to the Future models the process of aligning assessment, standards for learning, curriculum and instruction that both NCLB and the research literature assert are central to improving

¹¹ Cohen, Raudenbush & Ball, 2003; National Commission on Teaching and America's Future, 2003.

¹² Darling-Hammond, 1999; National Commission on Teaching and America's Future, 2003; U.S. Department of Education, 2000; Wenglinsky, 2000; Wiggins & McTighe, 2000.

¹³ Fishman, Marx, Best & Tal, 2003; National Commission on Teaching and America's Future, 2003; National Foundation for the Improvement of Education, 1996; National Staff Development Council, 2001.

¹⁴ ESEA, Section 2113 (c); "Improving Teacher Quality: Non-Regulatory Guidance, Revised Draft," Section D-1. Department of Education, September 12, 2003.

¹⁵ For more information on the ISTE NETs standards, visit <http://cnets.iste.org/>.

¹⁶ ESEA, Section 1001 (1).

instruction and raising student achievement.¹⁷ By focusing on meeting state learning standards; fostering proven, high-quality instructional strategies; and aligning assessment, curriculum, and instruction, rather than on simply using technology for its own sake, Intel Teach to the Future provides teachers with an opportunity to learn how to integrate technology into curriculum and instruction as NCLB demands and in a way that draws on best-known practices for professional development that produces real change in the classroom.

Providing sustained and intensive learning experiences

Intel Teach to the Future, which provides 40 hours of training in ten modules, delivered over one to ten weeks, is consistent with NCLB's call for sustained, intensive and classroom-focused professional development.¹⁸ Moreover, because Intel Teach to the Future uses a train the trainer model, the program often produces groups of trained teachers at the school level who are capable of providing ongoing support to each other when teachers return to the classroom. The research literature makes clear that sustained professional development has a greater impact on teacher practice than one day or short-term workshops.¹⁹ In particular, teachers with more hours of technology-related professional development report being more prepared to use technology in the classroom.²⁰

Evaluating program quality and program impact

A final touchstone of the Intel Teach to the Future program is rigorous evaluation. NCLB states a firm preference for professional development offerings that “as a whole, are regularly evaluated for their impact on increased teacher effectiveness and improved student academic achievement, with the findings of the evaluations used to improve the quality of professional development.”²¹ As noted above, Intel Teach to the Future has been evaluated by the Center for Children and Technology for the past three years.

CCT's evaluation of Intel Teach to the Future began with a formative study of the program's implementation model, and provided feedback that contributed to improved support and delivery of the program. CCT has also conducted two years of outcome evaluation, using surveys, site visits, classroom observations, and phone interviews with program participants and administrators to determine whether and how this program is reaching its core goal of improving the integration of technology into K-12 classrooms.²² The multiyear evaluation of Intel Teach to the Future demonstrates the effectiveness of

¹⁷ Cohen and Hill, 2001; Loucks-Horsley, 1998; Mann, Shakeshaft, Becker, & Kottkamp, 1999; National Research Council, 2001; President's Commission of Advisors on Science and Technology, 1997

¹⁸ ESEA, Section 2113 (c)(2); “Improving Teacher Quality: Non-Regulatory Guidance, Revised Draft,” Section D-1. Department of Education, September 12, 2003.

ESEA, Section 2415, Section (3); “Guidance on the Enhancing Education Through Technology (Ed Tech) Program,” Section H-1. Department of Education, March 11, 2002.

¹⁹ Hodges, 1996; NFIE, 1996; Putnam & Borko, 2000; U.S. Department of Education, 2000.

²⁰ U.S. Department of Education, 2000a

²¹ ESEA, Section 9101 (34)(xii).

²² For more information about evaluation questions, goals, and methods, visit Intel Teach to the Future's website with the CCT's findings. http://www97.intel.com/education/teach/us_results.htm.

the program and its close alignment with the NCLB criteria for quality professional development.

Key conclusions from the evaluation of Intel Teach to the Future

Intel Teach to the Future focuses on technology integration

In order to ensure that technology will be “effectively used in the classroom to improve teaching and learning in the curricula and core academic subjects...,”²³ NCLB mandates professional development in technology. The CCT evaluation found that Intel Teach to the Future was effective in preparing teachers to integrate technology into the classroom to support student learning in core content areas.

The evaluation demonstrates that teachers’ use of technology when they return to their classrooms after this training is consistent with the core objectives of the training: it is content-driven, centered on student activity, and involves students in using technology for gathering, synthesizing, analyzing and communicating about information and ideas.

The evaluation also found that both the scope and quality of teachers’ integration of technology increases after they complete this training. Further, teachers recognize that they have become better prepared for technology integration. For example, teachers who complete this program consistently report that they feel significantly more prepared after the training to integrate technology into the grade level or subject area they teach than they reported themselves to be prior to the training. Teachers also follow up on what they learn from the program the large majority of program participants do use the unit plans they developed during training, often repeatedly over multiple school years.

Intel Teach to the Future helps teachers link technology integration to effective instruction

NCLB also states a strong preference for training that will advance teacher understanding of instructional strategies that “will improve student achievement or substantially increase the knowledge and teaching skills of teachers.”²⁴ The evaluation found that Intel Teach to the Future’s focus on learning effective instructional strategies as well as on technology led to improved conditions for learning in the classroom. Teachers find the instructional strategies discussed in the training to be relevant to their teaching and helpful toward integrating technology into their classrooms. They also feel their Intel Teach to the Future unit plans are effective learning experiences for their students. They report that these units support increased understanding of content; motivate their students; and encourage collaboration among students.

Many teachers who make use of their unit plans also experiment with new kinds of activities, work products and assessments, moving toward a more project-based approach to instruction. There is some evidence that the impact of the program on the quality of instruction is sustained over time: survey data shows that many teachers have continued

²³ ESEA, Section 2413, Section (b)(1); “Guidance on the Enhancing Education Through Technology (Ed Tech) Program,” Section H-1. Department of Education, March 11, 2002.

²⁴ ESEA, Section 9101, (34)(A)(vii)II).

to use their unit plans for over three years, and some data suggests that their use of project-based instructional strategies has increased over time.

Teachers take what they learn from Intel Teach to the Future back to their classrooms and act on it

Teachers were enthusiastically positive about this training. Their enthusiasm was largely tied to their perception of the training as being *relevant* to their needs. Teachers felt that the training addressed many of the challenges that they felt made it difficult to begin using technology with their students, such as finding appropriate online resources to connect with their curriculum; managing many students with few computers in the room; and supporting students as they worked on diverse project topics.

Intel Teach to the Future prepares teachers to align their teaching to state learning standards

The central requirement of NCLB is its mandate to align standards, instruction and assessment in order to improve student achievement. The evaluation found that teachers in this standards based program report feeling more prepared to align their teaching and assessment with state learning standards after completing the training than they reported feeling prior to the training.

Teachers recognize Intel Teach to the Future as an intensive, productive learning experience

NCLB also requires professional development to be sustained, intensive and classroom-focused, in order to have a lasting impact on classroom instruction and teacher performance.²⁵ The evaluation found that the Intel Teach to the Future is intensive and sustained and that teachers recognized these qualities as being important to the program's impact on them. The forty hours of face time involved in this training allowed groups of teachers to engage deeply with the curricular, instructional, and technical issues they were exploring through the process of creating their unit plans. During the training, teachers had a reason and an opportunity to think deeply about how to bring technology into their teaching and improve student learning. Over the course of the training, teachers were typically able to solidify their technical skills and move on to thinking about how to support their students' learning.

Intel Teach to the Future can catalyze broader, systemic changes in technology planning and professional development within school districts

Finally, NCLB states a preference for professional development programs that connect with systemic reform and district-wide improvement plans.²⁶ The CCT evaluation found that Intel Teach to the Future often becomes a catalyst for broad changes to both technology planning processes and technology-related professional development within school districts. For example, districts with significant levels of teacher participation in Intel Teach to the Future frequently reported an increased willingness to devote funds earmarked for technology to professional development programs rather than to hardware purchasing. Access and distribution policies often began to change as well, in order to

²⁵ ESEA, Section 9101(37).

²⁶ ESEA, Section 2113.

provide teachers with more and more flexible access to technology both during and after school hours. Other professional development programs within districts were often restructured to align with Intel Teach to the Future's focus on curriculum integration, rather than technical skill-building. These kinds of changes were motivated in part by district-level administrators, but were also often made in response to teachers' increased interest in receiving high-quality professional development related to technology, and in improving their own access to the technology itself.

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