Sixth grade language arts teacher Ms. Jones* has just finished teaching a unit she’s taught for the past 10 years. She uses the works of O. Henry to teach literary elements. Not much has changed about this unit over the years; the learning objectives and concepts covered have stayed the same. But something is different this year. Students are building and presenting their knowledge using technology. For the first time, her students are using technology to research and present what they have learned about literary elements. Jones modified this unit the previous school year, while participating in the Intel Teach to the Future program, a large-scale professional development program for K–12 teachers. For the past three years, Education Development Center's Center for Children and Technology (CCT) has been conducting an evaluation of the program.

* Not her real name. Teachers participating in this research project are guaranteed confidentiality.
What is striking about Jones’ account of her experience with the Intel Teach to the Future program was that the training had provided her, a teacher who was unsure of how to bring her existing technology skills into the classroom, an opportunity to explore different curricular uses of technology. I use *explore* here to mean engaging in an activity simply for the pleasure of achieving mastery, free of any immediate expectation to perform or produce anything for an audience. Although participants move through a structured and complex professional development curriculum, that curriculum allows them to experiment with meaningful technology integration and to investigate both new and familiar software tools in the context of a project-based pedagogy. What Jones and many teachers like her may need most to become comfortable with and expand and improve their use of technology is this opportunity to explore, check out new tools, ask questions of colleagues, and experiment with new ideas and new resources.

**The Value of Exploration**

Teachers, like students, come into any new situation with a range of skills, abilities, and experiences, and are in a continual process of learning. One of the major challenges in developing effective professional development offerings is meeting all participating teachers at their particular levels of skill, motivation, and prior knowledge, while also making the content engaging and relevant to what goes on in each teacher’s classroom. A growing number of teachers, like Jones, have some technology skills and are likely to use computers in their personal lives, but have not yet brought technology into the everyday work of their teaching. In our evaluation, the research team found that the approach used in this program, which emphasizes exploration, helps teachers to make the transition from knowing about computers to actually using them in their classrooms. Teachers talked about being allowed to sit down and experiment with technology in a way they had not previously been invited to do—having the opportunity to create unit plans that accommodate the realities of their classrooms—and the experience of gradually increasing their level of comfort...
Learning & Leading with Technology

Supporting Teachers’ Learning

Creating an environment in which teachers feel supported and comfortable trying new things can be difficult. With extensive guidance from a master teacher, a group of peers and a detailed professional development curriculum, teachers can pursue largely self-directed goals, working on a lesson plan of their own choosing while knowing support is available to them. Teachers can focus on their own interests and professional pursuits, learning actively, discussing their ideas with colleagues, and reflecting on the types of activities they may want to add to their teaching repertoire.

The following features of the program are particularly important to the program’s ability to create a productive learning environment for teachers. You may notice that these qualities are also ones frequently mentioned in the research on effective professional development.

Treat Teachers as Active Learners.

A range of research has demonstrated that, just like their students, teachers learn best when they are given opportunities to engage in active learning experiences. In this case, teachers were invited to create, review, and revise a unit plan that incorporates technology in multiple ways. The process of adding this new element (technology integration) into a familiar activity (writing curriculum) created a context for learning in which teachers could gradually test the opportunities technology might offer their students, while also creat-
ing something of immediate relevance and value to them (a revised and improved unit plan). One teacher revamped a lesson she designed on lifestyles where students choose a career, learn the income they will earn, and then spend that money to buy and furnish a house and to construct a lifestyle. Technology components she added to the lesson include students conducting Internet research on career options and related incomes; creating a PowerPoint presentation to depict their profile, finances, and a floor plan and picture of their house; using Publisher to make a mock housewares catalog; and developing a classwide Web page illustrating a virtual neighborhood out of all the students’ homes.

Provide Opportunities to Collaborate with Peers. The Intel Teach to the Future curriculum emphasizes group work. Teachers participated in group discussions, reviewed and commented on each other’s works in progress, and often developed their unit plans in small groups. These kinds of activities help establish a supportive environment in which teachers can learn from each other as well as from the trainer or the printed curriculum. We found that teachers often sought to carry out sustained collaborations with others who taught similar grade levels or complementary content areas, but they also were likely to share ideas and information throughout the whole training group. Through these kinds of communication, teachers began to establish real learning communities and increased the likelihood that they would continue to share knowledge and support one another in the future.

Train over an Extended Period of Time. Our evaluation found that the length of this training was an important strength of the program, providing the time teachers need for inquiry, reflection, and collaboration. Although many teachers were intimidated by the idea of 40+ hours of training, by asking teachers to carve out 60 hours for this learning experience, the program ensures that teachers will have the chance to do more than listen to a lecture or briefly try out skills presented to them by a trainer. One teacher commented that she appreciated the speed of the training: “I usually learn quickly, but I needed that slow pace to work through these new programs.” Over the course of the training, teachers have time to establish a supportive environment where they can ask questions, build on one another’s knowledge, and learn at their own pace. For many teachers, this was the first time they had been able to spend a significant amount of time exploring different uses of technology and, more important, developing a unit plan drawing on those tools that they could implement in their classroom.

Conclusion
The structure and core features of any professional development program are major determinants of its effectiveness. Our evaluation suggests that for many teachers, the intensity of the time commitment and the amount of work required to complete the training actually helped them engage deeply enough with the core ideas of the training to have an effect on their instructional use of technology. The Intel Teach to the Future program has given these teachers permission to spend time exploring, pursuing new ideas, and testing new skills as well as the opportunity to come up with their own ideas about how to use technology with their students. As one teacher reflected after having participated in the program, “It's an ongoing learning process. I look forward to learning more things, doing more advanced projects, [and] allowing the students more flexibility in what they do.”

Sustaining the Learning
The following are some general recommendations to help sustain the effects of staff development efforts:

- Assess and build on teachers’ skill level and knowledge to make the training coherent.
- Provide ongoing, extended training that goes beyond a “one-shot” seminar to allow teachers the time to explore new skills and uses as well as build relationships that will help support technology use in the future.
- Give teachers the time or incentive to participate in prolonged staff development.
- Assess teachers’ curricular goals and objectives to make the training content specific/relevant to their classroom.
- Make the training adaptable to accommodate teachers of diverse disciplines, grade levels, and teaching conditions.
- Have teachers make a product they can use in their classroom.
- Create activities for peer collaboration and model ways teachers can collaborate in the future.
- Provide follow-up to the training to sustain interest and continual learning.

Resources
Intel Teach to the Future: http://www.intel.com/education/
EDC’s Center for Children and Technology: http://www.edc.org/cct/

Hannah Nudell has been working in education research for the past four years. She is currently a researcher at Education Development Center’s Center for Children and Technology.