Educating teachers is not only one of the most important jobs in the world, it is also one of the most difficult. It means battling tremendous irony. Because teachers, who spend so much time and energy attending to the education of their students, have little of either left to devote to their own. The task is further confounded by the fact that teachers must be prepared to work in classrooms and with students whose characteristics change so rapidly that constant professional development is required for survival, much less success.

Technology, in various forms, is behind the changes that make teacher education such demanding and important work. Its presence in our daily lives, its place in our economy, and its importance as an information source has increased the number of decisions we make and the speed with which we must make them. Technology has magnified existing social problems and created new ones. The technology used for educational purposes, or educational technology, promises to help address the challenge of preparing high-quality educators for their important work in schools. If we use effective guidelines to determine if, when, and how technology will be used, we may manage to harness its power to accomplish the goals of education. I recommend the “yardstick” the Amish use to evaluate every new technology they consider introducing to their community: Does it bring us together as a community or does it drive us apart? Here I want to share with you a particular application of educational technology, a tool that I think will bring educators and teacher educators together as a community while also making it possible for teachers to keep pace with a constantly changing profession. That tool is the digital teaching portfolio.
Challenges Facing Teacher Educators

As a technology educator working to prepare teachers at various career stages to make better use of technology, there are three challenges I face most frequently. I am challenged to help teachers develop both the knowledge and the skill required to effectively use the computer-based technologies available to them. The term “skill” implies that teachers know and can use various technology applications (i.e., software, languages, etc.) proficiently. The term “knowledge” implies that teachers understand the potential that various applications have for helping them in their work. Consider a carpenter. This expert needs to know what each of his different tools is capable of doing. He needs to know how to use these tools. But knowledge and skills are really only useful if the carpenter can integrate them, which leads to the next point.

Second, I am challenged to help teachers learn how to integrate knowledge and skills to make learning more efficient, effective, and engaging. I use these three adjectives with my students to perform what we call the “Triple-E test.” We run any use of educational technology through three questions: “Does it make learning more efficient? More effective? More engaging?” We believe that at least one of these criteria should be met to justify the energy and expense of educational technology.

Third, I am challenged to help teachers understand how to use technology to make learning accessible, relevant, and meaningful to all learners. We need to examine how we combine new technologies with tried and true instructional models designed to address the individual learning needs of all students. Research has shown that approaches like concept attainment, concept development, direct instruction, differentiated instruction, and universal design for learning are methods that work. We should not use new technologies just for the sake of doing something different but to enhance our use of methods that we already know to be effective.

I am also aware of other challenges related to professionalism and accountability. I know that we must promote collegiality and collaboration among teachers. We must also enhance teacher professionalism by promoting teachers’ recognition of national, state, and local professional teaching standards. In addition, teachers must be empowered to reflect critically on their own strengths and weaknesses for the purpose of charting directions for their professional growth. Developing methods for appropriately and accurately assessing teacher quality will be essential to achieving these goals.
What are Portfolios, Teaching Portfolios, and Digital Teaching Portfolios?

My purpose is to explain how these challenges can be addressed by linking a teacher’s professional development experiences to the activity of producing a digital teaching portfolio. A portfolio is a goal driven, organized collection of materials that demonstrates growth over time. Portfolios are used by all kinds of professionals—architects, engineers, etc. They are also used to demonstrate student growth in grades K–12. Right now, student portfolios are the predominant educational use of portfolios.

A teaching portfolio has three distinct characteristics. First, it reflects the work of a teacher and contains artifacts from his or her classroom. Artifacts are real materials that have significance and meaning to teachers and their professional work. Some artifacts include lesson plans, curriculum materials, newsletters, and student work. Second, a teaching portfolio demonstrates the professional competencies of a teacher. A teaching portfolio teaches others about the teacher who designed it; however, its name is derived from the type of work it displays rather than its function. Third, a teaching portfolio includes reflections written by the teacher about the work contained in the portfolio. Reflection is a critical component of a teaching portfolio. Without the teacher’s reflections, a portfolio is nothing more than a scrapbook. The reflections glue materials in the portfolio together and explain their significance.

A digital teaching portfolio then is a teaching portfolio that is produced and displayed in digital format. The use of digital teaching portfolios is a growing movement across the country. Teachers studying in preservice education programs and working in school districts are creating their own portfolios to showcase their talents. They are using HyperStudio®, Kid Pix®, PowerPoint®, and HTML. Some are using “turnkey solutions” like Chalk and Wire’s R.O.A.D. Learning™ ePortfolio™ and TaskStream’s Web Folio Builder®. As teachers create their own portfolios, they are learning about the technology. The portfolio experience not only helps teachers reflect on their teaching and identify their areas of strength and weakness; it also serves as a self-development experience allowing them to rediscover how it feels to be a learner again and reflect on how this discovery impacts their teaching.
The Digital Teaching Portfolio Process

I would like to describe the process we use to create digital teaching portfolios at the University of Massachusetts. Although there are different ways to organize portfolio contents, my students organize their portfolios around the INTASC (Interstate New Teacher Assessment and Support Consortium) standards for new teachers. Students collect artifacts from their teaching practice and then reflect on how each artifact meets specific professional standards. One artifact is selected to correspond to each standard. Of course, teachers learn to use some technological tools to put their portfolios together. First students create a visual map demonstrating the organization of the materials in their portfolio. My students use Kidspiration™, a popular concept-mapping tool that is useful for elementary school and high school teachers. After they have created a graphic of the visual flow of materials in their portfolios, they learn a simple programming language, HTML (Hyper-Text Mark-Up Language), to create a portfolio that can be placed on the Web. When they have completed developing their digital teaching portfolios, teachers have a product that can be used for getting a job or in the licensure process. Better still, the teachers have acquired some useful skills through the process of creating their portfolios. Each one knows how to use educational software applications that can be useful in teaching and can now create a document that can be placed on the World Wide Web.

While taking part in the development of a digital teaching portfolio, teachers have also engaged in other activities that result in beneficial outcomes. For one, they have had the opportunity to invest in their own learning and experience what it is like to be immersed in a world of new vocabulary, new conventions, and new rules. The reflections that I have collected from my students indicate that after creating a portfolio they are not only more aware of the learning process, but also more understanding about the challenges and frustrations of being a learner.

A Process for Implementing Digital Teaching Portfolios

At the University of Massachusetts, we recognize the rewards that teachers experience from both having and creating digital teaching portfolios. Due to this, we are developing a method for implementing them across various teacher education programs. Here I explain the process we envision and how we expect it to work.
Each teacher education program that intends to implement portfolios will meet and identify the goals and purposes for the portfolios that will be created. With these goals in mind, the faculty will agree upon a framework for the portfolios and determine whether they will be based upon a set of professional standards and if so, which ones. Once this foundation is established, the faculty will select an appropriate design tool. They will develop a list of technical skills and professional knowledge that teachers should develop through the creation of their portfolio, and then design projects that will help teachers develop the knowledge and skills on the list.

Students will begin the portfolio process by developing basic technological skills and competence. Ideally, they come to us already knowing how to interact with MAC and PC operating systems, how to use electronic communications such as e-mail and file attachments, chat rooms, and online discussion groups, and how to perform basic file management operations using portable diskettes, CD-ROMs, and a server. If they do not already have these skills, their first step in our program is to acquire them. We expect they will do this by taking advantage of learning experiences offered through University workshops, their school districts, or commercial providers.

Next, teachers will learn to use productivity software such as word-processing tools, spreadsheets, databases, and presentation programs like PowerPoint®. We expect these skills will be developed by students working independently to accomplish project-based tasks relating to their coursework. After this second level of proficiency is developed, teachers will learn content-specific software, such as graphing calculator tools and assistive writing software, and software designed especially for education, such as Kidspiration™ and TimeLiner™. Teachers in each program will be responsible for learning the software that is most useful to them.

In order to integrate all this technology into their teaching education, teachers attend classes where they experience the integration of technology as it is modeled by program faculty, and they become acquainted with the theory and research supporting technology integration. Teachers develop, implement, assess, and revise lesson plans that integrate technology. They also consider how the integration of technology corresponds to their own beliefs about teaching and learning.

Throughout their experience in teacher education programs, teachers and teacher candidates attend the regular program workshops and courses and perform the various class assignments. Ideally, in each course they produce
or collect a digital artifact and a low-tech artifact that can be converted into
digital format. As they collect these artifacts, they also reflect on their learning
experiences and record these reflections.

As a capstone experience, teachers assemble their portfolios in the final
semester of their program. They might attend either formal courses and/or
informal workshops where they develop knowledge of portfolio design
tools (i.e., HTML or “turnkey solutions”) and work as a group to develop
their portfolios. Teachers practice using these skills to create and assemble
their portfolio contents into a finished product that can be burned on a CD
or posted on the Web. Using the completed digital teaching portfolio, they
evaluate their own work and develop a professional growth plan.

Finally, teachers will work together with the faculty in their teacher education
program to set up systems for continuing portfolio maintenance and
professional relationships. With the help of our development director, we
hope to provide our graduates with Web space that they can keep for free
as long as they keep their addresses updated. That way, we have a means for
connecting with our alumni to monitor their progress. We expect this method
for continuous communication to be not only useful for maintaining good
relationships with our alumni, but also important in helping us meet some
of the NCATE (National Council for Accreditation of Teacher Education)
performance-based accountability standards. We are required to keep track of
how our graduates do in the field, which is difficult because they usually leave
our geographic area to take teaching positions elsewhere. We hope that using
technology will make it possible to keep in touch and track their careers.

Evaluating Digital Teaching Portfolios

Digital teaching portfolios are not only beneficial for teachers and teacher
educators. They can also yield information that is useful for evaluation
purposes. So what can you learn from a portfolio? To begin with, the quality
of the portfolio itself can be evaluated. Some basic information that might
be obtained includes, but is not limited to:

- how well the portfolio materials are organized;
- how well the materials in the portfolio are linked together;
- how effectively the navigation of the portfolio works for the evaluator; and
- how effectively various software applications are integrated in the
  portfolio’s design.
Such information can give evaluators an idea of how well a teacher can design instructional materials, how well they understand elements of visual design, and how much they know about technology. Portfolios that demonstrate a teacher’s actual work are the best way to measure skills and knowledge associated with teaching in technology-rich environments.

A portfolio can also be evaluated to measure growth over time. Surely an important measure of a professional’s quality is how much they continue to grow throughout their career. If we want our professional teachers to continue to keep up with the changes in society and technology, we need to encourage a culture of life-long learning, not just among our students, not just among our community members, but also among the professionals in our schools. And we need to give our teachers a chance to showcase that learning. What better way to do this than by having teacher Web pages where families could actually observe the professional development of their teachers over time?

Teacher Web pages would allow families and other professionals to evaluate teachers in many ways. Just as a doctor determines the state of your health based on more than just your temperature, we also need many indicators for measuring a teacher’s competence, skills, and knowledge. We could look up a teacher’s professional competencies, including professional credentials and teaching evaluations, and we could examine the quality of the artifacts associated with teaching, such as lesson plans, if they were included in his or her portfolio. By examining a portfolio, we could see how well teachers reflect on their own work and their own professionalism, and how well they can evaluate their own work. We could check out their level of technical skill and knowledge, and how well that skill and knowledge is integrated into the classroom.

Digital teaching portfolios could also provide a means for measuring a teacher’s professional competence. Although examining the evidence of teaching contained in a portfolio is not the same as actually witnessing it first hand, this method of evaluating teachers might be at least one step more accurate than measuring their ability to teach through written exams. If framed around a set of standards, tangible evidence of a teacher’s skill could be presented in a compelling manner with proof from their actual practice.

In our rapidly changing technological society, digital teaching portfolios offer multiple ways to educate and evaluate the quality of teachers. Creating digital teaching portfolios serves as a valuable educational experience for teachers.
at all career stages and promises to promote their continued learning about themselves, their professions, and new technology. Creating digital portfolios helps teachers develop important technical skills that they can apply in their classrooms and transmit to their students. Engagement in this process reminds teachers about the challenges of being a learner, making them more sympathetic to their students. Digital teaching portfolios also serve as an important tool for evaluating teachers by presenting a broad range of performance-based professional indicators, including standardized measures of achievement. When a portfolio is based on well-articulated, professional standards, it also provides a means for communicating teacher competence.