A Framework for Teaching and Technology

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What technology skills do all teachers need? Administrators have been asking this basic question many years and it still does not seem to have a definitive answer.

The International Society for Technology in Education's (ISTE) *NETS for Teachers* (2000, 2008) is the mostly widely known and respected attempt at answering the question. ISTE breaks teacher technology use into five broad categories:

1. Facilitate and Inspire Student Learning and Creativity
2. Design and Develop Digital Age Learning Experiences and Assessments
3. Model Digital Age Work and Learning
4. Promote and Model Digital Citizenship and Responsibility
5. Engage in Professional Growth and Leadership

In this article, however, we would like to suggest that instead of starting with technology skills and see how they might be applied to education, we start with good teaching practices and see how these practices might be enhanced with technology. A subtle but important difference if administrators and teachers are to take the use of technology seriously.

Both of our districts use Danielson's book *Enhancing Professional Practice: A Framework for Teaching , 2nd edition* as a guide for effective teaching practices and teacher evaluations. Danielson lists "appropriate use of technology" as one of her seven common themes, yet descriptions of what constitutes appropriate technology use do not appear in the teacher assessment rubrics. Danielson rightly asserts that technology is not *what* teachers do but *how* they do it.

But a case can be made for an inclusion of the assessment of skillful technology use to improve teacher effectiveness, whether using the *Frameworks* model or other models that focus on best teaching practices.

Effective technology use is still relatively new and not as well understood as traditional teaching practices by both teachers and those who evaluate them. There is no long history of effective technology practices that are a part of the culture of education. If a principal had last taught 10 years ago, a PowerPoint presentation was cutting edge technology use. But 2002 is a lifetime ago in terms of technology. A simple guide is useful to both to those assessing teacher performances

as well as to those being assessed. Communities through their very investments in educational technology demand that all teachers use and all students receive the benefits from those investments. As educators and public servants we are not honoring the financial commitment made by our taxpayers if we do not require the use of the resources they provide. And finally, this is one way to ensure that the skills and benefits students receive are not wholly dependent on the individual commitment to technology use by the teacher.

Below we have described some specific ways teachers can use common technologies to do their jobs more effectively as organized by the Danielson framework. By using the model of a recognized authority in good teaching practices that the district has already adopted, good technology practices can be described and blended into teacher evaluations.

Concrete examples of the most important things to look for under each domain have been added at the request of our principals.

Teacher Technology Use Organized by Danielson's Frameworks for Teaching Domains

Domain 1: Planning and Preparation

Technology-related competencies in this domain:

	Basic	**Proficient**	**Distinguished**
1. Teacher uses online resources, including professional social networking sites, to stay current on the latest research and best practices in his/her field.	The teacher reviews information online, discusses it with colleagues, but practice is minimally impacted.	The teacher interacts in online networks with professionals. Teaching reflects what has been learned from those interactions.	The teacher creates and shares innovative content and teaching practices with other professionals online.
2. Teacher is aware of the characteristics of "net generation" learners and their relationship with technology and uses this information to design engaging activities.	The teacher uses technology to present information in a one-to-many learning environment.	The teacher uses technologies to offer students a variety of resources to learn and solve problems.	The teacher asks students to use technology resources of their choosing to learn and solve problems everyday in class.
3. The teacher determines the technology skill level of students, knows the expected competencies	The teacher knows individual skill levels, but moves on according to their pre-determined lesson plans.	The teacher has appropriate expectations of students based on technology skill level. Creates separate	The teacher uses formative assessments to gauge student skill development and provides flexible pathways,

for productivity and research, and finds means of remediation of individual students when needed.		pre-determined pathways for low and high skilled students.	including student choice, for all learners.
4. Teacher uses adaptive and adoptive technologies with special needs students.	The teacher uses technologies based on IEP requirements.	The teacher uses technologies to meet the special needs of students with and without IEP requirements.	The teacher empowers special needs students to be independent.
5. Teacher establishes appropriate goals for technology applications for students.	The teacher establishes technology goals that are not related to curricular content.	The teacher establishes clear quality criteria that apply the technology into a context. Students know what is expected of the products they create with technology.	The teacher asks students to create quality criteria related to technology use.
6. Teacher knows, accesses and uses digital resources provided by the state and district, including productivity tools, online teaching/reference materials, and textbook supplemental materials.	The teacher uses school-provided technology for learning during technology units during the school year.	The teacher uses school-provided technology for learning in all units during the school year, and complements school-provided resources with carefully chosen external resources.	The teacher provides leadership in the use of school-provided technologies.
7. Teacher designs learning activities that use the technology resources available.	The teacher creates learning activities with technology that focus on lower-order thinking skills.	The teacher creates learning activities with technology that allow students to learn independently, to be creative, and to think critically.	The teacher creates learning activities with technology that allow students to learn independently, to be creative, and to think critically about issues relevant to their own lives.
8. Teacher uses online resources to provide instructional materials at differing levels and subjects to meet individual student abilities, needs and	The teacher uses some online resources that meet the needs of special needs students.	The teacher uses a variety of online resources to meet the needs of a range of student ability groups.	The teacher asks students to find and assess online resources that can meet their personal abilities and needs.

interests.			
9. Assessment criteria of student work include qualitative indicators of effective technology production.	The teacher in summative assessment addresses technology use.	The teacher clearly lists qualitative indicators of technology use and these indicators are shared with the student when the assignment is given.	The teacher and students collaboratively create qualitative indicators of technology use.

Domain 2: The Classroom Environment

Technology-related competencies in this domain:

	Basic	**Proficient**	**Distinguished**
1. **Teacher interactions online follow the same guidelines as face-to-face interactions.**	The teacher follows rules of professional conduct when online.	The teacher acts professionally and positively with all stakeholders online and articulates online behavior expectations of students.	The teacher models positive interactions face-to-face and online. Students can formulate and articulate their own set of online communications rules.
2. Teacher demonstrates an enthusiasm for educational technology and its uses.	The teacher participates in the required educational application of digital tools.	The teacher speaks positively to students and fellow staff about educational technology use with students.	The teacher, in addition to demonstrating district-offered and district-trained digital technologies, finds resources to use on their own and seeks ideas from students.
3. Teacher uses technology to provide a wider audience for student work. Appropriate safety and privacy efforts are made.	The teacher periodically publishes student work according to district guidelines.	The teacher regularly publishes student work according to district guidelines and actively elicits feedback from reader/viewers outside the school.	The teacher helps students build portfolios of published work and helps students understand digital reputation management.
4. Teacher helps students use technology in the revision process of their creative efforts.	The teacher allows students to revise digital versions of their work, adding suggestions for improvement in comments.	The teacher asks students to revise digital versions of their work based on the teacher's online review and comments.	The teacher requires students to revise digital versions of their work based on the teacher's online review and comments.
5. Teacher uses technology to facilitate peer editing of student work.	The teacher allows students to revise digital versions of their work based on online peer review and comments.	The teacher asks students to revise digital versions of their work based on online peer review and comments and provides clear guidelines for online peer-editing.	The teachers encourages students to find ways to help improve each other's work.
6. Teacher has rules and expectations for	The teacher's expectations of technology use in the	The teacher has clear guidelines for appropriate	The teacher gives students input into classroom

productive technology use in the classroom, including the use of personally owned technology devices.	classroom is stated.	use of technology in the classroom. Lessons leverage the technology available, reducing inappropriate use.	technology rules.
7. Teacher uses the student information system efficiently, resulting in minimum use of class time in management tasks.	The teacher accurately and regularly inputs data into the students information system.	The teacher accurately, regularly and efficiently inputs data into the students information system and has established reasonable student expectations of when data will be available.	The teacher demonstrates leadership by sharing effective practices with fellow staff members to help them improve their student information system efficiency as well.
8. Teacher monitors student technology use and responds to misbehavior if it occurs.	The teacher monitors and responds to student technology use as needed.	The teacher monitors and responds to student technology use as needed and addresses appropriate technology use on a regular basis.	The teacher creates a classroom environment in active, positive uses of technology result in a minimal need for monitoring.
9. The teacher arranges the technology in the classroom for ease of monitoring and flexible use.	The teacher can easily view the screens of classroom technologies that are permanently installed.	The teacher can move around the room easily, view the technology and interact with students face-to-face. Classroom rules allow the teacher to view personal technologies (laptops, tablets, cellphones).	The teacher arranges the classroom for flexible movement, group collaboration, and independent work with technology.

Domain 3: Instruction

Technology-related competencies in this domain:

	Basic	**Proficient**	**Distinguished**
1. Teacher gives students alternate means of discussion and asking question using technologies to bring out the ideas of all students.	The teacher allows students to e-mail or post comments and questions related to classroom content from outside of class.	The teacher occasionally uses student response systems, online polls, back-channel tools, and other technology tools during class to stimulate discussion and feedback.	The teacher regularly uses technology tools during class to stimulate discussion and feedback and encourages students to use these tools in presentations to the class.

2. Teacher allows students to initiate discussions in online forums such as classroom blogs, discussion lists and social networking tools.	The teacher allows students to use a teacher-created online forums (website, blog, wiki, Facebook group) as an option for reflection and discussion.	The teacher encourages students to use a teacher-created online forums for reflection and discussion.	The teacher requires students to use a teacher-created online forums for reflection and discussion. Students initiate thoughtful discussions with their peers.
3. Teacher expects and reinforces appropriate student interaction when using online tools.	The teacher establishes basic guidelines for online interactions based in the school's Acceptable Use Policy and shares these with students.	The teacher establishes basic guidelines for online interactions, shares these with students, regularly discusses the guidelines, and responds when the guidelines are not followed.	The teacher works to create online environments in which are self-regulating and develop personal standards of appropriate use.
4. Teacher uses technology to create and project visual and auditory data that help explain content and concepts.	The teacher uses a LCD/LED projector to show slideshows with images.	The teacher uses a LCD/LED projector to show slideshows with self-created or modified images and sound that enhance connections in the content and concepts.	The teacher demonstrates sound theories of visual and auditory design in lessons that use these media.
5. Teacher uses technologies such as interactive white boards, student response systems and computer games to engage students.	The teacher uses technologies to passively disseminate information, to ask low-level questions, to only practice low level skills or for rewards.	Teacher uses the interactive white board in ways that engage students, including student use of the board, gaming applications, actions based on student responses, and polling.	The teacher uses a range of technologies to engage students by asking for student responses and differentiated self-directed activities.
6. Teacher encourages students to use online resources to answer questions and explore concepts during class and teaches search and information evaluation strategies.	The teacher allows students to use online resources without guidance on effective searching and evaluation techniques.	The teacher encourages students to use online resources and helps build online research skills, resulting in quality information obtained.	The teacher requires students to use online resources and asks for self-reflection by students on the efficacy of their research..
7. Teacher uses technology in ways that make students	The teacher asks students to use technology complete some	The teacher asks students to use technology complete assignments that	The teacher asks students to use technology complete assignments,

productive and meet the instructional goals of the lesson.	assignments.	ask for problem-solving and creativity on a regular basis.	investigate new means of using technology to meet class requirements and to share those uses with the teacher and class.

Domain 4: Professional Responsibilities

Technology-related competencies in this domain:

	Basic	**Proficient**	**Distinguished**
1. Teacher uses online grading and reporting system to maintain information on student completion rates and shares this information through student and parent portals in real time.	The teacher uses the online grading and reporting system to meet minimum district requirements.	The teacher uses the online grading and reporting system in a timely manner that allows students and parents to effectively monitor their progress.	The teacher he teacher uses the online grading and reporting system to communicate student status, with scores having meaningful links to standards and other information.
2. Teacher uses online grading system portal to inform students and parents of upcoming assignments, projects and assessments.	The teacher uses the online grading and reporting system to meet minimum district requirements.	The teacher communicates upcoming assignments, projects, and assessments well-ahead completion deadlines.	The teacher communicates upcoming assignments, projects, and assessments at the beginning of the term for the entire term, adjusting as needed..
3. Teacher uses the district website to provide a wide range of current information to students and parents.	The teacher posts the minimum information required to meet district requirements.	The teacher posts information that might have been sent to student homes on paper, including newsletters, permission slips, supply lists, class expectations, etc.	The teacher posts information about online resources that support classroom goals that parents can work with their children on at home.
4. Teacher uses online communication tools such as e-mail, blogging and social networking to keep students and parents informed on a regular basis.	The teacher answers emails from stakeholders in a timely fashion.	The teacher engages with stakeholders in a timely, positive and productive fashion in various media.	The teacher explores and used new forms of communication with students and parents.
5. Teacher uses	The teacher uses email to	The teacher uses online	The teacher uses online

collaborative online tools to communicate and work with colleagues.	collaborate and communicate with their peers.	tools such as GoogleDocs to share, create and edit materials with peers.	tools to share, create and edit materials with peers so successfully that paper printouts are rarely used.
6. Teacher volunteers to share effective uses of technology at staff meetings and inservices; through professional writings and presentations; and through demonstrations to parent-teacher and community organizations.	The teacher shares information/personal best practices when required.	The teacher willingly shares their knowledge with colleagues in their grade level or department.	The teacher proactively communications effective technology uses to their building, district, and other professionals beyond of the district.
7. Teacher participates in both organized and personal learning opportunities online.	The teacher participates in learning opportunities assigned to them.	The teacher is a self-directed learner that participates in learning opportunities that align with personal, building and district initiatives.	The teacher uses technology to build a network of colleagues for acquisition and sharing of current information about best teaching practices..
8. Teacher honors and learns from students who have technology competencies and knowledge.	The teacher uses students to help trouble-shoot and solve classroom technology problems	The teacher accepts information about and skills in the use of technology from students.	The teacher actively seeks information about and skills in the use of technology from students and incorporates student ideas in their professional practice.
9. Teacher keeps an open but critical mind about technology uses.	The teacher use technologies after other teachers in their building have demonstrated their successful use.	The teacher is willing to explore new technologies when requested and share the successes and failures with other teachers.	The teacher is a leader in the building in selectively adopting new technologies that have the potential for improving learning.

In the rubrics above, some of the "Distinguished" criteria are difficult to meet. If a district doesn't allow relatively open access to information and tools to staff and students, the criteria may be impossible to meet. This framework hopes to move both districts and individuals down progressive instructional paths.

At the beginning of this article we asked "What technology skills do all teachers need?" and suggested that the question does not have a definitive answer. Perhaps it never will. Both

technology and best practices in teaching will continue evolve and neither set of competencies will remain constant.

But what should remain certain is that good teaching practices should drive technology use rather than technology driving the practice of teaching.

Danielson, Charlotte. *Enhancing Professional Practice: A Framework for Teaching, 2nd Edition.* Alexandria, VA: ASCD, 2007.

International Society for Technology in Education, *NETS for Teachers*, 2008. <http://www.iste.org/standards/nets-for-teachers>