By Mary Burns

THE FUTURE OF PROFESSIONAL LEARNING

What will technology-based teacher professional development look like in the next few years? Teacher training curriculum designer Mary Burns presents her top picks from the professional learning technologies now emerging around the world.

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5 EMERGING PD TECHNOLOGIES

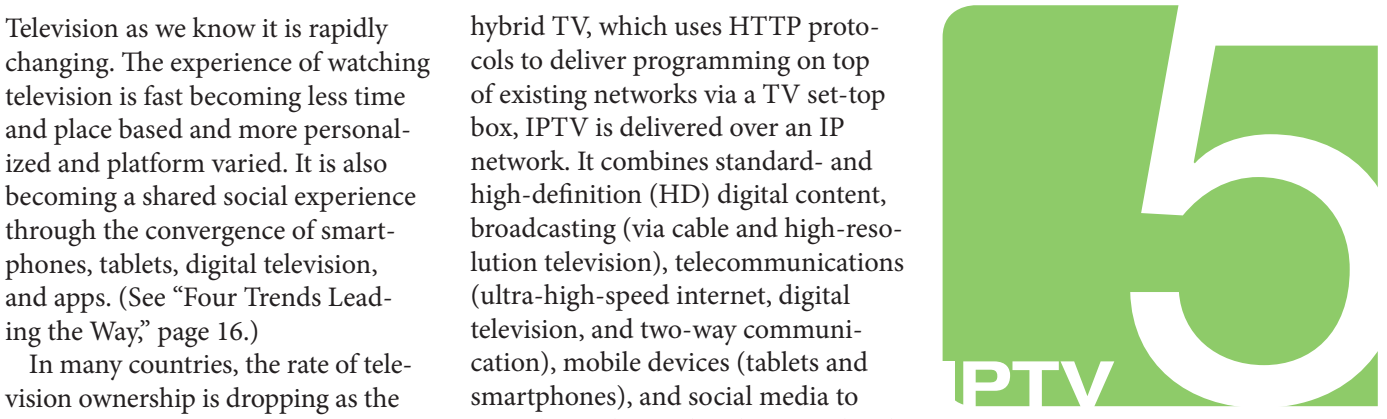
Like every other industry, professional development (PD) is going through a lot of changes as technology continues to advance. Based on two years of research on teacher PD, Education Development Center (EDC, www.edc.org) has identified technologies that are poised for more widespread adoption for teacher learning around the world. Here are the top five, presented in reverse order of likelihood of widespread adoption.

Television as we know it is rapidly changing. The experience of watching television is fast becoming less time and place based and more personalized and platform varied. It is also becoming a shared social experience through the convergence of smartphones, tablets, digital television, and apps. (See "Four Trends Leading the Way," page 16.)

In many countries, the rate of television ownership is dropping as the television experience shifts online via on-demand internet streaming. Though this change in how we watch television is occurring everywhere, it is most pronounced in East Asia, where extensive broadband access and low prices have spawned the development of internet protocol TV (IPTV).

In contrast to internet-enhanced and web TV, such as Apple TV, or hybrid TV, which uses HTTP protocols to deliver programming on top of existing networks via a TV set-top box, IPTV is delivered over an IP network. It combines standard- and high-definition (HD) digital content, broadcasting (via cable and high-resolution television), telecommunications (ultra-high-speed internet, digital television, and two-way communication), mobile devices (tablets and smartphones), and social media to provide on-demand and personalized PD programming to teachers at home or at school.

In South Korea, a global leader in the use of IPTV, teachers can order the delivery of PD programming in HD video, instructional television, or multimedia to their TVs, gaming consoles, tablets, or smartphones. They can even create personalized "playlists" of professional development to view at their convenience.



In addition to expanding the amount of PD content and allowing it to be stored and viewed in different ways, IPTV allows teachers to view programming and engage in discussions about it via teacher social networking sites.

Immersive environments allow users to have experiences while "immersed" in a self-contained artificial or simulated environment. Because the interface is so visual, the activities so complex, and the experience so engaging, users can hone their technical, creative, and problem-solving skills in a safe environment where they don't have to worry about inevitable mistakes.

Many professions use immersive environments that simulate real-life worlds—airplane pilots with flight simulation programs, for instance—and many teachers interact with immersive environments informally as gamers. We see the potential of immersive environments to help teachers build, enhance, and refine a particular skill or set of behaviors.

One example of this is the University of Central Florida's TeachLivE program (bit.ly/Oc1ct4), which helps preservice teachers develop classroom management skills by teaching a virtual classroom full of student avatars. The teacher stands in front of a screen and engages the avatars, which are voiced by real actors who respond as students would over an audio-video connection. This approach—a digital version of face-to-face simulations that some school districts use to prepare new teachers in classroom management—allows novice teachers to make mistakes in a fail-safe environment, receive feedback from their education instructors, and prepare virtually for live interactions with real students.

Though research on its impact is limited, this kind of immersive environment offers several benefits for teacher learning, including addressing problems that new teachers commonly face and providing instant feedback that teachers can use to improve their knowledge and skills.

3 Video

One of video's greatest (and often underused) benefits is as an in-class personalized teacher support tool. Here are two ways this can work:

Video for co-teaching. In Indonesia, as part of a program to help teachers use technology, EDC used two-way video to connect teachers who were new to technology to a master teacher so the two could co-teach a technology-based lesson that the novice technology user found particularly difficult. Using TeamViewer, the master and novice teachers co-planned, co-taught, and co-reflected on the lesson.

Video for coaching. The University of Alabama's Project TEACH (projectteach.ua.edu) developed a "virtual bug in the ear"—a Bluetooth-enabled earphone that teachers wear to receive real-time coaching from an off-site coach who observes the classroom via Skype over an HD webcam. EDC used this approach for live in-class coaching in Indonesian classrooms with good internet bandwidth. Because most female teachers wear jilbabs, or traditional Indonesian Muslim head coverings, that covered the earpieces, the devices were invisible to the students.

In both of these examples, teachers receive "just-in-time" and "just-as-needed" support. These uses of video are powerful because they bring models of good practice and support directly into the teacher's classroom, particularly in areas where teachers may lack access to face-to-face expertise, support, and teacher exemplars.

In the classroom, the in-school, novice teacher (front) prepares students to ask a question of the video-based co-teacher.

Using video conferencing, an offsite master teacher co-teaches with a novice teacher and students in a remote Indonesian school.

Four Trends Leading the Way

Many factors could impede widespread adoption of many of these technologies, not the least of which are cost, technical issues (especially around bandwidth), the lack of a common platform among mobile devices, and content and design issues. However, a number of technical, demographic, and educational trends cumulatively suggest that these five technologies stand a good chance for widespread adoption as teacher PD tools.

Greater Understanding of Teacher-Centered PD

There is a growing consensus that optimal PD is school based, just in time, individualized, and collaborative, and that it models intended practices and comes with ongoing in-class support. There is also an increasing understanding that technology can play an important role in PD because it is easy to use and multimodal, has multiple entry points, and facilitates networking and collaboration.

The technologies in this article reflect optimal uses of technology for teacher learning, as cited in the MacArthur Foundation study *Building the Field of Digital Media and Learning* (bit.ly/12SI6mL): They are participatory, offer multiple entry points to users, have "low barriers to expression and engagement," and offer "informal mentorship and connections to other people."

Continual Developments in Technology Design

Major developments in technology have already changed the PD game, including the:

- Diversification of the web as a platform
- Proliferation of digital content and the devices that support diversified web applications and content
- Increases in bandwidth and the processing and graphics power of computing devices
- Miniaturization and personalization of computing devices

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Social Media

Though social media are popular teacher collaboration tools, they are still often used primarily for informal learning or as adjuncts to online courses. However, EDC's research has found that social media offer greater differentiated and individualized learning than the standard, one-size-fits-all online courses delivered through a learning management system. They are simple to use, offer highly personalized content and instruction, and allow teachers to share ideas and collaborate with a more intimate group of colleagues within micro-networks or "social nicheworks." And their often bite-sized offerings allow teachers to drop in and out of learning experiences as desired.

The promise of social media as a mainstream teacher learning tool continues to improve as a result of ongoing improvement in both app development and enhancements in the utility and functionality of social media sites. For example, professional social networking sites, such as Edmodo, mimic many of the social features of Facebook but have additional professional functionality that allows teachers to join groups, attend lectures, co-develop activities, participate in blogs, and more.

While research on social media is limited, their real power—providing access to personal learning networks (PLNs)—is well documented. PLNs allow teachers across distances to establish and nurture strong professional relationships as they share ideas, content, and strategies and collaborate on lessons and activities. This kind of sharing has the immediate benefit of bringing resources and expertise to teachers who may lack both. This is particularly valuable for young teachers wrestling with the first year of teaching. Developing networked relationships can also influence the effective functioning of groups engaged in knowledge-intensive work, lay the foundation for professional learning communities, and provide learning opportunities to teachers isolated by geographic distance.

- Convergence of technology applications and platforms

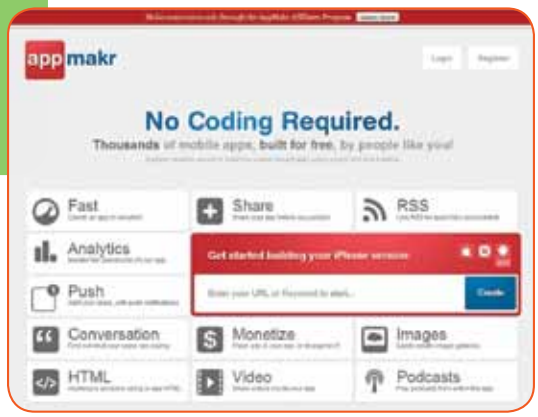
For example, despite the startup difficulties of Google TV and Apple TV and proprietary restrictions by TV manufacturers, the trend toward IPTV and all versions of web-enabled TV is expanding globally. By 2016, it's estimated that 400 million households will have some type of web-enabled television, while 1.5 billion people will own some device that will connect televisions to the internet. Many HD televisions and companies offer backup video services, mobile services (such as podcasting and programming via cell phones), easier connections to laptops, and libraries of web apps that allow users to immediately stream high-resolution video content to cell phones. Many consider programming such as The Teaching Channel (www.teachingchannel.org) to be an optimal teacher-learning vehicle because it offers personalized and differentiated learning.

Rapid Global Growth in Affordable Access

Since 2000, Asian growth rates in broadband internet, cellular, and mobile coverage have far outpaced those in other parts of the globe. According to a 2010 U.S. Department of Commerce survey, households in Hong Kong, South Korea, and Singapore have nearly universal access to broadband internet service (99%, 97%, and 96%, respectively), compared to 69% access in the United States. Their access is also cheaper: One megabit per second is less than $0.001 in Japan and $0.21 in South Korea, versus $1.10 in the United States, according to a 2012 Organisation for Economic Cooperation and Development survey.

This means that the type of rich, streaming, full-motion video and digital media that are the crux of IPTV or immersive environments are available and affordable to many Asian teachers and will be more prevalent as incomes rise and costs drop. Even in Asian countries without universal access to broadband

Mobile Technologies



The convergence of the internet, video, and mobile platforms has redefined reading, writing, literacy—and indeed, all learning. All of the technologies mentioned in this article are available on mobile devices (cell phones, MP3 players, and tablets), the technology that appears most promising for personalized teacher PD.

In Asia and Africa, where most of the world's teachers reside, mobile devices are an alternative way to engage teachers in the learning and teaching process. For example, in Niger—where teachers must instruct in, but do not speak, French—teachers receive language and literacy PD via their cell phones. In Zambia and Malawi, they use MP3 players to study examples of good instruction and hone their content skills. And in South Korea, the Korean National Open University (KNOU) has transferred all of its online courses, including lectures, multimedia applications, and IPTV programming, to mobile devices. For approximately $2 per month, all KNOU students, including preservice teachers, get a smartphone to access their online courses.

Much of the excitement surrounding smartphones and tablets as PD tools focuses on the increasing availability and variety of low-cost or free apps, which serve as distribution channels to provide educational content to teachers. Though still largely geared toward student and teacher productivity, apps can offer teachers increasingly robust professional learning opportunities as well. Many students and teachers are even creating their own apps with do-it-yourself app creating tools, such as AppMakr (www.appmakr.com).

Together, smartphones and apps allow teachers to capitalize on what many see as the future of the web: "the fully mobile web," a platform that is mobile and differentiated, resides on a teacher's learning device, and offers access to a customized menu of PD opportunities via changeable and customizable apps at the time and place of the teacher's choosing.

internet, such as Indonesia, China, and India, cellular coverage is prevalent (and cheap, in the case of India).

UNESCO reports that while most Asians don't own laptops, they do own and use mobile phones at rates that far outstrip the rest of the world. The two areas of the globe with the most acute teacher education needs are sub-Saharan Africa and South Asia, particularly India. Sub-Saharan Africa, despite having an internet penetration rate of only 12%, has the fastest cell phone subscriber growth rate in the world. South Africa is a global leader in mobile-based learning initiatives. India, meanwhile, adds more cell phone subscribers per month than any country in the world. Since the debut of the $50 Aakash tablet, India has also become an incubator of rival low-cost, multifunctional tablets, which should inevitably benefit teachers and other consumers.

Sociotechnical Practices in Key Demographics

Today's teens will be the teachers of tomorrow. And how do they learn? How do they interact with technology? They watch internet TV on mobile devices, engage in immersive environments and virtual worlds, participate in social networks, and communicate via two-way video. They own smartphones, which they see as extensions of themselves and use for a variety of purposes—recreational, personal, educational, and economic. They spend one of every seven minutes on Facebook. They create and share content and are active participants in an array of online micronetworks.

If we drill down further into the "teachers of the future" demographic, we see that in most countries, the majority of the teaching force—at least at the primary school level—is female. Women are greater consumers of visual content than men, and they use technology more for collaboration and problem solving. And, while gaming remains a male-dominated enterprise, women are increasingly becoming serious gamers. In some countries, including the United States, almost half of gamers are women. Finally, in most regions of the globe, women are more enthusiastic users of social media than men.

Given these age- and gender-influenced uses of technology, it is not a stretch to suggest that future teachers across the globe will want to participate in the kinds of technology-based learning that they already find familiar while using the technology tools they already own.

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