Breaking Boundaries with Technology

The mind is not a vessel to be filled, but a fire to be kindled ~ Plutarch

This quote nicely captures some of the ideas I have been knitting together as I think about the boundaries we can break through the use of technology. What fun it has been to brainstorm lists of digital tools that can (and have) revolutionized our classroom traditions and stimulated new approaches to teaching and learning. But while there is joy in thinking about LMSes and CMSes and BYOD initiatives, a vast litany of technology acronyms means little unless we consider the needs of our students and what structures accompany these initiatives to allow students to flourish. To kindle students’ fires, as Plutarch suggests.

Learners excel and they struggle. They come to school motivated, and sometimes discouraged. The have many cultures and they speak many languages. They come from families with strong traditions and they have interests and skills that transcend school walls. They need us to be creative in helping them to access content in ways that some other students do naturally or without accommodations. We are compelled to find a way to provide opportunities for learning and success for each and every one of our unique students.

There are formal and informal structures that schools use to meet the needs of all learners. Some of these include Response to Intervention, Data-Driven Instruction, Professional Learning Communities, and Instructional Frameworks such as “The Gradual Release of Responsibility.” Within those structures, we must leverage tools and resources to extend our ability to meet the needs of a diverse range of students. Technology empowers us to foster success for our learners that our hands and minds alone might not otherwise be able to do.

In their position statement on the Common Core State Standards, the International Society for Technology in Education (ISTE, 2014) states “technology, used effectively, can help all students meet and exceed the rigorous learning goals embedded in the Common Core State Standards by providing access to tools and resources that personalize instruction and by creating rich, engaging and relevant learning environments.” Use of effective technology creates opportunity to overcome boundaries that challenge us in our teaching practice: boundaries set by time, space, attitudes about the role of teachers and learners, content, and even culture. Breaking through these boundaries is a critical step in the effort to reach all students and support their progress toward self-actualization and self-fulfillment.

Overcoming Time Boundaries

Ask any teacher “What resource do you lack the most?” and “time” is quite often the answer. Time is the manna of our profession - time with students, time to collaborate, time to plan, time to communicate with parents. Time is measured carefully in our field: seat time, minutes of instruction, contract hours, block schedules, snow days, zero periods, and so on.

Not long ago, the vast majority of us expected learners to follow a prescribed pattern of receiving content at school and practicing skills at home. Web-enabled and cloud-based technologies challenge this paradigm. These tools allow us to leverage easily published digital content to replace the traditional lesson or lecture with more classroom activity, whether for enrichment or remediation.

An example of the way educators are thinking differently about time through technology is flipped learning. Flipped learning is an approach in which “direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into
a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter” (Flipped Learning Network, 2014). Although this definition does not distinctly imply the use of technology, there are many tools that make this not only possible, but a rich and engaging experience for students.

Khan Academy (khanacademy.org) is another flipped learning tool, with a specific focus on direct instruction videos. Khan Academy enables students to access tutorials, interactive challenges, and assessments, all from web-connected devices. Topics range from early elementary math to test prep for AP Art History. Teachers, or as Khan Academy refers to them – Coaches, can set up accounts and classrooms and prescribe specific content to students based on particular needs.

As the model of Khan Academy suggests, two of the tools required for effective flipping are screen capture and a learning management systems (LMS). On the one hand, screen capture enables creation of instructional videos. On the other, a LMS enables organization of content. Screen capture applications, such as Camtasia, enable users to make their own video lessons and distribute them through YouTube or Screencast.com. Once lessons are constructed, a LMS helps organize content, such as documents, self-assessment quizzes, and discussion boards. Two popular LMSes for K-12 educators include Moodle (moodle.org) and Edmodo (edmodo.com).

Despite these amazing technological innovations and formats, flipped learning may not translate to more time for either students or educators. What it does accomplish is the affordance of more meaningful time for teachers to facilitate rich learning experiences with the limited time that is available. For example, less time required for whole group instruction leaves more time for differentiation, extending student thinking, or to support individual students with interventions.

**Challenging Space Boundaries**

The tools we use for the flipped classroom also push boundaries of physical space. Online content provides a way for students to learn concepts outside of the formal setting we typically associate with a brick-and-mortar environment. Khan Academy, Curriki (curriki.org), and CK12 (ck12.org) allow students access to online content that they may not have otherwise. Moreover, limitations on expertise in teaching staff or course offerings in remote locations can be overcome with the litany of online learning options available to students.

An example of the way educators are overcoming space boundaries is with tools like CK-12, which provides open-source content and applications to help teachers provide learning opportunities for students, regardless of location. Platforms like CK-12 are free, geared toward multiple modalities and learning, and customizable. These qualities encourage experimentation and innovation and stretch space boundaries, as well as boundaries associated with pedagogy.

An effort similar to CK-12 is the Office of Superintendent of Public Instruction Digital Learning Department (http://digitallearning.k12.wa.us/oed/). One initiative of the Department is to assess the quality of online content and make it accessible to educators in Washington. A notable feature of OSPi’s Online and Alternative Learning activities is the explicit effort to connect content to Common Core standards, as well as to supplement existing state and district programs for learners with specific needs.

Another boundary breaking technology are digital textbooks, or eBooks (books.com), which are making their way into mainstream classroom environments. Use of digital textbooks appear to be accelerating with the proliferation of mobile devices and participation of large publishing companies. For example, Pearson recently partnered with Overdrive to supply e-versions of their textbooks using a subscription process, making the physical textbooks somewhat obsolete – at least for those with devices able to access eBooks. Another advantage of eBooks is many local public libraries stock digital copies for patron checkout, which likely increases convenience and access for most.

Massive Open Online Courses (MOOCs) are yet another approach to breaking space boundaries. One vendor of MOOCs is Coursera (coursera.org), which offers online courses from top university partners through an Internet interface, making content open to all learners, regardless of physical location, background, or level of previous knowledge.

Another intriguing development are apps such as iBooks Author (apple.com/ibooks-author), which enables anyone to publish their own content. iBooks are not just for text, however, since users may include video, images, and other interactive tools. Access to these kinds of applications is exerting pressure on publishers like Pearson and Houghton Mifflin to include similar interactive features in their textbooks, rather than just a static PDF for eBook reading. Self-publishing continues to stretch space boundaries by changing the hierarchy of who controls information. In a world where my 8-year old daughter can produce her own story, picture book, or video tutorial, it is easy to see that the relationship between expert and pupil is shifting.

**Dismantling Culture and Language Boundaries**

Barriers between learners of different languages and culture are also changing. One indication of this is the various educational content that can be accessed via the Internet, in multiple modalities. Consider one example, YouTube. My older daughter spends a lot of time on YouTube. I recall watching funny cat videos with her, until her interests changed. She began watching educational videos. Several channels she now follows are published by educators from other countries. On more than one occasion I have observed her watching science experiments conducted by someone from Russia, or China, with English subtitles. We live in a constantly shrinking world, where language and cultural boundaries are fragmenting. The personal anecdote of my daughter and her interest in educational videos is one example, among many.

The connection to schools is apparent. Educators across the country are experiencing increases in English language learner enrollments in almost every state. Economic improvements are contributing to changing demographics. This diversity manifests in our classrooms where students have contact with people of other cultures and languages. Nevertheless, in less diverse classrooms, technology enables cultural and language enrichment through various Internet applications.

One way to transcend cultural and language boundaries is by having a face-to-face conversation. Along with Skype, Google Hangouts includes video chat, and conversations can be recorded and shared on YouTube. Google Helpouts (helpouts.google.com) is another application that enables face-to-face interactions over the
Helpouts facilitates getting help from an expert via video chat. Topics and audiences vary, and include teachers, counselors, doctors, home repair specialists, personal trainers, hobby enthusiasts, and more. Searching on the topic of “culture” produces dozens of results, including sessions for learning Russian and Chinese.

While digital technologies breakdown language barriers, they also facilitate intercultural exchange, such as learning a new language. Indeed, there is a plethora of technology-based ways to learn a new language on all kinds of devices, mobile or otherwise. Duolingo (duolingo.com) is one that incorporates gamification to make learning a language motivating and engaging. One independent study showed that 34 hours of Duolingo as equivalent to 11 weeks of traditional course instruction (Vesselinov & Grego, 2012). Although these results are very preliminary and have yet to be reproduced or published in a peer reviewed journal, they are intriguing.

A final example of dismantling culture and language boundaries is by promoting alternative perspectives. Perspective-taking comes in all forms and sometimes understanding and empathy results from new knowledge of other people and places. Perspective, through the lens of geography, is an example and the app that comes to mind for promoting alternative viewpoints is Google Earth. Google Earth provides high quality images that students can process to understand geography and how environment shapes culture. Making observations through Google Earth may be especially powerful for those students who remain close to home, and travel little outside of their regular communities.

### Conclusion

Technology overcomes, challenges, and dismantles existing boundaries of time, space, and culture. Technology tools are forcing us to question whether these boundaries even exist. Some may suggest that perceived limits to a subject area or sphere of activity binds what students learn, how students learn, and where students learn. However, the elegant and informative chaos of the Internet is either broadening or invalidating these limits. The learning tools that are available have tremendous potential to connect students to expert knowledge wherever and whenever it may be needed. What will classrooms look like when more educators embrace the notion of boundless learning experiences for all? We are already seeing the impact on libraries, where books still exist, but digital material is curated for students at a scale most librarians likely had not anticipated even a few years ago. The sky seems to be the limit as various innovations emerge, not the least of which include wearable devices, home-based 3D printing, assistive technology, and new formats for using these inventions such as bring your own device, flipped learning, and adaptive computer-based instruction. The potential for these tools to narrow learning gaps for many students seems promising. At the same time, something more important is occurring. These innovations and ideas are breaking-down boundaries.

### References


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